# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212001 2005 $BX_9$ | 16.9 | $X$ | 8.05116 | 3.05095 | 340.07996 | 3.06408 | 0.0804292 | 0.27932978 | 2.3177036 | 21 | 10 19.7 | 19.4 |
| 212002 2005 $BU_{10}$ | 16.5 | $X$ | 219.25211 | 125.50430 | 281.31856 | 5.15608 | 0.1088988 | 0.26525048 | 2.3990093 | 21 | 6 2.0 | 20.0 |
| 212003 2005 $BL_{11}$ | 16.9 | $X$ | 249.40916 | 296.99277 | 111.51813 | 2.19779 | 0.1843858 | 0.27058687 | 2.3673633 | 21 | 6 30.9 | 20.3 |
| 212004 2005 $BC_{13}$ | 15.9 | $X$ | 276.07737 | 94.64342 | 308.36455 | 10.15039 | 0.0912012 | 0.21413896 | 2.7669773 | 21 | 8 8.1 | 19.5 |
| 212005 2005 $BW_{16}$ | 17.4 | $X$ | 133.59504 | 89.78364 | 53.81919 | 2.87622 | 0.1301884 | 0.26588947 | 2.3951642 | 21 | 7 10.8 | 20.8 |
| 212006 2005 $BM_{22}$ | 17.0 | $X$ | 244.74372 | 276.24562 | 103.78283 | 3.20697 | 0.2534215 | 0.26711057 | 2.3878589 | 21 | 5 13.9 | 20.9 |
| 212007 2005 $BC_{24}$ | 16.7 | $X$ | 198.16112 | 19.56265 | 112.69656 | 4.95217 | 0.1025885 | 0.27188456 | 2.3598244 | 21 | 9 5.3 | 20.0 |
| 212008 2005 $BU_{24}$ | 16.6 | $X$ | 89.79525 | 196.81247 | 345.56946 | 5.78818 | 0.0426526 | 0.26271392 | 2.4144265 | 21 | 6 26.9 | 19.6 |
| 212009 2005 $BD_{27}$ | 15.9 | $X$ | 168.55511 | 179.43110 | 29.94745 | 24.31495 | 0.2040115 | 0.27831253 | 2.3233477 | 21 | 11 3.9 | 19.7 |
| 212010 2005 $BH_{33}$ | 16.6 | $X$ | 207.31487 | 346.23039 | 304.03561 | 6.15009 | 0.1233077 | 0.24149260 | 2.5538781 | 21 | — | — |
| 212011 2005 $CM_2$ | 17.0 | $X$ | 84.95070 | 129.54337 | 91.13480 | 4.02493 | 0.1272381 | 0.26556745 | 2.3971000 | 21 | 8 28.8 | 20.1 |
| 212012 2005 $CV_2$ | 16.7 | $X$ | 110.70485 | 160.25614 | 31.64981 | 2.98494 | 0.1443111 | 0.26460977 | 2.4028803 | 21 | 8 21.9 | 20.2 |
| 212013 2005 $CO_4$ | 16.5 | $X$ | 149.03653 | 189.24692 | 357.94065 | 2.98129 | 0.1082881 | 0.27091706 | 2.3654393 | 21 | 9 22.6 | 20.0 |
| 212014 2005 $CX_4$ | 16.2 | $X$ | 243.65685 | 341.35226 | 57.08702 | 3.30251 | 0.1665707 | 0.26714815 | 2.3876350 | 21 | 6 12.7 | 19.7 |
| 212015 2005 $CJ_6$ | 17.1 | $X$ | 145.07212 | 336.02331 | 158.32477 | 2.75324 | 0.1598955 | 0.26248446 | 2.4158334 | 21 | 7 11.9 | 20.8 |
| 212016 2005 $CA_{11}$ | 17.0 | $X$ | 172.14797 | 44.32166 | 22.96527 | 3.49210 | 0.1495467 | 0.25870109 | 2.4393300 | 21 | 5 10.9 | 20.7 |
| 212017 2005 $CP_{11}$ | 17.3 | $X$ | 170.77217 | 115.09471 | 356.45563 | 3.06106 | 0.1699786 | 0.26485280 | 2.4014101 | 21 | 7 8.1 | 21.0 |
| 212018 2005 $CG_{13}$ | 16.8 | $X$ | 271.69670 | 75.98724 | 347.55835 | 6.45821 | 0.0890630 | 0.27445834 | 2.3450481 | 21 | 9 5.3 | 19.3 |
| 212019 2005 $CJ_{13}$ | 17.0 | $X$ | 98.08185 | 119.47938 | 80.70754 | 3.43450 | 0.1642791 | 0.26398084 | 2.4066953 | 21 | 8 21.2 | 20.4 |
| 212020 2005 $CD_{14}$ | 16.3 | $X$ | 56.40014 | 290.47415 | 333.47977 | 9.11338 | 0.2132708 | 0.26665170 | 2.3905976 | 21 | 9 28.2 | 19.4 |
| 212021 2005 $CK_{15}$ | 16.9 | $X$ | 170.17227 | 205.28681 | 271.94740 | 2.80395 | 0.0777807 | 0.26696750 | 2.3887120 | 21 | 7 12.9 | 20.3 |
| 212022 2005 $CY_{15}$ | 17.5 | $X$ | 181.30838 | 272.92785 | 200.30919 | 0.77892 | 0.1403990 | 0.26767278 | 2.3845142 | 21 | 7 19.9 | 21.1 |
| 212023 2005 $CE_{19}$ | 17.3 | $X$ | 106.48393 | 283.95246 | 264.90204 | 1.52146 | 0.1239320 | 0.26475184 | 2.4020206 | 21 | 8 8.7 | 20.6 |
| 212024 2005 $CZ_{20}$ | 16.6 | $X$ | 171.57822 | 38.08139 | 85.93604 | 3.02407 | 0.1288970 | 0.26587764 | 2.3952352 | 21 | 7 24.9 | 20.3 |
| 212025 2005 $CZ_{21}$ | 17.4 | $X$ | 112.20074 | 97.56220 | 66.03626 | 3.23690 | 0.1325248 | 0.26245807 | 2.4159954 | 21 | 7 13.7 | 20.8 |
| 212026 2005 $CY_{22}$ | 16.8 | $X$ | 125.17253 | 99.24798 | 35.99595 | 4.74747 | 0.1209818 | 0.26047143 | 2.4282645 | 21 | 6 18.1 | 20.2 |
| 212027 2005 $CV_{24}$ | 16.3 | $X$ | 110.99056 | 262.97350 | 232.38846 | 7.01463 | 0.1027790 | 0.25884313 | 2.4384374 | 21 | 5 29.8 | 19.4 |
| 212028 2005 $CT_{26}$ | 16.8 | $X$ | 332.04753 | 118.17520 | 72.04313 | 3.85102 | 0.0671065 | 0.24185343 | 2.5513373 | 21 | 1 13.9 | 20.1 |
| 212029 2005 $CW_{27}$ | 17.0 | $X$ | 204.29911 | 268.22887 | 187.27676 | 9.99360 | 0.1183091 | 0.26896382 | 2.3768775 | 21 | 7 19.2 | 20.7 |
| 212030 2005 $CG_{30}$ | 17.2 | $X$ | 195.44491 | 59.59085 | 18.56114 | 2.62499 | 0.1847945 | 0.26492810 | 2.4009551 | 21 | 6 16.7 | 21.0 |
| 212031 2005 $CH_{36}$ | 16.6 | $X$ | 72.17365 | 70.75208 | 117.89178 | 6.18181 | 0.0628693 | 0.26005893 | 2.4308316 | 21 | 6 13.5 | 19.6 |
| 212032 2005 $CL_{36}$ | 17.0 | $X$ | 150.67637 | 97.58986 | 107.64265 | 3.13395 | 0.1548545 | 0.27395521 | 2.3479184 | 21 | 10 19.9 | 20.7 |
| 212033 2005 $CY_{36}$ | 17.1 | $X$ | 260.87299 | 66.04991 | 48.22877 | 6.21808 | 0.0627111 | 0.28030487 | 2.3123254 | 21 | 11 5.9 | 19.6 |
| 212034 2005 $CC_{38}$ | 16.7 | $X$ | 291.34573 | 199.05574 | 38.60922 | 2.86423 | 0.0903169 | 0.24188920 | 2.5510858 | 21 | 1 20.2 | 20.2 |
| 212035 2005 $CU_{45}$ | 17.0 | $X$ | 27.01822 | 291.24395 | 344.61516 | 2.01399 | 0.1766990 | 0.26301537 | 2.4125813 | 21 | 8 25.5 | 19.0 |
| 212036 2005 $CZ_{50}$ | 16.9 | $X$ | 187.54609 | 287.19770 | 160.55439 | 6.39294 | 0.2408743 | 0.26515089 | 2.3996100 | 21 | 6 21.9 | 21.1 |
| 212037 2005 $CF_{51}$ | 16.9 | $X$ | 115.73443 | 177.63942 | 45.98267 | 2.84039 | 0.1646742 | 0.26986156 | 2.3716032 | 21 | 10 9.4 | 20.5 |
| 212038 2005 $CW_{52}$ | 16.4 | $X$ | 25.32345 | 199.51966 | 40.12701 | 3.62382 | 0.1372670 | 0.25723254 | 2.4486052 | 21 | 6 18.7 | 18.6 |
| 212039 2005 $CZ_{52}$ | 16.8 | $X$ | 45.85928 | 175.00168 | 34.60665 | 2.37072 | 0.1595648 | 0.25567620 | 2.4585319 | 21 | 6 15.5 | 19.1 |
| 212040 2005 $CH_{53}$ | 16.5 | $X$ | 109.43246 | 107.92392 | 77.58872 | 3.44067 | 0.1199368 | 0.26265309 | 2.4147993 | 21 | 8 8.8 | 19.8 |
| 212041 2005 $CZ_{56}$ | 16.9 | $X$ | 232.79400 | 312.31689 | 162.78476 | 2.97890 | 0.1113191 | 0.27674894 | 2.3320905 | 21 | 9 21.1 | 20.0 |
| 212042 2005 $CJ_{58}$ | 16.4 | $X$ | 39.91286 | 297.09636 | 281.31149 | 5.35339 | 0.0742560 | 0.25877232 | 2.4388823 | 21 | 6 6.6 | 19.0 |
| 212043 2005 $CW_{63}$ | 16.8 | $X$ | 130.36117 | 108.67035 | 343.71112 | 5.74950 | 0.0941997 | 0.25432998 | 2.4671999 | 21 | 4 21.9 | 20.2 |
| 212044 2005 $CC_{65}$ | 16.9 | $X$ | 153.45062 | 94.07136 | 6.40419 | 3.72462 | 0.1473126 | 0.26058161 | 2.4275800 | 21 | 6 4.5 | 20.7 |
| 212045 2005 $CL_{65}$ | 17.0 | $X$ | 196.59323 | 24.28368 | 82.82556 | 3.05439 | 0.1571973 | 0.26746404 | 2.3857547 | 21 | 7 27.4 | 20.6 |
| 212046 2005 $CP_{67}$ | 16.8 | $X$ | 43.34940 | 154.15415 | 61.86523 | 3.26592 | 0.0426801 | 0.26010441 | 2.4305482 | 21 | 6 5.2 | 19.4 |
| 212047 2005 $CT_{75}$ | 16.4 | $X$ | 104.92503 | 320.63182 | 230.94756 | 3.21285 | 0.1366219 | 0.26451993 | 2.4034243 | 21 | 8 11.2 | 19.8 |
| 212048 2005 $CE_{76}$ | 16.9 | $X$ | 3.03208 | 137.52067 | 150.58285 | 1.37967 | 0.1811501 | 0.26207381 | 2.4183564 | 21 | 7 21.6 | 18.7 |
| 212049 2005 $CD_{79}$ | 16.8 | $X$ | 78.15547 | 10.79653 | 178.39281 | 5.32592 | 0.0904463 | 0.25944580 | 2.4346598 | 21 | 6 27.1 | 19.8 |
| 212050 2005 $EM_8$ | 16.8 | $X$ | 6.33519 | 269.32658 | 337.86655 | 3.93811 | 0.0885859 | 0.25287489 | 2.4766554 | 21 | 5 21.6 | 19.5 |
| 212051 2005 $EP_{11}$ | 17.0 | $X$ | 155.32009 | 337.29335 | 136.69358 | 4.03828 | 0.1375746 | 0.26221862 | 2.4174660 | 21 | 6 24.4 | 20.7 |
| 212052 2005 $EG_{20}$ | 16.5 | $X$ | 113.47686 | 103.22006 | 152.86906 | 3.40433 | 0.1052912 | 0.27438272 | 2.3454790 | 21 | 11 14.7 | 19.8 |
| 212053 2005 $EP_{20}$ | 16.0 | $X$ | 350.07459 | 146.39214 | 143.77821 | 6.84527 | 0.1283893 | 0.25917853 | 2.4363333 | 21 | 6 25.9 | 18.3 |
| 212054 2005 $EC_{21}$ | 15.7 | $X$ | 153.14469 | 196.52025 | 143.19233 | 9.15603 | 0.1125976 | 0.23584999 | 2.5944510 | 21 | 1 1.2 | 19.5 |
| 212055 2005 $ES_{22}$ | 16.7 | $X$ | 52.07458 | 129.10882 | 334.67851 | 11.96101 | 0.2171801 | 0.24341241 | 2.5404320 | 21 | 1 27.0 | 18.8 |
| 212056 2005 $EA_{23}$ | 17.3 | $X$ | 69.23285 | 247.85792 | 329.29146 | 0.40300 | 0.1275826 | 0.25990344 | 2.4318010 | 21 | 7 31.1 | 20.2 |
| 212057 2005 $EH_{25}$ | 16.5 | $X$ | 76.84696 | 117.69451 | 122.41040 | 3.91553 | 0.1331369 | 0.26364859 | 2.4087168 | 21 | 9 14.7 | 19.6 |
| 212058 2005 $EH_{30}$ | 16.9 | $X$ | 79.66219 | 245.16242 | 6.75851 | 5.27008 | 0.1629850 | 0.26640676 | 2.3920627 | 21 | 10 6.5 | 20.1 |
| 212059 2005 $ER_{31}$ | 16.1 | $X$ | 193.41190 | 146.20964 | 155.04301 | 11.88024 | 0.0606487 | 0.23526217 | 2.5987708 | 21 | — | — |
| 212060 2005 $EC_{32}$ | 17.1 | $X$ | 66.20440 | 263.26517 | 350.41636 | 1.70635 | 0.1732831 | 0.26431226 | 2.4046831 | 21 | 9 23.9 | 20.0 |
| 212061 2005 $EJ_{32}$ | 16.6 | $X$ | 209.84279 | 110.19979 | 160.85826 | 3.72998 | 0.1713794 | 0.23063852 | 2.6333878 | 21 | — | — |
| 212062 2005 $EQ_{32}$ | 17.2 | $X$ | 136.48219 | 56.50019 | 126.36708 | 1.28727 | 0.1494651 | 0.26528551 | 2.3987981 | 21 | 9 5.5 | 20.7 |
| 212063 2005 $EB_{33}$ | 16.5 | $X$ | 108.03949 | 334.41565 | 242.50508 | 4.92468 | 0.0664486 | 0.26692350 | 2.3889745 | 21 | 9 9.4 | 19.8 |
| 212064 2005 $EZ_{35}$ | 16.6 | $X$ | 70.19669 | 11.45353 | 230.04193 | 3.94731 | 0.3148313 | 0.26001633 | 2.4310970 | 21 | 9 29.8 | 20.2 |
| 212065 2005 $ER_{36}$ | 16.6 | $X$ | 34.26551 | 189.87308 | 54.54444 | 3.81405 | 0.1506838 | 0.25879531 | 2.4387378 | 21 | 7 17.3 | 18.9 |
| 212066 2005 $EQ_{39}$ | 16.5 | $X$ | 358.23199 | 298.08238 | 315.66654 | 6.04319 | 0.0899265 | 0.25847923 | 2.4407256 | 21 | 5 15.4 | 19.3 |
| 212067 2005 $ER_{40}$ | 16.4 | $X$ | 64.46556 | 129.13688 | 135.05075 | 3.06207 | 0.1907617 | 0.26390941 | 2.4071295 | 21 | 10 10.1 | 19.6 |
| 212068 2005 $EW_{43}$ | 16.2 | $X$ | 353.27200 | 304.62530 | 187.32337 | 3.57898 | 0.1168283 | 0.23764475 | 2.5813718 | 21 | — | — |
| 212069 2005 $EV_{49}$ | 16.8 | $X$ | 194.89656 | 50.49815 | 33.33167 | 4.85020 | 0.1355153 | 0.26240189 | 2.4163402 | 21 | 6 24.9 | 20.6 |
| 212070 2005 $EP_{53}$ | 16.7 | $X$ | 7.13710 | 331.91995 | 154.23413 | 4.66886 | 0.1051130 | 0.23694706 | 2.5864366 | 21 | — | — |
| 212071 2005 $ED_{56}$ | 17.5 | $X$ | 64.11095 | 111.17759 | 180.81778 | 1.27145 | 0.1733096 | 0.27029910 | 2.3690432 | 21 | 11 12.8 | 20.5 |
| 212072 2005 $EL_{58}$ | 16.4 | $X$ | 339.21137 | 90.38775 | 194.79281 | 4.24851 | 0.0626631 | 0.25566241 | 2.4586203 | 21 | 6 3.7 | 19.3 |
| 212073 2005 $EF_{65}$ | 16.9 | $X$ | 56.81980 | 315.58441 | 155.80351 | 1.88869 | 0.1164297 | 0.24380311 | 2.5377172 | 21 | 2 5.9 | 19.3 |
| 212074 2005 $EG_{65}$ | 16.1 | $X$ | 324.74619 | 315.77236 | 160.12229 | 8.82907 | 0.0552490 | 0.22831455 | 2.6512275 | 21 | — | — |
| 212075 2005 $EK_{71}$ | 16.4 | $X$ | 100.04743 | 126.45312 | 25.17767 | 5.57298 | 0.0917293 | 0.25813297 | 2.4429077 | 21 | 6 4.2 | 19.6 |
| 212076 2005 $EQ_{75}$ | 17.1 | $X$ | 45.80795 | 96.00158 | 354.26924 | 9.89228 | 0.2115437 | 0.23889015 | 2.5723924 | 21 | — | — |
| 212077 2005 $EB_{76}$ | 17.3 | $X$ | 44.51996 | 208.83242 | 353.41034 | 2.28496 | 0.1391061 | 0.25280027 | 2.4771427 | 21 | 5 29.1 | 19.7 |
| 212078 2005 $EL_{79}$ | 15.9 | $X$ | 326.42240 | 1.96853 | 146.98951 | 13.74000 | 0.1152298 | 0.23238605 | 2.6201692 | 21 | — | — |
| 212079 2005 $EX_{82}$ | 17.3 | $X$ | 324.58730 | 247.62064 | 322.93639 | 3.53598 | 0.1496195 | 0.24028313 | 2.5624409 | 21 | 1 18.2 | 20.4 |
| 212080 2005 $EJ_{84}$ | 16.6 | $X$ | 52.93252 | 202.69537 | 345.63050 | 10.66550 | 0.1701644 | 0.25506517 | 2.4624567 | 21 | 5 25.5 | 19.4 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212081 2005 $EM_{96}$ | 16.3 | $X$ | 12.89639 | 311.93604 | 263.52284 | 6.33022 | 0.0491693 | 0.25340929 | 2.4731722 | 21 | 4 15.2 | 19.4 |
| 212082 2005 $EA_{97}$ | 16.4 | $X$ | 7.75429 | 292.82046 | 154.41927 | 13.58996 | 0.1019464 | 0.23251803 | 2.6191777 | 21 | — | — |
| 212083 2005 $ES_{101}$ | 15.6 | $X$ | 248.78181 | 207.91001 | 5.73462 | 14.34575 | 0.0208159 | 0.22679935 | 2.6630226 | 21 | — | — |
| 212084 2005 $EE_{114}$ | 16.9 | $X$ | 247.28843 | 273.31914 | 163.95899 | 6.41323 | 0.1018940 | 0.26917443 | 2.3756375 | 21 | 8 17.5 | 19.9 |
| 212085 2005 $EZ_{114}$ | 17.1 | $X$ | 47.25639 | 113.67667 | 150.57275 | 2.99232 | 0.2629198 | 0.25980889 | 2.4323910 | 21 | 9 27.8 | 19.9 |
| 212086 2005 $ED_{115}$ | 17.0 | $X$ | 81.41636 | 223.80114 | 156.72270 | 2.80934 | 0.1129306 | 0.23045523 | 2.6347839 | 21 | — | — |
| 212087 2005 $EO_{119}$ | 15.8 | $X$ | 62.95436 | 261.04019 | 181.08586 | 21.61486 | 0.1177293 | 0.23628633 | 2.5912560 | 21 | 1 7.3 | 19.2 |
| 212088 2005 $EY_{121}$ | 16.7 | $X$ | 348.06469 | 111.77465 | 181.93438 | 8.87978 | 0.1350682 | 0.25837079 | 2.4414084 | 21 | 6 26.5 | 19.2 |
| 212089 2005 $EA_{124}$ | 16.8 | $X$ | 328.34612 | 157.40968 | 46.89568 | 2.79503 | 0.0752930 | 0.24021492 | 2.5629260 | 21 | 1 26.8 | 19.9 |
| 212090 2005 $EK_{124}$ | 16.5 | $X$ | 83.11542 | 66.61133 | 167.68269 | 6.99133 | 0.0801720 | 0.26310890 | 2.4120096 | 21 | 9 5.0 | 19.4 |
| 212091 2005 $EP_{125}$ | 16.6 | $X$ | 144.86604 | 200.30766 | 180.84380 | 3.24868 | 0.0616004 | 0.23856006 | 2.5747648 | 21 | 2 4.9 | 20.2 |
| 212092 2005 $EQ_{126}$ | 17.3 | $X$ | 202.69653 | 304.69440 | 13.23939 | 7.56394 | 0.1670791 | 0.29405765 | 2.2396547 | 21 | 1 20.9 | 20.8 |
| 212093 2005 $EM_{129}$ | 16.6 | $X$ | 280.35464 | 351.64512 | 303.02643 | 6.06569 | 0.1213483 | 0.25403687 | 2.4690973 | 21 | 3 11.8 | 20.1 |
| 212094 2005 $ER_{136}$ | 16.5 | $X$ | 343.60474 | 141.57530 | 54.52453 | 5.60431 | 0.0344077 | 0.24209842 | 2.5496158 | 21 | 2 12.9 | 19.8 |
| 212095 2005 $EY_{137}$ | 16.5 | $X$ | 312.17394 | 221.37820 | 49.34263 | 2.09675 | 0.0166118 | 0.24642426 | 2.5196898 | 21 | 4 10.4 | 19.6 |
| 212096 2005 $EH_{138}$ | 16.5 | $X$ | 52.02288 | 114.04260 | 112.27921 | 8.35770 | 0.1577236 | 0.25663606 | 2.4523978 | 21 | 7 22.6 | 19.2 |
| 212097 2005 $EY_{138}$ | 16.5 | $X$ | 134.88367 | 77.30166 | 177.62583 | 4.14286 | 0.0568268 | 0.21328241 | 2.7743805 | 21 | 11 24.9 | 20.5 |
| 212098 2005 $EL_{139}$ | 16.2 | $X$ | 174.53908 | 187.56912 | 52.02023 | 3.37492 | 0.0307540 | 0.21778224 | 2.7360314 | 21 | 12 21.1 | 20.1 |
| 212099 2005 $EX_{139}$ | 16.1 | $X$ | 283.72036 | 224.24479 | 354.12575 | 11.63465 | 0.1651074 | 0.23236966 | 2.6202925 | 21 | — | — |
| 212100 2005 $EX_{151}$ | 16.0 | $X$ | 215.68710 | 282.65407 | 55.66118 | 4.05563 | 0.0785767 | 0.24157247 | 2.5533151 | 21 | 3 6.2 | 19.8 |
| 212101 2005 $ET_{153}$ | 15.8 | $X$ | 48.28460 | 32.58648 | 75.38361 | 23.02033 | 0.0803523 | 0.23953766 | 2.5677546 | 21 | 1 18.7 | 19.1 |
| 212102 2005 $EH_{154}$ | 16.2 | $X$ | 353.31749 | 177.66032 | 4.12357 | 12.72666 | 0.1934354 | 0.24021408 | 2.5629320 | 21 | 1 19.3 | 19.2 |
| 212103 2005 $EP_{154}$ | 15.8 | $X$ | 103.00440 | 57.37041 | 11.67837 | 14.83933 | 0.0727939 | 0.24009128 | 2.5638058 | 21 | 2 21.8 | 19.3 |
| 212104 2005 $EH_{156}$ | 16.7 | $X$ | 169.07765 | 143.69638 | 19.23342 | 6.75186 | 0.1268859 | 0.27150533 | 2.3620213 | 21 | 9 13.9 | 20.2 |
| 212105 2005 $EV_{159}$ | 16.8 | $X$ | 295.89312 | 83.01030 | 176.97929 | 13.21500 | 0.2511889 | 0.24008608 | 2.5638428 | 21 | 1 31.1 | 20.9 |
| 212106 2005 $EE_{161}$ | 17.4 | $X$ | 30.19414 | 109.64859 | 21.65515 | 4.60278 | 0.1690203 | 0.23954378 | 2.5677109 | 21 | 1 18.2 | 19.8 |
| 212107 2005 $ET_{161}$ | 16.5 | $X$ | 211.63517 | 141.69132 | 169.96276 | 5.29586 | 0.1393045 | 0.23440531 | 2.6051001 | 21 | 1 26.5 | 20.6 |
| 212108 2005 $EV_{169}$ | 15.9 | $X$ | 323.83009 | 130.60270 | 97.15905 | 25.42464 | 0.2419315 | 0.23824465 | 2.5770367 | 21 | 1 26.4 | 19.5 |
| 212109 2005 $EY_{170}$ | 16.0 | $X$ | 262.55975 | 269.94648 | 314.93345 | 16.44318 | 0.1496736 | 0.23252724 | 2.6191085 | 21 | — | — |
| 212110 2005 $EM_{173}$ | 15.8 | $X$ | 144.57280 | 4.19943 | 4.22500 | 11.26494 | 0.1360197 | 0.23858327 | 2.5745978 | 21 | 2 2.8 | 19.6 |
| 212111 2005 $EE_{174}$ | 16.5 | $X$ | 189.81779 | 345.77594 | 337.92140 | 8.90426 | 0.1247184 | 0.23603649 | 2.5930842 | 21 | 1 22.7 | 20.5 |
| 212112 2005 $ES_{176}$ | 16.2 | $X$ | 1.49706 | 106.45023 | 76.10817 | 15.18495 | 0.1143983 | 0.24160997 | 2.5530510 | 21 | 2 15.6 | 19.4 |
| 212113 2005 $EN_{177}$ | 16.6 | $X$ | 294.56494 | 275.57195 | 12.77618 | 5.80750 | 0.2616022 | 0.24151805 | 2.5536987 | 21 | 3 7.9 | 20.3 |
| 212114 2005 $EW_{179}$ | 17.3 | $X$ | 43.54774 | 221.19262 | 213.07520 | 2.93957 | 0.1370305 | 0.23498757 | 2.6007950 | 21 | — | — |
| 212115 2005 $EP_{184}$ | 15.9 | $X$ | 330.41273 | 207.09962 | 205.37109 | 12.59360 | 0.1143404 | 0.21510367 | 2.7586981 | 21 | 11 14.5 | 19.0 |
| 212116 2005 $ER_{184}$ | 16.3 | $X$ | 349.44468 | 160.15846 | 276.63609 | 2.59261 | 0.0868066 | 0.22247820 | 2.6973941 | 21 | — | — |
| 212117 2005 $EQ_{189}$ | 16.6 | $X$ | 239.30391 | 95.93892 | 149.72203 | 5.11569 | 0.0856629 | 0.23169332 | 2.6253892 | 21 | — | — |
| 212118 2005 $EG_{190}$ | 17.1 | $X$ | 41.96910 | 28.95904 | 218.06818 | 2.02711 | 0.1260780 | 0.26325843 | 2.4110961 | 21 | 7 30.4 | 19.6 |
| 212119 2005 $EC_{191}$ | 16.6 | $X$ | 252.68205 | 31.09771 | 306.37849 | 4.95008 | 0.1558162 | 0.25446259 | 2.4663427 | 21 | 4 2.3 | 20.4 |
| 212120 2005 $EG_{193}$ | 17.1 | $X$ | 31.21928 | 143.22069 | 299.15106 | 1.51152 | 0.0844820 | 0.23319289 | 2.6141219 | 21 | — | — |
| 212121 2005 $EP_{195}$ | 17.5 | $X$ | 16.02662 | 77.21816 | 226.87816 | 0.82362 | 0.1658219 | 0.26206795 | 2.4183925 | 21 | 9 14.3 | 19.5 |
| 212122 2005 $EK_{197}$ | 16.6 | $X$ | 358.09265 | 210.23745 | 342.17355 | 7.23416 | 0.0591606 | 0.24380888 | 2.5376772 | 21 | 2 23.6 | 19.7 |
| 212123 2005 $EB_{198}$ | 17.1 | $X$ | 358.89121 | 349.83338 | 195.91278 | 7.34445 | 0.1812248 | 0.24132323 | 2.5550729 | 21 | 1 29.6 | 19.9 |
| 212124 2005 $EW_{209}$ | 16.8 | $X$ | 321.00373 | 339.94227 | 211.49597 | 2.95280 | 0.0337400 | 0.23771847 | 2.5808381 | 21 | 1 5.8 | 20.3 |
| 212125 2005 $ED_{211}$ | 16.4 | $X$ | 291.64483 | 187.33189 | 349.95884 | 11.87475 | 0.0528466 | 0.23009311 | 2.6375476 | 21 | — | — |
| 212126 2005 $EJ_{217}$ | 17.0 | $X$ | 67.51653 | 57.63859 | 177.10021 | 10.22837 | 0.1372773 | 0.25963028 | 2.4335064 | 21 | 8 22.4 | 20.2 |
| 212127 2005 $EF_{218}$ | 16.0 | $X$ | 50.33911 | 117.58174 | 19.00778 | 15.00396 | 0.1143873 | 0.24195423 | 2.5506287 | 21 | 3 9.3 | 18.9 |
| 212128 2005 $EL_{218}$ | 16.6 | $X$ | 182.43090 | 289.92778 | 194.23911 | 6.84836 | 0.0488283 | 0.26762093 | 2.3848222 | 21 | 8 4.8 | 19.8 |
| 212129 2005 $ED_{219}$ | 16.8 | $X$ | 18.33876 | 243.15245 | 34.00822 | 2.44349 | 0.1992672 | 0.25692744 | 2.4505433 | 21 | 8 12.7 | 18.8 |
| 212130 2005 $ET_{222}$ | 16.0 | $X$ | 343.09778 | 93.33883 | 105.39727 | 12.92607 | 0.1080282 | 0.24154426 | 2.5535139 | 21 | 2 5.2 | 19.1 |
| 212131 2005 $EP_{225}$ | 16.7 | $X$ | 161.47032 | 118.26623 | 0.61280 | 9.70071 | 0.0913017 | 0.26395454 | 2.4068552 | 21 | 7 7.3 | 20.3 |
| 212132 2005 $EV_{230}$ | 16.6 | $X$ | 4.52868 | 304.53408 | 2.86150 | 5.06542 | 0.1812025 | 0.26457308 | 2.4031024 | 21 | 8 29.8 | 18.4 |
| 212133 2005 $EY_{230}$ | 16.1 | $X$ | 292.57316 | 93.92382 | 148.60204 | 12.38157 | 0.1455363 | 0.23850875 | 2.5751340 | 21 | 1 19.9 | 19.9 |
| 212134 2005 $EN_{237}$ | 17.4 | $X$ | 83.34088 | 332.03522 | 125.84513 | 1.92292 | 0.1600022 | 0.24557088 | 2.5255238 | 21 | 3 10.5 | 20.1 |
| 212135 2005 $ED_{241}$ | 16.8 | $X$ | 132.50729 | 64.81243 | 106.24921 | 6.10816 | 0.1054190 | 0.26465946 | 2.4025795 | 21 | 8 14.8 | 20.2 |
| 212136 2005 $EQ_{241}$ | 16.2 | $X$ | 77.17833 | 108.47103 | 102.64469 | 7.10505 | 0.0815736 | 0.26123976 | 2.4235010 | 21 | 7 26.9 | 19.1 |
| 212137 2005 $EF_{251}$ | 17.4 | $X$ | 152.08950 | 268.13452 | 196.01592 | 3.44385 | 0.1020554 | 0.25892862 | 2.4379007 | 21 | 6 5.9 | 20.8 |
| 212138 2005 $EJ_{251}$ | 16.6 | $X$ | 92.00155 | 66.24214 | 99.96676 | 7.01657 | 0.0721663 | 0.25662627 | 2.4524603 | 21 | 6 11.9 | 19.7 |
| 212139 2005 $EF_{253}$ | 16.3 | $X$ | 41.13410 | 22.68406 | 106.84723 | 11.89855 | 0.1041339 | 0.23949000 | 2.5680952 | 21 | 2 6.7 | 19.1 |
| 212140 2005 $EM_{260}$ | 16.9 | $X$ | 297.61476 | 165.09123 | 108.13826 | 2.39737 | 0.1449419 | 0.24157055 | 2.5533287 | 21 | 3 7.0 | 20.2 |
| 212141 2005 $ER_{276}$ | 17.2 | $X$ | 34.23585 | 118.04182 | 6.26522 | 2.55931 | 0.1734903 | 0.23918122 | 2.5703050 | 21 | 1 15.6 | 19.6 |
| 212142 2005 $EN_{277}$ | 16.5 | $X$ | 36.38465 | 163.53620 | 61.19853 | 9.25540 | 0.1548834 | 0.25604942 | 2.4561422 | 21 | 6 19.4 | 18.8 |
| 212143 2005 $EM_{278}$ | 16.8 | $X$ | 260.21595 | 54.52069 | 164.98668 | 5.02826 | 0.2256912 | 0.22827319 | 2.6515477 | 21 | — | — |
| 212144 2005 $EE_{279}$ | 16.8 | $X$ | 39.12149 | 120.66115 | 24.96785 | 11.86178 | 0.0977892 | 0.24146823 | 2.5540499 | 21 | 3 1.3 | 19.8 |
| 212145 2005 $EM_{280}$ | 16.7 | $X$ | 289.46446 | 86.23324 | 138.91527 | 6.87893 | 0.1310814 | 0.23489149 | 2.6015042 | 21 | — | — |
| 212146 2005 $ES_{280}$ | 16.0 | $X$ | 34.12211 | 278.08201 | 11.98393 | 12.37109 | 0.2385811 | 0.26361786 | 2.4089040 | 21 | 10 9.1 | 18.5 |
| 212147 2005 $EX_{280}$ | 15.2 | $X$ | 201.33984 | 278.49864 | 107.22334 | 12.75974 | 0.0267869 | 0.18974353 | 2.9993333 | 21 | 4 28.9 | 19.7 |
| 212148 2005 $EN_{288}$ | 16.9 | $X$ | 51.23705 | 72.75716 | 11.28922 | 2.75348 | 0.1523173 | 0.23618235 | 2.5920165 | 21 | — | — |
| 212149 2005 $EB_{293}$ | 16.1 | $X$ | 243.71383 | 170.72839 | 63.83214 | 10.93281 | 0.1416591 | 0.22774525 | 2.6556438 | 21 | — | — |
| 212150 2005 $EP_{310}$ | 16.8 | $X$ | 294.92884 | 295.25334 | 6.51886 | 1.38941 | 0.1796819 | 0.25315922 | 2.4748006 | 21 | 4 2.5 | 20.1 |
| 212151 2005 $EP_{312}$ | 17.0 | $X$ | 69.24984 | 139.20560 | 183.27722 | 5.97899 | 0.1436828 | 0.27740699 | 2.3284011 | 21 | 12 24.9 | 20.3 |
| 212152 2005 $EA_{314}$ | 16.7 | $X$ | 141.30633 | 306.30947 | 42.41419 | 1.79945 | 0.1294724 | 0.23307147 | 2.6150298 | 21 | 1 1.9 | 20.3 |
| 212153 2005 $EV_{317}$ | 16.5 | $X$ | 295.45725 | 261.68697 | 357.42410 | 8.72496 | 0.1600085 | 0.24091103 | 2.5579866 | 21 | 2 14.1 | 20.2 |
| 212154 2005 $EK_{325}$ | 16.9 | $X$ | 162.87886 | 176.60583 | 138.85735 | 0.71909 | 0.1164496 | 0.22647205 | 2.6655877 | 21 | — | — |
| 212155 2005 $FY_{3}$ | 16.2 | $X$ | 30.64485 | 111.33634 | 127.16966 | 10.62157 | 0.1250698 | 0.25445514 | 2.4663908 | 21 | 6 26.9 | 18.7 |
| 212156 2005 $FB_{8}$ | 15.9 | $X$ | 280.77554 | 108.54481 | 91.93362 | 12.68750 | 0.0198041 | 0.22985032 | 2.6394046 | 21 | — | — |
| 212157 2005 $GF_{5}$ | 16.7 | $X$ | 338.89503 | 134.85029 | 42.47018 | 12.81999 | 0.1736709 | 0.23575333 | 2.5951601 | 21 | — | — |
| 212158 2005 $GL_{5}$ | 16.8 | $X$ | 262.13265 | 175.65166 | 142.50432 | 3.81776 | 0.2144040 | 0.24106492 | 2.5568978 | 21 | 3 18.2 | 20.7 |
| 212159 2005 $GV_{6}$ | 16.2 | $X$ | 289.33767 | 87.21230 | 190.84403 | 15.13280 | 0.1353894 | 0.24077304 | 2.5589638 | 21 | 3 1.1 | 19.9 |
| 212160 2005 $GF_{12}$ | 15.9 | $X$ | 227.94663 | 140.06613 | 151.35186 | 5.83263 | 0.1968592 | 0.23247045 | 2.6195350 | 21 | 1 17.1 | 20.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212161 2005 $GW_{12}$ | 15.0 | X | 120.83908 | 275.75425 | 43.88393 | 16.62369 | 0.3534630 | 0.21538079 | 2.7563312 | 21 | — | — |
| 212162 2005 $GK_{13}$ | 15.9 | X | 275.50060 | 117.26927 | 87.96865 | 12.10779 | 0.1492965 | 0.22860631 | 2.6489713 | 21 | — | — |
| 212163 2005 $GL_{13}$ | 16.3 | X | 238.18433 | 168.64873 | 73.47067 | 11.63404 | 0.1638402 | 0.22694061 | 2.6619174 | 21 | — | — |
| 212164 2005 $GO_{13}$ | 16.0 | X | 252.09161 | 185.29499 | 70.41586 | 14.35038 | 0.1443825 | 0.23100372 | 2.6306116 | 21 | — | — |
| 212165 2005 $GH_{27}$ | 16.7 | X | 53.31463 | 184.96867 | 334.48986 | 3.67391 | 0.0900765 | 0.24687771 | 2.5166035 | 21 | 4 4.9 | 19.6 |
| 212166 2005 $GY_{27}$ | 16.2 | X | 305.64552 | 235.04900 | 8.93974 | 11.53575 | 0.1442148 | 0.23910906 | 2.5708221 | 21 | 2 11.4 | 19.8 |
| 212167 2005 $GR_{41}$ | 17.2 | X | 168.02165 | 308.83479 | 170.72580 | 4.16393 | 0.0192512 | 0.26514092 | 2.3996701 | 21 | 7 11.7 | 20.3 |
| 212168 2005 $GO_{48}$ | 16.5 | X | 8.72089 | 14.73037 | 36.95907 | 5.44344 | 0.1109211 | 0.21975264 | 2.7196518 | 21 | — | — |
| 212169 2005 $GL_{50}$ | 15.8 | X | 290.13621 | 6.81348 | 201.70319 | 10.19598 | 0.0705624 | 0.23031609 | 2.6358450 | 21 | — | — |
| 212170 2005 $GR_{50}$ | 15.7 | X | 182.39199 | 151.42095 | 128.37556 | 15.36483 | 0.2573604 | 0.22335473 | 2.6903324 | 21 | — | — |
| 212171 2005 $GT_{50}$ | 16.1 | X | 260.50516 | 194.58212 | 44.37916 | 4.97916 | 0.0976983 | 0.23172784 | 2.6251285 | 21 | — | — |
| 212172 2005 $GQ_{52}$ | 16.2 | X | 204.10736 | 81.92633 | 211.53095 | 5.57375 | 0.1149721 | 0.22746597 | 2.6578171 | 21 | — | — |
| 212173 2005 $GQ_{53}$ | 16.1 | X | 356.62859 | 315.49125 | 201.21220 | 11.80815 | 0.1152951 | 0.23704449 | 2.5857278 | 21 | — | — |
| 212174 2005 $GD_{54}$ | 16.0 | X | 343.89687 | 21.69530 | 213.54351 | 8.06351 | 0.1601234 | 0.24506697 | 2.5289847 | 21 | 3 16.4 | 18.9 |
| 212175 2005 $GB_{60}$ | 15.5 | X | 271.76493 | 66.13534 | 196.41732 | 29.62212 | 0.3317053 | 0.23131009 | 2.6282882 | 21 | 1 7.3 | 20.8 |
| 212176 Fabriziospaziani | 16.0 | X | 272.58438 | 257.69904 | 319.25528 | 14.43124 | 0.1677302 | 0.22975230 | 2.6401553 | 21 | — | — |
| 212177 2005 $GT_{74}$ | 15.5 | X | 223.84618 | 303.58056 | 26.17479 | 29.10129 | 0.1521986 | 0.24124802 | 2.5556039 | 21 | 3 15.8 | 20.0 |
| 212178 2005 $GD_{76}$ | 16.0 | X | 193.90237 | 188.23729 | 76.69980 | 7.60470 | 0.1856325 | 0.22185880 | 2.7024123 | 21 | — | — |
| 212179 2005 $GE_{76}$ | 16.2 | X | 220.99706 | 50.80759 | 158.75176 | 7.97161 | 0.1530797 | 0.21959187 | 2.7209791 | 21 | 12 23.9 | 20.2 |
| 212180 2005 $GJ_{76}$ | 16.1 | X | 272.23560 | 149.60683 | 82.45049 | 4.98496 | 0.1291518 | 0.23093547 | 2.6311299 | 21 | — | — |
| 212181 2005 $GH_{79}$ | 15.4 | X | 308.42842 | 57.66815 | 101.14916 | 16.08340 | 0.0410301 | 0.22607286 | 2.6687246 | 21 | — | — |
| 212182 2005 $GV_{79}$ | 15.8 | X | 11.51329 | 331.00214 | 130.21919 | 14.67180 | 0.0696598 | 0.22785075 | 2.6548241 | 21 | — | — |
| 212183 2005 $GX_{80}$ | 16.4 | X | 108.85398 | 68.84290 | 264.87878 | 0.93536 | 0.0994789 | 0.21874857 | 2.7279678 | 21 | — | — |
| 212184 2005 $GX_{84}$ | 16.5 | X | 267.82972 | 37.85493 | 283.10458 | 2.17182 | 0.0738708 | 0.24603517 | 2.5223456 | 21 | 4 8.9 | 19.9 |
| 212185 2005 $GL_{86}$ | 16.1 | X | 286.39175 | 246.94564 | 24.86775 | 17.52174 | 0.1971568 | 0.23908484 | 2.5709958 | 21 | 2 22.3 | 20.3 |
| 212186 2005 $GL_{92}$ | 15.9 | X | 246.01743 | 283.66172 | 354.27110 | 7.11154 | 0.1777021 | 0.23344327 | 2.6122525 | 21 | 1 18.9 | 20.2 |
| 212187 2005 $GT_{94}$ | 16.9 | X | 326.23706 | 117.15938 | 51.40785 | 4.41239 | 0.1091277 | 0.23203138 | 2.6228386 | 21 | — | — |
| 212188 2005 $GX_{94}$ | 16.3 | X | 6.69496 | 129.68913 | 196.65562 | 14.05315 | 0.3557544 | 0.25732473 | 2.4480204 | 21 | 11 3.7 | 18.1 |
| 212189 2005 $GY_{97}$ | 16.0 | X | 305.60926 | 197.32651 | 157.93309 | 2.93777 | 0.2042661 | 0.19666180 | 2.9285729 | 21 | 6 29.5 | 19.6 |
| 212190 2005 $GT_{100}$ | 16.5 | X | 190.95183 | 120.75660 | 193.24876 | 1.72449 | 0.0711313 | 0.23186590 | 2.6240864 | 21 | 1 7.6 | 20.2 |
| 212191 2005 $GL_{101}$ | 16.4 | X | 315.86171 | 355.29322 | 69.88092 | 1.53659 | 0.0565182 | 0.21292069 | 2.7775218 | 21 | 11 8.6 | 19.9 |
| 212192 2005 $GL_{102}$ | 16.5 | X | 279.81454 | 324.42468 | 184.85292 | 9.30788 | 0.1884237 | 0.22209767 | 2.7004743 | 21 | 12 21.3 | 19.7 |
| 212193 2005 $GF_{103}$ | 15.9 | X | 359.66460 | 336.70945 | 180.85381 | 12.46091 | 0.1819789 | 0.23594427 | 2.5937598 | 21 | — | — |
| 212194 2005 $GK_{105}$ | 16.4 | X | 38.30080 | 234.35161 | 177.26436 | 5.30784 | 0.1372842 | 0.22423623 | 2.6832771 | 21 | — | — |
| 212195 2005 $GV_{105}$ | 16.7 | X | 37.52616 | 210.08107 | 125.72934 | 2.15121 | 0.0460352 | 0.20957992 | 2.8069603 | 21 | 11 7.7 | 20.4 |
| 212196 2005 $GR_{117}$ | 16.1 | X | 342.20137 | 20.93006 | 38.69891 | 5.75078 | 0.0128486 | 0.21696587 | 2.7428903 | 21 | 12 7.7 | 19.8 |
| 212197 2005 $GX_{124}$ | 15.9 | X | 221.93594 | 80.52231 | 203.84098 | 13.32301 | 0.1355156 | 0.23026114 | 2.6362643 | 21 | 1 3.2 | 20.4 |
| 212198 2005 $GA_{128}$ | 16.0 | X | 232.76305 | 285.30716 | 48.33111 | 13.93635 | 0.0643988 | 0.24271897 | 2.5452683 | 21 | 3 24.5 | 19.8 |
| 212199 2005 $GW_{129}$ | 16.0 | X | 49.33870 | 7.57120 | 60.12561 | 9.40292 | 0.0415325 | 0.22773460 | 2.6557266 | 21 | — | — |
| 212200 2005 $GQ_{132}$ | 17.3 | X | 47.70000 | 93.55972 | 39.68785 | 10.92993 | 0.1803417 | 0.24207707 | 2.5497657 | 21 | 3 4.5 | 19.8 |
| 212201 2005 $GR_{134}$ | 16.8 | X | 292.76544 | 232.28625 | 24.47588 | 3.28856 | 0.1451340 | 0.23744624 | 2.5828103 | 21 | 2 9.3 | 20.4 |
| 212202 2005 $GX_{137}$ | 16.0 | X | 325.13020 | 231.55987 | 228.98362 | 4.29485 | 0.1252110 | 0.22046133 | 2.7138204 | 21 | — | — |
| 212203 2005 $GU_{145}$ | 16.2 | X | 349.46685 | 231.89529 | 214.12100 | 10.93158 | 0.1598528 | 0.22384270 | 2.6864211 | 21 | — | — |
| 212204 2005 $GZ_{151}$ | 15.9 | X | 295.03330 | 163.21882 | 24.51411 | 10.07826 | 0.1083299 | 0.22910251 | 2.6451450 | 21 | — | — |
| 212205 2005 $GM_{152}$ | 15.6 | X | 163.47524 | 267.32845 | 67.35303 | 4.83393 | 0.3017658 | 0.22382327 | 2.6865766 | 21 | 1 24.9 | 20.3 |
| 212206 2005 $GQ_{152}$ | 15.9 | X | 151.63450 | 256.45226 | 59.49884 | 10.31517 | 0.1487713 | 0.22209649 | 2.7004839 | 21 | — | — |
| 212207 2005 $GD_{153}$ | 16.3 | X | 249.02852 | 209.74523 | 63.33740 | 8.61718 | 0.1712250 | 0.23166858 | 2.6255762 | 21 | 1 15.7 | 20.7 |
| 212208 2005 $GN_{158}$ | 16.6 | X | 242.03431 | 266.97075 | 354.03541 | 3.84285 | 0.1620961 | 0.22969689 | 2.6405799 | 21 | — | — |
| 212209 2005 $GJ_{162}$ | 16.1 | X | 285.73588 | 109.52614 | 86.45865 | 12.98735 | 0.1940976 | 0.22757574 | 2.6569624 | 21 | — | — |
| 212210 2005 $GT_{162}$ | 16.0 | X | 313.12175 | 109.59173 | 45.59738 | 10.24297 | 0.1255470 | 0.22584226 | 2.6705410 | 21 | — | — |
| 212211 2005 $GO_{167}$ | 16.6 | X | 300.00099 | 342.72946 | 224.81539 | 3.77921 | 0.1851483 | 0.23151347 | 2.6267488 | 21 | — | — |
| 212212 2005 $GP_{167}$ | 16.6 | X | 37.79102 | 153.18362 | 227.55402 | 3.62275 | 0.0624825 | 0.21470816 | 2.7620849 | 21 | — | — |
| 212213 2005 $GZ_{172}$ | 16.9 | X | 335.48461 | 307.31820 | 169.88838 | 3.93178 | 0.0724841 | 0.22520773 | 2.6755548 | 21 | — | — |
| 212214 2005 $GN_{182}$ | 16.5 | X | 203.81537 | 163.35661 | 63.54160 | 3.57900 | 0.0845322 | 0.22040365 | 2.7142938 | 21 | — | — |
| 212215 2005 $GH_{197}$ | 17.0 | X | 23.73368 | 49.22751 | 86.92869 | 1.83486 | 0.0447157 | 0.23642130 | 2.5902697 | 21 | 1 19.4 | 20.1 |
| 212216 2005 $GP_{214}$ | 16.8 | X | 239.56240 | 126.05773 | 129.98283 | 4.56075 | 0.0458417 | 0.22859569 | 2.6490533 | 21 | — | — |
| 212217 2005 $GL_{215}$ | 15.7 | X | 224.91634 | 348.85143 | 251.92862 | 10.68473 | 0.1877944 | 0.22246193 | 2.6975256 | 21 | — | — |
| 212218 2005 $GA_{224}$ | 16.3 | X | 131.18168 | 227.75852 | 60.91655 | 4.53318 | 0.0679639 | 0.21370002 | 2.7707649 | 21 | 12 31.4 | 20.5 |
| 212219 2005 $HC$ | 16.4 | X | 126.82954 | 36.83587 | 109.01067 | 7.39264 | 0.0847943 | 0.25465355 | 2.4651096 | 21 | 6 30.9 | 19.8 |
| 212220 2005 $HV_3$ | 15.8 | X | 210.72714 | 237.32185 | 51.87459 | 14.16880 | 0.1044768 | 0.23010235 | 2.6374770 | 21 | — | — |
| 212221 2005 $JU_9$ | 16.9 | X | 326.19406 | 146.02172 | 33.99796 | 5.98519 | 0.1378729 | 0.23373417 | 2.6100846 | 21 | — | — |
| 212222 2005 $JF_{13}$ | 16.6 | X | 9.46552 | 137.00750 | 50.79411 | 3.50540 | 0.0547908 | 0.24138131 | 2.5546630 | 21 | 3 8.5 | 19.6 |
| 212223 2005 $JZ_{13}$ | 16.1 | X | 315.78644 | 218.30967 | 352.66664 | 9.85353 | 0.0769777 | 0.23577492 | 2.5950017 | 21 | 1 21.5 | 19.6 |
| 212224 2005 $JO_{14}$ | 15.7 | X | 203.60640 | 258.18763 | 37.43729 | 14.19691 | 0.1905637 | 0.22641725 | 2.6660178 | 21 | 1 4.7 | 20.4 |
| 212225 2005 $JR_{14}$ | 15.7 | X | 338.76211 | 21.24373 | 152.68942 | 12.11275 | 0.1172546 | 0.23205119 | 2.6226893 | 21 | — | — |
| 212226 2005 $JL_{17}$ | 16.3 | X | 257.05245 | 84.84717 | 177.56185 | 12.90752 | 0.1654581 | 0.23207748 | 2.6224913 | 21 | 1 7.9 | 20.7 |
| 212227 2005 $JJ_{19}$ | 16.3 | X | 263.69284 | 131.49893 | 112.96984 | 5.98985 | 0.1951732 | 0.22958169 | 2.6414631 | 21 | — | — |
| 212228 2005 $JS_{19}$ | 15.9 | X | 230.15672 | 189.94643 | 88.44683 | 14.85462 | 0.0668024 | 0.23085188 | 2.6317650 | 21 | 1 6.4 | 19.7 |
| 212229 2005 $JV_{21}$ | 15.8 | X | 358.04482 | 347.54040 | 186.86164 | 13.36204 | 0.0607183 | 0.23560088 | 2.5962795 | 21 | 1 28.4 | 19.2 |
| 212230 2005 $JW_{25}$ | 16.5 | X | 131.79314 | 202.04573 | 126.93853 | 5.97350 | 0.1148110 | 0.21948330 | 2.7218764 | 21 | — | — |
| 212231 2005 $JM_{27}$ | 16.2 | X | 344.94338 | 81.99739 | 90.56630 | 4.16726 | 0.1900806 | 0.23479729 | 2.6021999 | 21 | — | — |
| 212232 2005 $JO_{30}$ | 16.8 | X | 299.13928 | 123.86934 | 164.15808 | 3.85931 | 0.1856163 | 0.24104472 | 2.5570407 | 21 | 3 21.9 | 20.2 |
| 212233 2005 $JR_{30}$ | 15.6 | X | 223.15133 | 105.99241 | 211.15213 | 11.63785 | 0.2798814 | 0.23062178 | 2.6335152 | 21 | 2 8.3 | 20.6 |
| 212234 2005 $JP_{31}$ | 15.4 | X | 157.99137 | 272.22917 | 38.20463 | 14.37072 | 0.2130449 | 0.21974175 | 2.7197417 | 21 | — | — |
| 212235 2005 $JY_{32}$ | 16.5 | X | 323.09728 | 113.99456 | 129.70805 | 4.69953 | 0.1593078 | 0.23981375 | 2.5657834 | 21 | 2 27.9 | 19.5 |
| 212236 2005 $JB_{33}$ | 16.2 | X | 309.73285 | 70.85096 | 167.71873 | 14.91886 | 0.0642616 | 0.23803521 | 2.5785482 | 21 | 2 15.2 | 19.6 |
| 212237 2005 $JJ_{35}$ | 16.8 | X | 319.03847 | 61.37288 | 194.10062 | 8.43052 | 0.1287324 | 0.23939290 | 2.5687896 | 21 | 3 12.1 | 20.0 |
| 212238 2005 $JD_{36}$ | 15.9 | X | 262.81535 | 57.78017 | 86.85930 | 11.01943 | 0.0615844 | 0.21326772 | 2.7745079 | 21 | 12 6.6 | 19.5 |
| 212239 2005 $JW_{38}$ | 15.7 | X | 200.76149 | 284.38654 | 44.07648 | 4.11692 | 0.2834981 | 0.22819912 | 2.6521214 | 21 | 2 11.7 | 20.5 |
| 212240 2005 $JW_{42}$ | 15.9 | X | 140.38086 | 89.71368 | 198.13050 | 7.26056 | 0.1616941 | 0.21450962 | 2.7637889 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212241 2005 $JN_{44}$ | 16.6 | $X$ | 350.96494 | 159.53616 | 65.29234 | 4.93417 | 0.2023408 | 0.24209229 | 2.5496589 | 21 | 3 14.3 | 19.1 |
| 212242 2005 $JL_{49}$ | 16.9 | $X$ | 228.70277 | 209.45469 | 127.21024 | 3.40448 | 0.0543512 | 0.23943069 | 2.5685193 | 21 | 3 18.9 | 20.4 |
| 212243 2005 $JQ_{57}$ | 16.5 | $X$ | 153.45614 | 113.23173 | 241.84492 | 3.80554 | 0.1205527 | 0.22832517 | 2.6511453 | 21 | 1 21.9 | 20.4 |
| 212244 2005 $JU_{57}$ | 17.0 | $X$ | 269.61883 | 256.53845 | 291.62162 | 0.85679 | 0.0105570 | 0.22190527 | 2.7020350 | 21 | — | — |
| 212245 2005 $JS_{65}$ | 15.9 | $X$ | 248.51486 | 244.86012 | 16.73268 | 11.25171 | 0.1669132 | 0.22940278 | 2.6428363 | 21 | 1 2.2 | 20.4 |
| 212246 2005 $JV_{65}$ | 15.8 | $X$ | 240.90427 | 341.52167 | 258.57785 | 7.95994 | 0.1058379 | 0.22687262 | 2.6624492 | 21 | — | — |
| 212247 2005 $JS_{67}$ | 16.0 | $X$ | 209.69291 | 22.24815 | 254.18766 | 3.71680 | 0.0797311 | 0.22515583 | 2.6759659 | 21 | — | — |
| 212248 2005 $JG_{68}$ | 16.0 | $X$ | 59.29074 | 309.37634 | 187.13032 | 14.75554 | 0.1348790 | 0.24190711 | 2.5509599 | 21 | 3 19.8 | 18.6 |
| 212249 2005 $JQ_{68}$ | 15.8 | $X$ | 192.83577 | 115.47295 | 190.78113 | 12.27699 | 0.1699248 | 0.22518120 | 2.6757650 | 21 | 1 5.2 | 20.4 |
| 212250 2005 $JQ_{76}$ | 16.5 | $X$ | 153.53664 | 358.74343 | 235.57807 | 5.44750 | 0.0260887 | 0.20989196 | 2.8041776 | 21 | 11 18.9 | 20.5 |
| 212251 2005 $JH_{83}$ | 16.9 | $X$ | 290.34197 | 89.69599 | 183.80979 | 2.45776 | 0.1825820 | 0.23757663 | 2.5818652 | 21 | 2 21.0 | 20.7 |
| 212252 2005 $JJ_{83}$ | 16.7 | $X$ | 52.88508 | 148.96175 | 148.52014 | 2.68950 | 0.0540778 | 0.20283759 | 2.8688230 | 21 | 10 10.3 | 20.6 |
| 212253 2005 $JQ_{88}$ | 15.9 | $X$ | 219.76580 | 11.06816 | 214.46151 | 7.04197 | 0.0980779 | 0.21931385 | 2.7232782 | 21 | — | — |
| 212254 2005 $JZ_{88}$ | 16.0 | $X$ | 29.99551 | 44.38941 | 115.43935 | 4.77463 | 0.1929991 | 0.24096668 | 2.5575927 | 21 | 3 1.3 | 18.1 |
| 212255 2005 $JX_{91}$ | 16.0 | $X$ | 257.51242 | 331.48616 | 308.13540 | 12.11382 | 0.2389541 | 0.23419068 | 2.6066915 | 21 | 1 25.7 | 20.5 |
| 212256 2005 $JH_{94}$ | 16.4 | $X$ | 274.89055 | 257.65127 | 225.88868 | 3.47868 | 0.0588121 | 0.21352911 | 2.7722431 | 21 | 11 25.9 | 19.9 |
| 212257 2005 $JS_{109}$ | 15.0 | $X$ | 139.77964 | 260.98690 | 54.46395 | 31.14601 | 0.1868453 | 0.21600636 | 2.7510070 | 21 | — | — |
| 212258 2005 $JY_{109}$ | 16.0 | $X$ | 153.12349 | 232.98974 | 62.74579 | 6.06560 | 0.1040403 | 0.21841970 | 2.7307054 | 21 | — | — |
| 212259 2005 $JC_{111}$ | 16.1 | $X$ | 226.58512 | 158.42887 | 65.35810 | 12.72447 | 0.0842785 | 0.22083188 | 2.7107837 | 21 | — | — |
| 212260 2005 $JG_{111}$ | 15.9 | $X$ | 225.06960 | 193.12855 | 70.64509 | 13.20664 | 0.1603395 | 0.22473588 | 2.6792986 | 21 | — | — |
| 212261 2005 $JN_{113}$ | 17.9 | $X$ | 35.25880 | 322.41033 | 190.42105 | 4.41670 | 0.0422688 | 0.29927428 | 2.2135523 | 21 | 2 12.6 | 20.3 |
| 212262 2005 $JL_{115}$ | 16.3 | $X$ | 70.32471 | 211.91493 | 121.41273 | 7.07470 | 0.0435224 | 0.21184297 | 2.7869340 | 21 | 12 15.5 | 20.2 |
| 212263 2005 $JM_{117}$ | 15.9 | $X$ | 34.11494 | 265.76263 | 130.77130 | 6.97960 | 0.0695695 | 0.21559354 | 2.7545176 | 21 | — | — |
| 212264 2005 $JJ_{122}$ | 15.7 | $X$ | 171.51060 | 110.71830 | 198.41779 | 10.83912 | 0.1947320 | 0.22279769 | 2.6948148 | 21 | — | — |
| 212265 2005 $JA_{126}$ | 16.5 | $X$ | 56.26185 | 89.62400 | 358.40166 | 12.44958 | 0.0971961 | 0.23849573 | 2.5752277 | 21 | 1 6.7 | 19.6 |
| 212266 2005 $JF_{128}$ | 15.6 | $X$ | 271.20588 | 215.76499 | 118.31330 | 6.44975 | 0.2782327 | 0.23959375 | 2.5673538 | 21 | 4 11.4 | 19.8 |
| 212267 2005 $JT_{131}$ | 15.6 | $X$ | 280.60284 | 104.22072 | 159.17294 | 7.63272 | 0.1731339 | 0.23370785 | 2.6102805 | 21 | 1 30.8 | 19.6 |
| 212268 2005 $JH_{132}$ | 15.6 | $X$ | 242.41188 | 287.97103 | 8.96804 | 12.85621 | 0.1781316 | 0.23231124 | 2.6207318 | 21 | 2 10.6 | 20.0 |
| 212269 2005 $JQ_{136}$ | 16.4 | $X$ | 326.93942 | 286.73267 | 200.86208 | 11.98576 | 0.2170363 | 0.22965372 | 2.6409107 | 21 | — | — |
| 212270 2005 $JU_{136}$ | 15.8 | $X$ | 124.74240 | 175.91164 | 190.44807 | 17.74681 | 0.1275963 | 0.22883225 | 2.6472273 | 21 | 1 2.8 | 19.8 |
| 212271 2005 $JO_{140}$ | 16.3 | $X$ | 291.88103 | 25.79994 | 180.09757 | 9.98000 | 0.1656779 | 0.22920771 | 2.6443356 | 21 | — | — |
| 212272 2005 $JV_{143}$ | 17.0 | $X$ | 303.33919 | 43.19915 | 122.03498 | 3.92136 | 0.0591814 | 0.22318125 | 2.6917264 | 21 | — | — |
| 212273 2005 $JR_{147}$ | 15.3 | $X$ | 133.85197 | 196.36881 | 156.93327 | 14.29385 | 0.1749764 | 0.22218423 | 2.6997729 | 21 | 1 6.6 | 19.4 |
| 212274 2005 $JK_{148}$ | 15.9 | $X$ | 176.59943 | 29.53736 | 153.56241 | 14.03353 | 0.1575561 | 0.20506282 | 2.8480314 | 21 | 10 12.0 | 20.7 |
| 212275 2005 $JY_{157}$ | 16.3 | $X$ | 235.37093 | 95.50932 | 166.18744 | 12.32232 | 0.1863746 | 0.22538548 | 2.6741479 | 21 | — | — |
| 212276 2005 $KO_{1}$ | 16.3 | $X$ | 226.46932 | 68.62398 | 187.45748 | 4.77057 | 0.1851620 | 0.22422113 | 2.6833976 | 21 | — | — |
| 212277 2005 $KN_{5}$ | 16.8 | $X$ | 276.40271 | 136.34030 | 45.39935 | 5.64719 | 0.0919013 | 0.22295506 | 2.6935466 | 21 | — | — |
| 212278 2005 $KV_{8}$ | 17.1 | $X$ | 274.36882 | 65.57970 | 166.87982 | 4.94817 | 0.1134113 | 0.22827597 | 2.6515262 | 21 | — | — |
| 212279 2005 $KF_{11}$ | 15.2 | $X$ | 170.54824 | 203.61721 | 115.21795 | 29.43654 | 0.0497801 | 0.22395818 | 2.6854976 | 21 | — | — |
| 212280 2005 $LK_{1}$ | 16.4 | $X$ | 247.16467 | 39.29902 | 164.10797 | 9.20935 | 0.0626853 | 0.21927592 | 2.7235923 | 21 | — | — |
| 212281 2005 $LQ_{6}$ | 15.6 | $X$ | 105.87955 | 171.24994 | 189.33541 | 25.77126 | 0.1272018 | 0.21870676 | 2.7283154 | 21 | — | — |
| 212282 2005 $LX_{8}$ | 16.0 | $X$ | 228.58952 | 81.82578 | 115.42154 | 12.21190 | 0.0461477 | 0.21511936 | 2.7585640 | 21 | 12 30.9 | 19.9 |
| 212283 2005 $LC_{21}$ | 15.9 | $X$ | 252.54578 | 341.92752 | 223.84847 | 8.78217 | 0.1523985 | 0.22080066 | 2.7110392 | 21 | — | — |
| 212284 2005 $LX_{22}$ | 16.2 | $X$ | 8.45984 | 204.88096 | 69.61673 | 0.26482 | 0.0484374 | 0.18361966 | 3.0656549 | 21 | 7 6.2 | 20.0 |
| 212285 2005 $LW_{28}$ | 16.1 | $X$ | 252.93475 | 336.15585 | 227.29234 | 4.59052 | 0.0955924 | 0.22186181 | 2.7023878 | 21 | — | — |
| 212286 2005 $LX_{32}$ | 16.5 | $X$ | 97.46636 | 161.08765 | 165.82938 | 2.83474 | 0.0740911 | 0.21426419 | 2.7658990 | 21 | — | — |
| 212287 2005 $LG_{38}$ | 16.4 | $X$ | 16.99907 | 81.88050 | 153.27779 | 6.98745 | 0.1137676 | 0.18486561 | 3.0518649 | 21 | 5 31.1 | 20.1 |
| 212288 2005 $LE_{45}$ | 15.8 | $X$ | 332.65025 | 353.11501 | 204.01380 | 11.45631 | 0.1216335 | 0.23325147 | 2.6136843 | 21 | 1 14.5 | 19.4 |
| 212289 2005 $MF_{3}$ | 16.2 | $X$ | 244.63708 | 145.12812 | 185.61486 | 10.92805 | 0.1914568 | 0.23717858 | 2.5847532 | 21 | 3 18.3 | 20.3 |
| 212290 2005 $MJ_{3}$ | 15.8 | $X$ | 81.19149 | 211.61765 | 137.53374 | 6.24054 | 0.0925539 | 0.21305170 | 2.7763830 | 21 | — | — |
| 212291 2005 $MC_{11}$ | 16.0 | $X$ | 347.89525 | 272.61071 | 106.03550 | 3.49635 | 0.0280819 | 0.20361574 | 2.8615092 | 21 | 10 24.7 | 19.7 |
| 212292 2005 $MZ_{14}$ | 15.8 | $X$ | 23.24637 | 169.49906 | 149.85517 | 4.70397 | 0.1296453 | 0.19051002 | 2.9912830 | 21 | 10 5.9 | 19.4 |
| 212293 2005 $MG_{28}$ | 15.5 | $X$ | 355.04956 | 116.92728 | 153.55796 | 10.32632 | 0.0590460 | 0.17915216 | 3.1164107 | 21 | 6 12.3 | 19.7 |
| 212294 2005 $MP_{36}$ | 15.9 | $X$ | 304.73334 | 305.41390 | 329.50174 | 3.95967 | 0.1424427 | 0.17223266 | 3.1993300 | 21 | 3 25.6 | 20.4 |
| 212295 2005 $MT_{54}$ | 15.1 | $X$ | 73.80161 | 261.12316 | 302.33586 | 14.16807 | 0.0908013 | 0.18199427 | 3.0838807 | 21 | 7 12.2 | 19.3 |
| 212296 2005 $NH_{5}$ | 15.9 | $X$ | 110.79396 | 125.63345 | 120.37602 | 7.31588 | 0.1733442 | 0.19742005 | 2.9210694 | 21 | 10 28.1 | 20.6 |
| 212297 2005 $NV_{22}$ | 16.2 | $X$ | 162.08491 | 163.37679 | 148.54997 | 5.93958 | 0.0673402 | 0.22066740 | 2.7121306 | 21 | — | — |
| 212298 2005 $NN_{30}$ | 16.1 | $X$ | 299.26443 | 241.96665 | 109.96589 | 3.03821 | 0.1020932 | 0.18224819 | 3.0810156 | 21 | 7 1.6 | 20.2 |
| 212299 2005 $NP_{35}$ | 16.0 | $X$ | 334.09936 | 336.77653 | 327.78048 | 2.30388 | 0.0847316 | 0.18122694 | 3.0925795 | 21 | 6 23.0 | 20.0 |
| 212300 2005 $NB_{41}$ | 16.1 | $X$ | 36.06860 | 132.80360 | 127.98560 | 2.71376 | 0.1145573 | 0.18626193 | 3.0365935 | 21 | 8 4.9 | 19.7 |
| 212301 2005 $NO_{52}$ | 15.6 | $X$ | 247.13293 | 194.12378 | 152.70273 | 5.84297 | 0.1534640 | 0.17245846 | 3.1965368 | 21 | 4 19.9 | 20.6 |
| 212302 2005 $NX_{57}$ | 15.2 | $X$ | 85.29747 | 5.10899 | 146.90424 | 9.96991 | 0.0405413 | 0.17434157 | 3.1734774 | 21 | 5 16.6 | 19.8 |
| 212303 2005 $NZ_{71}$ | 16.1 | $X$ | 357.24591 | 97.69070 | 167.32674 | 6.66039 | 0.1427861 | 0.18007934 | 3.1057044 | 21 | 6 5.7 | 19.7 |
| 212304 2005 $NR_{72}$ | 16.1 | $X$ | 220.65843 | 82.60617 | 101.22763 | 3.28256 | 0.0089543 | 0.20335663 | 2.8639394 | 21 | 12 7.5 | 20.0 |
| 212305 2005 $NT_{78}$ | 16.6 | $X$ | 245.74109 | 128.87088 | 164.76549 | 7.75407 | 0.3295063 | 0.22638048 | 2.6663064 | 21 | 1 29.0 | 21.6 |
| 212306 2005 $OT_{4}$ | 17.2 | $X$ | 266.79642 | 335.57595 | 221.06860 | 3.94424 | 0.0928238 | 0.27540751 | 2.3396570 | 21 | — | — |
| 212307 2005 $OG_{6}$ | 15.5 | $X$ | 315.59852 | 253.99782 | 73.51078 | 2.34923 | 0.1062969 | 0.17785581 | 3.1315355 | 21 | 6 22.7 | 19.6 |
| 212308 2005 $OD_{7}$ | 15.5 | $X$ | 308.82812 | 315.00796 | 0.84017 | 8.69955 | 0.0722772 | 0.17486542 | 3.1671364 | 21 | 5 31.4 | 19.9 |
| 212309 2005 $OS_{11}$ | 15.0 | $X$ | 238.87282 | 274.14632 | 134.19767 | 13.73981 | 0.0541707 | 0.17821170 | 3.1273650 | 21 | 7 4.1 | 19.7 |
| 212310 2005 $QX_{6}$ | 16.0 | $X$ | 282.49341 | 126.62389 | 207.29865 | 0.71017 | 0.2201870 | 0.17274006 | 3.1930619 | 21 | 5 1.1 | 20.7 |
| 212311 2005 $QM_{20}$ | 15.6 | $X$ | 344.96371 | 164.85116 | 150.61302 | 4.20687 | 0.1903096 | 0.18072269 | 3.0983294 | 21 | 7 19.3 | 18.8 |
| 212312 2005 $QY_{26}$ | 15.2 | $X$ | 39.51067 | 100.04827 | 162.03368 | 16.60608 | 0.2047821 | 0.18063264 | 3.0993590 | 21 | 8 23.7 | 19.1 |
| 212313 2005 $QZ_{34}$ | 16.0 | $X$ | 358.35213 | 167.87985 | 126.64442 | 1.41718 | 0.2064544 | 0.18072287 | 3.0983273 | 21 | 7 18.4 | 19.0 |
| 212314 2005 $QU_{42}$ | 15.0 | $X$ | 275.00288 | 315.31576 | 18.40375 | 5.21863 | 0.1477192 | 0.17069654 | 3.2184954 | 21 | 5 1.0 | 19.7 |
| 212315 2005 $QZ_{55}$ | 14.9 | $X$ | 338.35154 | 162.86034 | 167.68878 | 13.68721 | 0.1580997 | 0.17980348 | 3.1088802 | 21 | 7 28.1 | 18.6 |
| 212316 2005 $QP_{60}$ | 15.4 | $X$ | 330.48839 | 321.61806 | 322.32606 | 9.21106 | 0.1874069 | 0.17493481 | 3.1662987 | 21 | 5 4.7 | 19.4 |
| 212317 2005 $QA_{62}$ | 16.0 | $X$ | 21.72502 | 242.61849 | 122.18925 | 3.08888 | 0.0589377 | 0.19405120 | 2.9547801 | 21 | 11 22.1 | 19.8 |
| 212318 2005 $QV_{70}$ | 15.8 | $X$ | 40.92277 | 198.47228 | 121.78952 | 2.96888 | 0.2112743 | 0.19045834 | 2.9918241 | 21 | 11 13.5 | 19.6 |
| 212319 2005 $QZ_{71}$ | 15.4 | $X$ | 305.75107 | 149.26470 | 175.08046 | 5.63965 | 0.1808374 | 0.17493818 | 3.1662581 | 21 | 5 25.2 | 19.7 |
| 212320 2005 $QG_{108}$ | 15.7 | $X$ | 32.65086 | 61.05143 | 188.81149 | 3.84571 | 0.1283833 | 0.17788711 | 3.1311682 | 21 | 7 16.0 | 19.5 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212321 2005 $QQ_{126}$ | 16.5 | X | 105.83732 | 326.20042 | 162.97986 | 7.27949 | 0.1585015 | 0.22835551 | 2.6509104 | 21 | 5 25.8 | 20.4 |
| 212322 2005 $QM_{146}$ | 15.2 | X | 345.95586 | 299.75608 | 353.92007 | 16.88865 | 0.1895152 | 0.18070976 | 3.0984772 | 21 | 6 20.6 | 18.9 |
| 212323 2005 $QG_{157}$ | 14.7 | X | 119.26171 | 193.27166 | 211.87267 | 9.56620 | 0.0864408 | 0.15045748 | 3.5010115 | 21 | 2 19.6 | 19.9 |
| 212324 2005 $RH_{16}$ | 15.9 | X | 31.17500 | 230.07162 | 341.72445 | 4.52648 | 0.1211161 | 0.17108083 | 3.2136740 | 21 | 5 22.1 | 19.9 |
| 212325 2005 $SB_{22}$ | 15.5 | X | 295.19652 | 186.42892 | 148.45757 | 5.36222 | 0.1492872 | 0.17238890 | 3.1973967 | 21 | 5 29.1 | 19.9 |
| 212326 2005 $SU_{26}$ | 15.4 | X | 315.78382 | 198.31866 | 100.07151 | 2.53854 | 0.1433559 | 0.17086228 | 3.2164138 | 21 | 5 11.6 | 19.5 |
| 212327 2005 $SX_{54}$ | 15.9 | X | 340.76742 | 127.01691 | 173.45220 | 0.63957 | 0.2023364 | 0.17451724 | 3.1713475 | 21 | 6 18.4 | 19.2 |
| 212328 2005 $SD_{59}$ | 15.8 | X | 332.93170 | 146.80797 | 197.33104 | 16.59131 | 0.2157510 | 0.17899082 | 3.1182832 | 21 | 7 28.7 | 19.5 |
| 212329 2005 $SR_{72}$ | 15.8 | X | 338.92648 | 135.41120 | 183.32957 | 5.85328 | 0.1101176 | 0.17757473 | 3.1348393 | 21 | 7 16.8 | 19.7 |
| 212330 2005 $SM_{90}$ | 16.3 | X | 188.88998 | 166.95357 | 195.83556 | 4.36133 | 0.1338457 | 0.21797051 | 2.7344557 | 21 | 3 9.8 | 20.6 |
| 212331 2005 $SK_{122}$ | 14.9 | X | 27.29945 | 273.23128 | 5.20243 | 18.18031 | 0.2114787 | 0.17975700 | 3.1094161 | 21 | 9 2.4 | 18.6 |
| 212332 2005 $SC_{152}$ | 16.8 | X | 281.53452 | 209.56881 | 129.36582 | 4.10397 | 0.1414125 | 0.22991476 | 2.6389114 | 21 | 5 14.6 | 20.5 |
| 212333 2005 $SF_{191}$ | 14.8 | X | 347.15767 | 105.16449 | 188.27968 | 25.94380 | 0.2018504 | 0.17437386 | 3.1730857 | 21 | 6 20.8 | 18.9 |
| 212334 2005 $SL_{204}$ | 15.0 | X | 338.70765 | 216.57351 | 201.69361 | 1.94004 | 0.0555119 | 0.13047098 | 3.8499945 | 21 | 11 16.8 | 20.1 |
| 212335 2005 $SB_{212}$ | 16.2 | X | 110.67790 | 12.38412 | 256.88289 | 0.85186 | 0.1270821 | 0.18925717 | 3.0044696 | 21 | 11 16.8 | 20.8 |
| 212336 2005 $SZ_{227}$ | 16.8 | X | 269.26862 | 170.76783 | 27.80405 | 2.21800 | 0.0187497 | 0.20426686 | 2.8554251 | 21 | — | — |
| 212337 2005 $SD_{273}$ | 14.8 | X | 81.75810 | 253.55581 | 39.11325 | 0.86118 | 0.1565925 | 0.12403174 | 3.9821184 | 21 | 11 9.8 | 20.6 |
| 212338 2005 $SH_{278}$ | 15.4 | X | 13.76642 | 127.97681 | 161.45025 | 5.97103 | 0.2236094 | 0.17784948 | 3.1316099 | 21 | 8 15.2 | 18.5 |
| 212339 2005 $SL_{280}$ | 15.7 | X | 240.29461 | 17.15844 | 87.84797 | 6.56862 | 0.1014010 | 0.17717789 | 3.1395184 | 21 | 9 12.5 | 20.4 |
| 212340 2005 $TN_{5}$ | 14.7 | X | 31.20140 | 39.84460 | 230.33084 | 14.07166 | 0.1959571 | 0.17842970 | 3.1248173 | 21 | 8 13.5 | 18.7 |
| 212341 2005 $TX_{90}$ | 16.2 | X | 220.39454 | 200.67861 | 24.92561 | 5.72169 | 0.0517229 | 0.20231828 | 2.8737300 | 21 | — | — |
| 212342 2005 $TY_{120}$ | 16.7 | X | 167.33932 | 224.89545 | 176.03655 | 1.71889 | 0.0784878 | 0.22013289 | 2.7165191 | 21 | 4 2.2 | 20.7 |
| 212343 2005 $TV_{135}$ | 15.3 | X | 325.85463 | 245.59144 | 28.77697 | 4.44021 | 0.0969861 | 0.16782423 | 3.2551145 | 21 | 4 30.8 | 19.5 |
| 212344 2005 $UJ_{13}$ | 14.5 | X | 276.78411 | 87.68457 | 23.41195 | 4.05087 | 0.1447012 | 0.12426803 | 3.9770687 | 21 | 10 17.9 | 19.9 |
| 212345 2005 $UW_{13}$ | 14.9 | X | 94.00753 | 60.65619 | 205.72891 | 2.23694 | 0.1674308 | 0.12417565 | 3.9790410 | 21 | 10 24.8 | 20.7 |
| 212346 2005 $UY_{68}$ | 14.9 | X | 10.40232 | 280.33676 | 11.39955 | 9.52306 | 0.2143969 | 0.17677005 | 3.1443454 | 21 | 8 15.2 | 18.2 |
| 212347 2005 $UX_{121}$ | 16.0 | X | 57.81607 | 237.76416 | 20.86514 | 2.19637 | 0.1899332 | 0.17645614 | 3.1480736 | 21 | 9 14.1 | 20.1 |
| 212348 2005 $UK_{123}$ | 16.3 | X | 316.55110 | 157.25862 | 304.45555 | 0.37829 | 0.0202639 | 0.19122161 | 2.9838574 | 21 | 12 22.3 | 20.1 |
| 212349 2005 $UM_{169}$ | 17.2 | X | 251.33925 | 267.94720 | 337.12333 | 1.70846 | 0.1530581 | 0.26833645 | 2.3805808 | 21 | — | — |
| 212350 2005 $VU_{43}$ | 15.5 | X | 320.97182 | 233.97881 | 40.23650 | 6.25392 | 0.1126293 | 0.16716568 | 3.2636580 | 21 | 4 22.5 | 19.8 |
| 212351 2005 $XE_{12}$ | 17.1 | X | 198.28661 | 158.32744 | 203.32622 | 2.42672 | 0.1042282 | 0.21643720 | 2.7473550 | 21 | 3 17.5 | 21.2 |
| 212352 2005 $YC_{33}$ | 16.9 | X | 322.03510 | 258.74002 | 121.78670 | 24.40196 | 0.0965064 | 0.35931675 | 1.9595262 | 21 | 10 25.8 | 19.3 |
| 212353 2005 $YG_{172}$ | 16.9 | X | 181.21331 | 116.63846 | 99.88005 | 24.07821 | 0.0429734 | 0.36623836 | 1.9347588 | 21 | 12 30.6 | 18.9 |
| 212354 2006 $BQ_{101}$ | 16.2 | X | 148.48431 | 171.38445 | 124.69104 | 11.93310 | 0.1865353 | 0.24656635 | 2.5187217 | 21 | — | — |
| 212355 2006 $DT_{37}$ | 17.2 | X | 256.03218 | 129.08765 | 3.50267 | 3.47303 | 0.0661223 | 0.29604016 | 2.2296445 | 21 | 11 26.1 | 19.6 |
| 212356 2006 $DC_{87}$ | 17.6 | X | 137.38395 | 227.28736 | 124.87118 | 2.53160 | 0.0920968 | 0.31348537 | 2.1461391 | 21 | — | — |
| 212357 2006 $DJ_{116}$ | 16.5 | X | 353.55747 | 160.88219 | 160.28621 | 6.76279 | 0.1225295 | 0.27887137 | 2.3202428 | 21 | 8 23.5 | 18.6 |
| 212358 2006 $DP_{150}$ | 17.2 | X | 124.67999 | 240.73879 | 188.69540 | 5.23981 | 0.2012840 | 0.26520922 | 2.3992581 | 21 | 3 30.8 | 20.4 |
| 212359 2006 $EV_{52}$ | 16.6 | X | 17.34108 | 167.11678 | 168.50193 | 15.95524 | 0.7076238 | 0.34434657 | 2.0159150 | 21 | — | — |
| 212360 2006 $FD_{6}$ | 16.3 | X | 152.09090 | 122.42700 | 135.25305 | 8.48015 | 0.1470148 | 0.29540327 | 2.2328481 | 21 | 12 27.8 | 19.7 |
| 212361 2006 $FQ_{24}$ | 17.5 | X | 50.49034 | 139.30814 | 148.84141 | 2.88350 | 0.2034064 | 0.27888767 | 2.3201524 | 21 | 10 28.5 | 20.3 |
| 212362 2006 $FS_{41}$ | 17.2 | X | 123.33238 | 43.98181 | 179.06621 | 3.45227 | 0.1767184 | 0.28322552 | 2.2964013 | 21 | 10 17.7 | 20.7 |
| 212363 2006 $GK_{12}$ | 17.5 | X | 92.90601 | 184.72578 | 91.76786 | 2.99229 | 0.2136560 | 0.28508078 | 2.2864275 | 21 | 11 28.2 | 21.1 |
| 212364 2006 $GC_{23}$ | 17.2 | X | 162.52668 | 152.14691 | 149.71128 | 2.97866 | 0.1408154 | 0.30205201 | 2.1999606 | 21 | — | — |
| 212365 2006 $GF_{25}$ | 18.2 | X | 178.52879 | 193.11711 | 83.10857 | 1.24702 | 0.1626246 | 0.30075877 | 2.2062625 | 21 | — | — |
| 212366 2006 $GQ_{31}$ | 16.7 | X | 220.27808 | 29.71530 | 207.99172 | 4.48459 | 0.1076095 | 0.30188706 | 2.2007619 | 21 | — | — |
| 212367 2006 $GC_{35}$ | 18.1 | X | 155.84031 | 216.50337 | 69.86621 | 3.20283 | 0.1508466 | 0.29808069 | 2.2194574 | 21 | — | — |
| 212368 2006 $GK_{37}$ | 15.7 | X | 168.19471 | 15.93912 | 154.73319 | 24.70738 | 0.2092690 | 0.28360213 | 2.2943679 | 21 | 9 23.4 | 19.6 |
| 212369 2006 $GD_{39}$ | 14.1 | X | 258.50320 | 136.97024 | 152.05626 | 9.66460 | 0.1264882 | 0.12588760 | 3.9428848 | 21 | 2 28.8 | 19.9 |
| 212370 2006 $GP_{40}$ | 17.1 | X | 206.69797 | 181.23071 | 86.40990 | 4.42765 | 0.1677192 | 0.30377553 | 2.1916315 | 21 | — | — |
| 212371 2006 $HE_{6}$ | 17.3 | X | 230.02824 | 142.55178 | 134.76285 | 3.08093 | 0.1207199 | 0.30978085 | 2.1632149 | 21 | — | — |
| 212372 2006 $HF_{15}$ | 17.4 | X | 156.82012 | 50.72174 | 202.01244 | 4.29654 | 0.0680598 | 0.29419219 | 2.2389718 | 21 | 12 29.9 | 20.5 |
| 212373 Pietrocascella | 17.2 | X | 276.40602 | 12.13567 | 222.51373 | 3.32741 | 0.0863423 | 0.31044875 | 2.1601112 | 21 | — | — |
| 212374 Vellerat | 17.0 | X | 224.92792 | 169.37929 | 83.87679 | 6.84069 | 0.1756874 | 0.30486179 | 2.1864223 | 21 | — | — |
| 212375 2006 $HE_{33}$ | 15.3 | X | 257.74376 | 140.24736 | 98.32336 | 6.09726 | 0.1336657 | 0.18020560 | 3.1042536 | 21 | — | — |
| 212376 2006 $HR_{35}$ | 17.1 | X | 254.10156 | 143.24087 | 126.57507 | 4.60692 | 0.1943300 | 0.31118459 | 2.1567046 | 21 | 1 1.8 | 20.5 |
| 212377 2006 $HO_{39}$ | 17.3 | X | 288.23598 | 38.53193 | 152.89796 | 3.04286 | 0.0966074 | 0.30712898 | 2.1756491 | 21 | — | — |
| 212378 2006 $HW_{43}$ | 16.9 | X | 246.53394 | 258.36720 | 28.34520 | 2.25360 | 0.0883952 | 0.31346844 | 2.1462163 | 21 | 1 19.4 | 19.6 |
| 212379 2006 $HD_{55}$ | 17.1 | X | 197.33061 | 180.07729 | 64.13463 | 5.84004 | 0.1174377 | 0.29804869 | 2.2196163 | 21 | — | — |
| 212380 2006 $HQ_{55}$ | 16.8 | X | 149.44119 | 87.88115 | 180.83033 | 6.78890 | 0.1374029 | 0.29532669 | 2.2332341 | 21 | — | — |
| 212381 2006 $HP_{59}$ | 17.4 | X | 198.29620 | 141.86231 | 150.89936 | 2.06491 | 0.1559611 | 0.30646048 | 2.1788119 | 21 | — | — |
| 212382 2006 $HJ_{63}$ | 17.4 | X | 92.89356 | 174.59020 | 203.60759 | 5.11742 | 0.1768982 | 0.30265857 | 2.1970203 | 21 | — | — |
| 212383 2006 $HQ_{77}$ | 17.2 | X | 228.14750 | 210.61968 | 40.16827 | 3.56073 | 0.1158001 | 0.30409482 | 2.1900971 | 21 | — | — |
| 212384 2006 $HK_{82}$ | 17.4 | X | 294.96426 | 297.78257 | 220.81528 | 2.90959 | 0.0926829 | 0.30209341 | 2.1997596 | 21 | — | — |
| 212385 2006 $HL_{84}$ | 17.5 | X | 179.01716 | 29.91777 | 192.61012 | 5.04408 | 0.0569508 | 0.29084748 | 2.2561043 | 21 | 12 17.2 | 20.4 |
| 212386 2006 $HP_{86}$ | 17.2 | X | 193.92297 | 234.02552 | 62.00386 | 5.47877 | 0.1378622 | 0.30665317 | 2.1778991 | 21 | — | — |
| 212387 2006 $HM_{88}$ | 17.2 | X | 209.13832 | 1.02467 | 232.61330 | 5.85821 | 0.1179556 | 0.29871669 | 2.2163060 | 21 | — | — |
| 212388 2006 $HP_{100}$ | 17.3 | X | 231.57436 | 125.70088 | 138.02056 | 5.35812 | 0.1339230 | 0.30645418 | 2.1788417 | 21 | — | — |
| 212389 2006 $HU_{108}$ | 17.0 | X | 187.41104 | 142.25801 | 118.76085 | 6.48083 | 0.1378799 | 0.29877818 | 2.2160019 | 21 | — | — |
| 212390 2006 $HD_{111}$ | 17.4 | X | 225.42718 | 280.24979 | 270.64429 | 2.12260 | 0.0840873 | 0.29608965 | 2.2293961 | 21 | 12 31.6 | 20.1 |
| 212391 2006 $HG_{111}$ | 16.7 | X | 250.06889 | 341.87313 | 249.31264 | 4.04853 | 0.1171103 | 0.30593181 | 2.1813212 | 21 | — | — |
| 212392 2006 $HE_{140}$ | 17.0 | X | 162.96364 | 354.68047 | 56.33156 | 2.86903 | 0.1652376 | 0.25619018 | 2.4552425 | 21 | 4 13.5 | 20.8 |
| 212393 2006 $HE_{153}$ | 17.4 | X | 81.52856 | 124.42081 | 150.13917 | 3.13074 | 0.1582172 | 0.27966177 | 2.3158690 | 21 | 11 9.8 | 20.7 |
| 212394 2006 $JD_{7}$ | 17.7 | X | 273.15592 | 16.64227 | 173.02443 | 2.74091 | 0.0872580 | 0.30386041 | 2.1912233 | 21 | — | — |
| 212395 2006 $JL_{12}$ | 16.9 | X | 236.26768 | 217.53480 | 183.60652 | 7.85262 | 0.1288917 | 0.26702922 | 2.3883439 | 21 | 6 12.6 | 20.5 |
| 212396 2006 $JN_{19}$ | 17.0 | X | 323.71383 | 291.53263 | 92.10664 | 4.01645 | 0.0952452 | 0.28047874 | 2.3113697 | 21 | 10 6.4 | 19.2 |
| 212397 2006 $JZ_{23}$ | 17.4 | X | 42.77105 | 80.65308 | 240.52784 | 1.65379 | 0.1455861 | 0.28236082 | 2.3010873 | 21 | 11 22.8 | 19.9 |
| 212398 2006 $JF_{27}$ | 17.9 | X | 198.01092 | 74.82314 | 198.62218 | 4.89449 | 0.0501590 | 0.30380588 | 2.1914855 | 21 | — | — |
| 212399 2006 $JH_{38}$ | 17.8 | X | 18.27830 | 354.29951 | 100.23891 | 2.55151 | 0.0437837 | 0.30752881 | 2.1737629 | 21 | — | — |
| 212400 2006 $JZ_{38}$ | 17.0 | X | 335.22582 | 131.38052 | 156.90826 | 2.07266 | 0.2078976 | 0.26197115 | 2.4189882 | 21 | 5 12.5 | 19.1 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212401 2006 $JW_{42}$ | 16.7 | $X$ | 256.10004 | 70.43285 | 80.43562 | 4.53413 | 0.1336961 | 0.29479762 | 2.2359053 | 21 | 12 12.5 | 18.6 |
| 212402 2006 $JN_{48}$ | 17.5 | $X$ | 148.60874 | 34.99937 | 230.22201 | 2.93897 | 0.0894397 | 0.29244716 | 2.2478696 | 21 | — | — |
| 212403 2006 $JQ_{60}$ | 17.2 | $X$ | 0.65426 | 88.15640 | 195.07525 | 1.59265 | 0.2249777 | 0.26634252 | 2.3924473 | 21 | 7 7.3 | 18.4 |
| 212404 2006 $KO_{1}$ | 16.9 | $X$ | 232.90425 | 344.11361 | 251.00630 | 5.23038 | 0.1210698 | 0.30257826 | 2.1974090 | 21 | — | — |
| 212405 2006 $KM_{8}$ | 16.8 | $X$ | 233.23188 | 329.64543 | 239.42653 | 7.34740 | 0.0883210 | 0.29835599 | 2.2180919 | 21 | — | — |
| 212406 2006 $KJ_{23}$ | 17.2 | $X$ | 118.36783 | 218.82766 | 61.79492 | 3.62471 | 0.1230373 | 0.28771956 | 2.2724262 | 21 | 12 22.7 | 20.4 |
| 212407 2006 $KE_{27}$ | 17.5 | $X$ | 188.69835 | 231.41214 | 62.15857 | 3.94617 | 0.1235438 | 0.30304316 | 2.1951611 | 21 | — | — |
| 212408 2006 $KV_{27}$ | 17.9 | $X$ | 350.48405 | 73.75430 | 50.92410 | 1.42400 | 0.0702238 | 0.30566248 | 2.1826024 | 21 | — | — |
| 212409 2006 $KZ_{36}$ | 18.0 | $X$ | 166.94966 | 50.18393 | 184.09404 | 2.21756 | 0.1176516 | 0.29035903 | 2.2586338 | 21 | 12 13.7 | 21.1 |
| 212410 2006 $KG_{39}$ | 17.0 | $X$ | 83.07558 | 203.11160 | 94.22218 | 4.63274 | 0.2026232 | 0.28204913 | 2.3027822 | 21 | 12 13.7 | 20.4 |
| 212411 2006 $KO_{42}$ | 17.3 | $X$ | 60.11564 | 243.46076 | 64.10119 | 2.36660 | 0.1159760 | 0.28135664 | 2.3065592 | 21 | 11 22.3 | 20.0 |
| 212412 2006 $KN_{56}$ | 17.0 | $X$ | 296.67812 | 211.94733 | 119.99101 | 3.94957 | 0.2085734 | 0.26244760 | 2.4160596 | 21 | 5 12.4 | 20.0 |
| 212413 2006 $KW_{58}$ | 17.4 | $X$ | 243.33773 | 259.86461 | 197.79751 | 6.24081 | 0.0589673 | 0.28012645 | 2.3133072 | 21 | 9 17.2 | 20.2 |
| 212414 2006 $KB_{69}$ | 17.7 | $X$ | 247.66451 | 343.65817 | 293.17201 | 0.22104 | 0.1740028 | 0.30963970 | 2.1638723 | 21 | 1 5.7 | 21.1 |
| 212415 2006 $KP_{97}$ | 15.8 | $X$ | 261.68417 | 304.53174 | 180.30086 | 12.12637 | 0.0767600 | 0.22662384 | 2.6643973 | 21 | 11 11.8 | 19.4 |
| 212416 2006 $KV_{100}$ | 17.7 | $X$ | 61.00644 | 306.92864 | 329.14071 | 1.82540 | 0.1615832 | 0.27705476 | 2.3303741 | 21 | 10 16.9 | 20.6 |
| 212417 2006 $KJ_{103}$ | 15.9 | $X$ | 348.74359 | 273.85484 | 28.10838 | 14.71839 | 0.2405801 | 0.26075699 | 2.4264913 | 21 | 7 7.9 | 17.9 |
| 212418 2006 $KD_{113}$ | 17.1 | $X$ | 238.28611 | 2.24660 | 218.51085 | 4.92888 | 0.1926633 | 0.30062306 | 2.2069264 | 21 | — | — |
| 212419 2006 $KK_{113}$ | 17.3 | $X$ | 203.78426 | 81.25765 | 181.90638 | 4.73060 | 0.1122433 | 0.30164065 | 2.2019602 | 21 | — | — |
| 212420 2006 $KD_{116}$ | 17.1 | $X$ | 349.95862 | 231.67692 | 123.95417 | 2.63100 | 0.0937886 | 0.27855418 | 2.3220038 | 21 | 10 10.8 | 19.3 |
| 212421 2006 $KV_{120}$ | 17.0 | $X$ | 265.93649 | 84.99994 | 100.87349 | 4.70613 | 0.1478764 | 0.30113992 | 2.2044005 | 21 | — | — |
| 212422 2006 $LG_{7}$ | 16.1 | $X$ | 297.30547 | 191.75544 | 124.17898 | 7.32086 | 0.1156198 | 0.25514949 | 2.4619142 | 21 | 5 8.1 | 19.2 |
| 212423 2006 $MT_{1}$ | 16.2 | $X$ | 144.00833 | 205.61613 | 155.50580 | 15.53158 | 0.1281463 | 0.23881699 | 2.5729177 | 21 | 1 17.9 | 20.0 |
| 212424 2006 $MA_{9}$ | 16.7 | $X$ | 80.46658 | 216.07460 | 185.31859 | 3.28715 | 0.0621368 | 0.22866046 | 2.6485530 | 21 | — | — |
| 212425 2006 $MQ_{13}$ | 17.3 | $X$ | 129.13161 | 193.59716 | 29.62758 | 3.01946 | 0.1492274 | 0.28171406 | 2.3046079 | 21 | 10 21.5 | 20.8 |
| 212426 2006 $OB$ | 17.0 | $X$ | 1.32778 | 208.18909 | 102.45862 | 3.57417 | 0.2043432 | 0.26458476 | 2.4030317 | 21 | 8 29.8 | 18.6 |
| 212427 2006 $OL$ | 17.4 | $X$ | 71.12496 | 14.43523 | 318.58547 | 1.90857 | 0.1796451 | 0.28108617 | 2.3080386 | 21 | — | — |
| 212428 2006 $OX_{1}$ | 16.8 | $X$ | 355.63406 | 277.92931 | 54.22965 | 2.16150 | 0.1977328 | 0.26695970 | 2.3887585 | 21 | 9 20.7 | 18.5 |
| 212429 2006 $OF_{4}$ | 16.6 | $X$ | 86.87812 | 117.81041 | 161.74664 | 2.95409 | 0.2172559 | 0.27179734 | 2.3603292 | 21 | 11 25.5 | 20.2 |
| 212430 2006 $OV_{7}$ | 16.9 | $X$ | 357.55738 | 215.15134 | 110.11104 | 2.61260 | 0.2008758 | 0.26563935 | 2.3966675 | 21 | 9 14.0 | 18.5 |
| 212431 2006 $OO_{11}$ | 17.0 | $X$ | 18.35630 | 132.64313 | 185.12052 | 1.83959 | 0.2273164 | 0.26684915 | 2.3894182 | 21 | 10 22.0 | 19.2 |
| 212432 2006 $OX_{12}$ | 17.2 | $X$ | 26.49940 | 197.48185 | 93.72510 | 3.62481 | 0.2226872 | 0.26680240 | 2.3896973 | 21 | 9 28.1 | 19.4 |
| 212433 2006 $OP_{15}$ | 15.9 | $X$ | 202.68232 | 259.50086 | 65.50353 | 10.39309 | 0.0902075 | 0.23830789 | 2.5765808 | 21 | 2 5.9 | 19.9 |
| 212434 2006 $OA_{16}$ | 15.6 | $X$ | 8.59813 | 164.72982 | 326.95948 | 21.65400 | 0.0153521 | 0.23271505 | 2.6176992 | 21 | — | — |
| 212435 2006 $OJ_{16}$ | 16.7 | $X$ | 18.99993 | 113.48701 | 143.68086 | 3.16953 | 0.1769836 | 0.25918265 | 2.4363075 | 21 | 7 7.3 | 18.6 |
| 212436 2006 $OA_{20}$ | 15.9 | $X$ | 198.42779 | 280.54660 | 47.41825 | 7.89395 | 0.1469573 | 0.23717808 | 2.5847568 | 21 | 2 6.7 | 20.1 |
| 212437 2006 $PA_{13}$ | 17.6 | $X$ | 196.41547 | 108.11396 | 158.76681 | 6.12005 | 0.2054600 | 0.29431260 | 2.2383611 | 21 | — | — |
| 212438 2006 $PP_{13}$ | 16.7 | $X$ | 270.98001 | 64.88379 | 201.47763 | 5.40229 | 0.0998883 | 0.24039708 | 2.5616311 | 21 | 1 29.9 | 20.5 |
| 212439 2006 $PN_{15}$ | 16.1 | $X$ | 112.74195 | 29.01520 | 308.03442 | 2.22808 | 0.0498460 | 0.22040838 | 2.7142550 | 21 | — | — |
| 212440 2006 $PH_{19}$ | 17.3 | $X$ | 35.90283 | 112.51933 | 166.83110 | 2.36421 | 0.1701588 | 0.26536868 | 2.3982968 | 21 | 9 15.4 | 19.6 |
| 212441 2006 $PU_{19}$ | 17.1 | $X$ | 349.69842 | 306.28647 | 4.32674 | 2.21596 | 0.1990976 | 0.26099917 | 2.4249901 | 21 | 7 27.4 | 18.7 |
| 212442 2006 $PQ_{23}$ | 17.0 | $X$ | 2.80672 | 162.82333 | 105.44705 | 2.39177 | 0.1580364 | 0.25850980 | 2.4405331 | 21 | 6 16.9 | 18.8 |
| 212443 2006 $PA_{24}$ | 16.9 | $X$ | 76.00373 | 237.66805 | 59.35894 | 3.26387 | 0.1512932 | 0.27581024 | 2.3373789 | 21 | 11 30.2 | 20.2 |
| 212444 2006 $PD_{24}$ | 16.0 | $X$ | 79.71663 | 358.19879 | 341.22042 | 12.45712 | 0.1912345 | 0.21573124 | 2.7533454 | 21 | — | — |
| 212445 2006 $PQ_{34}$ | 16.3 | $X$ | 304.72934 | 250.27192 | 74.65826 | 3.41616 | 0.2274628 | 0.25626336 | 2.4547751 | 21 | 5 10.5 | 19.2 |
| 212446 2006 $PL_{39}$ | 15.4 | $X$ | 230.32087 | 47.44798 | 317.90901 | 14.19362 | 0.1773096 | 0.18210597 | 3.0826196 | 21 | 4 15.1 | 20.8 |
| 212447 2006 $PU_{39}$ | 15.6 | $X$ | 259.96501 | 257.58439 | 123.26265 | 10.86765 | 0.1047659 | 0.19034836 | 2.9929764 | 21 | 6 18.3 | 20.0 |
| 212448 2006 $PT_{41}$ | 15.9 | $X$ | 263.47619 | 239.78119 | 153.37034 | 10.61078 | 0.1156291 | 0.19175881 | 2.9782821 | 21 | 7 5.7 | 20.3 |
| 212449 2006 $PQ_{42}$ | 16.2 | $X$ | 146.61080 | 68.30154 | 182.71180 | 5.06453 | 0.1110072 | 0.21549035 | 2.7553969 | 21 | 12 3.2 | 20.5 |
| 212450 2006 $QO$ | 16.8 | $X$ | 154.55119 | 258.62644 | 26.94122 | 7.03307 | 0.2145757 | 0.28831316 | 2.2693060 | 21 | — | — |
| 212451 2006 $QV_{15}$ | 16.2 | $X$ | 61.30349 | 176.76081 | 109.64215 | 3.09998 | 0.0443836 | 0.20349539 | 2.8626374 | 21 | 10 6.4 | 20.0 |
| 212452 2006 $QJ_{18}$ | 16.4 | $X$ | 333.94926 | 204.01957 | 82.00614 | 7.17260 | 0.1126173 | 0.25388527 | 2.4700801 | 21 | 5 21.9 | 19.0 |
| 212453 2006 $QL_{19}$ | 16.7 | $X$ | 267.62868 | 279.63863 | 38.25022 | 5.56919 | 0.1126006 | 0.24537351 | 2.5268780 | 21 | 4 2.7 | 20.3 |
| 212454 2006 $QZ_{19}$ | 15.3 | $X$ | 287.17619 | 181.41885 | 151.03832 | 12.72810 | 0.1118214 | 0.18556757 | 3.0441636 | 21 | 5 22.5 | 19.8 |
| 212455 2006 $QA_{20}$ | 17.1 | $X$ | 96.48858 | 310.04394 | 329.42332 | 5.38232 | 0.2692789 | 0.27733858 | 2.3287839 | 21 | 12 6.2 | 21.1 |
| 212456 2006 $QK_{20}$ | 15.4 | $X$ | 240.92306 | 341.42991 | 344.40573 | 7.45420 | 0.1626638 | 0.17618501 | 3.1513024 | 21 | 3 16.5 | 20.6 |
| 212457 2006 $QO_{22}$ | 16.3 | $X$ | 359.70597 | 166.82460 | 114.06958 | 4.50994 | 0.1669133 | 0.25916042 | 2.4364468 | 21 | 6 30.8 | 18.2 |
| 212458 2006 $QF_{24}$ | 14.7 | $X$ | 197.28586 | 8.42766 | 348.35706 | 14.39517 | 0.0864664 | 0.17042827 | 3.2218720 | 21 | 3 14.9 | 19.7 |
| 212459 2006 $QK_{26}$ | 15.7 | $X$ | 203.32469 | 161.52522 | 221.27102 | 2.19700 | 0.0751108 | 0.17723152 | 3.1388850 | 21 | 4 21.6 | 20.5 |
| 212460 2006 $QD_{28}$ | 16.6 | $X$ | 26.07028 | 267.61322 | 24.21592 | 5.20884 | 0.2250505 | 0.26310832 | 2.4120131 | 21 | 9 27.1 | 18.8 |
| 212461 2006 $QT_{29}$ | 16.8 | $X$ | 15.66956 | 190.31712 | 110.36030 | 3.21963 | 0.2102855 | 0.26318809 | 2.4115257 | 21 | 9 17.5 | 18.7 |
| 212462 2006 $QH_{30}$ | 16.9 | $X$ | 344.30702 | 175.32138 | 121.37556 | 1.91793 | 0.1782786 | 0.25868741 | 2.4394159 | 21 | 6 19.9 | 18.8 |
| 212463 2006 $QP_{32}$ | 15.7 | $X$ | 62.80880 | 197.20860 | 165.68302 | 10.76541 | 0.1720327 | 0.21430493 | 2.7655485 | 21 | — | — |
| 212464 2006 $QK_{34}$ | 16.2 | $X$ | 307.72786 | 255.30768 | 326.56499 | 2.96827 | 0.0969215 | 0.23558434 | 2.5964010 | 21 | 1 19.9 | 19.6 |
| 212465 Goroshky | 16.0 | $X$ | 84.93829 | 212.72738 | 151.14479 | 8.80794 | 0.0923701 | 0.21979039 | 2.7193405 | 21 | — | — |
| 212466 2006 $QA_{41}$ | 15.5 | $X$ | 171.87311 | 58.57364 | 347.95741 | 10.11713 | 0.0927835 | 0.17702862 | 3.1412830 | 21 | 4 14.7 | 20.5 |
| 212467 2006 $QC_{42}$ | 15.9 | $X$ | 341.95712 | 213.50182 | 119.89276 | 3.12215 | 0.0936390 | 0.19546881 | 2.9404767 | 21 | 8 14.3 | 19.3 |
| 212468 2006 $QL_{43}$ | 15.3 | $X$ | 219.34405 | 27.92887 | 359.12135 | 9.60972 | 0.1028628 | 0.17857749 | 3.1230929 | 21 | 5 9.2 | 20.2 |
| 212469 2006 $QS_{44}$ | 15.9 | $X$ | 119.71369 | 211.46884 | 120.12318 | 7.34921 | 0.0356626 | 0.22175187 | 2.7032810 | 21 | — | — |
| 212470 2006 $QU_{44}$ | 16.9 | $X$ | 29.06254 | 118.24386 | 159.48893 | 2.65427 | 0.1732129 | 0.26351145 | 2.4095525 | 21 | 8 31.6 | 19.2 |
| 212471 2006 $QH_{47}$ | 15.3 | $X$ | 264.14937 | 15.03468 | 22.02892 | 11.96641 | 0.1153748 | 0.19064631 | 2.9898572 | 21 | 7 14.5 | 19.8 |
| 212472 2006 $QQ_{47}$ | 16.5 | $X$ | 354.54944 | 278.92344 | 29.71091 | 7.17713 | 0.2291534 | 0.26121002 | 2.4236849 | 21 | 8 10.3 | 18.1 |
| 212473 2006 $QR_{52}$ | 16.0 | $X$ | 146.58764 | 175.57408 | 114.69524 | 4.40831 | 0.0521772 | 0.21879722 | 2.7275634 | 21 | — | — |
| 212474 2006 $QW_{53}$ | 16.0 | $X$ | 214.92465 | 236.05256 | 68.39736 | 6.59944 | 0.0996964 | 0.23450384 | 2.6043703 | 21 | 1 22.9 | 20.0 |
| 212475 2006 $QL_{62}$ | 16.7 | $X$ | 71.09175 | 143.66296 | 141.65078 | 3.19542 | 0.2207899 | 0.26994109 | 2.3711374 | 21 | 11 18.0 | 20.2 |
| 212476 2006 $QR_{65}$ | 16.3 | $X$ | 80.58266 | 319.32461 | 351.42339 | 0.87871 | 0.0588530 | 0.20917549 | 2.8105772 | 21 | 11 30.7 | 20.3 |
| 212477 2006 $QK_{71}$ | 15.7 | $X$ | 6.98376 | 33.73378 | 147.37091 | 5.88592 | 0.1134511 | 0.17134376 | 3.2103855 | 21 | 3 4.8 | 19.7 |
| 212478 2006 $QK_{72}$ | 15.9 | $X$ | 116.13346 | 295.80436 | 0.96228 | 4.33592 | 0.0484233 | 0.21330401 | 2.7741932 | 21 | 12 23.9 | 19.9 |
| 212479 2006 $QU_{78}$ | 16.5 | $X$ | 134.98007 | 345.42562 | 353.79779 | 4.59429 | 0.2383821 | 0.22379788 | 2.6867798 | 21 | — | — |
| 212480 2006 $QB_{79}$ | 15.9 | $X$ | 5.10231 | 226.00482 | 137.19313 | 3.09238 | 0.0923507 | 0.20401159 | 2.8578066 | 21 | 11 2.1 | 19.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212481 2006 $QM_{81}$ | 16.9 | $X$ | 139.26806 | 160.17921 | 138.13505 | 3.17053 | 0.1606413 | 0.21862981 | 2.7289556 | 21 | — | — |
| 212482 2006 $QQ_{81}$ | 15.7 | $X$ | 57.66268 | 0.09544 | 339.80535 | 7.53492 | 0.1047458 | 0.20873408 | 2.8145382 | 21 | 12 15.3 | 19.7 |
| 212483 2006 $QF_{82}$ | 16.6 | $X$ | 29.80678 | 237.11747 | 166.55432 | 5.13002 | 0.1514384 | 0.21350626 | 2.7724409 | 21 | — | — |
| 212484 2006 $QC_{93}$ | 16.8 | $X$ | 17.20651 | 118.67796 | 178.64902 | 6.44212 | 0.1230543 | 0.26427361 | 2.4049175 | 21 | 8 30.9 | 19.2 |
| 212485 2006 $QS_{93}$ | 17.0 | $X$ | 49.49092 | 172.50052 | 216.28676 | 6.28281 | 0.1740142 | 0.28250397 | 2.3003099 | 21 | — | — |
| 212486 2006 $QE_{100}$ | 15.3 | $X$ | 274.93654 | 44.34939 | 324.02879 | 9.42956 | 0.1045794 | 0.18624348 | 3.0367940 | 21 | 6 20.3 | 19.7 |
| 212487 2006 $QM_{100}$ | 16.0 | $X$ | 71.88150 | 308.78909 | 37.01242 | 9.81561 | 0.1657183 | 0.21326725 | 2.7745120 | 21 | — | — |
| 212488 2006 $QG_{103}$ | 17.1 | $X$ | 323.44053 | 27.34539 | 225.83618 | 1.06343 | 0.0756541 | 0.24449696 | 2.5329138 | 21 | 3 23.8 | 20.2 |
| 212489 2006 $QL_{113}$ | 16.5 | $X$ | 359.67543 | 115.59803 | 213.29467 | 5.58544 | 0.1707401 | 0.26271050 | 2.4144475 | 21 | 9 18.0 | 18.6 |
| 212490 2006 $QL_{117}$ | 15.0 | $X$ | 300.48835 | 106.05610 | 271.95242 | 1.73056 | 0.2550748 | 0.12426151 | 3.9772079 | 21 | 7 13.3 | 20.3 |
| 212491 2006 $QW_{117}$ | 16.2 | $X$ | 283.82356 | 84.40045 | 235.47449 | 0.97517 | 0.1760869 | 0.18251278 | 3.0780372 | 21 | 4 20.1 | 20.6 |
| 212492 2006 $QH_{122}$ | 16.6 | $X$ | 66.74878 | 73.62560 | 191.72342 | 6.86842 | 0.2066520 | 0.26697601 | 2.3886612 | 21 | 10 16.1 | 19.7 |
| 212493 2006 $QL_{139}$ | 16.4 | $X$ | 324.62591 | 210.18073 | 129.23715 | 3.11883 | 0.1024475 | 0.19454552 | 2.9497727 | 21 | 7 23.6 | 20.1 |
| 212494 2006 $QO_{139}$ | 16.1 | $X$ | 58.97441 | 351.19902 | 15.96326 | 5.75419 | 0.0667776 | 0.21587173 | 2.7521506 | 21 | — | — |
| 212495 2006 $QU_{141}$ | 16.2 | $X$ | 246.55051 | 97.38306 | 146.44612 | 5.04094 | 0.0864643 | 0.22812568 | 2.6526906 | 21 | — | — |
| 212496 2006 $QX_{144}$ | 15.9 | $X$ | 117.44947 | 164.60640 | 200.90281 | 5.61813 | 0.0440697 | 0.22452151 | 2.6810037 | 21 | — | — |
| 212497 2006 $QV_{154}$ | 16.3 | $X$ | 109.48817 | 10.35334 | 356.80978 | 4.92252 | 0.0679325 | 0.22417304 | 2.6837814 | 21 | — | — |
| 212498 2006 $QS_{165}$ | 16.1 | $X$ | 218.90114 | 327.57472 | 277.62135 | 3.75842 | 0.0529692 | 0.22166517 | 2.7039858 | 21 | — | — |
| 212499 2006 $QA_{168}$ | 16.3 | $X$ | 43.48878 | 276.30526 | 101.86181 | 4.42369 | 0.1035450 | 0.21249401 | 2.7812386 | 21 | — | — |
| 212500 Robertojoppolo | 16.2 | $X$ | 223.04020 | 287.28499 | 7.75161 | 7.85724 | 0.1864375 | 0.23035142 | 2.6355754 | 21 | 1 20.4 | 20.7 |
| 212501 2006 $RK_{6}$ | 16.3 | $X$ | 187.23062 | 324.49692 | 5.30070 | 4.15403 | 0.2610785 | 0.23002976 | 2.6380319 | 21 | 2 2.7 | 21.0 |
| 212502 2006 $RQ_{6}$ | 15.7 | $X$ | 123.81583 | 171.96546 | 192.19058 | 14.23922 | 0.1474484 | 0.22189927 | 2.7020837 | 21 | 1 3.5 | 19.7 |
| 212503 2006 $RS_{7}$ | 16.3 | $X$ | 91.19147 | 140.56913 | 174.99831 | 3.32142 | 0.1741866 | 0.21246241 | 2.7815144 | 21 | 12 29.7 | 20.8 |
| 212504 2006 $RK_{8}$ | 16.1 | $X$ | 101.43909 | 136.62760 | 178.79473 | 3.27083 | 0.0861731 | 0.21292944 | 2.7774457 | 21 | — | — |
| 212505 2006 $RT_{16}$ | 16.4 | $X$ | 173.55587 | 257.82924 | 65.41319 | 2.35334 | 0.0516744 | 0.22684873 | 2.6626361 | 21 | — | — |
| 212506 2006 $RE_{17}$ | 16.0 | $X$ | 166.41441 | 294.26303 | 16.30131 | 8.95068 | 0.1324529 | 0.22424243 | 2.6832277 | 21 | — | — |
| 212507 2006 $RB_{18}$ | 15.1 | $X$ | 301.35282 | 13.70282 | 318.64125 | 9.41161 | 0.1479842 | 0.18451951 | 3.0556799 | 21 | 5 31.4 | 19.3 |
| 212508 2006 $RZ_{18}$ | 15.9 | $X$ | 232.25071 | 305.39963 | 340.52232 | 11.74977 | 0.1818418 | 0.23108643 | 2.6299839 | 21 | 1 17.8 | 20.4 |
| 212509 2006 $RA_{20}$ | 16.3 | $X$ | 74.52823 | 240.98785 | 171.42556 | 6.69408 | 0.0408943 | 0.22347497 | 2.6893673 | 21 | — | — |
| 212510 2006 $RL_{22}$ | 17.1 | $X$ | 131.16660 | 357.89097 | 339.10961 | 2.87761 | 0.1691219 | 0.28736176 | 2.2743121 | 21 | — | — |
| 212511 2006 $RC_{27}$ | 16.7 | $X$ | 260.37803 | 135.60107 | 162.16894 | 4.10033 | 0.2057281 | 0.23824841 | 2.5770096 | 21 | 2 19.5 | 20.8 |
| 212512 2006 $RF_{27}$ | 16.4 | $X$ | 210.15156 | 139.10086 | 182.39328 | 13.44781 | 0.2273861 | 0.23243769 | 2.6197811 | 21 | 2 5.2 | 21.1 |
| 212513 2006 $RB_{31}$ | 15.2 | $X$ | 257.46802 | 14.32338 | 343.12090 | 9.89292 | 0.1084526 | 0.18037696 | 3.1022873 | 21 | 5 12.3 | 20.0 |
| 212514 2006 $RC_{33}$ | 16.2 | $X$ | 27.77973 | 279.17182 | 27.63435 | 8.81734 | 0.2538926 | 0.26327834 | 2.4109746 | 21 | 10 25.7 | 18.6 |
| 212515 2006 $RG_{34}$ | 15.8 | $X$ | 92.94493 | 307.85958 | 43.12378 | 6.71567 | 0.0470579 | 0.21524774 | 2.7574670 | 21 | — | — |
| 212516 2006 $RM_{34}$ | 15.3 | $X$ | 217.68227 | 207.32218 | 170.49900 | 5.97127 | 0.1390274 | 0.17539472 | 3.1607614 | 21 | 4 29.5 | 20.3 |
| 212517 2006 $RZ_{35}$ | 15.2 | $X$ | 283.59096 | 154.95523 | 188.54730 | 10.40230 | 0.1892715 | 0.18227525 | 3.0807106 | 21 | 5 19.4 | 19.7 |
| 212518 2006 $RK_{36}$ | 15.7 | $X$ | 347.35515 | 22.19711 | 3.59090 | 13.99527 | 0.2331456 | 0.20360062 | 2.8616509 | 21 | 11 4.6 | 18.5 |
| 212519 2006 $RE_{40}$ | 15.3 | $X$ | 252.46383 | 227.24898 | 166.73080 | 12.63562 | 0.1254354 | 0.18379201 | 3.0637380 | 21 | 6 23.3 | 20.1 |
| 212520 2006 $RD_{43}$ | 16.2 | $X$ | 49.64582 | 262.55685 | 29.01526 | 1.94291 | 0.0722570 | 0.19574994 | 2.9376606 | 21 | 9 29.6 | 20.1 |
| 212521 2006 $RK_{43}$ | 15.8 | $X$ | 204.32613 | 232.60252 | 14.52391 | 9.03724 | 0.1156301 | 0.21681788 | 2.7441383 | 21 | — | — |
| 212522 2006 $RY_{46}$ | 16.2 | $X$ | 115.61408 | 282.80036 | 30.17704 | 5.23768 | 0.0672135 | 0.21199841 | 2.7855715 | 21 | — | — |
| 212523 2006 $RB_{55}$ | 16.5 | $X$ | 113.65346 | 196.78243 | 114.50965 | 1.69023 | 0.0612840 | 0.21030172 | 2.8005339 | 21 | — | — |
| 212524 2006 $RO_{57}$ | 16.2 | $X$ | 272.28782 | 34.39653 | 2.11147 | 2.78041 | 0.0896593 | 0.18925371 | 3.0045063 | 21 | 7 26.2 | 20.3 |
| 212525 2006 $RM_{61}$ | 16.3 | $X$ | 20.38019 | 30.75762 | 331.31751 | 1.19053 | 0.0860583 | 0.20560400 | 2.8430315 | 21 | 11 21.2 | 20.0 |
| 212526 2006 $RZ_{67}$ | 15.4 | $X$ | 193.71095 | 89.92188 | 349.90157 | 10.00774 | 0.0825802 | 0.18277880 | 3.0750500 | 21 | 6 20.8 | 20.3 |
| 212527 2006 $RY_{71}$ | 16.2 | $X$ | 301.54342 | 23.60510 | 0.75702 | 1.72867 | 0.0796525 | 0.19185002 | 2.9773380 | 21 | 8 21.0 | 20.1 |
| 212528 2006 $RE_{74}$ | 16.0 | $X$ | 75.88050 | 97.59039 | 169.15479 | 1.99723 | 0.0379185 | 0.19637358 | 2.9314377 | 21 | 9 26.8 | 20.0 |
| 212529 2006 $RL_{74}$ | 15.9 | $X$ | 156.16161 | 0.29725 | 149.38073 | 1.33633 | 0.0828365 | 0.18696846 | 3.0289387 | 21 | 8 7.1 | 20.4 |
| 212530 2006 $RR_{74}$ | 16.1 | $X$ | 130.68834 | 101.48451 | 42.44301 | 1.24031 | 0.1150731 | 0.18094070 | 3.0958403 | 21 | 7 6.1 | 20.7 |
| 212531 2006 $RD_{77}$ | 16.0 | $X$ | 16.71320 | 190.50007 | 146.55918 | 2.75778 | 0.0461416 | 0.19820064 | 2.9133948 | 21 | 10 10.6 | 19.8 |
| 212532 2006 $RH_{78}$ | 16.8 | $X$ | 230.41710 | 126.34803 | 149.77929 | 3.35839 | 0.1055974 | 0.22825694 | 2.6516735 | 21 | 1 3.5 | 20.9 |
| 212533 2006 $RB_{85}$ | 16.0 | $X$ | 177.78140 | 235.88542 | 189.35503 | 8.48784 | 0.0836860 | 0.17525164 | 3.1624815 | 21 | 5 18.4 | 20.9 |
| 212534 2006 $RK_{87}$ | 16.1 | $X$ | 296.57075 | 202.15117 | 159.12940 | 1.31225 | 0.0207263 | 0.18666966 | 3.0321700 | 21 | 7 21.5 | 20.3 |
| 212535 2006 $RY_{89}$ | 16.3 | $X$ | 280.97379 | 273.00016 | 350.30646 | 2.90802 | 0.1174357 | 0.23414046 | 2.6070643 | 21 | 2 7.6 | 19.9 |
| 212536 2006 $RY_{91}$ | 15.5 | $X$ | 159.31254 | 251.89511 | 193.97931 | 4.62616 | 0.1557215 | 0.17346204 | 3.1841957 | 21 | 5 27.4 | 20.6 |
| 212537 2006 $RM_{95}$ | 16.0 | $X$ | 287.29413 | 347.21862 | 2.14194 | 4.39428 | 0.0474587 | 0.18138285 | 3.0908071 | 21 | 6 19.9 | 20.3 |
| 212538 2006 $RS_{95}$ | 16.3 | $X$ | 159.21560 | 214.74950 | 15.35865 | 6.09531 | 0.0085081 | 0.20212368 | 2.8755742 | 21 | 11 17.9 | 20.4 |
| 212539 2006 $RS_{97}$ | 15.7 | $X$ | 285.55751 | 37.35097 | 204.50745 | 9.51357 | 0.1676468 | 0.23095578 | 2.6309757 | 21 | 1 9.9 | 19.9 |
| 212540 2006 $RR_{99}$ | 16.4 | $X$ | 92.77298 | 324.17819 | 15.49497 | 3.34337 | 0.0796940 | 0.21467611 | 2.7623598 | 21 | — | — |
| 212541 2006 $RY_{104}$ | 15.7 | $X$ | 189.83292 | 241.81101 | 333.84534 | 6.88851 | 0.1616873 | 0.21248785 | 2.7812924 | 21 | 11 26.9 | 20.3 |
| 212542 2006 $SF_{4}$ | 16.0 | $X$ | 121.24616 | 349.77693 | 307.54603 | 5.73332 | 0.2352206 | 0.21459587 | 2.7630483 | 21 | — | — |
| 212543 2006 $SU_{4}$ | 15.7 | $X$ | 123.02462 | 318.48525 | 31.75992 | 13.92021 | 0.2800329 | 0.21739826 | 2.7392521 | 21 | 1 7.6 | 19.9 |
| 212544 2006 $SA_{8}$ | 15.6 | $X$ | 266.69602 | 60.77416 | 335.22141 | 9.07642 | 0.0180704 | 0.18707693 | 3.0277678 | 21 | 7 30.0 | 19.8 |
| 212545 2006 $SG_{11}$ | 16.6 | $X$ | 202.46405 | 157.52937 | 167.70470 | 7.97879 | 0.1989127 | 0.23256193 | 2.6188480 | 21 | 2 4.5 | 21.2 |
| 212546 2006 $SV_{19}$ | 17.6 | $X$ | 297.37808 | 182.58796 | 116.21263 | 7.35546 | 0.5155369 | 0.31647055 | 2.1326218 | 21 | 2 19.2 | 21.5 |
| 212547 2006 $SD_{20}$ | 15.9 | $X$ | 223.23439 | 352.11780 | 20.93039 | 17.50787 | 0.0273239 | 0.17305351 | 3.1892050 | 21 | 4 30.7 | 20.6 |
| 212548 2006 $SW_{23}$ | 16.5 | $X$ | 185.85451 | 178.89537 | 157.89888 | 4.44922 | 0.1321755 | 0.23070543 | 2.6328786 | 21 | 2 2.4 | 20.6 |
| 212549 2006 $SA_{24}$ | 15.3 | $X$ | 228.39299 | 240.94260 | 147.20875 | 12.05571 | 0.1041504 | 0.17620181 | 3.1511021 | 21 | 5 26.0 | 20.3 |
| 212550 2006 $SR_{25}$ | 15.5 | $X$ | 227.43848 | 144.96808 | 190.30178 | 5.43096 | 0.1207736 | 0.17270872 | 3.1934482 | 21 | 3 18.3 | 20.4 |
| 212551 2006 $SL_{30}$ | 16.4 | $X$ | 157.97932 | 350.80042 | 266.59215 | 5.23415 | 0.0261541 | 0.21491618 | 2.7603023 | 21 | 12 23.4 | 20.1 |
| 212552 2006 $SU_{36}$ | 15.0 | $X$ | 35.33960 | 350.19111 | 207.32248 | 17.76900 | 0.0788404 | 0.17360012 | 3.1825070 | 21 | 5 8.7 | 19.1 |
| 212553 2006 $SY_{37}$ | 16.8 | $X$ | 178.96452 | 44.88361 | 292.35029 | 4.64738 | 0.0841410 | 0.22862485 | 2.6488280 | 21 | 1 24.5 | 20.8 |
| 212554 2006 $SG_{43}$ | 16.1 | $X$ | 285.78741 | 191.11297 | 194.50153 | 9.23634 | 0.0081276 | 0.18629460 | 3.0362385 | 21 | 8 7.3 | 20.4 |
| 212555 2006 $SQ_{46}$ | 15.9 | $X$ | 210.97387 | 299.47885 | 335.98981 | 13.57694 | 0.0529532 | 0.22506813 | 2.6766611 | 21 | — | — |
| 212556 2006 $SV_{49}$ | 16.1 | $X$ | 184.39923 | 113.41367 | 192.80810 | 11.97470 | 0.1244547 | 0.22340725 | 2.6899107 | 21 | — | — |
| 212557 2006 $SW_{49}$ | 15.2 | $X$ | 175.83028 | 67.02392 | 19.98167 | 15.85569 | 0.0801102 | 0.17696291 | 3.1420605 | 21 | 6 7.8 | 20.2 |
| 212558 2006 $SM_{50}$ | 15.1 | $X$ | 178.76416 | 100.06649 | 340.72562 | 8.73075 | 0.0407432 | 0.17886643 | 3.1197287 | 21 | 6 4.2 | 19.9 |
| 212559 2006 $SE_{66}$ | 15.9 | $X$ | 25.56622 | 132.27003 | 178.53953 | 11.99819 | 0.0470705 | 0.19721338 | 2.9231098 | 21 | 9 17.4 | 19.7 |
| 212560 2006 $SF_{66}$ | 16.1 | $X$ | 181.28518 | 254.98973 | 357.89366 | 8.88189 | 0.1083351 | 0.21562474 | 2.7542519 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212561 2006 $SP_{73}$ | 15.1 | X | 318.66933 | 66.58703 | 191.62221 | 10.69102 | 0.0684266 | 0.16981486 | 3.2296262 | 21 | 4 4.5 | 19.5 |
| 212562 2006 $SY_{74}$ | 16.4 | X | 97.47941 | 211.95778 | 83.36373 | 3.20076 | 0.0423842 | 0.20334098 | 2.8640864 | 21 | 11 28.9 | 20.5 |
| 212563 2006 $SM_{80}$ | 15.9 | X | 65.65415 | 296.47833 | 43.48251 | 5.10441 | 0.1204674 | 0.20954642 | 2.8072594 | 21 | 12 27.2 | 20.0 |
| 212564 2006 $SJ_{81}$ | 16.8 | X | 240.61666 | 66.51757 | 177.98664 | 2.50709 | 0.1304712 | 0.22359151 | 2.6884328 | 21 | — | — |
| 212565 2006 $SW_{83}$ | 16.2 | X | 108.15743 | 301.97175 | 23.07560 | 5.53824 | 0.1662569 | 0.21401224 | 2.7680694 | 21 | — | — |
| 212566 2006 $ST_{84}$ | 16.4 | X | 95.20749 | 312.40924 | 31.54889 | 2.26059 | 0.0925869 | 0.21373230 | 2.7704859 | 21 | — | — |
| 212567 2006 $SW_{85}$ | 16.0 | X | 15.53421 | 80.34149 | 195.35832 | 9.24100 | 0.0344400 | 0.18501428 | 3.0502297 | 21 | 7 15.6 | 20.2 |
| 212568 2006 $SH_{91}$ | 16.0 | X | 261.08843 | 318.71844 | 19.01881 | 3.45104 | 0.1194263 | 0.17546555 | 3.1599107 | 21 | 4 24.1 | 20.8 |
| 212569 2006 $SL_{92}$ | 15.6 | X | 242.55280 | 157.87852 | 207.17405 | 4.32526 | 0.1455004 | 0.17616678 | 3.1515197 | 21 | 5 6.3 | 20.4 |
| 212570 2006 $SE_{94}$ | 15.9 | X | 330.33043 | 211.04059 | 35.82065 | 6.09254 | 0.2373102 | 0.23977617 | 2.5660515 | 21 | 3 4.1 | 18.9 |
| 212571 2006 $SH_{97}$ | 16.4 | X | 164.22423 | 120.53813 | 194.13768 | 4.63837 | 0.1124319 | 0.22025819 | 2.7154887 | 21 | — | — |
| 212572 2006 $SG_{99}$ | 16.3 | X | 254.51568 | 267.05316 | 16.28651 | 7.23924 | 0.1989845 | 0.23349930 | 2.6118345 | 21 | 2 1.2 | 20.7 |
| 212573 2006 $SM_{106}$ | 17.0 | X | 252.48706 | 62.48168 | 198.40061 | 4.52043 | 0.2033405 | 0.23017655 | 2.6369102 | 21 | 1 1.5 | 21.5 |
| 212574 2006 $SO_{111}$ | 14.8 | X | 265.20562 | 55.01227 | 291.98470 | 9.89855 | 0.0871010 | 0.17906525 | 3.1174190 | 21 | 5 12.0 | 19.5 |
| 212575 2006 $SH_{115}$ | 16.2 | X | 209.28614 | 3.13542 | 29.37597 | 1.18467 | 0.0888825 | 0.17600320 | 3.1534722 | 21 | 5 9.4 | 21.0 |
| 212576 2006 $SK_{115}$ | 15.8 | X | 235.46221 | 61.25787 | 282.95267 | 3.50894 | 0.0938393 | 0.17574509 | 3.1565591 | 21 | 4 6.0 | 20.6 |
| 212577 2006 $SK_{116}$ | 16.7 | X | 321.36286 | 133.27886 | 184.63789 | 0.64846 | 0.0465192 | 0.18160266 | 3.0883125 | 21 | 6 25.6 | 20.6 |
| 212578 2006 $SD_{123}$ | 15.9 | X | 81.06077 | 238.88822 | 132.16968 | 10.39110 | 0.0910745 | 0.21642461 | 2.7474615 | 21 | — | — |
| 212579 2006 $SG_{124}$ | 15.3 | X | 254.29935 | 230.19321 | 137.79165 | 12.64417 | 0.1649247 | 0.17981055 | 3.1087988 | 21 | 5 22.7 | 20.3 |
| 212580 2006 $SN_{125}$ | 15.1 | X | 214.87820 | 228.42050 | 156.24047 | 17.69436 | 0.1517877 | 0.17530477 | 3.1618425 | 21 | 5 7.7 | 20.5 |
| 212581 2006 $ST_{133}$ | 16.0 | X | 277.10173 | 38.36633 | 213.28971 | 4.37041 | 0.0464815 | 0.23129550 | 2.6283988 | 21 | 1 26.3 | 19.6 |
| 212582 2006 $SD_{134}$ | 15.6 | X | 170.34335 | 35.16242 | 12.19670 | 11.67117 | 0.0852182 | 0.17198409 | 3.2024119 | 21 | 4 16.0 | 20.4 |
| 212583 2006 $SS_{139}$ | 15.2 | X | 297.30884 | 226.66738 | 38.03061 | 18.33801 | 0.1881750 | 0.23621469 | 2.5917799 | 21 | 2 27.9 | 19.3 |
| 212584 2006 $SO_{149}$ | 16.3 | X | 292.41264 | 3.93120 | 241.99551 | 1.80439 | 0.1630113 | 0.23245286 | 2.6196672 | 21 | 1 23.4 | 20.2 |
| 212585 2006 $SQ_{159}$ | 16.3 | X | 182.52426 | 5.49400 | 66.30978 | 2.97193 | 0.0869330 | 0.17514525 | 3.1637620 | 21 | 5 30.1 | 21.1 |
| 212586 2006 $SD_{161}$ | 16.1 | X | 22.17514 | 256.32817 | 91.41942 | 3.26078 | 0.0922722 | 0.19918581 | 2.9037805 | 21 | 11 6.4 | 19.7 |
| 212587 Bartasiute | 15.9 | X | 275.71396 | 265.15845 | 359.03219 | 7.23245 | 0.1658723 | 0.23381510 | 2.6094822 | 21 | 1 30.7 | 19.9 |
| 212588 2006 $SK_{173}$ | 17.5 | X | 298.66451 | 240.17849 | 224.20474 | 2.05637 | 0.1198010 | 0.27160630 | 2.3614359 | 21 | 12 14.6 | 19.6 |
| 212589 2006 $SQ_{173}$ | 15.5 | X | 236.75289 | 159.94947 | 203.92875 | 7.83874 | 0.0870850 | 0.17780472 | 3.1321354 | 21 | 5 4.2 | 20.3 |
| 212590 2006 $SA_{177}$ | 16.2 | X | 283.17202 | 353.06374 | 22.82435 | 3.35370 | 0.1366286 | 0.18652357 | 3.0337531 | 21 | 7 6.1 | 20.3 |
| 212591 2006 $SO_{192}$ | 16.3 | X | 295.46171 | 301.46563 | 60.85509 | 3.96014 | 0.0931494 | 0.18709559 | 3.0275664 | 21 | 7 11.8 | 20.4 |
| 212592 2006 $SH_{194}$ | 15.8 | X | 316.98987 | 311.25207 | 3.62402 | 10.03798 | 0.0485077 | 0.18159315 | 3.0884203 | 21 | 6 14.4 | 20.2 |
| 212593 2006 $SF_{206}$ | 16.2 | X | 272.06648 | 21.66367 | 18.20738 | 2.61274 | 0.0528728 | 0.18716990 | 3.0267651 | 21 | 8 4.9 | 20.3 |
| 212594 2006 $SN_{208}$ | 15.1 | X | 216.84207 | 30.90974 | 18.66486 | 11.04290 | 0.0934063 | 0.18033335 | 3.1027873 | 21 | 6 5.1 | 20.0 |
| 212595 2006 $SZ_{208}$ | 16.3 | X | 202.31175 | 285.97968 | 36.39131 | 2.86010 | 0.0997855 | 0.23047841 | 2.6346072 | 21 | 2 1.4 | 20.3 |
| 212596 2006 $SF_{218}$ | 16.5 | X | 237.23843 | 293.88339 | 28.70898 | 3.66664 | 0.2428504 | 0.23610303 | 2.5925970 | 21 | 3 2.0 | 20.9 |
| 212597 2006 $SM_{220}$ | 15.6 | X | 343.04558 | 65.31523 | 219.67825 | 2.97280 | 0.1225391 | 0.18388600 | 3.0626939 | 21 | 6 7.9 | 19.1 |
| 212598 2006 $SW_{230}$ | 16.5 | X | 177.02486 | 320.89981 | 304.52971 | 2.38915 | 0.1584916 | 0.21736248 | 2.7395527 | 21 | — | — |
| 212599 2006 $SN_{239}$ | 16.1 | X | 247.03373 | 212.52185 | 144.83856 | 1.94057 | 0.1647055 | 0.17813740 | 3.1282346 | 21 | 4 29.9 | 21.0 |
| 212600 2006 $SN_{241}$ | 16.1 | X | 247.90671 | 277.69080 | 141.23988 | 1.97556 | 0.0870109 | 0.18853196 | 3.0121694 | 21 | 7 24.2 | 20.5 |
| 212601 2006 $SO_{273}$ | 15.7 | X | 224.23866 | 20.70150 | 34.87054 | 9.83852 | 0.1227724 | 0.17701938 | 3.1413922 | 21 | 6 19.6 | 20.7 |
| 212602 2006 $SG_{274}$ | 15.6 | X | 355.93129 | 275.10697 | 34.97445 | 10.81950 | 0.0456189 | 0.18780869 | 3.0198979 | 21 | 8 9.0 | 19.7 |
| 212603 2006 $SR_{275}$ | 16.4 | X | 272.37788 | 85.41329 | 160.08025 | 14.04587 | 0.0750894 | 0.23442406 | 2.6049612 | 21 | 1 9.9 | 20.3 |
| 212604 2006 $SR_{279}$ | 16.5 | X | 205.05437 | 37.79403 | 285.56673 | 3.30936 | 0.2751394 | 0.23197172 | 2.6232883 | 21 | 2 6.0 | 21.1 |
| 212605 2006 $SO_{281}$ | 15.2 | X | 154.90566 | 26.13114 | 209.97774 | 12.52216 | 0.0672534 | 0.20505055 | 2.8481450 | 21 | 11 22.5 | 19.5 |
| 212606 Janulis | 16.2 | X | 143.08010 | 353.76132 | 325.56533 | 0.88258 | 0.1255585 | 0.21717011 | 2.7411703 | 21 | — | — |
| 212607 2006 $SN_{299}$ | 16.0 | X | 223.61460 | 77.72177 | 6.49869 | 10.00467 | 0.0208859 | 0.18677175 | 3.0310651 | 21 | 8 7.9 | 20.4 |
| 212608 2006 $SL_{316}$ | 16.5 | X | 275.93739 | 240.99056 | 39.75166 | 5.27775 | 0.2731275 | 0.23934685 | 2.5691191 | 21 | 2 9.6 | 20.8 |
| 212609 2006 $SB_{320}$ | 15.6 | X | 350.53693 | 221.69347 | 37.22915 | 10.51265 | 0.0304676 | 0.17733153 | 3.1377047 | 21 | 5 20.0 | 19.9 |
| 212610 2006 $ST_{325}$ | 16.2 | X | 187.45518 | 111.41821 | 195.35872 | 11.58757 | 0.0955471 | 0.22302339 | 2.6929964 | 21 | — | — |
| 212611 2006 $SU_{353}$ | 15.3 | X | 240.85766 | 332.16030 | 51.11168 | 10.28975 | 0.0795286 | 0.17842323 | 3.1248927 | 21 | 5 31.7 | 20.0 |
| 212612 2006 $SQ_{358}$ | 15.5 | X | 234.89901 | 189.50464 | 158.32501 | 4.68600 | 0.1063606 | 0.17246245 | 3.1964875 | 21 | 4 12.3 | 20.4 |
| 212613 2006 $SY_{365}$ | 15.7 | X | 127.10854 | 3.10490 | 207.91610 | 8.48678 | 0.0369109 | 0.18938610 | 3.0031059 | 21 | 9 15.7 | 20.1 |
| 212614 2006 $SZ_{385}$ | 15.3 | X | 273.90954 | 210.75059 | 145.28626 | 11.61725 | 0.1020330 | 0.17925393 | 3.1152310 | 21 | 6 5.4 | 19.9 |
| 212615 2006 $SV_{386}$ | 16.4 | X | 114.85018 | 196.44979 | 103.85534 | 2.47716 | 0.1164020 | 0.21115804 | 2.7929573 | 21 | 12 29.9 | 20.8 |
| 212616 2006 $SF_{396}$ | 15.7 | X | 80.27318 | 306.05467 | 187.70748 | 7.92858 | 0.0568429 | 0.17238171 | 3.1974856 | 21 | 4 17.6 | 20.0 |
| 212617 2006 $SJ_{399}$ | 17.1 | X | 239.30556 | 222.90871 | 62.04832 | 2.81392 | 0.1656606 | 0.23122191 | 2.6289565 | 21 | 1 21.0 | 21.3 |
| 212618 2006 $SK_{407}$ | 16.4 | X | 87.05983 | 281.45644 | 5.65919 | 6.38683 | 0.0364045 | 0.20037905 | 2.8922412 | 21 | 11 3.4 | 20.4 |
| 212619 2006 $TD_9$ | 15.3 | X | 302.75395 | 356.64669 | 331.11542 | 7.84575 | 0.1162261 | 0.18296874 | 3.0729214 | 21 | 6 1.3 | 19.5 |
| 212620 2006 $TF_{15}$ | 14.9 | X | 88.23014 | 276.07045 | 211.56527 | 12.48160 | 0.0191488 | 0.16915290 | 3.2380465 | 21 | 4 13.6 | 19.5 |
| 212621 2006 $TC_{18}$ | 16.6 | X | 131.12783 | 256.93994 | 66.85566 | 3.14903 | 0.2168607 | 0.21667078 | 2.7453801 | 21 | — | — |
| 212622 2006 $TU_{21}$ | 15.8 | X | 311.76326 | 308.15389 | 51.50226 | 4.91518 | 0.0764858 | 0.18514100 | 3.0488378 | 21 | 8 4.5 | 19.8 |
| 212623 2006 $TB_{22}$ | 15.8 | X | 323.63945 | 257.07744 | 77.99352 | 4.51248 | 0.0980737 | 0.18383365 | 3.0632754 | 21 | 7 16.9 | 19.6 |
| 212624 2006 $TD_{25}$ | 16.0 | X | 35.70336 | 209.39172 | 29.94003 | 5.40504 | 0.0796940 | 0.17939937 | 3.1135470 | 21 | 7 2.6 | 20.1 |
| 212625 2006 $TZ_{26}$ | 16.0 | X | 279.12536 | 336.50998 | 32.06481 | 5.98272 | 0.0786709 | 0.18156394 | 3.0887516 | 21 | 6 29.8 | 20.3 |
| 212626 2006 $TZ_{27}$ | 15.0 | X | 41.18057 | 193.38459 | 39.07524 | 19.03413 | 0.0906182 | 0.17824071 | 3.1270257 | 21 | 7 2.6 | 19.4 |
| 212627 2006 $TW_{28}$ | 15.9 | X | 321.37804 | 253.47381 | 55.27091 | 2.05107 | 0.1472144 | 0.18126298 | 3.0921696 | 21 | 5 31.9 | 19.7 |
| 212628 2006 $TR_{41}$ | 15.0 | X | 152.71164 | 66.58176 | 43.45996 | 11.95488 | 0.0526514 | 0.17755814 | 3.1350345 | 21 | 6 11.4 | 19.7 |
| 212629 2006 $TC_{49}$ | 16.3 | X | 237.02122 | 352.37164 | 319.91145 | 1.54675 | 0.2079414 | 0.23456627 | 2.6039082 | 21 | 2 17.7 | 20.6 |
| 212630 2006 $TK_{54}$ | 15.4 | X | 241.81240 | 63.92062 | 272.92819 | 3.74349 | 0.1437809 | 0.17039157 | 3.2223346 | 21 | 3 31.2 | 20.5 |
| 212631 Hsinchu | 15.3 | X | 273.88889 | 195.23376 | 191.24902 | 9.11817 | 0.0577671 | 0.18303866 | 3.0721388 | 21 | 7 17.2 | 19.7 |
| 212632 2006 $TY_{94}$ | 15.6 | X | 219.59440 | 23.86187 | 229.58771 | 12.71126 | 0.1875427 | 0.21998645 | 2.7177245 | 21 | — | — |
| 212633 2006 $TV_{95}$ | 15.5 | X | 247.25198 | 325.93047 | 329.31503 | 12.37175 | 0.1778296 | 0.23470665 | 2.6028698 | 21 | 2 8.7 | 19.6 |
| 212634 2006 $TB_{105}$ | 15.8 | X | 17.36450 | 191.11833 | 77.51222 | 3.73084 | 0.1030036 | 0.18174554 | 3.0866937 | 21 | 7 15.1 | 19.4 |
| 212635 2006 $TJ_{106}$ | 15.9 | X | 250.68648 | 82.70705 | 329.15741 | 2.38689 | 0.0453016 | 0.18325563 | 3.0697134 | 21 | 7 24.5 | 20.3 |
| 212636 2006 $TQ_{109}$ | 15.4 | X | 273.28713 | 9.07305 | 12.59421 | 7.51466 | 0.0591917 | 0.18052658 | 3.1005729 | 21 | 7 13.4 | 19.9 |
| 212637 2006 $TC_{110}$ | 15.2 | X | 259.58200 | 157.67587 | 177.77369 | 18.20686 | 0.0874123 | 0.17287640 | 3.1913828 | 21 | 4 26.9 | 20.1 |
| 212638 2006 $UE_2$ | 15.9 | X | 299.27086 | 239.23771 | 76.52296 | 5.56817 | 0.1053445 | 0.17522766 | 3.1627699 | 21 | 5 16.1 | 20.1 |
| 212639 2006 $UB_5$ | 16.6 | X | 354.30776 | 280.66454 | 59.74834 | 2.54704 | 0.0397124 | 0.19229530 | 2.9727401 | 21 | 9 12.7 | 20.6 |
| 212640 2006 $UD_{25}$ | 16.6 | X | 15.27998 | 342.59917 | 321.75062 | 1.36786 | 0.0854862 | 0.18911287 | 3.0059978 | 21 | 8 27.7 | 20.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212641 2006 $UP_{28}$ | 15.5 | $X$ | 219.06622 | 34.06699 | 25.49151 | 12.17617 | 0.0905502 | 0.17929953 | 3.1147028 | 21 | 6 21.5 | 20.4 |
| 212642 2006 $UJ_{33}$ | 15.9 | $X$ | 95.63085 | 123.39500 | 73.28478 | 2.04005 | 0.0978919 | 0.18009989 | 3.1054682 | 21 | 7 31.5 | 20.4 |
| 212643 2006 $UW_{35}$ | 15.9 | $X$ | 38.33665 | 244.69914 | 355.78965 | 2.48330 | 0.0605206 | 0.17892310 | 3.1190699 | 21 | 7 5.9 | 19.9 |
| 212644 2006 $UA_{38}$ | 15.6 | $X$ | 269.27400 | 65.00029 | 249.18462 | 1.26630 | 0.0855295 | 0.16956299 | 3.2328236 | 21 | 4 9.1 | 20.2 |
| 212645 2006 $UF_{39}$ | 16.5 | $X$ | 330.41415 | 79.46191 | 33.51925 | 5.84475 | 0.0077640 | 0.20951550 | 2.8075357 | 21 | — | — |
| 212646 2006 $UV_{52}$ | 16.7 | $X$ | 39.18810 | 192.61798 | 94.73345 | 3.38193 | 0.0914913 | 0.18918513 | 3.0052324 | 21 | 9 12.9 | 20.7 |
| 212647 2006 $UX_{67}$ | 15.7 | $X$ | 269.49110 | 5.29021 | 66.76113 | 10.75057 | 0.0580311 | 0.19070942 | 2.9891975 | 21 | 9 16.8 | 20.0 |
| 212648 2006 $UH_{68}$ | 15.8 | $X$ | 325.87238 | 172.99512 | 169.87515 | 5.19934 | 0.1203941 | 0.18689711 | 3.0297095 | 21 | 7 27.4 | 19.4 |
| 212649 2006 $UW_{80}$ | 15.9 | $X$ | 194.64411 | 52.87729 | 223.59617 | 6.85078 | 0.1217148 | 0.21960780 | 2.7208475 | 21 | — | — |
| 212650 2006 $UF_{91}$ | 15.7 | $X$ | 337.96495 | 335.87950 | 44.18290 | 10.96458 | 0.1052968 | 0.19236338 | 2.9720387 | 21 | 10 12.4 | 19.3 |
| 212651 2006 $UK_{103}$ | 15.3 | $X$ | 283.25956 | 87.72000 | 201.98853 | 4.67032 | 0.0911143 | 0.16744328 | 3.2600498 | 21 | 3 25.9 | 20.1 |
| 212652 2006 $UF_{116}$ | 16.4 | $X$ | 262.37481 | 152.68262 | 130.25714 | 6.69181 | 0.2433677 | 0.23915003 | 2.5705285 | 21 | 2 1.4 | 20.7 |
| 212653 2006 $UG_{124}$ | 15.1 | $X$ | 331.80950 | 19.75105 | 320.79546 | 10.81135 | 0.1107174 | 0.18915422 | 3.0055597 | 21 | 8 6.1 | 18.6 |
| 212654 2006 $UM_{125}$ | 16.3 | $X$ | 349.00672 | 279.31373 | 17.80261 | 10.07695 | 0.0494546 | 0.18189056 | 3.0850528 | 21 | 7 9.4 | 20.5 |
| 212655 2006 $UN_{135}$ | 15.9 | $X$ | 352.24191 | 169.23890 | 151.05319 | 2.20079 | 0.1421624 | 0.18779119 | 3.0200855 | 21 | 8 12.1 | 19.3 |
| 212656 2006 $UW_{163}$ | 16.4 | $X$ | 283.30057 | 176.35784 | 95.52604 | 3.30959 | 0.1494439 | 0.23474188 | 2.6026094 | 21 | 2 17.5 | 20.1 |
| 212657 2006 $UF_{173}$ | 17.7 | $X$ | 274.47042 | 97.95425 | 189.04495 | 3.76759 | 0.0760398 | 0.30054856 | 2.2072911 | 21 | 2 22.9 | 20.6 |
| 212658 2006 $UX_{178}$ | 15.3 | $X$ | 330.34684 | 166.43036 | 185.61006 | 9.47371 | 0.0783808 | 0.18835586 | 3.0140465 | 21 | 8 18.5 | 19.2 |
| 212659 2006 $UQ_{195}$ | 17.9 | $X$ | 316.62488 | 209.54834 | 37.06309 | 4.21956 | 0.1099256 | 0.30126571 | 2.2037868 | 21 | 2 20.3 | 20.4 |
| 212660 2006 $US_{195}$ | 16.4 | $X$ | 124.99242 | 101.74115 | 194.31128 | 5.33101 | 0.0791316 | 0.21278377 | 2.7787132 | 21 | — | — |
| 212661 2006 $UL_{213}$ | 15.9 | $X$ | 79.52774 | 266.07640 | 8.17054 | 2.73091 | 0.0491456 | 0.19074614 | 2.9888140 | 21 | 10 11.2 | 20.2 |
| 212662 2006 $UV_{218}$ | 15.8 | $X$ | 317.22089 | 238.35527 | 175.07338 | 9.09570 | 0.0922715 | 0.19902004 | 2.9053928 | 21 | 10 23.5 | 19.3 |
| 212663 2006 $UB_{233}$ | 15.9 | $X$ | 324.64577 | 303.99290 | 56.90752 | 2.43506 | 0.1293019 | 0.18955186 | 3.0013549 | 21 | 8 20.7 | 19.4 |
| 212664 2006 $UF_{233}$ | 15.5 | $X$ | 340.17284 | 291.45858 | 48.59519 | 11.50320 | 0.0868972 | 0.18866042 | 3.0108019 | 21 | 8 26.0 | 19.4 |
| 212665 2006 $UR_{237}$ | 15.6 | $X$ | 101.40386 | 343.99740 | 171.19650 | 2.81187 | 0.1086884 | 0.17382209 | 3.1797970 | 21 | 6 16.8 | 20.1 |
| 212666 2006 $UY_{246}$ | 15.7 | $X$ | 51.98921 | 193.83173 | 355.35884 | 1.43797 | 0.0683541 | 0.17224019 | 3.1992368 | 21 | 5 19.8 | 19.9 |
| 212667 2006 $UU_{253}$ | 15.9 | $X$ | 11.40882 | 66.27428 | 158.94702 | 0.69208 | 0.0782262 | 0.17039838 | 3.2222488 | 21 | 5 7.8 | 19.9 |
| 212668 2006 $UL_{256}$ | 16.3 | $X$ | 289.98786 | 19.59708 | 55.67386 | 2.85039 | 0.0787076 | 0.19602066 | 2.9349552 | 21 | 10 11.3 | 20.2 |
| 212669 2006 $UL_{278}$ | 14.5 | $X$ | 85.07629 | 191.19594 | 228.23263 | 8.83415 | 0.0487621 | 0.15386021 | 3.4492010 | 21 | 1 22.2 | 19.4 |
| 212670 2006 $UB_{322}$ | 15.9 | $X$ | 72.03628 | 216.38533 | 52.20001 | 2.71455 | 0.0589750 | 0.19398295 | 2.9554731 | 21 | 9 27.9 | 19.9 |
| 212671 2006 $UB_{328}$ | 15.6 | $X$ | 358.43411 | 344.78530 | 7.41619 | 12.01161 | 0.0699061 | 0.19471724 | 2.9480383 | 21 | 10 3.6 | 19.1 |
| 212672 2006 $UP_{332}$ | 15.7 | $X$ | 35.42189 | 88.66351 | 152.43303 | 10.31563 | 0.0387185 | 0.18013410 | 3.1050750 | 21 | 6 30.0 | 20.0 |
| 212673 2006 $UO_{333}$ | 15.8 | $X$ | 133.45454 | 315.09391 | 161.88311 | 9.67668 | 0.0611623 | 0.17448643 | 3.1717208 | 21 | 6 1.9 | 20.6 |
| 212674 2006 $VL_{1}$ | 15.7 | $X$ | 298.14366 | 276.62584 | 33.65305 | 6.17625 | 0.1399206 | 0.17518949 | 3.1632294 | 21 | 5 1.3 | 20.0 |
| 212675 2006 $VN_{17}$ | 15.7 | $X$ | 131.54915 | 119.86830 | 43.40556 | 9.60363 | 0.0501241 | 0.17831209 | 3.1261911 | 21 | 7 28.2 | 20.4 |
| 212676 2006 $VK_{21}$ | 16.5 | $X$ | 184.38149 | 49.54791 | 230.83475 | 3.90000 | 0.1337063 | 0.22377326 | 2.6869768 | 21 | — | — |
| 212677 2006 $VE_{45}$ | 15.6 | $X$ | 294.68849 | 46.94623 | 252.01393 | 3.34109 | 0.1620162 | 0.17547001 | 3.1598571 | 21 | 4 8.6 | 20.0 |
| 212678 2006 $VX_{59}$ | 15.8 | $X$ | 279.94515 | 254.27754 | 95.37862 | 3.31620 | 0.0164626 | 0.17421912 | 3.1749643 | 21 | 6 15.6 | 20.1 |
| 212679 2006 $VK_{67}$ | 15.2 | $X$ | 359.35790 | 189.26770 | 66.04734 | 3.98082 | 0.0771754 | 0.17003426 | 3.2268474 | 21 | 5 28.5 | 19.2 |
| 212680 2006 $VZ_{97}$ | 16.4 | $X$ | 348.55523 | 97.55192 | 70.44265 | 2.30411 | 0.1026057 | 0.21833057 | 2.7314485 | 21 | 1 8.5 | 19.7 |
| 212681 2006 $VP_{99}$ | 15.8 | $X$ | 216.54011 | 344.39566 | 92.24759 | 5.50358 | 0.0426091 | 0.17954797 | 3.1118290 | 21 | 7 14.8 | 20.4 |
| 212682 2006 $VT_{109}$ | 16.5 | $X$ | 317.64121 | 265.10647 | 137.77363 | 6.97469 | 0.1704774 | 0.25938344 | 2.4350500 | 21 | 10 16.6 | 18.6 |
| 212683 2006 $VL_{169}$ | 17.1 | $X$ | 73.27477 | 80.96222 | 240.73996 | 3.05570 | 0.0386514 | 0.26354911 | 2.4093229 | 21 | 12 13.6 | 20.0 |
| 212684 2006 $WF_{60}$ | 15.7 | $X$ | 340.55289 | 200.25862 | 177.49289 | 5.43066 | 0.1475315 | 0.19268333 | 2.9687476 | 21 | 10 11.1 | 19.0 |
| 212685 2006 $WK_{70}$ | 16.0 | $X$ | 186.18036 | 224.54332 | 42.60049 | 9.65435 | 0.1135712 | 0.21062173 | 2.7976965 | 21 | — | — |
| 212686 2006 $WV_{74}$ | 15.3 | $X$ | 308.55688 | 289.76587 | 55.96767 | 10.29558 | 0.0748189 | 0.17996637 | 3.1070040 | 21 | 7 11.6 | 19.5 |
| 212687 2006 $WL_{82}$ | 16.1 | $X$ | 17.27433 | 221.76317 | 135.39625 | 2.37643 | 0.1121144 | 0.19417581 | 2.9535158 | 21 | 11 12.6 | 19.7 |
| 212688 2006 $WR_{106}$ | 17.3 | $X$ | 177.60478 | 269.30728 | 162.32474 | 5.04939 | 0.1388263 | 0.30538913 | 2.1839046 | 21 | 5 21.6 | 20.5 |
| 212689 2006 $WF_{159}$ | 15.3 | $X$ | 247.64100 | 320.34854 | 183.83511 | 3.40638 | 0.0447945 | 0.12662640 | 3.9275334 | 21 | 11 5.5 | 20.8 |
| 212690 2006 $WW_{181}$ | 14.8 | $X$ | 154.93805 | 141.60377 | 83.72279 | 4.32209 | 0.1439911 | 0.12486909 | 3.9642961 | 21 | 11 1.3 | 21.1 |
| 212691 2006 $XJ_{25}$ | 15.7 | $X$ | 199.77656 | 98.39705 | 352.88835 | 7.46946 | 0.1745446 | 0.17214171 | 3.2004568 | 21 | 7 9.3 | 21.0 |
| 212692 Lazauskaite | 15.3 | $X$ | 155.00765 | 153.25410 | 77.71372 | 10.37514 | 0.0293557 | 0.17965001 | 3.1106505 | 21 | 11 13.9 | 19.8 |
| 212693 2007 $HD_{18}$ | 15.9 | $X$ | 7.34353 | 213.13557 | 60.49931 | 5.71191 | 0.0746199 | 0.21948187 | 2.7218882 | 21 | 7 4.2 | 19.2 |
| 212694 2007 $PT_{11}$ | 12.6 | $X$ | 13.10039 | 16.49379 | 359.95808 | 12.65217 | 0.0859786 | 0.08197808 | 5.2481257 | 21 | 11 2.6 | 19.2 |
| 212695 2007 $PQ_{38}$ | 17.5 | $X$ | 171.03350 | 257.73098 | 336.63906 | 19.60314 | 0.1076334 | 0.37397843 | 1.9079706 | 21 | — | — |
| 212696 2007 $PH_{39}$ | 16.7 | $X$ | 291.66421 | 166.89492 | 180.06473 | 2.10364 | 0.2214903 | 0.27073758 | 2.3664847 | 21 | 5 23.2 | 19.7 |
| 212697 2007 $PF_{40}$ | 16.7 | $X$ | 266.17135 | 173.90429 | 341.08333 | 5.08808 | 0.0678389 | 0.29961528 | 2.2118725 | 21 | — | — |
| 212698 2007 $PA_{41}$ | 16.5 | $X$ | 175.10152 | 219.45304 | 177.46781 | 6.60417 | 0.1139863 | 0.25935955 | 2.4351996 | 21 | 4 4.3 | 20.1 |
| 212699 2007 $QN_{3}$ | 17.0 | $X$ | 291.51830 | 197.16681 | 203.03255 | 4.38328 | 0.1485774 | 0.28135619 | 2.3065617 | 21 | 8 21.6 | 19.5 |
| 212700 2007 $QJ_{6}$ | 17.0 | $X$ | 309.06539 | 218.78070 | 187.00719 | 2.71084 | 0.2099170 | 0.28429520 | 2.2906375 | 21 | 9 28.4 | 18.5 |
| 212701 2007 $QR_{9}$ | 17.0 | $X$ | 230.18715 | 164.83868 | 192.22869 | 0.59488 | 0.2032767 | 0.26073176 | 2.4266478 | 21 | 4 4.9 | 21.1 |
| 212702 2007 $QQ_{11}$ | 17.7 | $X$ | 316.73512 | 227.78718 | 163.09381 | 2.08578 | 0.1803729 | 0.28264625 | 2.2995379 | 21 | 9 25.5 | 19.1 |
| 212703 2007 $RA_{13}$ | 16.8 | $X$ | 222.43691 | 60.02509 | 327.48292 | 3.90742 | 0.2003864 | 0.26253258 | 2.4155382 | 21 | 5 4.9 | 20.9 |
| 212704 2007 $RA_{14}$ | 16.7 | $X$ | 301.86344 | 137.65666 | 223.50067 | 1.57452 | 0.2531623 | 0.27262843 | 2.3555299 | 21 | 6 22.3 | 19.2 |
| 212705 Friûl | 17.3 | $X$ | 177.14409 | 22.33104 | 43.34693 | 1.65086 | 0.1640015 | 0.25951666 | 2.4342166 | 21 | 5 14.7 | 21.2 |
| 212706 2007 $RU_{16}$ | 17.6 | $X$ | 308.21811 | 122.20846 | 245.06494 | 0.47475 | 0.2076774 | 0.27625095 | 2.3348923 | 21 | 7 22.5 | 19.7 |
| 212707 2007 $RD_{17}$ | 17.0 | $X$ | 120.57344 | 287.87308 | 16.48479 | 19.58543 | 0.0788098 | 0.37148789 | 1.9164888 | 21 | — | — |
| 212708 2007 $RW_{24}$ | 17.5 | $X$ | 343.62040 | 211.45261 | 160.32170 | 6.53093 | 0.1269543 | 0.28713176 | 2.2755265 | 21 | 10 28.8 | 19.5 |
| 212709 2007 $RC_{39}$ | 15.5 | $X$ | 213.02810 | 198.39319 | 200.72450 | 2.21819 | 0.2848647 | 0.18608380 | 3.0385310 | 21 | 5 13.9 | 21.0 |
| 212710 2007 $RS_{39}$ | 17.3 | $X$ | 207.80963 | 287.06741 | 324.71799 | 19.15756 | 0.0499801 | 0.38259497 | 1.8792153 | 21 | — | — |
| 212711 2007 $RE_{45}$ | 16.8 | $X$ | 228.17259 | 195.60019 | 211.47402 | 4.90987 | 0.2192621 | 0.26625240 | 2.3929871 | 21 | 6 4.9 | 20.8 |
| 212712 2007 $RW_{46}$ | 16.6 | $X$ | 149.99883 | 237.43325 | 207.06321 | 6.49463 | 0.0722156 | 0.25926550 | 2.4357884 | 21 | 5 5.4 | 20.0 |
| 212713 2007 $RN_{57}$ | 17.5 | $X$ | 335.88528 | 232.98772 | 210.41261 | 5.91396 | 0.0674675 | 0.29522193 | 2.2337624 | 21 | — | — |
| 212714 2007 $RY_{57}$ | 15.9 | $X$ | 359.04505 | 57.00056 | 17.74096 | 15.50461 | 0.1869500 | 0.22253548 | 2.6969312 | 21 | — | — |
| 212715 2007 $RO_{92}$ | 17.2 | $X$ | 293.54083 | 46.45944 | 1.78630 | 4.83844 | 0.1150366 | 0.27960685 | 2.3161722 | 21 | 9 14.6 | 19.3 |
| 212716 2007 $RY_{103}$ | 17.0 | $X$ | 292.34307 | 176.53646 | 178.66948 | 5.59177 | 0.1533905 | 0.27052304 | 2.3677356 | 21 | 6 16.4 | 19.8 |
| 212717 2007 $RH_{118}$ | 16.5 | $X$ | 163.99393 | 126.73754 | 15.85187 | 6.53514 | 0.0873639 | 0.27053877 | 2.3676438 | 21 | 8 12.8 | 19.9 |
| 212718 2007 $RO_{126}$ | 17.0 | $X$ | 327.34227 | 149.95592 | 184.26507 | 1.11191 | 0.1177014 | 0.27444071 | 2.3451486 | 21 | 7 21.4 | 19.2 |
| 212719 2007 $RN_{127}$ | 18.0 | $X$ | 62.02649 | 19.05833 | 13.16158 | 3.55415 | 0.0300338 | 0.30284903 | 2.1960990 | 21 | — | — |
| 212720 2007 $RA_{128}$ | 17.5 | $X$ | 356.13008 | 275.93210 | 164.59741 | 2.61181 | 0.1068401 | 0.22554250 | 2.6729066 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212721 2007 $RX_{134}$ | 16.8 | $X$ | 3.30943 | 204.95063 | 173.79321 | 6.38896 | 0.1058571 | 0.29043647 | 2.2582323 | 21 | 12 10.9 | 19.2 |
| 212722 2007 $RM_{135}$ | 16.9 | $X$ | 355.78013 | 198.89511 | 179.27231 | 9.96270 | 0.1399625 | 0.28805799 | 2.2706460 | 21 | 12 2.2 | 19.2 |
| 212723 Klitschko | 17.0 | $X$ | 212.13967 | 191.04602 | 200.58078 | 3.05957 | 0.1463057 | 0.26193383 | 2.4192179 | 21 | 5 4.7 | 20.8 |
| 212724 2007 $RP_{144}$ | 16.8 | $X$ | 205.38859 | 204.07382 | 206.86424 | 6.18607 | 0.1165107 | 0.26428754 | 2.4048330 | 21 | 5 24.2 | 20.4 |
| 212725 2007 $RC_{145}$ | 17.0 | $X$ | 88.00996 | 127.32843 | 211.60292 | 4.65907 | 0.1564233 | 0.29984949 | 2.2107205 | 21 | — | — |
| 212726 2007 $RD_{145}$ | 17.2 | $X$ | 23.88948 | 184.26701 | 205.61637 | 3.80147 | 0.1678708 | 0.29433321 | 2.2382566 | 21 | — | — |
| 212727 2007 $RW_{161}$ | 17.1 | $X$ | 270.74836 | 107.50264 | 30.24091 | 5.71932 | 0.0844194 | 0.29257017 | 2.2472395 | 21 | 12 24.1 | 19.4 |
| 212728 2007 $RK_{162}$ | 16.9 | $X$ | 335.34541 | 198.49504 | 135.61082 | 3.40299 | 0.1600570 | 0.27487327 | 2.3426876 | 21 | 8 3.5 | 18.8 |
| 212729 2007 $RJ_{168}$ | 17.2 | $X$ | 90.55051 | 262.38759 | 148.99634 | 5.52302 | 0.1063326 | 0.24163079 | 2.5529043 | 21 | 1 9.0 | 20.1 |
| 212730 2007 $RG_{184}$ | 17.3 | $X$ | 235.98613 | 232.99009 | 160.26023 | 3.81152 | 0.0817764 | 0.26826375 | 2.3810109 | 21 | 6 6.2 | 20.5 |
| 212731 2007 $RF_{188}$ | 17.0 | $X$ | 178.07721 | 106.41743 | 343.73955 | 11.74052 | 0.1526777 | 0.26442190 | 2.4040183 | 21 | 6 15.9 | 21.0 |
| 212732 2007 $RL_{193}$ | 17.0 | $X$ | 274.40850 | 266.58710 | 117.33430 | 5.14883 | 0.1647876 | 0.27135787 | 2.3628769 | 21 | 6 30.1 | 20.0 |
| 212733 2007 $RV_{194}$ | 16.4 | $X$ | 121.88840 | 131.73185 | 7.48897 | 7.57556 | 0.0869250 | 0.26158190 | 2.4213873 | 21 | 6 15.1 | 19.8 |
| 212734 2007 $RX_{235}$ | 17.0 | $X$ | 19.86125 | 272.20642 | 65.82201 | 2.09119 | 0.1842601 | 0.28328294 | 2.2960910 | 21 | 11 19.4 | 19.3 |
| 212735 2007 $RT_{242}$ | 16.6 | $X$ | 324.03644 | 284.24498 | 106.16490 | 4.71951 | 0.1559842 | 0.28373879 | 2.2936311 | 21 | 10 16.7 | 18.3 |
| 212736 2007 $RC_{244}$ | 16.9 | $X$ | 278.32679 | 318.07998 | 46.36800 | 3.79245 | 0.2098428 | 0.26900357 | 2.3766434 | 21 | 5 31.5 | 20.1 |
| 212737 2007 $RZ_{252}$ | 16.2 | $X$ | 13.54509 | 261.67668 | 191.64961 | 12.02477 | 0.1284887 | 0.23000847 | 2.6381946 | 21 | — | — |
| 212738 2007 $RJ_{271}$ | 16.2 | $X$ | 342.90748 | 12.03684 | 52.20681 | 4.07753 | 0.0798345 | 0.21286933 | 2.7779685 | 21 | 12 17.4 | 19.6 |
| 212739 2007 $RN_{271}$ | 16.4 | $X$ | 31.74321 | 103.03151 | 62.62918 | 4.31698 | 0.1093930 | 0.24033698 | 2.5620582 | 21 | 3 13.8 | 19.1 |
| 212740 2007 $RZ_{273}$ | 16.8 | $X$ | 218.64379 | 219.69067 | 204.32872 | 6.70432 | 0.0672535 | 0.26732068 | 2.3866076 | 21 | 6 27.8 | 20.1 |
| 212741 2007 $RH_{277}$ | 16.3 | $X$ | 116.12289 | 251.80128 | 139.75045 | 15.44182 | 0.1384486 | 0.24242259 | 2.5473424 | 21 | 1 23.9 | 19.7 |
| 212742 2007 $RU_{277}$ | 15.0 | $X$ | 120.72493 | 271.45858 | 147.79588 | 25.49989 | 0.2404147 | 0.17468959 | 3.1692612 | 21 | 4 1.6 | 20.2 |
| 212743 2007 $RT_{289}$ | 15.2 | $X$ | 88.09876 | 60.50196 | 45.82060 | 26.72619 | 0.2556763 | 0.17346329 | 3.1841803 | 21 | 4 25.7 | 19.8 |
| 212744 2007 $RL_{296}$ | 16.9 | $X$ | 274.76130 | 247.44628 | 26.76435 | 1.93818 | 0.1162588 | 0.24503181 | 2.5292266 | 21 | 2 12.9 | 20.6 |
| 212745 2007 $SG_{19}$ | 16.7 | $X$ | 188.40749 | 240.77938 | 85.64626 | 0.76801 | 0.0703403 | 0.23548473 | 2.5971332 | 21 | 1 19.7 | 20.4 |
| 212746 2007 $SF_{20}$ | 16.6 | $X$ | 187.71482 | 104.37965 | 205.11967 | 2.87199 | 0.2017169 | 0.23788023 | 2.5796680 | 21 | 1 5.3 | 20.9 |
| 212747 2007 $TY$ | 16.5 | $X$ | 23.99989 | 92.04574 | 342.44112 | 3.93886 | 0.0879655 | 0.22698302 | 2.6615858 | 21 | — | — |
| 212748 2007 $TB_{2}$ | 17.5 | $X$ | 72.48583 | 329.43420 | 7.38612 | 3.07375 | 0.2653388 | 0.29621455 | 2.2287693 | 21 | — | — |
| 212749 2007 $TM_{4}$ | 17.8 | $X$ | 154.78307 | 157.43752 | 165.37100 | 3.91215 | 0.1243845 | 0.30818142 | 2.1706931 | 21 | — | — |
| 212750 2007 $TW_{6}$ | 16.4 | $X$ | 222.75947 | 120.00555 | 353.65708 | 6.97438 | 0.0629460 | 0.27540556 | 2.3396681 | 21 | 9 12.5 | 19.5 |
| 212751 2007 $TD_{9}$ | 16.4 | $X$ | 343.80777 | 41.33334 | 346.19044 | 1.92437 | 0.1740858 | 0.21459450 | 2.7630601 | 21 | 11 3.8 | 19.0 |
| 212752 2007 $TA_{10}$ | 16.9 | $X$ | 58.56121 | 218.59488 | 178.83436 | 2.95662 | 0.1833565 | 0.22953142 | 2.6418488 | 21 | — | — |
| 212753 2007 $TE_{11}$ | 16.6 | $X$ | 296.98673 | 281.20566 | 62.17819 | 0.54289 | 0.1213396 | 0.26834506 | 2.3805299 | 21 | 6 11.4 | 19.3 |
| 212754 2007 $TL_{12}$ | 16.8 | $X$ | 85.64224 | 258.13005 | 181.28704 | 3.98776 | 0.1513859 | 0.24028555 | 2.5624237 | 21 | 2 14.6 | 19.8 |
| 212755 2007 $TW_{12}$ | 16.7 | $X$ | 61.62706 | 302.10743 | 41.00034 | 4.06647 | 0.1971259 | 0.29312995 | 2.2443775 | 21 | — | — |
| 212756 2007 $TY_{16}$ | 17.3 | $X$ | 218.95845 | 73.77031 | 12.39477 | 2.52087 | 0.0981816 | 0.26909597 | 2.3760993 | 21 | 7 27.6 | 20.5 |
| 212757 2007 $TZ_{19}$ | 16.7 | $X$ | 261.78220 | 358.06358 | 13.80557 | 7.51635 | 0.0948611 | 0.26605104 | 2.3941944 | 21 | 6 5.5 | 19.9 |
| 212758 2007 $TR_{27}$ | 17.6 | $X$ | 229.10732 | 261.40440 | 189.96030 | 2.21919 | 0.0204842 | 0.27405291 | 2.3473604 | 21 | 8 25.2 | 20.3 |
| 212759 2007 $TM_{29}$ | 16.9 | $X$ | 81.41029 | 39.98617 | 27.96283 | 2.32214 | 0.1390290 | 0.23765887 | 2.5812696 | 21 | 1 23.7 | 19.8 |
| 212760 2007 $TF_{38}$ | 17.3 | $X$ | 86.08913 | 119.13511 | 184.49952 | 0.62282 | 0.1142551 | 0.29287629 | 2.2456733 | 21 | 12 19.0 | 20.4 |
| 212761 2007 $TA_{40}$ | 15.9 | $X$ | 269.44445 | 298.43305 | 198.06919 | 8.52147 | 0.0953248 | 0.21552726 | 2.7550823 | 21 | 12 1.2 | 19.6 |
| 212762 2007 $TN_{40}$ | 16.2 | $X$ | 197.16173 | 320.31794 | 224.60565 | 3.43264 | 0.0426155 | 0.21064961 | 2.7974497 | 21 | 11 7.9 | 20.2 |
| 212763 2007 $TH_{44}$ | 15.7 | $X$ | 240.55979 | 268.75081 | 354.12999 | 6.22584 | 0.1962988 | 0.23990217 | 2.5651529 | 21 | — | — |
| 212764 2007 $TU_{57}$ | 16.7 | $X$ | 224.43026 | 249.78361 | 212.23465 | 1.79617 | 0.1250391 | 0.19805898 | 2.9147838 | 21 | 8 16.9 | 21.1 |
| 212765 2007 $TK_{63}$ | 16.8 | $X$ | 185.09012 | 266.02762 | 47.89042 | 4.22894 | 0.1135180 | 0.31038477 | 2.1604080 | 21 | — | — |
| 212766 2007 $TK_{66}$ | 16.0 | $X$ | 172.09142 | 72.15726 | 322.49279 | 4.18651 | 0.1340071 | 0.18048040 | 3.1011018 | 21 | 4 4.0 | 21.0 |
| 212767 2007 $TG_{70}$ | 16.9 | $X$ | 237.03080 | 348.29464 | 53.75522 | 4.67526 | 0.0486757 | 0.26572425 | 2.3961569 | 21 | 6 23.0 | 20.1 |
| 212768 2007 $TO_{70}$ | 15.4 | $X$ | 183.07184 | 256.99034 | 143.95611 | 5.92864 | 0.1550316 | 0.18212368 | 3.0824197 | 21 | 4 25.9 | 20.5 |
| 212769 2007 $TZ_{78}$ | 17.3 | $X$ | 234.94701 | 6.80830 | 247.42495 | 1.99363 | 0.1449068 | 0.30934750 | 2.1652347 | 21 | — | — |
| 212770 2007 $TL_{79}$ | 16.4 | $X$ | 29.23961 | 72.98026 | 335.10658 | 1.74543 | 0.0432523 | 0.22408257 | 2.6845036 | 21 | — | — |
| 212771 2007 $TZ_{87}$ | 16.7 | $X$ | 20.02537 | 186.98927 | 169.01375 | 4.33527 | 0.0835416 | 0.21249095 | 2.7812653 | 21 | 11 15.5 | 20.2 |
| 212772 2007 $TZ_{92}$ | 15.9 | $X$ | 36.17084 | 260.24612 | 181.50265 | 6.65366 | 0.2217187 | 0.22954876 | 2.6417157 | 21 | — | — |
| 212773 2007 $TA_{115}$ | 16.3 | $X$ | 115.70108 | 211.53179 | 156.08207 | 5.41650 | 0.1002030 | 0.23442661 | 2.6049423 | 21 | — | — |
| 212774 2007 $TR_{118}$ | 16.3 | $X$ | 311.36818 | 328.91390 | 49.26094 | 6.23646 | 0.1813031 | 0.27397868 | 2.3477843 | 21 | 8 24.8 | 18.4 |
| 212775 2007 $TC_{120}$ | 16.9 | $X$ | 258.61460 | 281.91413 | 123.59213 | 2.84856 | 0.1910521 | 0.26970602 | 2.3725149 | 21 | 7 6.4 | 20.0 |
| 212776 2007 $TQ_{125}$ | 16.5 | $X$ | 42.26967 | 323.11996 | 84.27488 | 3.31506 | 0.2048817 | 0.22605648 | 2.6688536 | 21 | — | — |
| 212777 2007 $TH_{139}$ | 16.9 | $X$ | 218.15413 | 120.27806 | 10.34476 | 6.53779 | 0.1016584 | 0.27599762 | 2.3363209 | 21 | 9 25.7 | 19.9 |
| 212778 2007 $TW_{141}$ | 17.7 | $X$ | 137.38886 | 63.32743 | 116.59333 | 2.06344 | 0.1221038 | 0.26953615 | 2.3735117 | 21 | 9 1.8 | 21.2 |
| 212779 2007 $TA_{143}$ | 17.9 | $X$ | 95.71191 | 200.55684 | 157.66322 | 1.67944 | 0.1948988 | 0.30250615 | 2.1977582 | 21 | — | — |
| 212780 2007 $TQ_{158}$ | 17.2 | $X$ | 316.64800 | 62.50182 | 277.57823 | 1.87354 | 0.1338759 | 0.27130364 | 2.3631918 | 21 | 7 7.9 | 19.4 |
| 212781 2007 $TU_{165}$ | 15.7 | $X$ | 60.48326 | 319.94115 | 73.78718 | 6.76447 | 0.1132606 | 0.22727457 | 2.6593091 | 21 | — | — |
| 212782 2007 $TT_{186}$ | 16.7 | $X$ | 295.18807 | 354.72377 | 46.76152 | 6.74147 | 0.0990287 | 0.27643127 | 2.3338769 | 21 | 9 12.6 | 19.3 |
| 212783 2007 $TO_{203}$ | 15.1 | $X$ | 94.87064 | 83.76048 | 48.81934 | 22.58149 | 0.1121956 | 0.17756769 | 3.1349221 | 21 | 5 10.9 | 19.5 |
| 212784 2007 $TV_{212}$ | 17.2 | $X$ | 180.15875 | 246.73952 | 343.71076 | 4.87362 | 0.1224289 | 0.29112855 | 2.2546520 | 21 | 12 22.6 | 20.3 |
| 212785 2007 $TG_{213}$ | 17.2 | $X$ | 113.58250 | 64.78602 | 353.41009 | 4.89342 | 0.1153325 | 0.24153357 | 2.5535893 | 21 | 2 22.4 | 20.5 |
| 212786 2007 $TC_{217}$ | 16.8 | $X$ | 51.89321 | 353.93883 | 357.44407 | 3.56798 | 0.0236696 | 0.21604216 | 2.7507030 | 21 | 12 12.5 | 20.5 |
| 212787 2007 $TF_{221}$ | 17.7 | $X$ | 235.43013 | 63.93749 | 14.91106 | 6.16972 | 0.2013419 | 0.27410113 | 2.3470851 | 21 | 7 27.2 | 21.2 |
| 212788 2007 $TK_{221}$ | 17.2 | $X$ | 161.33619 | 21.61531 | 28.11714 | 1.39774 | 0.1781833 | 0.25518827 | 2.4616648 | 21 | 4 10.5 | 21.0 |
| 212789 2007 $TH_{226}$ | 17.0 | $X$ | 295.41934 | 78.20380 | 339.30872 | 7.08032 | 0.0878713 | 0.28061273 | 2.3106339 | 21 | 10 2.6 | 19.6 |
| 212790 2007 $TX_{228}$ | 16.6 | $X$ | 304.67235 | 285.55422 | 220.74308 | 2.50121 | 0.1556601 | 0.22300008 | 2.6931840 | 21 | — | — |
| 212791 2007 $TN_{232}$ | 16.1 | $X$ | 205.07190 | 33.66849 | 56.14054 | 1.66532 | 0.1315700 | 0.19102444 | 2.9859103 | 21 | 7 13.2 | 20.9 |
| 212792 2007 $TZ_{233}$ | 15.8 | $X$ | 80.10272 | 92.91859 | 51.27714 | 22.66919 | 0.1835556 | 0.17455781 | 3.1708561 | 21 | 5 16.7 | 20.0 |
| 212793 2007 $TQ_{242}$ | 15.1 | $X$ | 100.86554 | 247.56598 | 228.59287 | 14.89913 | 0.2559408 | 0.17688491 | 3.1429842 | 21 | 5 17.4 | 19.7 |
| 212794 2007 $TM_{243}$ | 16.0 | $X$ | 86.85003 | 53.12213 | 343.00707 | 13.22205 | 0.1904023 | 0.23431812 | 2.6057464 | 21 | — | — |
| 212795 Fangjiancheng | 17.2 | $X$ | 59.84483 | 239.21619 | 135.59713 | 4.86093 | 0.1242143 | 0.29582221 | 2.2307395 | 21 | — | — |
| 212796 Guoyonghuai | 16.0 | $X$ | 291.54053 | 32.81017 | 125.62841 | 5.31697 | 0.0202157 | 0.22448960 | 2.6812578 | 21 | — | — |
| 212797 Lipei | 16.2 | $X$ | 347.45856 | 265.09343 | 145.61792 | 5.81580 | 0.0747043 | 0.21447201 | 2.7641120 | 21 | 12 7.8 | 19.6 |
| 212798 2007 $TK_{257}$ | 16.9 | $X$ | 264.48377 | 50.37079 | 31.32092 | 7.22415 | 0.0747185 | 0.27658811 | 2.3329945 | 21 | 9 25.6 | 19.6 |
| 212799 2007 $TB_{289}$ | 15.1 | $X$ | 167.27332 | 275.99722 | 121.60666 | 11.73975 | 0.1096889 | 0.18045929 | 3.1013436 | 21 | 4 8.7 | 20.1 |
| 212800 2007 $TN_{292}$ | 17.2 | $X$ | 121.03138 | 337.43911 | 49.99315 | 1.86756 | 0.0879240 | 0.24042396 | 2.5614402 | 21 | 1 18.9 | 20.4 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212801 2007 $TR_{299}$ | 17.8 | X | 120.39388 | 172.35659 | 357.62157 | 1.87405 | 0.0692813 | 0.26595377 | 2.3947781 | 21 | 7 25.3 | 20.8 |
| 212802 2007 $TZ_{315}$ | 17.3 | X | 348.29118 | 72.30906 | 121.57462 | 1.93928 | 0.0544930 | 0.24337459 | 2.5406952 | 21 | 2 11.5 | 20.4 |
| 212803 2007 $TS_{317}$ | 16.7 | X | 21.37536 | 205.86125 | 197.68728 | 2.28346 | 0.0400265 | 0.21974257 | 2.7197349 | 21 | — | — |
| 212804 2007 $TY_{358}$ | 16.5 | X | 15.46763 | 79.58686 | 46.83344 | 8.70288 | 0.1336359 | 0.23417627 | 2.6067985 | 21 | — | — |
| 212805 2007 $TU_{361}$ | 16.9 | X | 316.92720 | 15.74831 | 164.44643 | 1.09994 | 0.0826855 | 0.23091001 | 2.6313233 | 21 | — | — |
| 212806 2007 $TK_{362}$ | 16.4 | X | 281.93276 | 276.37664 | 142.15429 | 0.82562 | 0.0231901 | 0.20064885 | 2.8896480 | 21 | 9 15.8 | 20.2 |
| 212807 2007 $TR_{366}$ | 16.5 | X | 323.26630 | 152.40975 | 305.84732 | 3.95510 | 0.0382330 | 0.21919723 | 2.7242440 | 21 | — | — |
| 212808 2007 $TK_{368}$ | 16.5 | X | 63.73835 | 107.66631 | 93.67337 | 9.44966 | 0.0523171 | 0.26092445 | 2.4254530 | 21 | 6 17.1 | 19.2 |
| 212809 2007 $TW_{379}$ | 17.0 | X | 128.38139 | 277.94602 | 270.80628 | 4.20722 | 0.1068605 | 0.27324430 | 2.3519891 | 21 | 8 31.1 | 20.4 |
| 212810 2007 $TK_{380}$ | 16.3 | X | 178.16759 | 266.20964 | 297.32014 | 2.92457 | 0.0401743 | 0.21384069 | 2.7695496 | 21 | 11 8.6 | 20.3 |
| 212811 2007 $TE_{388}$ | 17.3 | X | 174.30033 | 280.17259 | 164.88502 | 4.27236 | 0.1179347 | 0.26176460 | 2.4202605 | 21 | 6 5.6 | 20.9 |
| 212812 2007 $TX_{391}$ | 15.9 | X | 225.75839 | 58.25653 | 318.47374 | 1.25802 | 0.0193380 | 0.18742378 | 3.0240311 | 21 | 5 11.4 | 20.2 |
| 212813 2007 $TH_{392}$ | 16.9 | X | 27.62961 | 271.62787 | 167.24914 | 3.35576 | 0.0390040 | 0.23136122 | 2.6279011 | 21 | — | — |
| 212814 2007 $TC_{400}$ | 17.2 | X | 170.69759 | 1.12411 | 322.62698 | 1.99014 | 0.1930480 | 0.31064770 | 2.1591888 | 21 | — | — |
| 212815 2007 $TF_{430}$ | 15.9 | X | 354.03072 | 357.22843 | 68.21163 | 6.93505 | 0.0286204 | 0.21984666 | 2.7188764 | 21 | — | — |
| 212816 2007 $TM_{436}$ | 16.2 | X | 246.36470 | 70.01614 | 112.92376 | 3.23682 | 0.0220045 | 0.22614557 | 2.6681526 | 21 | — | — |
| 212817 2007 $UH_{1}$ | 16.0 | X | 93.11126 | 340.59410 | 126.00182 | 1.94642 | 0.1573848 | 0.17433958 | 3.1735016 | 21 | 4 14.3 | 20.4 |
| 212818 2007 $UN_{1}$ | 16.7 | X | 54.75985 | 56.13851 | 326.66444 | 0.51197 | 0.1595852 | 0.22557943 | 2.6726149 | 21 | — | — |
| 212819 2007 $UJ_{2}$ | 16.9 | X | 278.16699 | 249.68428 | 152.43240 | 8.96988 | 0.2016138 | 0.27360580 | 2.3499169 | 21 | 7 24.8 | 19.9 |
| 212820 2007 $UJ_{14}$ | 17.3 | X | 15.67774 | 258.33863 | 106.38223 | 2.10697 | 0.1527125 | 0.28595090 | 2.2817869 | 21 | 12 16.3 | 19.6 |
| 212821 2007 $UV_{15}$ | 16.7 | X | 62.71144 | 92.63344 | 21.81958 | 14.67758 | 0.1337503 | 0.24445049 | 2.5332347 | 21 | 3 2.0 | 19.6 |
| 212822 2007 $UU_{17}$ | 17.5 | X | 87.52093 | 261.31303 | 1.23031 | 0.76234 | 0.0793243 | 0.28245253 | 2.3005892 | 21 | 10 21.8 | 20.5 |
| 212823 2007 $UW_{19}$ | 16.7 | X | 260.23805 | 300.24503 | 210.76807 | 1.26683 | 0.0125719 | 0.22148768 | 2.7054302 | 21 | 12 18.9 | 20.3 |
| 212824 2007 $UL_{25}$ | 17.4 | X | 207.77285 | 76.76142 | 221.36080 | 3.54505 | 0.0890203 | 0.31008870 | 2.1617830 | 21 | — | — |
| 212825 2007 $UV_{25}$ | 16.1 | X | 256.60428 | 292.07578 | 215.46923 | 8.12129 | 0.0979413 | 0.21376565 | 2.7701977 | 21 | 11 26.9 | 19.8 |
| 212826 2007 $UZ_{31}$ | 16.8 | X | 285.12409 | 324.29192 | 66.19157 | 3.16816 | 0.2096848 | 0.27100748 | 2.3649131 | 21 | 7 18.2 | 19.4 |
| 212827 2007 $UT_{33}$ | 16.4 | X | 357.31076 | 29.18682 | 326.11780 | 6.07860 | 0.1346916 | 0.27950551 | 2.3167320 | 21 | 10 23.2 | 18.6 |
| 212828 2007 $UP_{47}$ | 16.2 | X | 26.91198 | 194.02086 | 205.25316 | 6.27261 | 0.1949039 | 0.21951185 | 2.7216403 | 21 | — | — |
| 212829 2007 $UE_{50}$ | 16.2 | X | 357.53228 | 10.53848 | 144.97997 | 4.85420 | 0.0885017 | 0.23347510 | 2.6120150 | 21 | 1 2.8 | 19.4 |
| 212830 2007 $UC_{55}$ | 16.3 | X | 351.61479 | 83.74142 | 48.55753 | 3.19177 | 0.1516353 | 0.22875169 | 2.6478488 | 21 | — | — |
| 212831 2007 $UK_{64}$ | 17.6 | X | 143.26686 | 128.50452 | 171.12585 | 1.52118 | 0.2032264 | 0.30218857 | 2.1992977 | 21 | — | — |
| 212832 2007 $UX_{66}$ | 16.9 | X | 38.06856 | 121.75771 | 9.75586 | 4.03112 | 0.1792121 | 0.24044515 | 2.5612897 | 21 | 2 4.1 | 19.2 |
| 212833 2007 $UO_{67}$ | 17.6 | X | 90.97985 | 66.25961 | 30.50418 | 3.39731 | 0.1538916 | 0.24513590 | 2.5285106 | 21 | 3 20.2 | 20.5 |
| 212834 2007 $UO_{71}$ | 16.0 | X | 20.88848 | 18.96757 | 73.87775 | 14.50749 | 0.0668070 | 0.22811877 | 2.6527442 | 21 | — | — |
| 212835 2007 $UX_{71}$ | 16.8 | X | 85.46168 | 295.89194 | 230.62325 | 4.55593 | 0.1567860 | 0.25903059 | 2.4372609 | 21 | 6 16.4 | 19.7 |
| 212836 2007 $UN_{83}$ | 16.7 | X | 93.50695 | 344.16498 | 226.93898 | 4.52702 | 0.1498844 | 0.26617216 | 2.3934680 | 21 | 8 25.3 | 20.0 |
| 212837 2007 $UQ_{84}$ | 17.4 | X | 107.36816 | 103.70149 | 50.65352 | 1.98561 | 0.1316455 | 0.25555144 | 2.4593320 | 21 | 6 24.5 | 20.8 |
| 212838 2007 $UX_{84}$ | 15.6 | X | 196.97119 | 87.29946 | 55.96339 | 4.31312 | 0.0871040 | 0.19958253 | 2.8999312 | 21 | 9 14.4 | 19.9 |
| 212839 2007 $UR_{85}$ | 16.1 | X | 256.92049 | 244.90939 | 200.51642 | 1.50514 | 0.0346834 | 0.20210360 | 2.8757647 | 21 | 9 15.7 | 19.9 |
| 212840 2007 $UU_{91}$ | 16.3 | X | 131.05682 | 41.68967 | 50.99915 | 1.27544 | 0.1578270 | 0.17635605 | 3.1492645 | 21 | 5 8.2 | 21.1 |
| 212841 2007 $UV_{98}$ | 16.5 | X | 126.88505 | 87.54676 | 58.25904 | 3.29761 | 0.1588650 | 0.18374343 | 3.0642780 | 21 | 7 8.6 | 21.2 |
| 212842 2007 $UH_{104}$ | 16.5 | X | 77.22092 | 172.41423 | 78.66709 | 7.27530 | 0.0927066 | 0.27007538 | 2.3703513 | 21 | 9 27.8 | 19.6 |
| 212843 2007 $UV_{112}$ | 17.1 | X | 276.81468 | 207.97040 | 42.82710 | 2.74735 | 0.0283558 | 0.24250620 | 2.5467569 | 21 | 1 27.1 | 20.4 |
| 212844 2007 $UU_{121}$ | 16.7 | X | 30.11828 | 123.78021 | 18.67820 | 4.98685 | 0.2214268 | 0.24009867 | 2.5637532 | 21 | 2 2.3 | 18.7 |
| 212845 2007 $VD_{2}$ | 17.0 | X | 30.41260 | 342.57440 | 344.80156 | 5.29545 | 0.1283163 | 0.28231263 | 2.3013492 | 21 | 11 8.8 | 19.6 |
| 212846 2007 $VP_{7}$ | 15.6 | X | 349.78720 | 279.06658 | 242.18971 | 21.24067 | 0.0558444 | 0.23288874 | 2.6163975 | 21 | — | — |
| 212847 2007 $VD_{19}$ | 17.4 | X | 326.80569 | 51.03154 | 85.84238 | 2.46619 | 0.0987197 | 0.22689050 | 2.6623093 | 21 | — | — |
| 212848 2007 $VW_{34}$ | 16.0 | X | 111.46563 | 304.51224 | 197.85934 | 4.24134 | 0.0927007 | 0.18170896 | 3.0871080 | 21 | 6 10.3 | 20.5 |
| 212849 2007 $VJ_{36}$ | 17.0 | X | 52.45042 | 191.34313 | 249.37316 | 2.39076 | 0.0975228 | 0.23497084 | 2.6009185 | 21 | — | — |
| 212850 2007 $VL_{54}$ | 16.6 | X | 256.30004 | 340.87748 | 139.42312 | 3.68567 | 0.1542951 | 0.20591976 | 2.8401244 | 21 | 10 14.5 | 20.4 |
| 212851 2007 $VN_{60}$ | 16.2 | X | 96.93336 | 358.79111 | 30.03924 | 4.58475 | 0.1672520 | 0.23157432 | 2.6262886 | 21 | 1 1.2 | 19.3 |
| 212852 2007 $VM_{63}$ | 16.4 | X | 351.72218 | 39.61609 | 72.04437 | 5.56915 | 0.0559266 | 0.22411817 | 2.6842194 | 21 | — | — |
| 212853 2007 $VS_{63}$ | 16.3 | X | 2.38831 | 323.60877 | 81.01146 | 4.22912 | 0.0562119 | 0.21405191 | 2.7677274 | 21 | 12 18.9 | 19.8 |
| 212854 2007 $VU_{72}$ | 16.9 | X | 151.95882 | 286.63026 | 82.80423 | 1.42198 | 0.0279006 | 0.23642527 | 2.5902407 | 21 | 1 26.9 | 20.2 |
| 212855 2007 $VW_{72}$ | 16.5 | X | 271.77250 | 306.19650 | 233.31204 | 3.38497 | 0.0666259 | 0.22028267 | 2.7152876 | 21 | — | — |
| 212856 2007 $VX_{73}$ | 17.3 | X | 145.66763 | 321.66252 | 182.50233 | 2.52721 | 0.1241552 | 0.26588360 | 2.3951995 | 21 | 7 23.3 | 20.9 |
| 212857 2007 $VK_{84}$ | 16.0 | X | 349.67228 | 305.68960 | 188.76604 | 12.89565 | 0.1785314 | 0.22723425 | 2.6596236 | 21 | — | — |
| 212858 2007 $VM_{85}$ | 16.7 | X | 349.84845 | 13.10094 | 332.03590 | 6.17988 | 0.1393867 | 0.27878515 | 2.3207211 | 21 | 9 22.9 | 18.8 |
| 212859 2007 $VQ_{91}$ | 17.0 | X | 50.68677 | 84.16540 | 344.69959 | 2.72504 | 0.0764510 | 0.22942736 | 2.6426475 | 21 | — | — |
| 212860 2007 $VJ_{105}$ | 16.2 | X | 51.24931 | 172.45876 | 242.01500 | 4.96157 | 0.0624963 | 0.22661637 | 2.6644558 | 21 | — | — |
| 212861 2007 $VZ_{106}$ | 16.6 | X | 139.73804 | 308.51213 | 37.21207 | 2.82237 | 0.1570029 | 0.23413672 | 2.6070920 | 21 | — | — |
| 212862 2007 $VF_{111}$ | 17.8 | X | 199.58874 | 54.72542 | 264.22315 | 1.37143 | 0.1839932 | 0.31285022 | 2.1490428 | 21 | 1 14.9 | 21.1 |
| 212863 2007 $VN_{114}$ | 16.9 | X | 27.21485 | 173.18732 | 124.39381 | 3.21889 | 0.0842571 | 0.27059928 | 2.3672909 | 21 | 9 16.1 | 19.4 |
| 212864 2007 $VN_{115}$ | 15.6 | X | 137.96073 | 236.89402 | 76.41673 | 15.42008 | 0.0473768 | 0.22343479 | 2.6896898 | 21 | — | — |
| 212865 2007 $VX_{119}$ | 16.6 | X | 204.57166 | 35.21153 | 39.53424 | 11.10456 | 0.0753001 | 0.26572651 | 2.3961433 | 21 | 6 25.1 | 20.1 |
| 212866 2007 $VL_{123}$ | 17.4 | X | 124.91074 | 115.07920 | 16.58954 | 2.26865 | 0.1389967 | 0.25914529 | 2.4365416 | 21 | 6 15.1 | 20.7 |
| 212867 2007 $VL_{127}$ | 17.0 | X | 249.64077 | 92.55545 | 8.22115 | 6.72324 | 0.0482077 | 0.28147244 | 2.3059265 | 21 | 10 3.6 | 19.5 |
| 212868 2007 $VB_{143}$ | 16.5 | X | 37.17963 | 311.63328 | 95.46591 | 3.26433 | 0.0292126 | 0.22154300 | 2.7049798 | 21 | — | — |
| 212869 2007 $VW_{152}$ | 15.7 | X | 304.80571 | 26.96696 | 68.65544 | 5.32161 | 0.0266201 | 0.21057946 | 2.7980709 | 21 | 12 3.3 | 19.2 |
| 212870 2007 $VX_{166}$ | 16.8 | X | 277.46435 | 178.66550 | 5.87405 | 1.29600 | 0.0244551 | 0.22411713 | 2.6842277 | 21 | — | — |
| 212871 2007 $VG_{169}$ | 16.2 | X | 102.07005 | 240.87161 | 241.57299 | 1.43146 | 0.1554250 | 0.17191688 | 3.2032466 | 21 | 5 13.6 | 20.9 |
| 212872 2007 $VT_{173}$ | 15.9 | X | 6.31789 | 176.99434 | 271.24595 | 8.83362 | 0.0376801 | 0.22446813 | 2.6814287 | 21 | — | — |
| 212873 2007 $VP_{184}$ | 16.1 | X | 349.27108 | 0.31932 | 67.55552 | 6.33766 | 0.0263400 | 0.21715864 | 2.7412668 | 21 | 12 28.8 | 19.7 |
| 212874 2007 $VC_{185}$ | 16.0 | X | 300.61048 | 44.25133 | 20.45721 | 6.71682 | 0.0402346 | 0.20627857 | 2.8368300 | 21 | 10 17.1 | 19.6 |
| 212875 2007 $VM_{188}$ | 17.7 | X | 144.08463 | 164.25967 | 162.89923 | 3.32416 | 0.0740953 | 0.30336746 | 2.1935964 | 21 | — | — |
| 212876 2007 $VD_{219}$ | 16.0 | X | 336.50565 | 14.60707 | 53.13217 | 5.03022 | 0.0526642 | 0.21221033 | 2.7837167 | 21 | 12 11.0 | 19.6 |
| 212877 2007 $VB_{229}$ | 16.5 | X | 216.82155 | 60.85014 | 252.47869 | 3.30347 | 0.1208080 | 0.24243921 | 2.5472260 | 21 | 1 31.9 | 20.5 |
| 212878 2007 $VA_{230}$ | 17.8 | X | 235.22592 | 302.72645 | 329.38667 | 0.79810 | 0.1217516 | 0.30953831 | 2.1643448 | 21 | — | — |
| 212879 2007 $VH_{230}$ | 16.7 | X | 27.31424 | 222.33366 | 9.33232 | 0.90361 | 0.1396959 | 0.25744310 | 2.4472699 | 21 | 6 10.3 | 18.9 |
| 212880 2007 $VK_{232}$ | 16.6 | X | 229.65734 | 13.96705 | 230.82427 | 5.92658 | 0.1296802 | 0.30070362 | 2.2065322 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212881 2007 $VC_{235}$ | 15.8 | $X$ | 77.45181 | 254.57112 | 235.34945 | 5.45709 | 0.1159184 | 0.17061433 | 3.2195292 | 21 | 4 15.3 | 20.2 |
| 212882 2007 $VT_{238}$ | 16.1 | $X$ | 325.59233 | 230.49340 | 60.23316 | 1.24502 | 0.0261216 | 0.18307791 | 3.0716996 | 21 | 5 28.9 | 20.2 |
| 212883 2007 $VV_{241}$ | 16.9 | $X$ | 36.90072 | 219.66101 | 128.78874 | 8.19761 | 0.1532803 | 0.28683631 | 2.2770888 | 21 | 12 24.4 | 19.7 |
| 212884 2007 $VD_{252}$ | 16.1 | $X$ | 106.72031 | 136.19589 | 128.30988 | 4.59556 | 0.0563989 | 0.20936472 | 2.8088834 | 21 | 11 5.6 | 20.1 |
| 212885 2007 $VP_{253}$ | 15.5 | $X$ | 132.77264 | 291.67265 | 143.39085 | 6.70319 | 0.1782427 | 0.17280886 | 3.1922143 | 21 | 4 23.3 | 20.6 |
| 212886 2007 $VC_{270}$ | 17.0 | $X$ | 349.01343 | 35.42009 | 43.91219 | 5.34830 | 0.0331003 | 0.29013708 | 2.2597855 | 21 | — | — |
| 212887 2007 $VV_{272}$ | 16.0 | $X$ | 0.36131 | 293.83872 | 165.88926 | 22.04382 | 0.0480796 | 0.22566446 | 2.6719435 | 21 | — | — |
| 212888 2007 $VU_{284}$ | 15.7 | $X$ | 218.11898 | 75.92971 | 70.21594 | 11.73074 | 0.0935368 | 0.20281861 | 2.8690020 | 21 | 10 14.1 | 20.1 |
| 212889 2007 $VK_{286}$ | 17.0 | $X$ | 92.24247 | 320.76971 | 28.24714 | 2.88428 | 0.1087270 | 0.22070551 | 2.7118184 | 21 | — | — |
| 212890 2007 $VE_{287}$ | 16.7 | $X$ | 122.23151 | 190.10016 | 98.62670 | 7.31800 | 0.1310084 | 0.29126622 | 2.2539415 | 21 | — | — |
| 212891 2007 $VW_{290}$ | 16.2 | $X$ | 326.68254 | 9.82736 | 80.51850 | 3.64036 | 0.1657749 | 0.21344738 | 2.7729508 | 21 | 12 28.3 | 19.0 |
| 212892 2007 $VV_{291}$ | 16.5 | $X$ | 191.37772 | 301.30993 | 172.02031 | 1.34902 | 0.1014780 | 0.18971240 | 2.9996614 | 21 | 7 29.5 | 21.1 |
| 212893 2007 $VG_{293}$ | 15.9 | $X$ | 174.55270 | 224.82630 | 163.82278 | 10.04809 | 0.0932477 | 0.17458164 | 3.1705674 | 21 | 4 1.7 | 20.8 |
| 212894 2007 $VV_{306}$ | 16.0 | $X$ | 203.24881 | 106.92578 | 323.84769 | 1.63371 | 0.1099938 | 0.18585299 | 3.0410461 | 21 | 6 18.4 | 20.7 |
| 212895 2007 $VS_{309}$ | 16.7 | $X$ | 101.95120 | 273.87318 | 174.52761 | 0.78622 | 0.0670729 | 0.24044022 | 2.5613247 | 21 | 3 10.5 | 19.9 |
| 212896 2007 $WR$ | 16.0 | $X$ | 208.63986 | 73.78545 | 70.93843 | 3.10233 | 0.0061564 | 0.20368778 | 2.8608345 | 21 | 10 6.4 | 19.9 |
| 212897 2007 $WE_{4}$ | 17.2 | $X$ | 128.53765 | 314.02993 | 30.12169 | 7.69772 | 0.1731960 | 0.30322062 | 2.1943045 | 21 | — | — |
| 212898 2007 $WT_{5}$ | 15.7 | $X$ | 346.68619 | 255.51670 | 257.71351 | 11.14777 | 0.1250120 | 0.23122023 | 2.6289692 | 21 | — | — |
| 212899 2007 $WH_{11}$ | 16.3 | $X$ | 306.32239 | 346.16511 | 173.08114 | 7.24130 | 0.0683128 | 0.22432523 | 2.6825673 | 21 | — | — |
| 212900 2007 $WH_{18}$ | 16.3 | $X$ | 44.96958 | 160.52940 | 134.71538 | 2.94989 | 0.0041001 | 0.19955101 | 2.9002366 | 21 | 9 19.8 | 20.3 |
| 212901 2007 $WR_{18}$ | 17.4 | $X$ | 264.93636 | 201.59901 | 171.46645 | 2.59227 | 0.1036548 | 0.26164053 | 2.4210255 | 21 | 6 11.8 | 20.6 |
| 212902 2007 $WY_{31}$ | 15.8 | $X$ | 221.00979 | 290.11431 | 278.38623 | 6.98445 | 0.1891311 | 0.21545164 | 2.7557269 | 21 | 12 17.7 | 19.9 |
| 212903 2007 $WZ_{38}$ | 15.8 | $X$ | 134.74737 | 65.44936 | 34.85991 | 5.49969 | 0.1708685 | 0.17531823 | 3.1616806 | 21 | 5 21.5 | 20.8 |
| 212904 2007 $XB_{4}$ | 15.3 | $X$ | 104.58074 | 44.01762 | 60.13198 | 11.11222 | 0.1082995 | 0.17453795 | 3.1710965 | 21 | 4 20.7 | 19.9 |
| 212905 2007 $XN_{4}$ | 16.2 | $X$ | 193.79395 | 259.19461 | 158.93231 | 1.66087 | 0.1802192 | 0.18221686 | 3.0813688 | 21 | 5 24.0 | 21.4 |
| 212906 2007 $XN_{7}$ | 16.4 | $X$ | 109.87083 | 261.17597 | 197.99264 | 6.22477 | 0.0800799 | 0.24414411 | 2.5353537 | 21 | 4 6.0 | 19.4 |
| 212907 2007 $XO_{7}$ | 15.2 | $X$ | 139.00450 | 9.44706 | 122.40092 | 8.15644 | 0.0824327 | 0.18290292 | 3.0736585 | 21 | 6 27.1 | 19.8 |
| 212908 2007 $XD_{8}$ | 16.1 | $X$ | 126.01441 | 295.74381 | 215.46550 | 1.80122 | 0.0543146 | 0.18449617 | 3.0559375 | 21 | 7 3.7 | 20.6 |
| 212909 2007 $XQ_{15}$ | 16.2 | $X$ | 70.12407 | 11.02195 | 60.99324 | 4.90816 | 0.1558080 | 0.23115104 | 2.6294938 | 21 | 1 13.9 | 19.0 |
| 212910 2007 $XF_{22}$ | 16.1 | $X$ | 4.01578 | 15.05783 | 58.88611 | 3.15808 | 0.0333634 | 0.21770327 | 2.7366930 | 21 | — | — |
| 212911 2007 $XG_{22}$ | 16.3 | $X$ | 207.52550 | 64.74141 | 348.47293 | 1.05203 | 0.2739493 | 0.18424545 | 3.0587093 | 21 | 5 26.4 | 21.6 |
| 212912 2007 $XY_{34}$ | 16.5 | $X$ | 133.69579 | 20.01506 | 312.17819 | 3.16322 | 0.1698629 | 0.23034171 | 2.6356495 | 21 | — | — |
| 212913 2007 $XF_{38}$ | 16.1 | $X$ | 171.28456 | 306.72711 | 48.35705 | 6.51029 | 0.1689701 | 0.23912098 | 2.5707367 | 21 | 2 15.3 | 20.2 |
| 212914 2007 $XL_{44}$ | 15.8 | $X$ | 82.05054 | 92.40575 | 94.68569 | 9.29059 | 0.1329192 | 0.17982275 | 3.1086581 | 21 | 7 6.9 | 20.0 |
| 212915 2007 $XH_{47}$ | 15.8 | $X$ | 270.18264 | 347.66919 | 98.31451 | 3.25121 | 0.0233417 | 0.19856629 | 2.9098172 | 21 | 10 6.9 | 19.7 |
| 212916 2007 $XM_{50}$ | 15.4 | $X$ | 264.60324 | 262.42620 | 157.12083 | 14.62224 | 0.2029144 | 0.19503537 | 2.9448316 | 21 | 7 28.2 | 19.8 |
| 212917 2007 $YR$ | 16.0 | $X$ | 57.07310 | 189.70879 | 46.50672 | 5.23473 | 0.1097458 | 0.18214421 | 3.0821880 | 21 | 8 4.7 | 20.1 |
| 212918 2007 $YL_{4}$ | 17.1 | $X$ | 135.35075 | 306.85669 | 336.49943 | 4.30070 | 0.1361881 | 0.29228720 | 2.2486896 | 21 | — | — |
| 212919 2007 $YL_{13}$ | 15.5 | $X$ | 358.98215 | 326.16582 | 337.98105 | 7.51595 | 0.0469761 | 0.18495472 | 3.0508845 | 21 | 8 2.4 | 19.6 |
| 212920 2007 $YN_{21}$ | 16.2 | $X$ | 99.87109 | 292.02963 | 107.03365 | 5.04234 | 0.0616665 | 0.22716383 | 2.6601733 | 21 | 1 4.4 | 19.6 |
| 212921 2007 $YD_{23}$ | 15.4 | $X$ | 103.45705 | 211.88062 | 85.71581 | 13.48636 | 0.0457086 | 0.20384701 | 2.8593445 | 21 | 12 9.3 | 19.5 |
| 212922 2007 $YL_{32}$ | 15.7 | $X$ | 156.55151 | 352.67612 | 112.83887 | 2.51091 | 0.0367993 | 0.18221870 | 3.0813480 | 21 | 6 10.6 | 20.1 |
| 212923 2007 $YZ_{53}$ | 16.1 | $X$ | 56.95250 | 240.52646 | 187.62119 | 8.79294 | 0.0510367 | 0.22744554 | 2.6579763 | 21 | — | — |
| 212924 Yurishevchuk | 15.2 | $X$ | 272.94550 | 193.76071 | 156.07864 | 10.85186 | 0.0769098 | 0.18072796 | 3.0982692 | 21 | 5 30.9 | 19.8 |
| 212925 2008 $AL_{31}$ | 15.8 | $X$ | 298.77259 | 355.47121 | 303.54916 | 10.36152 | 0.0412845 | 0.17131364 | 3.2107618 | 21 | 4 28.6 | 20.5 |
| 212926 2008 $AD_{43}$ | 15.2 | $X$ | 332.54902 | 157.63104 | 124.79772 | 9.98015 | 0.0453346 | 0.17464542 | 3.1697955 | 21 | 5 28.7 | 19.6 |
| 212927 2008 $AL_{95}$ | 15.7 | $X$ | 49.73061 | 182.14202 | 23.13176 | 0.33547 | 0.0947448 | 0.17073196 | 3.2180504 | 21 | 6 10.1 | 19.8 |
| 212928 2008 $AK_{106}$ | 15.4 | $X$ | 229.39007 | 118.18293 | 31.95891 | 3.49275 | 0.1254787 | 0.12683901 | 3.9231431 | 21 | 10 14.3 | 21.1 |
| 212929 Satovski | 16.0 | $X$ | 105.75016 | 310.33278 | 79.63327 | 9.00595 | 0.1642017 | 0.23029556 | 2.6360016 | 21 | 1 15.9 | 19.4 |
| 212930 2008 $BX_{6}$ | 15.4 | $X$ | 297.77789 | 157.27603 | 150.17049 | 5.71461 | 0.1146853 | 0.16871700 | 3.2436214 | 21 | 5 3.9 | 19.9 |
| 212931 2008 $BZ_{10}$ | 15.7 | $X$ | 52.79308 | 43.24331 | 162.85010 | 1.13968 | 0.1688954 | 0.17227351 | 3.1988243 | 21 | 6 26.1 | 19.6 |
| 212932 2008 $CS_{204}$ | 15.5 | $X$ | 353.43584 | 350.74622 | 27.16106 | 9.31124 | 0.3271068 | 0.20365974 | 2.8610970 | 21 | 11 22.7 | 17.7 |
| 212933 2008 $DQ_{8}$ | 16.0 | $X$ | 26.58648 | 196.35549 | 59.03523 | 1.99270 | 0.1239469 | 0.17564899 | 3.1577103 | 21 | 7 14.0 | 19.9 |
| 212934 2008 $SN_{81}$ | 15.8 | $X$ | 350.56906 | 35.90017 | 39.34096 | 18.57791 | 0.1512918 | 0.23621145 | 2.5918036 | 21 | — | — |
| 212935 2008 $UH_{96}$ | 15.2 | $X$ | 240.24342 | 144.10721 | 166.32056 | 10.11748 | 0.0777521 | 0.19185032 | 2.9773350 | 21 | 3 2.3 | 19.7 |
| 212936 2008 $UX_{248}$ | 16.4 | $X$ | 33.43193 | 280.24948 | 143.77341 | 5.18065 | 0.0337440 | 0.22855963 | 2.6493319 | 21 | — | — |
| 212937 2008 $UD_{291}$ | 15.4 | $X$ | 18.34671 | 232.61663 | 319.63801 | 5.24809 | 0.0499570 | 0.17314838 | 3.1880400 | 21 | 4 2.5 | 19.7 |
| 212938 2008 $UE_{346}$ | 16.4 | $X$ | 224.85281 | 106.09589 | 150.12904 | 3.19194 | 0.0280136 | 0.23803485 | 2.5785507 | 21 | — | — |
| 212939 2008 $WL_{91}$ | 16.7 | $X$ | 92.10812 | 167.08906 | 291.00340 | 2.14634 | 0.0931472 | 0.25255211 | 2.4787651 | 21 | 3 10.6 | 19.6 |
| 212940 2008 $YS_{17}$ | 16.6 | $X$ | 281.74031 | 275.33290 | 239.24313 | 0.75747 | 0.0320908 | 0.22725782 | 2.6594398 | 21 | — | — |
| 212941 2008 $YR_{22}$ | 17.2 | $X$ | 205.89011 | 189.57024 | 183.52026 | 1.07550 | 0.2030801 | 0.26260207 | 2.4151121 | 21 | 4 4.2 | 21.3 |
| 212942 2008 $YC_{30}$ | 17.1 | $X$ | 185.38240 | 48.99887 | 106.96576 | 3.05226 | 0.1586759 | 0.28431305 | 2.2905416 | 21 | 9 20.6 | 20.6 |
| 212943 2008 $YX_{39}$ | 16.6 | $X$ | 312.04445 | 107.38237 | 31.24448 | 2.85517 | 0.0708372 | 0.23122287 | 2.6289491 | 21 | — | — |
| 212944 2008 $YE_{51}$ | 16.3 | $X$ | 0.80735 | 159.79106 | 305.09363 | 10.64028 | 0.1145991 | 0.23482919 | 2.6019643 | 21 | — | — |
| 212945 2008 $YS_{65}$ | 15.8 | $X$ | 16.87598 | 96.23870 | 171.13832 | 14.24919 | 0.1393475 | 0.17938419 | 3.1137227 | 21 | 7 13.0 | 19.7 |
| 212946 2008 $YU_{145}$ | 16.2 | $X$ | 123.07452 | 309.62742 | 142.88439 | 1.75626 | 0.1737800 | 0.18019477 | 3.1043780 | 21 | 5 1.9 | 20.9 |
| 212947 2009 $AC_{28}$ | 16.3 | $X$ | 274.97812 | 24.20032 | 158.51888 | 9.68192 | 0.0698203 | 0.22109591 | 2.7086252 | 21 | — | — |
| 212948 2009 $BZ_{8}$ | 16.3 | $X$ | 159.19205 | 305.20068 | 129.42221 | 6.17281 | 0.2327319 | 0.18631922 | 3.0359709 | 21 | 5 17.8 | 21.5 |
| 212949 2009 $BV_{23}$ | 16.9 | $X$ | 294.72078 | 158.50255 | 339.76809 | 6.83528 | 0.0370246 | 0.30308863 | 2.1949415 | 21 | — | — |
| 212950 2009 $BZ_{23}$ | 16.5 | $X$ | 274.02575 | 293.30868 | 334.01881 | 12.58960 | 0.1505807 | 0.24397262 | 2.5365416 | 21 | 2 1.9 | 20.4 |
| 212951 2009 $BB_{40}$ | 16.2 | $X$ | 163.56604 | 210.09001 | 107.86948 | 5.80732 | 0.0683589 | 0.23391386 | 2.6087477 | 21 | — | — |
| 212952 2009 $BP_{40}$ | 15.7 | $X$ | 130.40858 | 131.15623 | 116.90441 | 6.88588 | 0.0090802 | 0.21111433 | 2.7933428 | 21 | 11 10.5 | 19.7 |
| 212953 2009 $BU_{44}$ | 15.6 | $X$ | 324.84737 | 312.46296 | 314.02770 | 3.18077 | 0.0142089 | 0.17691409 | 3.1426385 | 21 | 4 27.2 | 19.9 |
| 212954 2009 $BL_{46}$ | 16.6 | $X$ | 276.22843 | 222.27600 | 162.07506 | 5.13806 | 0.0696977 | 0.27405091 | 2.3473718 | 21 | 7 18.4 | 19.4 |
| 212955 2009 $BF_{47}$ | 16.4 | $X$ | 105.19623 | 220.02398 | 181.49138 | 2.35654 | 0.2765362 | 0.24520513 | 2.5280346 | 21 | 2 11.9 | 19.6 |
| 212956 2009 $BH_{51}$ | 17.1 | $X$ | 68.19208 | 229.43380 | 354.54153 | 2.22598 | 0.1801316 | 0.26570141 | 2.3962942 | 21 | 8 17.9 | 19.9 |
| 212957 2009 $BY_{57}$ | 16.8 | $X$ | 101.08817 | 256.16613 | 317.57632 | 5.63773 | 0.2300131 | 0.27070022 | 2.3667024 | 21 | 9 15.1 | 20.4 |
| 212958 2009 $BW_{61}$ | 16.1 | $X$ | 309.61537 | 146.23803 | 156.39453 | 1.61813 | 0.1384072 | 0.18262617 | 3.0767630 | 21 | 5 7.7 | 20.0 |
| 212959 2009 $BD_{65}$ | 16.8 | $X$ | 214.46666 | 112.43297 | 163.99343 | 3.81223 | 0.1166382 | 0.23288009 | 2.6164623 | 21 | — | — |
| 212960 2009 $BB_{66}$ | 16.4 | $X$ | 207.47227 | 196.16509 | 311.61049 | 3.20299 | 0.0421464 | 0.20472940 | 2.8511227 | 21 | 10 2.3 | 20.6 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 212961 2009 $BD_{66}$ | 16.4 | *X* | 74.38933 | 231.52772 | 93.18672 | 0.32806 | 0.0693680 | 0.21436347 | 2.7650450 | 21 | 12 13.0 | 20.1 |
| 212962 2009 $BV_{72}$ | 17.5 | *X* | 230.19755 | 184.12292 | 358.19082 | 2.43068 | 0.0877288 | 0.29621554 | 2.2287644 | 21 | 12 26.0 | 20.0 |
| 212963 2009 $BZ_{72}$ | 15.7 | *X* | 301.93760 | 200.24179 | 139.69694 | 11.94051 | 0.0518868 | 0.18865709 | 3.0108374 | 21 | 6 27.1 | 19.9 |
| 212964 2009 $BZ_{75}$ | 17.1 | *X* | 350.56515 | 323.47681 | 145.64189 | 2.93604 | 0.1560163 | 0.23207088 | 2.6225410 | 21 | — | — |
| 212965 2009 $BV_{87}$ | 16.0 | *X* | 4.51731 | 269.23650 | 348.13212 | 2.87266 | 0.0428295 | 0.18520288 | 3.0481585 | 21 | 6 7.2 | 20.0 |
| 212966 2009 $BF_{102}$ | 16.4 | *X* | 325.15185 | 95.50760 | 356.36491 | 7.31023 | 0.1241438 | 0.21946255 | 2.7220479 | 21 | 12 29.5 | 19.5 |
| 212967 2009 $BK_{102}$ | 15.0 | *X* | 84.40926 | 69.45894 | 71.29311 | 20.33326 | 0.0836812 | 0.17580752 | 3.1558118 | 21 | 5 9.4 | 19.5 |
| 212968 2009 $BH_{104}$ | 17.0 | *X* | 39.62064 | 303.34996 | 294.08585 | 1.86109 | 0.1509683 | 0.26359087 | 2.4090685 | 21 | 7 15.9 | 19.1 |
| 212969 2009 $BK_{107}$ | 17.0 | *X* | 170.42957 | 224.22022 | 167.80112 | 1.29505 | 0.1841334 | 0.25694765 | 2.4504149 | 21 | 3 28.1 | 20.7 |
| 212970 2009 $BY_{109}$ | 17.3 | *X* | 339.27904 | 274.55806 | 160.65957 | 5.35312 | 0.1075316 | 0.29776247 | 2.2210384 | 21 | — | — |
| 212971 2009 $BA_{121}$ | 16.7 | *X* | 216.99399 | 310.29433 | 225.25830 | 0.85134 | 0.1511752 | 0.21222558 | 2.7835834 | 21 | 11 7.5 | 20.9 |
| 212972 2009 $BQ_{123}$ | 16.0 | *X* | 122.83747 | 311.42702 | 167.80099 | 5.36348 | 0.0918385 | 0.18088205 | 3.0965094 | 21 | 5 26.1 | 20.6 |
| 212973 2009 $BN_{146}$ | 17.8 | *X* | 160.67444 | 305.50866 | 212.40282 | 1.64696 | 0.1131236 | 0.27403357 | 2.3474708 | 21 | 8 26.8 | 21.1 |
| 212974 2009 $BQ_{155}$ | 15.9 | *X* | 72.68597 | 188.54815 | 130.05562 | 14.50236 | 0.0911961 | 0.21556674 | 2.7547459 | 21 | 12 9.0 | 20.1 |
| 212975 2009 $BJ_{156}$ | 17.2 | *X* | 158.85246 | 156.22316 | 327.47715 | 5.68767 | 0.0598298 | 0.26787685 | 2.3833030 | 21 | 7 8.6 | 20.4 |
| 212976 2009 $BK_{167}$ | 17.3 | *X* | 321.51852 | 290.85617 | 176.70163 | 6.08347 | 0.0838305 | 0.30085340 | 2.2057999 | 21 | — | — |
| 212977 Birute | 16.8 | *X* | 118.00218 | 259.20003 | 0.34007 | 5.98270 | 0.1430053 | 0.28885479 | 2.2664684 | 21 | 11 24.9 | 20.2 |
| 212978 2009 $CT_{25}$ | 16.1 | *X* | 119.59431 | 178.27253 | 341.54567 | 8.91168 | 0.0669364 | 0.18732099 | 3.0251373 | 21 | 7 10.4 | 20.6 |
| 212979 2009 $CN_{34}$ | 16.9 | *X* | 286.24057 | 315.09147 | 130.14575 | 4.97095 | 0.0732366 | 0.20997211 | 2.8034639 | 21 | 10 22.9 | 20.6 |
| 212980 2009 $CW_{37}$ | 15.8 | *X* | 237.54004 | 242.27883 | 349.19305 | 8.01092 | 0.2309955 | 0.22342114 | 2.6897993 | 21 | — | — |
| 212981 Majalitović | 17.9 | *X* | 248.59165 | 119.46498 | 7.27632 | 2.10684 | 0.1676550 | 0.29097269 | 2.2554571 | 21 | 10 20.6 | 20.6 |
| 212982 2009 $CC_{52}$ | 17.3 | *X* | 153.47001 | 275.48659 | 128.83403 | 1.97795 | 0.1801837 | 0.25590288 | 2.4570798 | 21 | 3 28.0 | 20.9 |
| 212983 2009 $CW_{52}$ | 17.8 | *X* | 85.20831 | 126.29069 | 138.90469 | 3.32131 | 0.1764382 | 0.27879727 | 2.3206539 | 21 | 11 3.6 | 21.1 |
| 212984 2009 $DC$ | 16.0 | *X* | 89.86748 | 185.69032 | 272.56111 | 13.20731 | 0.0716507 | 0.24452984 | 2.5326867 | 21 | 2 27.3 | 19.5 |
| 212985 2009 $DZ_5$ | 15.1 | *X* | 320.00880 | 165.99805 | 112.07813 | 11.18061 | 0.0516798 | 0.18089355 | 3.0963782 | 21 | 5 6.8 | 19.5 |
| 212986 2009 $DG_{14}$ | 16.8 | *X* | 46.79554 | 284.12889 | 290.75851 | 1.16216 | 0.1598073 | 0.25705974 | 2.4497025 | 21 | 6 25.7 | 19.0 |
| 212987 2009 $DO_{16}$ | 16.3 | *X* | 123.37405 | 2.63837 | 99.32403 | 2.31156 | 0.2358636 | 0.17955522 | 3.1117452 | 21 | 5 19.7 | 21.2 |
| 212988 2009 $DA_{18}$ | 16.3 | *X* | 78.81344 | 118.45255 | 165.18896 | 5.91579 | 0.0419957 | 0.20332319 | 2.8642534 | 21 | 10 24.7 | 20.3 |
| 212989 2009 $DZ_{22}$ | 16.8 | *X* | 214.32208 | 47.16502 | 33.94184 | 2.06221 | 0.0472947 | 0.26988488 | 2.3714666 | 21 | 7 19.2 | 19.8 |
| 212990 2009 $DT_{24}$ | 15.8 | *X* | 35.73563 | 236.79375 | 80.56791 | 3.07507 | 0.0757556 | 0.19909428 | 2.9046704 | 21 | 10 15.7 | 19.5 |
| 212991 Garcíalorca | 16.9 | *X* | 286.98046 | 310.42990 | 161.20131 | 6.88711 | 0.0476542 | 0.29252286 | 2.2474817 | 21 | 12 16.8 | 19.4 |
| 212992 2009 $DW_{56}$ | 16.2 | *X* | 135.42915 | 261.69057 | 74.90472 | 3.93670 | 0.0641141 | 0.22685231 | 2.6626081 | 21 | — | — |
| 212993 2132 *P–L* | 15.5 | *X* | 118.42084 | 325.32663 | 357.46185 | 13.26426 | 0.0805258 | 0.24678927 | 2.5172047 | 21 | — | — |
| 212994 6598 *P–L* | 16.0 | *X* | 139.67373 | 315.69365 | 15.62300 | 7.81460 | 0.2387304 | 0.21615577 | 2.7497392 | 21 | — | — |
| 212995 1230 *T–2* | 17.4 | *X* | 168.57521 | 299.46934 | 17.10095 | 2.77169 | 0.2294854 | 0.29673002 | 2.2261874 | 21 | — | — |
| 212996 3226 *T–2* | 16.8 | *X* | 310.05090 | 281.64379 | 66.90235 | 3.45483 | 0.2106801 | 0.26487624 | 2.4012684 | 21 | 6 25.6 | 19.0 |
| 212997 3238 *T–2* | 15.0 | *X* | 90.12724 | 190.83409 | 177.26001 | 20.75837 | 0.0834219 | 0.16999745 | 3.2273132 | 21 | — | — |
| 212998 Tolbachik | 16.6 | *X* | 34.67011 | 126.23540 | 198.02529 | 21.01279 | 0.0605263 | 0.35963344 | 1.9583757 | 21 | 11 18.6 | 18.8 |
| 212999 4330 *T–3* | 15.3 | *X* | 194.09597 | 226.70929 | 152.44424 | 5.47581 | 0.1653302 | 0.17089075 | 3.2160565 | 21 | 4 10.2 | 20.6 |
| 213000 1981 $ET_2$ | 15.7 | *X* | 122.09168 | 250.54736 | 249.20383 | 8.70694 | 0.1833708 | 0.17725234 | 3.1386392 | 21 | 6 27.8 | 20.6 |
| 213001 1981 $EP_3$ | 15.8 | *X* | 94.83084 | 302.06556 | 228.72835 | 9.03312 | 0.1626170 | 0.17642999 | 3.1483846 | 21 | 7 4.5 | 20.6 |
| 213002 1982 $QF_4$ | 16.9 | *X* | 126.84315 | 244.44288 | 48.71904 | 13.11970 | 0.2269117 | 0.28462256 | 2.2888807 | 21 | — | — |
| 213003 1992 $EC_{23}$ | 16.3 | *X* | 20.50996 | 37.35815 | 124.37419 | 7.89404 | 0.1441404 | 0.23696678 | 2.5862931 | 21 | 2 13.9 | 18.9 |
| 213004 1992 $SJ_7$ | 16.9 | *X* | 17.17175 | 206.51388 | 154.78467 | 4.24921 | 0.1895200 | 0.27632197 | 2.3344923 | 21 | 12 17.6 | 19.4 |
| 213005 1993 $RC$ | 15.2 | *X* | 336.75472 | 129.37827 | 186.94241 | 17.17909 | 0.1516822 | 0.17227278 | 3.1988333 | 21 | 7 5.7 | 19.3 |
| 213006 1994 $SL_5$ | 15.9 | *X* | 19.63451 | 149.86677 | 11.16581 | 13.86027 | 0.0982762 | 0.23799664 | 2.5788267 | 21 | 2 18.7 | 19.0 |
| 213007 1995 $BP_8$ | 18.1 | *X* | 236.72037 | 127.81241 | 12.38365 | 1.72754 | 0.1465179 | 0.28621214 | 2.2803982 | 21 | 10 26.0 | 20.8 |
| 213008 1995 $DB_3$ | 16.8 | *X* | 252.45536 | 254.43835 | 223.42230 | 19.25033 | 0.1186006 | 0.35935728 | 1.9593788 | 21 | 11 3.4 | 18.1 |
| 213009 1995 $FB_{15}$ | 16.3 | *X* | 141.33863 | 300.72978 | 45.72267 | 7.04790 | 0.0404066 | 0.21817424 | 2.7327531 | 21 | — | — |
| 213010 1995 $OW_4$ | 17.1 | *X* | 68.48871 | 175.84451 | 134.04228 | 6.09511 | 0.1978019 | 0.27240012 | 2.3568459 | 21 | 12 13.8 | 20.5 |
| 213011 1995 $OT_{12}$ | 17.0 | *X* | 199.68363 | 296.51561 | 194.65821 | 0.80919 | 0.0087103 | 0.26666805 | 2.3904999 | 21 | 9 11.1 | 20.0 |
| 213012 1995 $SA_{12}$ | 17.2 | *X* | 32.62778 | 95.90599 | 212.09391 | 0.61208 | 0.1949273 | 0.26765818 | 2.3846009 | 21 | 10 26.3 | 19.7 |
| 213013 1995 $SN_{25}$ | 15.6 | *X* | 125.78628 | 95.53785 | 9.46328 | 12.33625 | 0.0836197 | 0.17499559 | 3.1655656 | 21 | 5 6.2 | 20.3 |
| 213014 1995 $SS_{41}$ | 15.9 | *X* | 143.91243 | 289.51211 | 179.35277 | 14.06562 | 0.1453825 | 0.17732690 | 3.1377593 | 21 | 6 9.5 | 21.1 |
| 213015 1995 $SE_{50}$ | 17.0 | *X* | 48.17452 | 86.56121 | 208.28722 | 4.50120 | 0.2362271 | 0.26722548 | 2.3871744 | 21 | 11 5.9 | 19.9 |
| 213016 1995 $SX_{51}$ | 15.7 | *X* | 288.03085 | 359.11065 | 15.90650 | 8.90652 | 0.1930711 | 0.18362176 | 3.0656315 | 21 | 7 3.3 | 20.1 |
| 213017 1995 $SO_{81}$ | 17.7 | *X* | 86.40553 | 259.41146 | 27.18685 | 0.69254 | 0.2051629 | 0.27169123 | 2.3609437 | 21 | 12 1.9 | 21.4 |
| 213018 1995 $UD_{11}$ | 17.1 | *X* | 14.37136 | 80.64150 | 234.09725 | 1.69257 | 0.1474450 | 0.26490501 | 2.4010946 | 21 | 9 25.0 | 19.3 |
| 213019 1995 $UE_{58}$ | 16.5 | *X* | 87.54794 | 3.92598 | 284.56335 | 0.58600 | 0.1375442 | 0.19292199 | 2.9662988 | 21 | 11 17.9 | 21.0 |
| 213020 1995 $UK_{82}$ | 16.0 | *X* | 278.46142 | 274.55387 | 73.69735 | 9.79104 | 0.0624317 | 0.17751386 | 3.1355558 | 21 | 6 4.9 | 20.5 |
| 213021 1995 $VK_6$ | 17.4 | *X* | 289.87973 | 151.48326 | 217.26592 | 0.91211 | 0.1544882 | 0.25809108 | 2.4431720 | 21 | 7 2.2 | 20.3 |
| 213022 1995 $VG_{17}$ | 16.6 | *X* | 320.24959 | 280.81867 | 51.31172 | 6.74096 | 0.0936022 | 0.25715296 | 2.4491104 | 21 | 7 8.7 | 19.3 |
| 213023 1995 $WK_{18}$ | 15.3 | *X* | 55.37420 | 343.39423 | 245.61475 | 4.38026 | 0.0790052 | 0.17938444 | 3.1137199 | 21 | 7 16.4 | 19.4 |
| 213024 1995 $WX_{21}$ | 16.8 | *X* | 349.66336 | 187.75180 | 94.70157 | 5.55501 | 0.0906331 | 0.25468286 | 2.4649204 | 21 | 6 15.3 | 19.2 |
| 213025 1996 $FL_8$ | 16.7 | *X* | 37.43534 | 319.04409 | 170.17413 | 9.31286 | 0.0712027 | 0.23250942 | 2.6192424 | 21 | 1 29.0 | 19.9 |
| 213026 1996 $HZ_5$ | 16.3 | *X* | 45.53748 | 37.07320 | 51.96459 | 13.62034 | 0.1604155 | 0.22764816 | 2.6563989 | 21 | — | — |
| 213027 1996 $VZ_6$ | 16.6 | *X* | 83.30983 | 303.93603 | 49.01829 | 6.33455 | 0.2051598 | 0.28546198 | 2.2843915 | 21 | — | — |
| 213028 1996 $VN_9$ | 15.6 | *X* | 209.70669 | 347.52186 | 97.96188 | 9.69411 | 0.1322371 | 0.18567496 | 3.0429898 | 21 | 7 12.3 | 20.4 |
| 213029 1997 $BF_5$ | 17.2 | *X* | 273.92201 | 199.27427 | 193.75062 | 1.63574 | 0.1359523 | 0.26299935 | 2.4126793 | 21 | 7 16.8 | 20.1 |
| 213030 1997 $GN_7$ | 15.7 | *X* | 200.01948 | 178.85327 | 46.30010 | 12.74303 | 0.0977246 | 0.22716812 | 2.6601398 | 21 | 12 27.5 | 19.7 |
| 213031 1997 $OB$ | 16.3 | *X* | 252.76550 | 170.60826 | 179.53174 | 3.10050 | 0.2336687 | 0.23838000 | 2.5760612 | 21 | 4 16.4 | 20.3 |
| 213032 1997 $TX_3$ | 16.7 | *X* | 97.23680 | 328.21822 | 13.89085 | 8.56432 | 0.1240261 | 0.21532485 | 2.7568086 | 21 | — | — |
| 213033 1997 $UT_{15}$ | 16.8 | *X* | 189.27508 | 271.42008 | 31.38580 | 7.34431 | 0.2173025 | 0.22210822 | 2.7003888 | 21 | 1 2.8 | 21.5 |
| 213034 1997 $WL_5$ | 16.4 | *X* | 36.93226 | 181.00476 | 216.77335 | 4.59255 | 0.0583242 | 0.21126807 | 2.7919876 | 21 | — | — |
| 213035 1997 $WV_5$ | 15.9 | *X* | 102.23318 | 100.48167 | 214.42595 | 4.96961 | 0.0295143 | 0.20940368 | 2.8085350 | 21 | 12 27.7 | 19.9 |
| 213036 1997 $WD_{45}$ | 15.9 | *X* | 108.43158 | 143.56818 | 229.00354 | 6.14262 | 0.3144314 | 0.21787729 | 2.7352356 | 21 | 1 19.9 | 19.7 |
| 213037 1998 $FY_7$ | 15.9 | *X* | 178.58864 | 127.25617 | 355.42154 | 7.04545 | 0.1562713 | 0.18591170 | 3.0404059 | 21 | 7 29.9 | 20.9 |
| 213038 1998 $FV_{128}$ | 15.3 | *X* | 131.10370 | 182.31157 | 358.78754 | 12.68181 | 0.2143139 | 0.18450400 | 3.0558511 | 21 | 8 31.3 | 20.4 |
| 213039 1998 $GV_2$ | 14.9 | *X* | 183.18065 | 83.32455 | 34.60857 | 26.73411 | 0.2105943 | 0.18608340 | 3.0385354 | 21 | 8 4.7 | 20.6 |
| 213040 1998 $HY_1$ | 17.2 | *X* | 91.14412 | 25.07935 | 246.05278 | 3.35943 | 0.2181046 | 0.27065508 | 2.3669655 | 21 | 11 18.0 | 20.9 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213041 1998 $HJ_{22}$ | 17.0 | $X$ | 161.00563 | 172.00324 | 24.19664 | 6.24022 | 0.1677333 | 0.27373771 | 2.3491620 | 21 | 10 16.5 | 20.6 |
| 213042 1998 $HJ_{96}$ | 16.9 | $X$ | 118.58853 | 128.10792 | 86.37256 | 4.65845 | 0.1653989 | 0.26883518 | 2.3776357 | 21 | 10 2.2 | 20.6 |
| 213043 1998 $KB_{17}$ | 15.3 | $X$ | 358.92658 | 261.32552 | 30.40952 | 10.95927 | 0.0575162 | 0.17838960 | 3.1252855 | 21 | 7 17.6 | 19.6 |
| 213044 1998 $OG_{10}$ | 16.4 | $X$ | 140.93747 | 4.50728 | 314.18528 | 10.34562 | 0.1884033 | 0.23172633 | 2.6251399 | 21 | — | — |
| 213045 1998 $OL_{15}$ | 16.3 | $X$ | 150.66752 | 319.09620 | 313.82677 | 8.07977 | 0.1792820 | 0.27184006 | 2.3600819 | 21 | — | — |
| 213046 1998 $QA_{85}$ | 16.2 | $X$ | 223.12460 | 115.91749 | 245.77773 | 4.53634 | 0.2612720 | 0.24406234 | 2.5359199 | 21 | 4 2.5 | 20.8 |
| 213047 1998 $SJ_{75}$ | 15.8 | $X$ | 326.44180 | 51.30249 | 33.97387 | 15.36995 | 0.2869800 | 0.21733691 | 2.7397676 | 21 | 12 23.3 | 18.0 |
| 213048 1998 $SE_{99}$ | 16.3 | $X$ | 114.64019 | 202.56596 | 193.86540 | 8.50223 | 0.1811438 | 0.23253755 | 2.6190311 | 21 | 2 3.7 | 20.0 |
| 213049 1998 $SY_{130}$ | 16.1 | $X$ | 85.77660 | 220.08184 | 203.21691 | 12.99486 | 0.2430762 | 0.23041426 | 2.6350962 | 21 | 2 6.5 | 19.3 |
| 213050 1998 $TS_{3}$ | 17.7 | $X$ | 110.20872 | 339.52557 | 198.27951 | 34.49366 | 0.1224892 | 0.42313007 | 1.7571957 | 21 | 7 26.8 | 20.7 |
| 213051 1998 $UZ_{17}$ | 16.1 | $X$ | 163.97630 | 181.44463 | 223.28205 | 12.30420 | 0.2417867 | 0.23850915 | 2.5751312 | 21 | 4 9.8 | 20.5 |
| 213052 1998 $VV$ | 15.2 | $X$ | 107.90737 | 353.47040 | 41.44970 | 33.43211 | 0.1465047 | 0.23085194 | 2.6317645 | 21 | 2 3.7 | 19.5 |
| 213053 1998 $WT_{30}$ | 19.7 | $X$ | 30.13983 | 126.57957 | 36.01959 | 0.51164 | 0.3373713 | 0.40388000 | 1.8125966 | 21 | — | — |
| 213054 1999 $AW_{15}$ | 16.0 | $X$ | 275.78920 | 22.32084 | 117.73759 | 4.55211 | 0.0444319 | 0.21166551 | 2.7884915 | 21 | 12 19.4 | 19.7 |
| 213055 1999 $AL_{30}$ | 15.8 | $X$ | 71.43403 | 245.82581 | 125.58150 | 6.45061 | 0.0290610 | 0.21516206 | 2.7581989 | 21 | — | — |
| 213056 1999 $JA_{14}$ | 16.3 | $X$ | 142.43872 | 213.94214 | 81.23123 | 8.04542 | 0.1704551 | 0.29083117 | 2.2561887 | 21 | — | — |
| 213057 1999 $NM_{54}$ | 14.3 | $X$ | 313.14831 | 140.57371 | 223.99682 | 15.92175 | 0.2310456 | 0.17740159 | 3.1368786 | 21 | 7 16.2 | 18.3 |
| 213058 1999 $RJ_{7}$ | 15.4 | $X$ | 61.43005 | 110.21964 | 10.61607 | 8.65268 | 0.0886479 | 0.15645583 | 3.4109463 | 21 | 3 14.3 | 19.9 |
| 213059 1999 $RG_{42}$ | 15.3 | $X$ | 341.04576 | 245.90867 | 83.59129 | 5.38870 | 0.1879202 | 0.17438929 | 3.1728985 | 21 | 8 1.9 | 18.8 |
| 213060 1999 $RU_{50}$ | 16.6 | $X$ | 10.18581 | 285.45711 | 68.99770 | 3.21709 | 0.2258371 | 0.27415285 | 2.3467899 | 21 | 12 1.7 | 18.9 |
| 213061 1999 $RB_{64}$ | 15.1 | $X$ | 25.06769 | 138.44637 | 149.76849 | 13.76270 | 0.1987144 | 0.17989987 | 3.1077696 | 21 | 9 4.1 | 18.5 |
| 213062 1999 $RY_{82}$ | 16.9 | $X$ | 70.92643 | 136.34912 | 174.79672 | 6.45969 | 0.1758154 | 0.27648993 | 2.3335467 | 21 | 12 16.0 | 20.3 |
| 213063 1999 $RH_{94}$ | 16.8 | $X$ | 16.73702 | 262.57848 | 103.69266 | 2.93308 | 0.2168743 | 0.27400080 | 2.3476580 | 21 | 12 27.6 | 19.3 |
| 213064 1999 $RX_{121}$ | 16.9 | $X$ | 123.83100 | 141.33937 | 187.18141 | 6.76801 | 0.2593705 | 0.28607494 | 2.2811272 | 21 | — | — |
| 213065 1999 $RT_{127}$ | 16.8 | $X$ | 11.45317 | 143.12525 | 195.63230 | 3.71742 | 0.2282879 | 0.27264820 | 2.3554160 | 21 | 11 11.5 | 18.9 |
| 213066 1999 $RX_{133}$ | 16.6 | $X$ | 34.65208 | 142.81347 | 199.09208 | 7.45149 | 0.1692750 | 0.27558539 | 2.3386502 | 21 | 12 12.7 | 19.5 |
| 213067 1999 $ST_{15}$ | 14.8 | $X$ | 341.18421 | 72.64495 | 216.48405 | 17.67785 | 0.1995324 | 0.17221663 | 3.1995286 | 21 | 6 3.6 | 18.5 |
| 213068 1999 $SU_{23}$ | 17.9 | $X$ | 88.62902 | 273.92514 | 10.55233 | 2.35919 | 0.2308923 | 0.27656514 | 2.3331236 | 21 | 12 3.7 | 21.5 |
| 213069 1999 $TX_{17}$ | 16.4 | $X$ | 358.21057 | 176.59335 | 183.15956 | 10.32531 | 0.2351809 | 0.27016471 | 2.3698288 | 21 | 11 18.8 | 18.4 |
| 213070 1999 $TU_{50}$ | 17.4 | $X$ | 91.71785 | 101.75365 | 191.56604 | 2.60469 | 0.1604247 | 0.27683260 | 2.3316206 | 21 | 12 12.9 | 20.8 |
| 213071 1999 $TW_{51}$ | 16.9 | $X$ | 1.90421 | 336.76427 | 344.62449 | 3.47489 | 0.2170851 | 0.26706001 | 2.3881603 | 21 | 9 18.5 | 18.5 |
| 213072 1999 $TJ_{79}$ | 17.5 | $X$ | 320.41748 | 260.10918 | 26.78877 | 5.85020 | 0.1523055 | 0.30369306 | 2.1920282 | 21 | 4 16.4 | 19.3 |
| 213073 1999 $TE_{90}$ | 15.6 | $X$ | 307.30593 | 217.31964 | 185.94580 | 17.09427 | 0.2139675 | 0.17648195 | 3.1477666 | 21 | 9 1.3 | 19.5 |
| 213074 1999 $TH_{90}$ | 16.9 | $X$ | 258.31405 | 208.66573 | 146.78755 | 1.70573 | 0.1899832 | 0.25808145 | 2.4432328 | 21 | 5 1.0 | 20.5 |
| 213075 1999 $TK_{90}$ | 16.2 | $X$ | 291.44073 | 190.00882 | 173.41394 | 7.35067 | 0.2021926 | 0.26298793 | 2.4127492 | 21 | 6 18.9 | 19.2 |
| 213076 1999 $TY_{115}$ | 16.6 | $X$ | 243.98536 | 190.08030 | 213.53351 | 5.60489 | 0.1923974 | 0.26016911 | 2.4301452 | 21 | 6 17.7 | 20.3 |
| 213077 1999 $TY_{116}$ | 16.7 | $X$ | 71.13804 | 138.86372 | 191.11247 | 5.86139 | 0.2178429 | 0.27747788 | 2.3280045 | 21 | — | — |
| 213078 1999 $TG_{131}$ | 16.4 | $X$ | 133.86915 | 254.05190 | 4.14480 | 23.54306 | 0.2544874 | 0.27873011 | 2.3210266 | 21 | 12 3.1 | 20.9 |
| 213079 1999 $TL_{132}$ | 17.1 | $X$ | 243.01072 | 40.22956 | 355.71333 | 1.00022 | 0.1939603 | 0.25956651 | 2.4339049 | 21 | 6 6.3 | 20.6 |
| 213080 1999 $TQ_{133}$ | 17.0 | $X$ | 49.64978 | 77.59315 | 233.93952 | 1.72845 | 0.1995542 | 0.27271278 | 2.3550441 | 21 | 11 25.0 | 19.9 |
| 213081 1999 $TP_{137}$ | 16.4 | $X$ | 245.94729 | 229.66760 | 198.32806 | 12.21035 | 0.1670587 | 0.26259358 | 2.4151641 | 21 | 7 22.5 | 20.2 |
| 213082 1999 $TG_{138}$ | 17.1 | $X$ | 357.56224 | 57.06407 | 287.53326 | 0.98073 | 0.2266869 | 0.26882380 | 2.3777028 | 21 | 10 18.7 | 18.7 |
| 213083 1999 $TV_{159}$ | 17.2 | $X$ | 64.83369 | 107.38367 | 226.60097 | 4.70695 | 0.2009743 | 0.27770831 | 2.3267165 | 21 | — | — |
| 213084 1999 $TN_{169}$ | 17.2 | $X$ | 88.67750 | 89.06974 | 214.25833 | 5.54574 | 0.2880896 | 0.27742021 | 2.3283271 | 21 | 12 29.9 | 21.3 |
| 213085 1999 $TL_{218}$ | 16.8 | $X$ | 258.64043 | 121.78695 | 249.96333 | 1.59661 | 0.2089693 | 0.25798128 | 2.4438652 | 21 | 5 19.9 | 20.4 |
| 213086 1999 $TF_{230}$ | 16.4 | $X$ | 89.63665 | 198.90936 | 123.00355 | 6.57626 | 0.1703605 | 0.27846279 | 2.3225118 | 21 | — | — |
| 213087 1999 $TS_{230}$ | 16.7 | $X$ | 62.72147 | 313.66729 | 24.89198 | 12.10708 | 0.2236176 | 0.27782208 | 2.3260812 | 21 | — | — |
| 213088 1999 $TJ_{247}$ | 16.5 | $X$ | 86.78972 | 316.76863 | 100.03289 | 4.75061 | 0.2148794 | 0.23968033 | 2.5667355 | 21 | 1 28.2 | 19.1 |
| 213089 1999 $TS_{251}$ | 16.9 | $X$ | 220.11044 | 352.83715 | 57.30970 | 1.25833 | 0.2026190 | 0.25672826 | 2.4518107 | 21 | 6 2.5 | 20.9 |
| 213090 1999 $TY_{282}$ | 15.4 | $X$ | 47.55978 | 265.27886 | 25.91976 | 17.29326 | 0.3607061 | 0.18166153 | 3.0876453 | 21 | 11 2.7 | 19.7 |
| 213091 1999 $TH_{297}$ | 16.3 | $X$ | 118.80531 | 196.77101 | 191.32272 | 13.02346 | 0.1077174 | 0.24281600 | 2.5445902 | 21 | 1 16.2 | 19.8 |
| 213092 1999 $UC_{19}$ | 16.9 | $X$ | 38.79551 | 177.21291 | 36.42905 | 5.09880 | 0.1443371 | 0.25515475 | 2.4618803 | 21 | 6 5.1 | 19.2 |
| 213093 1999 $UM_{47}$ | 16.2 | $X$ | 258.48826 | 50.43376 | 41.48077 | 13.46607 | 0.1650850 | 0.21878752 | 2.7276440 | 21 | 9 15.9 | 20.2 |
| 213094 1999 $VD_{17}$ | 17.2 | $X$ | 55.47548 | 318.52468 | 5.52186 | 3.09356 | 0.2474574 | 0.27421851 | 2.3464153 | 21 | 12 23.7 | 20.5 |
| 213095 1999 $VV_{43}$ | 14.5 | $X$ | 347.51914 | 286.53253 | 29.14924 | 13.64826 | 0.2955858 | 0.17547591 | 3.1597863 | 21 | 7 24.5 | 17.5 |
| 213096 1999 $VA_{88}$ | 16.1 | $X$ | 353.75591 | 93.48312 | 237.48518 | 3.93089 | 0.1647195 | 0.26434157 | 2.4045053 | 21 | 9 7.3 | 18.1 |
| 213097 1999 $VR_{100}$ | 16.6 | $X$ | 53.57716 | 274.76699 | 60.76737 | 3.64674 | 0.1797541 | 0.27299793 | 2.3534040 | 21 | 12 28.0 | 19.8 |
| 213098 1999 $VJ_{120}$ | 16.6 | $X$ | 295.06563 | 307.74752 | 54.58615 | 3.45881 | 0.2086220 | 0.26292494 | 2.4131345 | 21 | 6 21.3 | 19.4 |
| 213099 1999 $VZ_{179}$ | 17.0 | $X$ | 357.49107 | 303.91185 | 64.16172 | 22.79896 | 0.0908950 | 0.35974902 | 1.9579562 | 21 | 11 28.9 | 18.5 |
| 213100 1999 $VW_{183}$ | 17.2 | $X$ | 107.15594 | 13.31464 | 63.85725 | 4.31385 | 0.1952276 | 0.24368573 | 2.5385321 | 21 | 3 24.0 | 20.5 |
| 213101 1999 $VU_{195}$ | 16.3 | $X$ | 227.52286 | 312.00765 | 89.10984 | 6.96680 | 0.1349547 | 0.25644839 | 2.4535942 | 21 | 6 2.8 | 20.0 |
| 213102 1999 $WW_{10}$ | 17.4 | $X$ | 67.40333 | 155.98770 | 218.94001 | 20.24056 | 0.0913643 | 0.37081864 | 1.9187940 | 21 | — | — |
| 213103 1999 $XK_{3}$ | 16.5 | $X$ | 106.05529 | 331.83272 | 97.02812 | 6.22465 | 0.2201390 | 0.24256952 | 2.5463137 | 21 | 3 16.6 | 19.9 |
| 213104 1999 $XF_{26}$ | 16.6 | $X$ | 336.77355 | 317.81737 | 38.64997 | 10.38712 | 0.2825279 | 0.26733652 | 2.3865133 | 21 | 9 16.7 | 17.8 |
| 213105 1999 $XO_{51}$ | 16.7 | $X$ | 299.33382 | 290.14055 | 53.85888 | 2.79279 | 0.1843901 | 0.25846736 | 2.4408003 | 21 | 6 5.3 | 19.3 |
| 213106 1999 $XS_{78}$ | 16.6 | $X$ | 96.22042 | 357.19245 | 72.65469 | 5.66629 | 0.2122031 | 0.24048352 | 2.5610172 | 21 | 3 3.6 | 19.7 |
| 213107 1999 $XU_{125}$ | 16.0 | $X$ | 56.88714 | 173.45739 | 294.99618 | 4.15169 | 0.2658329 | 0.23879327 | 2.5730881 | 21 | 2 17.8 | 17.8 |
| 213108 1999 $XY_{144}$ | 14.9 | $X$ | 138.70117 | 157.57364 | 231.14251 | 8.85488 | 0.0869381 | 0.15229017 | 3.4728669 | 21 | 2 20.9 | 20.2 |
| 213109 1999 $XX_{178}$ | 15.3 | $X$ | 26.00310 | 92.74528 | 77.99015 | 12.99646 | 0.1844714 | 0.23746120 | 2.5827019 | 21 | 3 17.0 | 18.0 |
| 213110 1999 $YF_{27}$ | 16.5 | $X$ | 57.42432 | 153.05147 | 107.21897 | 5.17848 | 0.2007806 | 0.26060467 | 2.4274367 | 21 | 9 28.3 | 19.5 |
| 213111 2000 $AS_{3}$ | 15.4 | $X$ | 127.98035 | 358.55314 | 87.02543 | 15.61340 | 0.1336536 | 0.24362087 | 2.5389826 | 21 | 4 25.8 | 19.3 |
| 213112 2000 $AM_{12}$ | 15.8 | $X$ | 165.77612 | 39.95270 | 0.75654 | 3.05598 | 0.2232431 | 0.24663167 | 2.5182769 | 21 | 4 6.1 | 19.8 |
| 213113 2000 $AX_{56}$ | 16.8 | $X$ | 57.20737 | 344.13856 | 114.77369 | 5.87162 | 0.2501866 | 0.23545832 | 2.5973274 | 21 | 2 5.0 | 18.7 |
| 213114 2000 $AH_{58}$ | 16.2 | $X$ | 81.79072 | 330.44533 | 104.35431 | 5.02211 | 0.2604451 | 0.23657861 | 2.5891213 | 21 | 2 23.4 | 18.9 |
| 213115 2000 $AL_{87}$ | 16.0 | $X$ | 349.18227 | 235.05174 | 294.63861 | 4.04709 | 0.1885082 | 0.23259934 | 2.6185673 | 21 | — | — |
| 213116 2000 $AF_{131}$ | 15.9 | $X$ | 29.85916 | 47.78658 | 121.46993 | 7.67437 | 0.1215080 | 0.23777579 | 2.5804234 | 21 | 3 17.1 | 18.6 |
| 213117 2000 $AU_{148}$ | 17.0 | $X$ | 38.34186 | 357.10836 | 125.92940 | 6.93911 | 0.1727400 | 0.23565934 | 2.5958501 | 21 | 1 22.9 | 19.4 |
| 213118 2000 $AL_{183}$ | 14.0 | $X$ | 18.67662 | 109.50543 | 264.67039 | 24.69825 | 0.2069369 | 0.17705377 | 3.1409855 | 21 | 12 14.6 | 17.7 |
| 213119 2000 $AT_{220}$ | 12.8 | $X$ | 287.80737 | 146.42369 | 308.45852 | 6.78757 | 0.0349586 | 0.07980022 | 5.3431822 | 21 | 10 18.2 | 19.8 |
| 213120 2000 $BU_{37}$ | 15.3 | $X$ | 60.59260 | 331.80769 | 327.53549 | 11.45977 | 0.0181207 | 0.21021636 | 2.8012919 | 21 | 10 11.7 | 19.4 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213121 2000 $CT_9$ | 16.4 | $X$ | 100.12669 | 309.04991 | 163.44888 | 3.73327 | 0.1850379 | 0.24193389 | 2.5507716 | 21 | 4 28.9 | 19.7 |
| 213122 2000 $CO_{11}$ | 16.6 | $X$ | 55.37945 | 211.69501 | 247.11674 | 3.57924 | 0.2489300 | 0.23502115 | 2.6005473 | 21 | 1 29.0 | 18.5 |
| 213123 2000 $CC_{60}$ | 15.9 | $X$ | 350.73553 | 314.42592 | 154.43861 | 14.75219 | 0.1211806 | 0.22594221 | 2.6697533 | 21 | — | — |
| 213124 2000 $CD_{74}$ | 16.5 | $X$ | 104.01465 | 305.66841 | 133.28578 | 5.36879 | 0.0759594 | 0.23687213 | 2.5869820 | 21 | 3 4.1 | 19.8 |
| 213125 2000 $CW_{79}$ | 16.5 | $X$ | 20.86687 | 303.16562 | 159.17691 | 4.41835 | 0.1936353 | 0.22832476 | 2.6511484 | 21 | — | — |
| 213126 2000 $CB_{115}$ | 16.1 | $X$ | 313.48841 | 51.27421 | 106.86280 | 8.57781 | 0.2597255 | 0.22414444 | 2.6840096 | 21 | — | — |
| 213127 2000 $DP_3$ | 16.1 | $X$ | 316.73866 | 215.86297 | 356.83179 | 4.24776 | 0.2345623 | 0.23233499 | 2.6205531 | 21 | — | — |
| 213128 2000 $DX_{24}$ | 15.8 | $X$ | 234.82661 | 15.67027 | 151.02005 | 14.37984 | 0.0756996 | 0.21686821 | 2.7437136 | 21 | 11 29.9 | 19.9 |
| 213129 2000 $DY_{43}$ | 15.9 | $X$ | 198.00416 | 136.62312 | 156.71427 | 12.28708 | 0.0428290 | 0.22695767 | 2.6617840 | 21 | — | — |
| 213130 2000 $DE_{44}$ | 16.0 | $X$ | 346.63639 | 22.23717 | 158.53698 | 12.16466 | 0.1183038 | 0.23135464 | 2.6279508 | 21 | 1 15.6 | 19.4 |
| 213131 2000 $DV_{92}$ | 16.6 | $X$ | 345.70252 | 129.44189 | 336.16498 | 1.31588 | 0.1504989 | 0.22380524 | 2.6867209 | 21 | — | — |
| 213132 2000 $ER_{24}$ | 16.0 | $X$ | 54.44269 | 95.41518 | 359.15339 | 9.67105 | 0.3141299 | 0.23166852 | 2.6255766 | 21 | 2 3.9 | 17.8 |
| 213133 2000 $ES_{66}$ | 16.1 | $X$ | 289.65194 | 35.94031 | 172.36280 | 13.87327 | 0.1916923 | 0.22470973 | 2.6795064 | 21 | — | — |
| 213134 2000 $EE_{108}$ | 15.8 | $X$ | 289.70005 | 49.95789 | 153.08576 | 9.48011 | 0.3227702 | 0.22370035 | 2.6875607 | 21 | — | — |
| 213135 2000 $EV_{151}$ | 15.8 | $X$ | 337.43050 | 13.54333 | 187.30986 | 19.57230 | 0.1834884 | 0.23234880 | 2.6204493 | 21 | 1 16.3 | 19.5 |
| 213136 2000 $EV_{199}$ | 15.8 | $X$ | 333.75789 | 253.36630 | 268.44088 | 10.36994 | 0.1375373 | 0.22827033 | 2.6515698 | 21 | — | — |
| 213137 2000 $FQ_{33}$ | 15.4 | $X$ | 357.90424 | 97.79021 | 52.69147 | 13.38689 | 0.1329084 | 0.22833483 | 2.6510704 | 21 | — | — |
| 213138 2000 $FY_{62}$ | 16.0 | $X$ | 198.04365 | 57.91609 | 210.54141 | 7.64987 | 0.2985004 | 0.21721646 | 2.7407804 | 21 | — | — |
| 213139 2000 $GH_{23}$ | 16.3 | $X$ | 304.80793 | 115.19939 | 21.97258 | 9.34093 | 0.1167089 | 0.21883885 | 2.7272175 | 21 | — | — |
| 213140 2000 $GG_{40}$ | 15.9 | $X$ | 223.27340 | 228.84474 | 21.56141 | 9.45662 | 0.1890177 | 0.21912317 | 2.7248578 | 21 | — | — |
| 213141 2000 $GF_{156}$ | 15.8 | $X$ | 243.05940 | 23.21691 | 221.67785 | 5.00927 | 0.0760056 | 0.22217084 | 2.6998813 | 21 | — | — |
| 213142 2000 $HM_2$ | 16.5 | $X$ | 38.85702 | 250.80369 | 142.19322 | 3.25239 | 0.0976209 | 0.21460384 | 2.7629798 | 21 | — | — |
| 213143 2000 $HX_5$ | 16.4 | $X$ | 95.94252 | 224.07682 | 116.61830 | 2.68335 | 0.0819643 | 0.21409561 | 2.7673508 | 21 | — | — |
| 213144 2000 $HT_{30}$ | 15.6 | $X$ | 291.47825 | 290.90762 | 228.61013 | 14.09814 | 0.0976977 | 0.21694645 | 2.7430540 | 21 | — | — |
| 213145 2000 $HW_{41}$ | 16.1 | $X$ | 269.92449 | 31.95087 | 154.33783 | 10.72673 | 0.2578082 | 0.21758689 | 2.7376688 | 21 | — | — |
| 213146 2000 $HD_{44}$ | 15.8 | $X$ | 263.26162 | 162.24005 | 41.49482 | 10.31904 | 0.1305129 | 0.22062822 | 2.7124517 | 21 | — | — |
| 213147 2000 $JT_{11}$ | 15.5 | $X$ | 206.90961 | 7.23239 | 249.33005 | 13.63447 | 0.1185945 | 0.21685482 | 2.7438266 | 21 | — | — |
| 213148 2000 $JB_{67}$ | 15.9 | $X$ | 152.92065 | 287.01385 | 33.61508 | 11.62198 | 0.0480300 | 0.21966330 | 2.7203892 | 21 | — | — |
| 213149 2000 $JW_{69}$ | 15.6 | $X$ | 243.73863 | 90.05148 | 133.06621 | 14.56834 | 0.1686651 | 0.21659732 | 2.7460009 | 21 | — | — |
| 213150 2000 $KN_{54}$ | 15.6 | $X$ | 216.23013 | 131.93273 | 109.17697 | 17.72100 | 0.2193596 | 0.21483680 | 2.7609822 | 21 | — | — |
| 213151 2000 $KL_{61}$ | 16.3 | $X$ | 200.77102 | 54.46098 | 208.66674 | 9.91124 | 0.2003736 | 0.21475133 | 2.7617147 | 21 | — | — |
| 213152 2000 $NO_{14}$ | 17.6 | $X$ | 239.38018 | 189.41328 | 127.87171 | 2.00508 | 0.2464787 | 0.31395369 | 2.1440043 | 21 | 2 16.1 | 20.9 |
| 213153 2000 $ON_{68}$ | 15.0 | $X$ | 1.87068 | 100.09589 | 120.85545 | 13.82616 | 0.1905713 | 0.17880090 | 3.1204909 | 21 | 4 18.2 | 18.6 |
| 213154 2000 $PD_{28}$ | 16.6 | $X$ | 31.22900 | 336.39106 | 84.97018 | 8.16805 | 0.2445993 | 0.29454301 | 2.2371936 | 21 | — | — |
| 213155 2000 $QN_{10}$ | 16.9 | $X$ | 149.45736 | 232.96550 | 127.85655 | 1.69301 | 0.1807713 | 0.30665246 | 2.1779024 | 21 | 1 18.5 | 19.5 |
| 213156 2000 $QJ_{25}$ | 17.3 | $X$ | 260.50481 | 47.82796 | 346.14409 | 18.82984 | 0.1022241 | 0.36959380 | 1.9230309 | 21 | 7 11.8 | 19.7 |
| 213157 2000 $QY_{42}$ | 15.6 | $X$ | 307.88214 | 178.07404 | 163.84984 | 6.93918 | 0.1902517 | 0.18364545 | 3.0653679 | 21 | 6 17.9 | 19.5 |
| 213158 2000 $QE_{55}$ | 17.3 | $X$ | 283.76192 | 295.50681 | 357.46071 | 5.90470 | 0.2746341 | 0.31769952 | 2.1271185 | 21 | 2 20.9 | 20.5 |
| 213159 2000 $QB_{100}$ | 17.3 | $X$ | 186.96867 | 225.10766 | 110.21956 | 3.95178 | 0.2261693 | 0.30709807 | 2.1757951 | 21 | 1 28.1 | 20.5 |
| 213160 2000 $QY_{115}$ | 16.9 | $X$ | 173.38937 | 334.67241 | 8.40411 | 5.05827 | 0.1988045 | 0.30724577 | 2.1750977 | 21 | 1 24.5 | 20.1 |
| 213161 2000 $RR_{24}$ | 17.4 | $X$ | 161.75959 | 116.23233 | 212.39938 | 5.33958 | 0.1746592 | 0.30343483 | 2.1932717 | 21 | — | — |
| 213162 2000 $RF_{44}$ | 15.7 | $X$ | 104.41013 | 128.52311 | 204.91968 | 20.71154 | 0.3677975 | 0.20065533 | 2.8895857 | 21 | — | — |
| 213163 2000 $RP_{86}$ | 15.7 | $X$ | 330.84597 | 135.30659 | 206.29709 | 6.39046 | 0.2096925 | 0.18409443 | 3.0603819 | 21 | 7 24.1 | 19.1 |
| 213164 2000 $RC_{92}$ | 16.6 | $X$ | 159.64124 | 136.38409 | 201.11576 | 7.50743 | 0.1780850 | 0.30266374 | 2.1969953 | 21 | — | — |
| 213165 2000 $RP_{92}$ | 16.7 | $X$ | 222.30486 | 201.40745 | 104.16904 | 3.53472 | 0.1709863 | 0.30792455 | 2.1719000 | 21 | 1 19.4 | 19.9 |
| 213166 2000 $SM$ | 15.9 | $X$ | 254.32669 | 65.31515 | 278.04736 | 0.44035 | 0.1915087 | 0.17451727 | 3.1713471 | 21 | 4 16.9 | 20.8 |
| 213167 2000 $SR_{21}$ | 17.8 | $X$ | 82.53450 | 269.06225 | 184.10906 | 22.15036 | 0.1065226 | 0.40048134 | 1.8228371 | 21 | 1 4.2 | 19.7 |
| 213168 2000 $SU_{37}$ | 17.0 | $X$ | 261.75375 | 212.99591 | 86.86046 | 4.15996 | 0.2030819 | 0.31306246 | 2.1480715 | 21 | 2 16.2 | 20.2 |
| 213169 2000 $SS_{53}$ | 15.4 | $X$ | 261.98598 | 349.40610 | 34.03899 | 9.91033 | 0.0802153 | 0.17969293 | 3.1101552 | 21 | 6 26.7 | 20.0 |
| 213170 2000 $SD_{62}$ | 17.2 | $X$ | 135.42664 | 285.92196 | 13.13949 | 4.89649 | 0.1730895 | 0.29612533 | 2.2292170 | 21 | — | — |
| 213171 2000 $SE_{63}$ | 16.7 | $X$ | 340.38609 | 357.14913 | 43.24070 | 3.31690 | 0.2408333 | 0.28472695 | 2.2883213 | 21 | 12 16.4 | 18.0 |
| 213172 2000 $SH_{75}$ | 15.0 | $X$ | 312.02854 | 305.99754 | 44.22508 | 10.72541 | 0.1036917 | 0.18038236 | 3.1022254 | 21 | 7 20.3 | 19.2 |
| 213173 2000 $ST_{102}$ | 16.7 | $X$ | 60.01192 | 194.66629 | 204.28126 | 3.65967 | 0.1608398 | 0.29549663 | 2.2323778 | 21 | — | — |
| 213174 2000 $SF_{104}$ | 16.7 | $X$ | 93.07542 | 169.16472 | 195.52605 | 5.05144 | 0.1861098 | 0.29650804 | 2.2272984 | 21 | — | — |
| 213175 2000 $SX_{107}$ | 17.3 | $X$ | 168.36998 | 354.62979 | 321.07951 | 0.50633 | 0.2112277 | 0.30192804 | 2.2005627 | 21 | — | — |
| 213176 2000 $SK_{120}$ | 15.5 | $X$ | 320.30802 | 325.17762 | 33.37967 | 12.48796 | 0.1976493 | 0.18223015 | 3.0812190 | 21 | 8 5.2 | 19.2 |
| 213177 2000 $SW_{125}$ | 16.5 | $X$ | 209.36093 | 48.19183 | 35.21020 | 24.16983 | 0.3205073 | 0.26909612 | 2.3760984 | 21 | 6 29.8 | 21.3 |
| 213178 2000 $SF_{145}$ | 16.9 | $X$ | 50.85357 | 175.46766 | 220.21449 | 3.57160 | 0.1589853 | 0.29341624 | 2.2429174 | 21 | — | — |
| 213179 2000 $SR_{162}$ | 17.0 | $X$ | 77.50088 | 226.85145 | 135.84958 | 8.56501 | 0.1589776 | 0.29482018 | 2.2357912 | 21 | — | — |
| 213180 2000 $SD_{173}$ | 12.5 | $X$ | 322.86361 | 50.19707 | 238.40500 | 25.56492 | 0.1564651 | 0.08378419 | 5.1724306 | 21 | 5 14.2 | 18.9 |
| 213181 2000 $SN_{191}$ | 16.1 | $X$ | 39.10260 | 232.01426 | 95.14634 | 2.91193 | 0.2325924 | 0.19227899 | 2.9729082 | 21 | 11 22.7 | 19.9 |
| 213182 2000 $SO_{198}$ | 15.3 | $X$ | 260.27831 | 234.22947 | 185.34269 | 8.78309 | 0.1318357 | 0.18164862 | 3.0877916 | 21 | 7 31.7 | 19.9 |
| 213183 2000 $ST_{217}$ | 16.5 | $X$ | 73.85286 | 228.74219 | 140.66346 | 7.19229 | 0.1625203 | 0.29353955 | 2.2422893 | 21 | — | — |
| 213184 2000 $SQ_{222}$ | 16.7 | $X$ | 278.34593 | 236.95576 | 140.88299 | 8.44135 | 0.2754089 | 0.27320800 | 2.3521974 | 21 | 6 11.0 | 20.1 |
| 213185 2000 $SS_{230}$ | 16.7 | $X$ | 83.45237 | 347.20894 | 22.31709 | 5.63001 | 0.2151564 | 0.29470464 | 2.2363755 | 21 | — | — |
| 213186 2000 $SN_{239}$ | 17.1 | $X$ | 271.49206 | 283.94456 | 172.35401 | 2.21657 | 0.1523372 | 0.28111532 | 2.3078790 | 21 | 10 13.3 | 19.3 |
| 213187 2000 $SS_{245}$ | 16.5 | $X$ | 317.68630 | 197.88534 | 161.53753 | 10.32658 | 0.0904002 | 0.27886948 | 2.3202533 | 21 | 8 14.5 | 18.8 |
| 213188 2000 $SM_{248}$ | 15.2 | $X$ | 279.69494 | 343.97196 | 23.50929 | 10.43874 | 0.1170278 | 0.17983268 | 3.1085436 | 21 | 6 22.8 | 19.7 |
| 213189 2000 $SH_{264}$ | 15.4 | $X$ | 273.02518 | 296.60077 | 71.45437 | 2.28550 | 0.2132198 | 0.17871360 | 3.1215070 | 21 | 6 2.5 | 20.1 |
| 213190 2000 $ST_{277}$ | 16.4 | $X$ | 159.98953 | 94.16285 | 228.53232 | 3.83704 | 0.1577658 | 0.29958137 | 2.2120394 | 21 | — | — |
| 213191 2000 $SG_{280}$ | 14.5 | $X$ | 197.45835 | 344.73517 | 65.81885 | 24.29727 | 0.1589247 | 0.17167012 | 3.2063154 | 21 | 5 20.2 | 19.7 |
| 213192 2000 $SO_{281}$ | 15.9 | $X$ | 7.30265 | 146.71134 | 202.56004 | 7.01506 | 0.1481824 | 0.19006762 | 2.9959229 | 21 | 10 19.9 | 19.3 |
| 213193 2000 $SB_{322}$ | 17.0 | $X$ | 111.55851 | 120.13505 | 181.09668 | 11.28629 | 0.1642170 | 0.24633641 | 2.5202888 | 21 | — | — |
| 213194 2000 $SD_{328}$ | 15.1 | $X$ | 301.06814 | 154.36193 | 240.13276 | 8.29952 | 0.0942700 | 0.18218514 | 3.0817264 | 21 | 8 26.4 | 19.3 |
| 213195 2000 $SP_{328}$ | 17.0 | $X$ | 87.10474 | 293.51171 | 63.47536 | 4.80263 | 0.1318206 | 0.29410407 | 2.2394190 | 21 | — | — |
| 213196 2000 $SU_{343}$ | 15.6 | $X$ | 295.05458 | 148.16160 | 209.38649 | 8.80291 | 0.1235584 | 0.18139238 | 3.0906989 | 21 | 6 28.9 | 19.9 |
| 213197 2000 $SW_{345}$ | 17.0 | $X$ | 121.10795 | 103.43206 | 197.67669 | 6.79691 | 0.3035202 | 0.20202318 | 2.8765278 | 21 | — | — |
| 213198 2000 $SJ_{353}$ | 15.4 | $X$ | 269.82821 | 178.15481 | 187.26530 | 10.54833 | 0.2457013 | 0.17637177 | 3.1490773 | 21 | 5 24.5 | 20.4 |
| 213199 2000 $SB_{358}$ | 14.7 | $X$ | 274.76318 | 315.00783 | 73.92018 | 24.57428 | 0.1852806 | 0.17931202 | 3.1145582 | 21 | 7 3.0 | 19.4 |
| 213200 2000 $SV_{364}$ | 15.0 | $X$ | 167.67200 | 222.85028 | 171.83076 | 13.63255 | 0.0763520 | 0.16887078 | 3.2416519 | 21 | 4 1.3 | 19.9 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213201 2000 $SA_{367}$ | 16.5 | $X$ | 250.79789 | 217.03581 | 65.63672 | 6.71829 | 0.1613675 | 0.30811565 | 2.1710019 | 21 | 1 17.6 | 19.7 |
| 213202 2000 $TC_{4}$ | 17.5 | $X$ | 216.41040 | 41.07964 | 20.23027 | 2.40228 | 0.1950501 | 0.27129730 | 2.3632286 | 21 | 6 13.5 | 21.3 |
| 213203 2000 $TT_{5}$ | 17.3 | $X$ | 353.52563 | 262.53515 | 176.16436 | 5.94964 | 0.0628644 | 0.29243428 | 2.2479356 | 21 | — | — |
| 213204 2000 $TR_{13}$ | 15.5 | $X$ | 251.83910 | 194.37233 | 205.86632 | 9.42739 | 0.0823607 | 0.17770288 | 3.1333320 | 21 | 7 4.3 | 20.3 |
| 213205 2000 $TZ_{22}$ | 17.4 | $X$ | 59.33796 | 217.08677 | 190.58047 | 3.20932 | 0.0961845 | 0.29673255 | 2.2261748 | 21 | — | — |
| 213206 2000 $TB_{35}$ | 15.8 | $X$ | 350.75241 | 144.97695 | 195.33794 | 10.18230 | 0.1379707 | 0.18449369 | 3.0559649 | 21 | 9 3.7 | 19.3 |
| 213207 2000 $TN_{40}$ | 16.8 | $X$ | 296.23032 | 310.98667 | 113.18238 | 6.37922 | 0.1830932 | 0.28232719 | 2.3012700 | 21 | 10 7.9 | 18.8 |
| 213208 2000 $UM_{21}$ | 16.5 | $X$ | 25.80686 | 329.46102 | 54.72142 | 7.57483 | 0.1359749 | 0.28824885 | 2.2696436 | 21 | — | — |
| 213209 2000 $UH_{28}$ | 15.3 | $X$ | 272.24309 | 167.03241 | 219.41698 | 8.56123 | 0.0932463 | 0.17907124 | 3.1173495 | 21 | 7 9.9 | 19.8 |
| 213210 2000 $UK_{49}$ | 15.2 | $X$ | 336.72925 | 290.23643 | 69.98106 | 6.12188 | 0.3091962 | 0.18354448 | 3.0664919 | 21 | 8 30.9 | 17.7 |
| 213211 2000 $UU_{57}$ | 15.4 | $X$ | 306.82590 | 145.98949 | 227.69431 | 7.10849 | 0.1917088 | 0.18185129 | 3.0854969 | 21 | 7 26.4 | 19.2 |
| 213212 2000 $UA_{69}$ | 16.3 | $X$ | 231.15312 | 186.12592 | 259.63084 | 5.42292 | 0.2052544 | 0.27266203 | 2.3553364 | 21 | 7 28.1 | 19.9 |
| 213213 2000 $UL_{75}$ | 17.1 | $X$ | 40.14012 | 271.64708 | 94.92641 | 4.81009 | 0.2367523 | 0.28823861 | 2.2696973 | 21 | — | — |
| 213214 2000 $UU_{83}$ | 16.6 | $X$ | 273.66159 | 358.63135 | 96.38443 | 5.74929 | 0.0902113 | 0.28043470 | 2.3116117 | 21 | 10 27.3 | 19.1 |
| 213215 2000 $UX_{85}$ | 16.9 | $X$ | 97.60542 | 282.60195 | 77.87169 | 3.95290 | 0.1390400 | 0.29501449 | 2.2348094 | 21 | — | — |
| 213216 2000 $UJ_{92}$ | 16.6 | $X$ | 82.99900 | 135.12915 | 258.97292 | 6.43185 | 0.1565787 | 0.29643457 | 2.2276664 | 21 | — | — |
| 213217 2000 $VT_{1}$ | 16.6 | $X$ | 220.08699 | 88.22198 | 213.43130 | 4.76487 | 0.2146058 | 0.30489714 | 2.1862533 | 21 | 1 12.7 | 20.2 |
| 213218 2000 $VJ_{18}$ | 16.9 | $X$ | 324.87880 | 334.62040 | 91.39563 | 5.83817 | 0.2055922 | 0.28264054 | 2.2995688 | 21 | 12 15.1 | 18.1 |
| 213219 2000 $VP_{21}$ | 17.0 | $X$ | 336.12335 | 219.09905 | 203.25337 | 1.61343 | 0.1306046 | 0.28460922 | 2.2889523 | 21 | 12 28.1 | 19.0 |
| 213220 2000 $VB_{25}$ | 14.5 | $X$ | 290.27907 | 298.97066 | 56.16945 | 25.44216 | 0.1347181 | 0.17527928 | 3.1621490 | 21 | 6 14.5 | 19.1 |
| 213221 2000 $VQ_{26}$ | 16.9 | $X$ | 312.28316 | 13.07919 | 30.35306 | 2.71742 | 0.2179358 | 0.27917933 | 2.3185361 | 21 | 10 1.2 | 18.5 |
| 213222 2000 $VP_{42}$ | 15.2 | $X$ | 349.29873 | 117.08788 | 234.78764 | 6.58931 | 0.2151673 | 0.18458024 | 3.0550096 | 21 | 9 17.4 | 18.3 |
| 213223 2000 $WR_{11}$ | 17.1 | $X$ | 207.42047 | 224.60239 | 73.44266 | 3.44366 | 0.0814621 | 0.30334341 | 2.1937123 | 21 | — | — |
| 213224 2000 $WU_{16}$ | 16.8 | $X$ | 259.55077 | 353.29056 | 79.63234 | 1.88027 | 0.1325109 | 0.27401418 | 2.3475816 | 21 | 8 25.4 | 19.5 |
| 213225 2000 $WD_{22}$ | 15.6 | $X$ | 276.76938 | 302.98417 | 79.63731 | 11.26669 | 0.2477978 | 0.17768180 | 3.1335798 | 21 | 6 20.1 | 20.2 |
| 213226 2000 $WQ_{24}$ | 15.2 | $X$ | 18.56661 | 257.66546 | 93.59226 | 11.64668 | 0.2656743 | 0.18781396 | 3.0198414 | 21 | 11 28.4 | 18.7 |
| 213227 2000 $WD_{43}$ | 16.7 | $X$ | 252.61291 | 335.84248 | 96.19278 | 4.81706 | 0.1435892 | 0.27334679 | 2.3514012 | 21 | 8 13.5 | 19.8 |
| 213228 2000 $WM_{44}$ | 14.7 | $X$ | 335.80576 | 91.95966 | 227.25628 | 16.13330 | 0.1316566 | 0.17757114 | 3.1348815 | 21 | 7 7.9 | 18.8 |
| 213229 2000 $WU_{76}$ | 14.9 | $X$ | 295.81320 | 308.26719 | 47.03739 | 13.89980 | 0.1371949 | 0.17611109 | 3.1521841 | 21 | 6 25.2 | 19.3 |
| 213230 2000 $WP_{85}$ | 16.3 | $X$ | 339.77961 | 351.96288 | 55.93767 | 6.14867 | 0.1731083 | 0.28217863 | 2.3020776 | 21 | 12 16.8 | 18.1 |
| 213231 2000 $WM_{94}$ | 16.7 | $X$ | 312.19326 | 354.56162 | 67.59631 | 6.95715 | 0.0982511 | 0.27953140 | 2.3165890 | 21 | 11 11.1 | 19.0 |
| 213232 2000 $WQ_{100}$ | 16.9 | $X$ | 4.46832 | 119.66175 | 269.10161 | 2.25142 | 0.0946329 | 0.28299149 | 2.2976672 | 21 | 12 22.8 | 19.1 |
| 213233 2000 $WL_{112}$ | 16.8 | $X$ | 191.79718 | 66.48557 | 26.03783 | 6.90673 | 0.1548353 | 0.26697673 | 2.3886569 | 21 | 7 3.4 | 20.6 |
| 213234 2000 $WD_{139}$ | 14.8 | $X$ | 357.38196 | 266.37058 | 61.19296 | 11.72455 | 0.1592358 | 0.18063520 | 3.0993298 | 21 | 9 8.2 | 18.5 |
| 213235 2000 $WH_{177}$ | 17.0 | $X$ | 307.24538 | 215.90756 | 225.16574 | 3.54348 | 0.1065696 | 0.28298480 | 2.2977035 | 21 | 11 30.1 | 19.1 |
| 213236 2000 $XT_{11}$ | 15.3 | $X$ | 56.83061 | 115.93113 | 20.50918 | 11.69866 | 0.1455088 | 0.25356864 | 2.4721360 | 21 | 3 18.8 | 17.7 |
| 213237 2000 $XZ_{19}$ | 14.5 | $X$ | 305.05558 | 290.70695 | 50.24348 | 26.20658 | 0.2146500 | 0.17575144 | 3.1564830 | 21 | 6 3.3 | 18.9 |
| 213238 2000 $YU_{9}$ | 16.8 | $X$ | 216.94521 | 49.52355 | 26.01700 | 5.78362 | 0.1912675 | 0.26730246 | 2.3867160 | 21 | 7 3.7 | 20.7 |
| 213239 2000 $YU_{82}$ | 17.1 | $X$ | 289.68109 | 268.35063 | 163.23601 | 2.89506 | 0.1431365 | 0.27731754 | 2.3289017 | 21 | 10 8.9 | 19.3 |
| 213240 2000 $YJ_{88}$ | 16.7 | $X$ | 256.58084 | 329.78672 | 113.06047 | 6.81186 | 0.1400906 | 0.27227626 | 2.3575606 | 21 | 9 4.7 | 19.6 |
| 213241 2001 $AL$ | 16.7 | $X$ | 76.49243 | 290.33166 | 316.68462 | 8.06398 | 0.1795605 | 0.26482272 | 2.4015919 | 21 | 9 24.8 | 20.1 |
| 213242 2001 $BY_{14}$ | 16.3 | $X$ | 6.69198 | 335.30200 | 137.02762 | 6.59768 | 0.2704473 | 0.24025310 | 2.5626544 | 21 | — | — |
| 213243 2001 $BR_{17}$ | 17.1 | $X$ | 150.26856 | 40.78610 | 89.68685 | 3.12836 | 0.1628544 | 0.26216518 | 2.4177945 | 21 | 7 12.7 | 20.9 |
| 213244 2001 $BN_{20}$ | 16.4 | $X$ | 102.05823 | 100.49985 | 75.87955 | 5.22638 | 0.0952876 | 0.26011989 | 2.4304518 | 21 | 7 13.8 | 19.6 |
| 213245 2001 $BD_{29}$ | 16.5 | $X$ | 151.70638 | 324.03284 | 132.67781 | 9.53850 | 0.2374133 | 0.25853800 | 2.4403557 | 21 | 6 5.6 | 20.7 |
| 213246 2001 $BP_{50}$ | 17.9 | $X$ | 177.63097 | 7.25505 | 112.54926 | 2.06944 | 0.1372371 | 0.26384441 | 2.4075249 | 21 | 7 25.1 | 21.3 |
| 213247 2001 $BJ_{53}$ | 16.5 | $X$ | 304.05166 | 314.66920 | 103.85669 | 6.53229 | 0.0838411 | 0.27266693 | 2.3553082 | 21 | 10 24.3 | 19.0 |
| 213248 2001 $CK_{10}$ | 16.6 | $X$ | 89.05845 | 221.71278 | 331.42327 | 6.03413 | 0.1482491 | 0.25939217 | 2.4349954 | 21 | 7 28.7 | 19.7 |
| 213249 2001 $CH_{23}$ | 16.6 | $X$ | 208.06734 | 3.07957 | 131.19031 | 4.61873 | 0.0542537 | 0.26932371 | 2.3747596 | 21 | 9 24.2 | 19.6 |
| 213250 2001 $CX_{35}$ | 15.6 | $X$ | 49.84068 | 354.86394 | 22.08315 | 16.24982 | 0.3020740 | 0.23821168 | 2.5772745 | 21 | — | — |
| 213251 2001 $CS_{41}$ | 16.8 | $X$ | 255.57066 | 318.80114 | 85.92530 | 2.45863 | 0.1831320 | 0.26794358 | 2.3829073 | 21 | 7 2.9 | 20.2 |
| 213252 2001 $DO_{1}$ | 16.4 | $X$ | 47.51532 | 159.74185 | 143.79189 | 6.89743 | 0.1344880 | 0.26851486 | 2.3795262 | 21 | 11 3.8 | 19.4 |
| 213253 2001 $DP_{32}$ | 17.1 | $X$ | 284.24199 | 105.46661 | 20.94412 | 3.38215 | 0.1171587 | 0.27756876 | 2.3274963 | 21 | 12 22.7 | 19.2 |
| 213254 2001 $DV_{100}$ | 16.7 | $X$ | 188.73576 | 37.41228 | 54.27111 | 4.21140 | 0.2095250 | 0.26242546 | 2.4161955 | 21 | 6 28.1 | 20.7 |
| 213255 Kimiyayui | 17.4 | $X$ | 9.90591 | 43.48956 | 22.24028 | 21.78280 | 0.0817647 | 0.37597360 | 1.9012146 | 21 | — | — |
| 213256 2001 $EK_{16}$ | 15.1 | $X$ | 106.95751 | 122.33181 | 10.94669 | 15.07535 | 0.0886590 | 0.20473182 | 2.8511002 | 21 | 5 17.4 | 19.3 |
| 213257 2001 $EA_{23}$ | 16.7 | $X$ | 82.83201 | 23.84355 | 178.74738 | 2.55435 | 0.1398326 | 0.25669376 | 2.4520304 | 21 | 7 30.6 | 19.9 |
| 213258 2001 $FT_{32}$ | 17.1 | $X$ | 33.16549 | 260.13734 | 175.75108 | 23.45994 | 0.0610915 | 0.38065542 | 1.8855933 | 21 | — | — |
| 213259 2001 $FK_{43}$ | 16.6 | $X$ | 40.60271 | 341.98859 | 179.37294 | 12.25368 | 0.1514903 | 0.24594487 | 2.5229629 | 21 | 3 22.6 | 18.9 |
| 213260 2001 $FZ_{51}$ | 16.0 | $X$ | 290.16655 | 184.72930 | 317.66545 | 4.77889 | 0.1376125 | 0.22907394 | 2.6453649 | 21 | — | — |
| 213261 2001 $FL_{115}$ | 16.1 | $X$ | 326.15404 | 330.88083 | 147.08260 | 8.17764 | 0.1518842 | 0.23223853 | 2.6212787 | 21 | — | — |
| 213262 2001 $FB_{148}$ | 16.3 | $X$ | 40.99332 | 283.33712 | 323.15621 | 6.91832 | 0.1396711 | 0.25566984 | 2.4585727 | 21 | 7 31.4 | 18.9 |
| 213263 2001 $FD_{166}$ | 15.4 | $X$ | 65.39154 | 297.47904 | 11.01449 | 11.89127 | 0.0738920 | 0.21865063 | 2.7287823 | 21 | 11 9.9 | 19.3 |
| 213264 2001 $FG_{196}$ | 16.4 | $X$ | 31.72541 | 160.28902 | 80.57353 | 6.57286 | 0.1013994 | 0.25335128 | 2.4735497 | 21 | 6 29.7 | 18.9 |
| 213265 2001 $GA_{6}$ | 17.3 | $X$ | 275.97087 | 313.25207 | 200.07182 | 21.53273 | 0.0976705 | 0.37284193 | 1.9118459 | 21 | — | — |
| 213266 2001 $KE_{32}$ | 16.9 | $X$ | 49.14062 | 214.72282 | 93.25439 | 24.39945 | 0.0558613 | 0.35793176 | 1.9645778 | 21 | 11 21.9 | 19.4 |
| 213267 2001 $LB_{9}$ | 15.6 | $X$ | 6.36495 | 9.01028 | 228.12910 | 14.52374 | 0.1254731 | 0.24449634 | 2.5329181 | 21 | 5 7.4 | 17.9 |
| 213268 2001 $LZ_{12}$ | 15.6 | $X$ | 259.64105 | 36.15640 | 264.77868 | 10.08615 | 0.2647592 | 0.23267044 | 2.6180337 | 21 | 2 15.3 | 20.2 |
| 213269 Angelbarbero | 15.9 | $X$ | 135.58912 | 178.43792 | 187.41821 | 13.96122 | 0.1017293 | 0.22321597 | 2.6914473 | 21 | 1 12.6 | 20.0 |
| 213270 2001 $NM$ | 15.8 | $X$ | 351.75194 | 327.97522 | 268.50673 | 12.50445 | 0.1486663 | 0.24373623 | 2.5381814 | 21 | 3 29.8 | 18.8 |
| 213271 2001 $NT_{5}$ | 15.7 | $X$ | 185.29048 | 178.06050 | 98.13486 | 13.59084 | 0.2018295 | 0.22082152 | 2.7108685 | 21 | — | — |
| 213272 2001 $NO_{12}$ | 16.4 | $X$ | 259.50181 | 336.24745 | 285.37166 | 4.27047 | 0.2450910 | 0.22993652 | 2.6387449 | 21 | 1 6.4 | 20.7 |
| 213273 2001 $NB_{18}$ | 16.2 | $X$ | 243.97350 | 107.00681 | 194.05719 | 28.21013 | 0.3397954 | 0.23164137 | 2.6257818 | 21 | 2 1.1 | 21.6 |
| 213274 2001 $OZ_{34}$ | 16.0 | $X$ | 126.17493 | 240.02377 | 73.78141 | 6.60957 | 0.0468018 | 0.21514450 | 2.7583490 | 21 | — | — |
| 213275 2001 $OK_{40}$ | 16.6 | $X$ | 137.81483 | 266.18987 | 80.82602 | 9.79154 | 0.2628684 | 0.21809144 | 2.7334447 | 21 | 1 15.4 | 20.9 |
| 213276 2001 $OD_{45}$ | 15.7 | $X$ | 201.91100 | 175.90135 | 159.57704 | 12.30348 | 0.1909779 | 0.22740164 | 2.6583184 | 21 | 2 17.1 | 20.1 |
| 213277 2001 $OJ_{77}$ | 16.9 | $X$ | 157.27896 | 100.85925 | 157.26810 | 25.35784 | 0.1892488 | 0.36282678 | 1.9468679 | 21 | — | — |
| 213278 2001 $OG_{90}$ | 16.3 | $X$ | 259.57979 | 169.46957 | 145.11821 | 6.07884 | 0.2349172 | 0.23450055 | 2.6043947 | 21 | 3 10.7 | 20.5 |
| 213279 2001 $ON_{111}$ | 15.8 | $X$ | 243.85379 | 311.54140 | 301.67358 | 14.61159 | 0.2484337 | 0.22393149 | 2.6857109 | 21 | — | — |
| 213280 2001 $PP_{10}$ | 16.2 | $X$ | 211.56098 | 139.25166 | 164.81900 | 8.47446 | 0.1866813 | 0.22583616 | 2.6705890 | 21 | 1 18.9 | 20.7 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213281 2001 $PE_{11}$ | 16.3 | $X$ | 134.15953 | 312.17315 | 42.77997 | 3.72719 | 0.1508802 | 0.22054069 | 2.7131694 | 21 | 1 7.2 | 20.1 |
| 213282 2001 $PA_{25}$ | 16.6 | $X$ | 191.49687 | 151.45332 | 170.59035 | 4.13720 | 0.2110517 | 0.22327610 | 2.6909640 | 21 | 1 25.0 | 21.3 |
| 213283 2001 $PE_{27}$ | 16.0 | $X$ | 126.36273 | 211.32901 | 166.16952 | 7.92661 | 0.3122881 | 0.21839139 | 2.7309414 | 21 | 2 13.5 | 20.3 |
| 213284 2001 $PT_{48}$ | 16.2 | $X$ | 264.52426 | 1.06472 | 238.06264 | 12.75972 | 0.2658422 | 0.22663247 | 2.6643296 | 21 | — | — |
| 213285 2001 $QY_{26}$ | 15.1 | $X$ | 170.19387 | 307.02215 | 352.03401 | 24.99891 | 0.1101460 | 0.21662973 | 2.7457269 | 21 | — | — |
| 213286 2001 $QV_{32}$ | 15.9 | $X$ | 127.79230 | 220.07836 | 159.12255 | 14.76793 | 0.0858483 | 0.22309891 | 2.6923887 | 21 | 1 18.6 | 19.7 |
| 213287 2001 $QQ_{59}$ | 16.7 | $X$ | 170.28389 | 289.54307 | 22.04806 | 3.71608 | 0.2039499 | 0.22036770 | 2.7145890 | 21 | — | — |
| 213288 2001 $QE_{95}$ | 16.1 | $X$ | 186.46543 | 162.50675 | 147.65078 | 13.26532 | 0.1418326 | 0.22276853 | 2.6950500 | 21 | 1 4.3 | 20.5 |
| 213289 2001 $QK_{100}$ | 16.7 | $X$ | 297.24731 | 250.86497 | 21.34163 | 5.06658 | 0.2417442 | 0.23593288 | 2.5938433 | 21 | 2 22.3 | 20.6 |
| 213290 2001 $QE_{113}$ | 15.8 | $X$ | 275.77324 | 87.67787 | 210.30391 | 9.53936 | 0.2629858 | 0.23236225 | 2.6203481 | 21 | 2 26.4 | 20.1 |
| 213291 2001 $QF_{123}$ | 16.2 | $X$ | 110.33341 | 236.90687 | 135.58583 | 10.06648 | 0.2036686 | 0.21742422 | 2.7390341 | 21 | 1 7.6 | 19.8 |
| 213292 2001 $QX_{127}$ | 15.8 | $X$ | 152.41081 | 152.56973 | 181.55910 | 13.44186 | 0.1864708 | 0.21987164 | 2.7186705 | 21 | 1 3.8 | 20.2 |
| 213293 2001 $QY_{154}$ | 16.0 | $X$ | 147.92427 | 138.16002 | 216.30631 | 5.71287 | 0.1097622 | 0.22108448 | 2.7087185 | 21 | 1 14.9 | 20.0 |
| 213294 2001 $QA_{162}$ | 16.1 | $X$ | 180.50467 | 291.70985 | 7.21095 | 4.93106 | 0.0975878 | 0.21957974 | 2.7210793 | 21 | — | — |
| 213295 2001 $QZ_{209}$ | 16.3 | $X$ | 138.21286 | 170.05848 | 180.49673 | 8.10576 | 0.1474636 | 0.21934361 | 2.7230319 | 21 | 1 4.8 | 20.4 |
| 213296 2001 $QV_{213}$ | 16.1 | $X$ | 137.73446 | 176.89146 | 170.05595 | 5.03893 | 0.1211912 | 0.21803558 | 2.7339116 | 21 | — | — |
| 213297 2001 $QS_{249}$ | 15.6 | $X$ | 158.45242 | 297.83420 | 19.81615 | 14.20918 | 0.0758438 | 0.21782069 | 2.7357094 | 21 | — | — |
| 213298 2001 $QG_{273}$ | 16.0 | $X$ | 270.40126 | 22.13950 | 356.24198 | 12.17147 | 0.1676859 | 0.19118441 | 2.9842444 | 21 | 6 17.8 | 20.5 |
| 213299 2001 $QS_{273}$ | 15.7 | $X$ | 152.96264 | 262.57837 | 96.54586 | 9.30967 | 0.1645516 | 0.22221315 | 2.6995386 | 21 | 2 3.4 | 19.9 |
| 213300 2001 $QM_{280}$ | 15.9 | $X$ | 171.45817 | 294.22295 | 57.41486 | 9.41742 | 0.2057213 | 0.22266686 | 2.6958703 | 21 | 2 16.9 | 20.5 |
| 213301 2001 $QS_{294}$ | 16.1 | $X$ | 101.90685 | 133.50698 | 181.40473 | 13.08448 | 0.2037677 | 0.21001453 | 2.8030864 | 21 | — | — |
| 213302 2001 $QL_{328}$ | 15.6 | $X$ | 333.13790 | 199.37458 | 177.44039 | 9.55706 | 0.0862221 | 0.19477782 | 2.9474270 | 21 | 9 28.2 | 19.2 |
| 213303 2001 $QM_{328}$ | 15.2 | $X$ | 182.28288 | 302.87114 | 147.09532 | 6.69559 | 0.1667346 | 0.18152516 | 3.0891915 | 21 | 6 21.5 | 20.4 |
| 213304 2001 $RL_{27}$ | 16.0 | $X$ | 161.11369 | 188.02672 | 154.84647 | 9.44085 | 0.2030335 | 0.22068833 | 2.7119592 | 21 | 1 23.8 | 20.5 |
| 213305 2001 $RD_{50}$ | 15.8 | $X$ | 65.72554 | 162.36595 | 222.29190 | 8.29239 | 0.1549800 | 0.21157129 | 2.7893193 | 21 | — | — |
| 213306 2001 $RR_{59}$ | 16.0 | $X$ | 115.20508 | 319.97932 | 21.43030 | 9.67045 | 0.1635961 | 0.21347580 | 2.7727047 | 21 | — | — |
| 213307 2001 $RB_{65}$ | 15.3 | $X$ | 19.03371 | 145.85254 | 218.50519 | 11.21055 | 0.0118933 | 0.20180187 | 2.8786305 | 21 | 11 13.9 | 19.1 |
| 213308 2001 $RQ_{79}$ | 15.3 | $X$ | 343.60538 | 277.40180 | 122.40356 | 5.77607 | 0.3268915 | 0.19635106 | 2.9316618 | 21 | 11 28.5 | 17.3 |
| 213309 2001 $RV_{80}$ | 16.3 | $X$ | 213.71591 | 267.61290 | 63.39887 | 16.27914 | 0.3726748 | 0.22480713 | 2.6787324 | 21 | 3 1.2 | 21.8 |
| 213310 2001 $RN_{90}$ | 16.2 | $X$ | 174.88450 | 227.79375 | 82.89097 | 5.89700 | 0.1172780 | 0.21806360 | 2.7336774 | 21 | — | — |
| 213311 2001 $RH_{101}$ | 15.8 | $X$ | 173.26568 | 183.07463 | 131.75558 | 7.81070 | 0.1323371 | 0.21967232 | 2.7203148 | 21 | — | — |
| 213312 2001 $RB_{115}$ | 16.4 | $X$ | 107.36428 | 237.39839 | 109.98738 | 1.81164 | 0.0819940 | 0.21346863 | 2.7727667 | 21 | — | — |
| 213313 2001 $RL_{136}$ | 16.2 | $X$ | 155.23169 | 275.59633 | 61.69975 | 5.79196 | 0.1646142 | 0.21822706 | 2.7323121 | 21 | 1 10.2 | 20.4 |
| 213314 2001 $SG_{9}$ | 15.2 | $X$ | 155.00235 | 307.43298 | 47.66185 | 12.65349 | 0.2720423 | 0.21990377 | 2.7184056 | 21 | 2 13.7 | 20.0 |
| 213315 2001 $SL_{16}$ | 16.4 | $X$ | 122.44369 | 209.65829 | 162.25236 | 3.87383 | 0.2050663 | 0.21710644 | 2.7417062 | 21 | 1 21.4 | 20.3 |
| 213316 2001 $SK_{19}$ | 15.7 | $X$ | 28.08122 | 216.28168 | 168.50885 | 11.75556 | 0.0971003 | 0.20599538 | 2.8394293 | 21 | 12 31.9 | 19.7 |
| 213317 2001 $ST_{32}$ | 15.6 | $X$ | 312.60247 | 338.09481 | 11.73395 | 10.68938 | 0.1115941 | 0.19051730 | 2.9912068 | 21 | 7 20.7 | 19.6 |
| 213318 2001 $SN_{40}$ | 15.5 | $X$ | 317.06128 | 275.74472 | 98.34344 | 3.69490 | 0.1697887 | 0.19293127 | 2.9662036 | 21 | 8 21.4 | 18.9 |
| 213319 2001 $ST_{63}$ | 15.8 | $X$ | 112.19101 | 160.65577 | 198.17389 | 9.12893 | 0.1676412 | 0.21240554 | 2.7820109 | 21 | — | — |
| 213320 2001 $SQ_{97}$ | 14.9 | $X$ | 3.15634 | 172.53071 | 350.68305 | 15.68237 | 0.0440410 | 0.17253907 | 3.1955412 | 21 | 2 12.4 | 19.3 |
| 213321 2001 $SG_{119}$ | 15.9 | $X$ | 216.21798 | 60.35146 | 200.50130 | 14.16791 | 0.1357377 | 0.21808208 | 2.7335230 | 21 | — | — |
| 213322 2001 $SN_{121}$ | 15.3 | $X$ | 161.61775 | 42.55212 | 284.42064 | 4.01477 | 0.1438204 | 0.21826299 | 2.7320123 | 21 | 1 1.6 | 19.4 |
| 213323 2001 $SA_{127}$ | 16.4 | $X$ | 236.10233 | 100.02004 | 181.80491 | 10.85328 | 0.2385303 | 0.22507465 | 2.6766094 | 21 | 1 11.6 | 21.3 |
| 213324 2001 $SP_{127}$ | 16.1 | $X$ | 175.24042 | 138.28210 | 183.05432 | 9.25444 | 0.1547802 | 0.21968250 | 2.7202307 | 21 | 1 7.5 | 20.5 |
| 213325 2001 $SV_{132}$ | 16.1 | $X$ | 47.01603 | 197.26148 | 196.73359 | 6.00275 | 0.0449161 | 0.20969987 | 2.8058898 | 21 | — | — |
| 213326 2001 $SC_{138}$ | 16.2 | $X$ | 35.33848 | 8.06948 | 349.78480 | 1.53853 | 0.0803791 | 0.20316745 | 2.8657170 | 21 | 12 5.1 | 19.9 |
| 213327 2001 $SM_{138}$ | 16.0 | $X$ | 17.84384 | 167.95337 | 190.42799 | 10.68454 | 0.1378877 | 0.20091863 | 2.8870607 | 21 | 11 20.5 | 19.6 |
| 213328 2001 $SF_{139}$ | 15.9 | $X$ | 238.78876 | 45.76074 | 356.98658 | 8.36588 | 0.1041782 | 0.18646739 | 3.0343624 | 21 | 6 21.2 | 20.6 |
| 213329 2001 $SE_{140}$ | 16.0 | $X$ | 151.95988 | 123.60438 | 188.15744 | 8.79697 | 0.1478206 | 0.21426097 | 2.7659267 | 21 | — | — |
| 213330 2001 $SX_{141}$ | 16.5 | $X$ | 107.09893 | 141.57166 | 218.23033 | 4.28251 | 0.1063210 | 0.21413957 | 2.7669720 | 21 | — | — |
| 213331 2001 $SG_{146}$ | 15.7 | $X$ | 330.89312 | 208.73913 | 204.97892 | 8.15060 | 0.0685460 | 0.20123240 | 2.8840589 | 21 | 11 13.9 | 19.2 |
| 213332 2001 $SV_{148}$ | 17.0 | $X$ | 317.11474 | 72.27290 | 231.08569 | 4.58303 | 0.2833922 | 0.28834366 | 2.2691460 | 21 | 4 13.0 | 19.6 |
| 213333 2001 $SX_{154}$ | 16.2 | $X$ | 108.43643 | 314.10772 | 5.20275 | 8.53513 | 0.2405680 | 0.20963338 | 2.8064830 | 21 | — | — |
| 213334 2001 $SW_{159}$ | 15.8 | $X$ | 188.70919 | 61.35273 | 349.73456 | 6.08353 | 0.1444995 | 0.18019173 | 3.1044129 | 21 | 5 8.9 | 20.9 |
| 213335 2001 $SJ_{166}$ | 16.5 | $X$ | 138.22060 | 112.33377 | 184.35122 | 2.66313 | 0.1684409 | 0.21211141 | 2.7845821 | 21 | — | — |
| 213336 2001 $SK_{177}$ | 15.4 | $X$ | 132.13750 | 171.40839 | 179.85447 | 10.31395 | 0.1813458 | 0.21479597 | 2.7613320 | 21 | 1 4.1 | 19.6 |
| 213337 2001 $SE_{209}$ | 15.9 | $X$ | 23.11040 | 220.03457 | 144.21239 | 4.33985 | 0.0553740 | 0.20287964 | 2.8684266 | 21 | 11 24.8 | 19.7 |
| 213338 2001 $SH_{214}$ | 16.0 | $X$ | 145.02995 | 125.44388 | 173.11023 | 17.66997 | 0.1611415 | 0.21232804 | 2.7826877 | 21 | — | — |
| 213339 2001 $SG_{216}$ | 16.6 | $X$ | 138.37621 | 312.15990 | 356.25915 | 3.39494 | 0.0892055 | 0.21265660 | 2.7798208 | 21 | — | — |
| 213340 2001 $SU_{219}$ | 17.0 | $X$ | 327.47415 | 226.34065 | 98.38158 | 0.64984 | 0.1619068 | 0.24057079 | 2.5603978 | 21 | 6 30.9 | 19.5 |
| 213341 2001 $SR_{245}$ | 15.6 | $X$ | 317.97755 | 340.81658 | 27.79603 | 12.57687 | 0.1431691 | 0.19166427 | 2.9792614 | 21 | 8 23.9 | 19.4 |
| 213342 2001 $SB_{251}$ | 15.9 | $X$ | 6.82882 | 243.79885 | 105.86780 | 3.19391 | 0.0812989 | 0.19616269 | 2.9335384 | 21 | 10 16.1 | 19.5 |
| 213343 2001 $SS_{274}$ | 16.8 | $X$ | 117.71748 | 302.59532 | 17.39534 | 2.24883 | 0.0554694 | 0.20919649 | 2.8103891 | 21 | — | — |
| 213344 2001 $ST_{302}$ | 16.7 | $X$ | 163.71102 | 347.02631 | 309.87522 | 2.70507 | 0.0769509 | 0.21496645 | 2.7598720 | 21 | — | — |
| 213345 2001 $SW_{302}$ | 16.5 | $X$ | 146.70716 | 351.56167 | 301.90096 | 3.44046 | 0.0439732 | 0.21161864 | 2.7889032 | 21 | — | — |
| 213346 2001 $SG_{303}$ | 15.7 | $X$ | 176.20780 | 92.20870 | 354.96972 | 9.93431 | 0.0933315 | 0.18359910 | 3.0658837 | 21 | 6 10.3 | 20.6 |
| 213347 2001 $SD_{304}$ | 12.8 | $X$ | 318.16948 | 84.71571 | 207.92863 | 10.96933 | 0.0471152 | 0.08416196 | 5.1569411 | 21 | 5 25.4 | 19.6 |
| 213348 2001 $SC_{308}$ | 16.3 | $X$ | 173.78281 | 119.23029 | 172.59026 | 7.75799 | 0.2143128 | 0.21635078 | 2.7480866 | 21 | — | — |
| 213349 2001 $SD_{327}$ | 16.3 | $X$ | 84.62607 | 151.58889 | 207.85435 | 10.16708 | 0.1395952 | 0.21039825 | 2.7996773 | 21 | — | — |
| 213350 2001 $SO_{327}$ | 16.2 | $X$ | 48.57373 | 259.07265 | 73.57841 | 3.08993 | 0.0724950 | 0.20298845 | 2.8674015 | 21 | 11 20.1 | 20.1 |
| 213351 2001 $SC_{333}$ | 13.5 | $X$ | 293.52798 | 119.09612 | 191.81152 | 12.93841 | 0.0819811 | 0.08293849 | 5.2075324 | 21 | 5 13.2 | 20.4 |
| 213352 2001 $SJ_{341}$ | 16.3 | $X$ | 95.07942 | 118.30778 | 172.46779 | 6.10834 | 0.0457605 | 0.20402542 | 2.8576773 | 21 | 11 22.2 | 20.4 |
| 213353 2001 $TJ_{2}$ | 16.1 | $X$ | 247.46816 | 212.58385 | 196.29307 | 4.80925 | 0.1592878 | 0.18808494 | 3.0169402 | 21 | 7 1.9 | 20.8 |
| 213354 2001 $TJ_{12}$ | 15.6 | $X$ | 175.33576 | 279.29249 | 25.02463 | 12.64195 | 0.1783322 | 0.21481696 | 2.7611522 | 21 | — | — |
| 213355 2001 $TE_{15}$ | 16.0 | $X$ | 169.15470 | 186.75710 | 156.37979 | 10.50484 | 0.2573973 | 0.21934822 | 2.7229937 | 21 | 2 3.6 | 20.8 |
| 213356 2001 $TV_{52}$ | 17.0 | $X$ | 321.41742 | 211.11110 | 133.13835 | 0.82373 | 0.1368016 | 0.24087664 | 2.5582300 | 21 | 7 22.5 | 19.7 |
| 213357 2001 $TE_{61}$ | 15.9 | $X$ | 102.33897 | 314.58704 | 53.52642 | 8.70048 | 0.2355653 | 0.21191417 | 2.7863097 | 21 | — | — |
| 213358 2001 $TO_{73}$ | 15.7 | $X$ | 278.25711 | 355.81371 | 46.29856 | 10.02301 | 0.1187020 | 0.18889445 | 3.0083146 | 21 | 8 9.3 | 20.0 |
| 213359 2001 $TD_{98}$ | 16.1 | $X$ | 176.27572 | 300.99337 | 19.71929 | 6.89544 | 0.2473218 | 0.21782957 | 2.7356351 | 21 | 1 16.4 | 20.8 |
| 213360 2001 $TO_{108}$ | 12.6 | $X$ | 279.55642 | 114.14969 | 217.91549 | 23.07415 | 0.0779772 | 0.08344762 | 5.1863293 | 21 | 5 20.2 | 19.5 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213361 2001 $TE_{118}$ | 15.5 | $X$ | 244.21858 | 19.46453 | 264.84178 | 15.73553 | 0.2952428 | 0.22538027 | 2.6741892 | 21 | 1 16.8 | 20.5 |
| 213362 2001 $TX_{132}$ | 15.7 | $X$ | 152.99871 | 310.09067 | 326.30877 | 7.06134 | 0.2011930 | 0.21068412 | 2.7971441 | 21 | — | — |
| 213363 2001 $TC_{139}$ | 15.8 | $X$ | 230.09135 | 281.07516 | 12.41998 | 16.19359 | 0.2215835 | 0.22553464 | 2.6729687 | 21 | 1 27.9 | 20.7 |
| 213364 2001 $TF_{142}$ | 15.6 | $X$ | 152.45718 | 69.97300 | 32.66512 | 17.09599 | 0.2381952 | 0.17929686 | 3.1147337 | 21 | 6 10.9 | 21.1 |
| 213365 2001 $TV_{148}$ | 16.7 | $X$ | 152.74589 | 180.01571 | 140.03688 | 7.06591 | 0.3152397 | 0.21614969 | 2.7497907 | 21 | — | — |
| 213366 2001 $TS_{156}$ | 16.3 | $X$ | 273.14519 | 333.78101 | 128.36059 | 0.61559 | 0.0663615 | 0.19800702 | 2.9152938 | 21 | 10 23.8 | 20.0 |
| 213367 2001 $TS_{173}$ | 16.3 | $X$ | 131.56776 | 145.28055 | 179.24562 | 5.39564 | 0.0510886 | 0.21049375 | 2.7988304 | 21 | — | — |
| 213368 2001 $TV_{179}$ | 16.2 | $X$ | 232.55155 | 70.09471 | 219.91730 | 11.27740 | 0.2427562 | 0.22254182 | 2.6968800 | 21 | 1 17.2 | 21.1 |
| 213369 2001 $TY_{180}$ | 15.5 | $X$ | 289.86789 | 353.84560 | 8.32915 | 7.35584 | 0.0420708 | 0.18665684 | 3.0323089 | 21 | 7 12.5 | 19.8 |
| 213370 2001 $TC_{206}$ | 15.3 | $X$ | 223.56820 | 259.50687 | 173.41220 | 19.52771 | 0.1177012 | 0.18556190 | 3.0442256 | 21 | 7 10.2 | 20.4 |
| 213371 2001 $TY_{210}$ | 15.6 | $X$ | 190.26319 | 2.46485 | 292.52281 | 8.08963 | 0.1547358 | 0.21851640 | 2.7298997 | 21 | — | — |
| 213372 2001 $TW_{226}$ | 15.8 | $X$ | 239.11366 | 217.26573 | 209.14003 | 9.77744 | 0.1399544 | 0.18530162 | 3.0470757 | 21 | 7 15.5 | 20.6 |
| 213373 2001 $TN_{230}$ | 16.4 | $X$ | 203.16467 | 211.74821 | 211.00346 | 1.14384 | 0.1651114 | 0.18269674 | 3.0759706 | 21 | 6 6.8 | 21.3 |
| 213374 2001 $TA_{246}$ | 16.4 | $X$ | 333.16987 | 225.49605 | 191.52447 | 5.81681 | 0.0520986 | 0.20241231 | 2.8728400 | 21 | 11 21.9 | 20.2 |
| 213375 2001 $TC_{246}$ | 16.4 | $X$ | 74.48964 | 346.58615 | 28.31769 | 1.74295 | 0.0761695 | 0.21098438 | 2.7944897 | 21 | — | — |
| 213376 2001 $UA_{24}$ | 15.4 | $X$ | 218.35243 | 34.71116 | 4.84585 | 17.00565 | 0.2234747 | 0.18141641 | 3.0904259 | 21 | 5 14.8 | 21.0 |
| 213377 2001 $UL_{27}$ | 15.9 | $X$ | 107.92020 | 278.78803 | 67.64184 | 4.30112 | 0.1022530 | 0.21125691 | 2.7920859 | 21 | — | — |
| 213378 2001 $UG_{29}$ | 15.6 | $X$ | 347.80072 | 201.13221 | 176.28708 | 12.12776 | 0.0692506 | 0.19699056 | 2.9253136 | 21 | 10 23.8 | 19.3 |
| 213379 2001 $UU_{42}$ | 15.8 | $X$ | 110.64467 | 293.73233 | 35.24075 | 13.75572 | 0.1333941 | 0.20908604 | 2.8113787 | 21 | — | — |
| 213380 2001 $UB_{43}$ | 16.1 | $X$ | 304.24649 | 339.99663 | 60.12397 | 4.22032 | 0.1005720 | 0.19296483 | 2.9658598 | 21 | 9 14.3 | 19.8 |
| 213381 2001 $UB_{45}$ | 15.6 | $X$ | 151.17592 | 49.07439 | 50.68798 | 11.86099 | 0.2875619 | 0.17610528 | 3.1522535 | 21 | 6 10.2 | 21.2 |
| 213382 2001 $UW_{50}$ | 15.0 | $X$ | 278.89053 | 198.76091 | 199.18082 | 16.30947 | 0.1686414 | 0.18717725 | 3.0266858 | 21 | 7 20.3 | 19.6 |
| 213383 2001 $UP_{62}$ | 16.5 | $X$ | 168.88513 | 300.29759 | 13.56909 | 1.60333 | 0.2462915 | 0.21598555 | 2.7511837 | 21 | 1 1.6 | 21.1 |
| 213384 2001 $UF_{72}$ | 15.8 | $X$ | 207.47423 | 204.76695 | 106.44776 | 14.18079 | 0.2824380 | 0.22170441 | 2.7036668 | 21 | 1 27.5 | 20.7 |
| 213385 2001 $US_{81}$ | 15.5 | $X$ | 173.47530 | 74.35084 | 41.52946 | 17.27205 | 0.1432993 | 0.18196001 | 3.0842678 | 21 | 7 17.6 | 20.8 |
| 213386 2001 $UV_{96}$ | 15.9 | $X$ | 144.43971 | 359.06502 | 68.15979 | 2.18997 | 0.2012356 | 0.17354448 | 3.1831872 | 21 | 4 24.5 | 21.1 |
| 213387 2001 $UG_{115}$ | 15.8 | $X$ | 248.77820 | 238.75640 | 202.74047 | 9.52625 | 0.0711866 | 0.18883003 | 3.0089988 | 21 | 8 22.4 | 20.3 |
| 213388 2001 $UO_{130}$ | 16.1 | $X$ | 156.67189 | 201.03017 | 101.87945 | 3.91455 | 0.1716576 | 0.21222713 | 2.7835698 | 21 | — | — |
| 213389 2001 $UY_{136}$ | 16.1 | $X$ | 146.05160 | 337.06447 | 57.43849 | 1.81897 | 0.1497132 | 0.17123018 | 3.2118050 | 21 | 3 14.9 | 21.1 |
| 213390 2001 $UF_{144}$ | 15.9 | $X$ | 238.56240 | 202.94418 | 193.36577 | 6.18697 | 0.1456660 | 0.18293745 | 3.0732717 | 21 | 6 9.4 | 20.7 |
| 213391 2001 $UF_{160}$ | 17.0 | $X$ | 78.16849 | 7.19908 | 96.32419 | 1.92080 | 0.1728709 | 0.26651777 | 2.3913984 | 21 | 3 7.9 | 19.2 |
| 213392 2001 $UY_{161}$ | 15.4 | $X$ | 261.01186 | 334.01208 | 73.50456 | 11.59339 | 0.1752906 | 0.18512594 | 3.0490031 | 21 | 7 14.3 | 20.0 |
| 213393 2001 $UR_{172}$ | 16.3 | $X$ | 4.21943 | 294.76865 | 48.79115 | 8.95453 | 0.0979391 | 0.19475912 | 2.9476156 | 21 | 10 6.9 | 19.9 |
| 213394 2001 $US_{187}$ | 13.0 | $X$ | 259.79936 | 158.05565 | 183.10172 | 8.55509 | 0.0511282 | 0.08250307 | 5.2258382 | 21 | 5 13.2 | 20.0 |
| 213395 2001 $UN_{190}$ | 16.7 | $X$ | 139.32299 | 76.99598 | 220.52992 | 5.38485 | 0.0993088 | 0.21023089 | 2.8011629 | 21 | — | — |
| 213396 2001 $UA_{198}$ | 15.8 | $X$ | 311.10025 | 308.94311 | 74.19392 | 8.92745 | 0.1599895 | 0.19310284 | 2.9644465 | 21 | 8 27.9 | 19.4 |
| 213397 2001 $US_{203}$ | 15.6 | $X$ | 297.10428 | 348.16327 | 24.12872 | 11.89692 | 0.0364146 | 0.18815943 | 3.0161439 | 21 | 8 9.1 | 19.9 |
| 213398 2001 $UK_{219}$ | 15.6 | $X$ | 9.04052 | 254.98478 | 138.70510 | 14.83388 | 0.1324372 | 0.19934022 | 2.9022808 | 21 | 12 21.1 | 19.4 |
| 213399 2001 $UJ_{228}$ | 15.7 | $X$ | 131.10762 | 138.05593 | 210.07765 | 15.93464 | 0.2348537 | 0.21222313 | 2.7836048 | 21 | 1 4.6 | 20.2 |
| 213400 2001 $VC_{3}$ | 16.2 | $X$ | 262.44574 | 5.99749 | 35.54645 | 10.14067 | 0.0697976 | 0.18629590 | 3.0362243 | 21 | 7 25.1 | 20.6 |
| 213401 2001 $VS_{56}$ | 15.7 | $X$ | 118.70479 | 335.75840 | 355.16208 | 7.84195 | 0.2237794 | 0.20989508 | 2.8041498 | 21 | — | — |
| 213402 2001 $VH_{111}$ | 15.5 | $X$ | 206.38983 | 2.91139 | 49.69062 | 11.62291 | 0.1388527 | 0.17844900 | 3.1245919 | 21 | 5 28.1 | 20.5 |
| 213403 2001 $WT$ | 16.0 | $X$ | 101.78231 | 233.19177 | 279.60467 | 0.07424 | 0.1246217 | 0.17543526 | 3.1602744 | 21 | 6 16.2 | 20.4 |
| 213404 2001 $WH_{3}$ | 15.1 | $X$ | 140.17998 | 270.41769 | 221.67691 | 20.10004 | 0.2391658 | 0.17844192 | 3.1246746 | 21 | 7 5.3 | 20.7 |
| 213405 2001 $WM_{8}$ | 15.6 | $X$ | 89.37024 | 272.85790 | 81.85347 | 10.14577 | 0.1485044 | 0.20620132 | 2.8375385 | 21 | — | — |
| 213406 2001 $WB_{17}$ | 16.2 | $X$ | 160.04532 | 333.59921 | 353.23162 | 2.00155 | 0.2111949 | 0.21568345 | 2.7537521 | 21 | 1 6.7 | 20.5 |
| 213407 2001 $WQ_{23}$ | 16.4 | $X$ | 252.43292 | 3.07322 | 38.26647 | 1.20566 | 0.0977491 | 0.18389901 | 3.0625496 | 21 | 7 5.9 | 20.7 |
| 213408 2001 $WJ_{26}$ | 15.3 | $X$ | 139.61178 | 48.78374 | 59.94206 | 25.07644 | 0.3379088 | 0.17386728 | 3.1792461 | 21 | 6 13.2 | 21.2 |
| 213409 2001 $WW_{29}$ | 15.4 | $X$ | 147.62723 | 262.98891 | 84.23504 | 13.19167 | 0.2589550 | 0.21387470 | 2.7692560 | 21 | 1 25.4 | 20.0 |
| 213410 2001 $WN_{53}$ | 16.0 | $X$ | 215.12941 | 63.38550 | 226.91355 | 11.69258 | 0.2255965 | 0.21814141 | 2.7330273 | 21 | 1 6.3 | 20.9 |
| 213411 2001 $WB_{58}$ | 16.1 | $X$ | 206.23805 | 45.52204 | 39.24709 | 2.85753 | 0.0612149 | 0.18414896 | 3.0597777 | 21 | 7 12.0 | 20.7 |
| 213412 2001 $WG_{68}$ | 16.3 | $X$ | 297.24648 | 155.67326 | 226.20543 | 2.50988 | 0.0962401 | 0.18871701 | 3.0102000 | 21 | 8 7.5 | 20.2 |
| 213413 2001 $WR_{75}$ | 15.4 | $X$ | 353.19416 | 250.36299 | 68.94397 | 4.86045 | 0.1088654 | 0.18838717 | 3.0137127 | 21 | 8 14.8 | 19.0 |
| 213414 2001 $WU_{81}$ | 15.5 | $X$ | 99.97290 | 8.14158 | 234.63498 | 7.86639 | 0.0523623 | 0.18918139 | 3.0052720 | 21 | 9 24.1 | 19.9 |
| 213415 2001 $WJ_{87}$ | 16.0 | $X$ | 140.51965 | 294.84252 | 31.84221 | 8.13960 | 0.2249095 | 0.21214185 | 2.7843157 | 21 | — | — |
| 213416 2001 $XL_{10}$ | 15.7 | $X$ | 269.35844 | 351.10335 | 22.57691 | 5.24246 | 0.1824111 | 0.18249637 | 3.0782217 | 21 | 6 8.6 | 20.3 |
| 213417 2001 $XZ_{30}$ | 15.3 | $X$ | 208.66520 | 225.82964 | 181.40455 | 14.19331 | 0.1742989 | 0.17812379 | 3.1283939 | 21 | 5 25.5 | 20.7 |
| 213418 2001 $XS_{32}$ | 15.3 | $X$ | 81.81452 | 306.00593 | 223.75853 | 14.49688 | 0.1443503 | 0.17607690 | 3.1525922 | 21 | 6 15.4 | 19.8 |
| 213419 2001 $XK_{38}$ | 15.3 | $X$ | 329.23919 | 316.22812 | 35.40532 | 12.54692 | 0.1916512 | 0.18795112 | 3.0183720 | 21 | 8 15.1 | 18.8 |
| 213420 2001 $XJ_{39}$ | 15.2 | $X$ | 334.97007 | 349.38147 | 35.68255 | 12.43334 | 0.1410654 | 0.19140439 | 2.9819575 | 21 | 10 12.5 | 18.6 |
| 213421 2001 $XO_{55}$ | 17.5 | $X$ | 45.64332 | 223.71193 | 182.28284 | 1.58452 | 0.1475578 | 0.30535080 | 2.1840874 | 21 | — | — |
| 213422 2001 $XR_{71}$ | 15.1 | $X$ | 180.34336 | 24.24233 | 72.32693 | 17.67422 | 0.0894684 | 0.18026349 | 3.1035890 | 21 | 6 26.5 | 19.9 |
| 213423 2001 $XL_{88}$ | 17.5 | $X$ | 216.45465 | 241.73306 | 102.65832 | 2.64755 | 0.1470844 | 0.31832119 | 2.1243481 | 21 | 3 3.9 | 20.6 |
| 213424 2001 $XS_{88}$ | 15.4 | $X$ | 211.61211 | 203.65550 | 209.52929 | 4.73325 | 0.1855756 | 0.17869907 | 3.1216762 | 21 | 6 2.3 | 20.6 |
| 213425 2001 $XS_{94}$ | 16.6 | $X$ | 187.88616 | 111.42391 | 57.96578 | 6.43292 | 0.1158415 | 0.29025529 | 2.2591720 | 21 | 10 14.8 | 19.7 |
| 213426 2001 $XN_{126}$ | 15.7 | $X$ | 274.64505 | 331.90871 | 75.37100 | 10.44596 | 0.1037874 | 0.18659662 | 3.0329613 | 21 | 8 12.8 | 20.0 |
| 213427 2001 $XS_{137}$ | 16.1 | $X$ | 177.71545 | 262.98042 | 138.62648 | 2.34149 | 0.1861319 | 0.17286546 | 3.1915175 | 21 | 4 22.1 | 21.4 |
| 213428 2001 $XV_{182}$ | 17.0 | $X$ | 322.48961 | 210.23557 | 272.96022 | 5.44562 | 0.0902404 | 0.29982827 | 2.2108248 | 21 | — | — |
| 213429 2001 $XQ_{200}$ | 15.4 | $X$ | 144.60236 | 266.29939 | 60.09228 | 9.04261 | 0.2084991 | 0.21003489 | 2.8029053 | 21 | — | — |
| 213430 2001 $XP_{201}$ | 16.7 | $X$ | 112.98335 | 47.62211 | 118.04050 | 3.38930 | 0.1017658 | 0.27365929 | 2.3496107 | 21 | 7 13.3 | 19.8 |
| 213431 2001 $XX_{224}$ | 16.9 | $X$ | 162.21337 | 64.94915 | 295.84439 | 4.00095 | 0.0162537 | 0.31522126 | 2.1382528 | 21 | 1 9.6 | 19.1 |
| 213432 2001 $XL_{240}$ | 16.4 | $X$ | 287.46003 | 240.22062 | 37.10138 | 2.68074 | 0.0626593 | 0.31725085 | 2.1291235 | 21 | 2 27.6 | 18.7 |
| 213433 2001 $XM_{258}$ | 15.4 | $X$ | 255.88376 | 209.93846 | 194.94546 | 8.71955 | 0.0694382 | 0.18394269 | 3.0620647 | 21 | 7 16.5 | 19.9 |
| 213434 2001 $XX_{258}$ | 15.4 | $X$ | 231.59054 | 203.31672 | 190.65207 | 9.11412 | 0.0592777 | 0.17976952 | 3.1092717 | 21 | 6 7.3 | 20.1 |
| 213435 2001 $YJ_{6}$ | 15.2 | $X$ | 100.03448 | 120.38698 | 64.76103 | 13.58590 | 0.0983392 | 0.18022556 | 3.1040244 | 21 | 7 23.8 | 19.9 |
| 213436 2001 $YN_{6}$ | 15.5 | $X$ | 219.35346 | 260.98618 | 184.21008 | 10.61174 | 0.0754459 | 0.18287012 | 3.0740261 | 21 | 7 23.8 | 20.3 |
| 213437 2001 $YU_{12}$ | 16.9 | $X$ | 27.02745 | 248.50444 | 69.50243 | 2.93768 | 0.1046903 | 0.29163632 | 2.2520341 | 21 | 10 22.0 | 19.3 |
| 213438 2001 $YV_{16}$ | 15.2 | $X$ | 299.85675 | 181.50514 | 284.08535 | 11.38532 | 0.1121855 | 0.19578850 | 2.9372749 | 21 | 11 28.1 | 18.9 |
| 213439 2001 $YF_{25}$ | 16.0 | $X$ | 305.83746 | 17.91813 | 10.17490 | 2.43993 | 0.1043415 | 0.18832271 | 3.0144002 | 21 | 8 29.2 | 19.8 |
| 213440 2001 $YE_{121}$ | 15.3 | $X$ | 227.15732 | 28.52610 | 60.02966 | 16.77202 | 0.0581646 | 0.18363966 | 3.0654323 | 21 | 8 16.7 | 20.1 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213441 2002 $AU_{6}$ | 15.5 | $X$ | 316.84089 | 171.49941 | 216.81640 | 11.52445 | 0.1273056 | 0.18969924 | 2.9998002 | 21 | 9 8.8 | 19.3 |
| 213442 2002 $AD_{23}$ | 17.4 | $X$ | 328.22503 | 335.93271 | 151.88825 | 4.87503 | 0.0985787 | 0.30117418 | 2.2042333 | 21 | — | — |
| 213443 2002 $AD_{24}$ | 16.7 | $X$ | 46.19864 | 320.19914 | 148.96971 | 4.37412 | 0.0648280 | 0.30883061 | 2.1676500 | 21 | — | — |
| 213444 2002 $AA_{44}$ | 15.0 | $X$ | 10.22776 | 6.90100 | 288.16126 | 9.65915 | 0.0821062 | 0.17933468 | 3.1142958 | 21 | 8 4.5 | 18.9 |
| 213445 2002 $AE_{51}$ | 15.4 | $X$ | 250.42163 | 292.45632 | 126.02006 | 15.13587 | 0.1625605 | 0.17990552 | 3.1077045 | 21 | 7 17.0 | 20.0 |
| 213446 2002 $AV_{66}$ | 16.8 | $X$ | 273.34258 | 322.25047 | 270.88736 | 2.71481 | 0.0772535 | 0.30677508 | 2.1773220 | 21 | — | — |
| 213447 2002 $AK_{144}$ | 17.3 | $X$ | 62.69044 | 215.07721 | 267.20996 | 0.55036 | 0.0445727 | 0.31343345 | 2.1463761 | 21 | 2 9.7 | 19.3 |
| 213448 2002 $AA_{155}$ | 16.2 | $X$ | 261.10156 | 68.98793 | 127.33665 | 7.36937 | 0.0711676 | 0.29686280 | 2.2255236 | 21 | — | — |
| 213449 2002 $AD_{176}$ | 16.9 | $X$ | 288.63413 | 99.05946 | 112.90365 | 6.92584 | 0.0768197 | 0.30458909 | 2.1877271 | 21 | — | — |
| 213450 2002 $CZ_{11}$ | 16.5 | $X$ | 214.67358 | 250.16099 | 14.43251 | 4.61589 | 0.0134336 | 0.30317590 | 2.1945203 | 21 | — | — |
| 213451 2002 $CJ_{18}$ | 16.4 | $X$ | 341.91842 | 83.21642 | 71.05305 | 8.12570 | 0.0171096 | 0.30408588 | 2.1901400 | 21 | — | — |
| 213452 2002 $CP_{33}$ | 17.1 | $X$ | 12.91728 | 70.57373 | 28.85655 | 7.51710 | 0.1029780 | 0.30193552 | 2.2005264 | 21 | — | — |
| 213453 2002 $CH_{37}$ | 17.1 | $X$ | 297.48482 | 6.66739 | 139.51083 | 3.94680 | 0.0256180 | 0.29634422 | 2.2281191 | 21 | — | — |
| 213454 2002 $CK_{48}$ | 17.3 | $X$ | 46.35748 | 341.20513 | 76.30551 | 3.51032 | 0.1098264 | 0.30223101 | 2.1990919 | 21 | — | — |
| 213455 2002 $CP_{54}$ | 17.1 | $X$ | 335.41496 | 317.97228 | 180.27323 | 5.53517 | 0.0865535 | 0.30023346 | 2.2088352 | 21 | — | — |
| 213456 2002 $CP_{119}$ | 17.3 | $X$ | 305.19265 | 341.42505 | 203.27170 | 2.65776 | 0.1011136 | 0.30342788 | 2.1933052 | 21 | — | — |
| 213457 2002 $CF_{152}$ | 17.5 | $X$ | 255.22006 | 151.44879 | 17.96031 | 3.55132 | 0.1130111 | 0.29134730 | 2.2535233 | 21 | — | — |
| 213458 2002 $CB_{170}$ | 17.4 | $X$ | 259.78302 | 38.19818 | 97.00566 | 4.16599 | 0.1576231 | 0.28894342 | 2.2660049 | 21 | 11 21.2 | 19.8 |
| 213459 2002 $CX_{172}$ | 15.4 | $X$ | 214.10026 | 306.81771 | 122.93713 | 16.35982 | 0.2380024 | 0.17479970 | 3.1679301 | 21 | 6 22.8 | 21.0 |
| 213460 2002 $CE_{184}$ | 17.6 | $X$ | 265.25400 | 203.33690 | 324.10623 | 1.89442 | 0.0988284 | 0.29490311 | 2.2353720 | 21 | — | — |
| 213461 2002 $CM_{197}$ | 17.4 | $X$ | 188.34369 | 152.86059 | 123.76576 | 3.50437 | 0.0946491 | 0.29835701 | 2.2180869 | 21 | — | — |
| 213462 2002 $CQ_{198}$ | 15.5 | $X$ | 141.74149 | 272.73666 | 118.80218 | 6.38944 | 0.0317044 | 0.15694938 | 3.4037918 | 21 | 2 26.1 | 20.4 |
| 213463 2002 $CF_{232}$ | 16.7 | $X$ | 190.57977 | 144.77355 | 117.85061 | 7.50071 | 0.1032009 | 0.29458147 | 2.2369989 | 21 | — | — |
| 213464 2002 $CM_{233}$ | 15.3 | $X$ | 227.86884 | 116.78578 | 304.93607 | 8.25813 | 0.0755398 | 0.17442699 | 3.1724413 | 21 | 7 6.5 | 19.9 |
| 213465 2002 $CL_{234}$ | 15.1 | $X$ | 12.56377 | 108.40771 | 129.92036 | 19.50953 | 0.0871844 | 0.16819896 | 3.2502780 | 21 | 6 1.1 | 19.6 |
| 213466 2002 $CE_{236}$ | 18.2 | $X$ | 254.85201 | 46.14561 | 92.79805 | 1.71509 | 0.1419514 | 0.28944207 | 2.2634016 | 21 | 11 20.9 | 20.7 |
| 213467 2002 $CX_{311}$ | 16.7 | $X$ | 335.50736 | 348.28030 | 103.49707 | 4.32117 | 0.1105092 | 0.29415286 | 2.2391714 | 21 | — | — |
| 213468 2002 $EU_{8}$ | 16.5 | $X$ | 246.89083 | 60.82769 | 82.22993 | 5.37777 | 0.1990322 | 0.28769025 | 2.2725806 | 21 | 11 6.6 | 19.1 |
| 213469 2002 $EX_{60}$ | 16.7 | $X$ | 151.68510 | 341.81860 | 315.09334 | 4.68315 | 0.1720757 | 0.29247856 | 2.2477087 | 21 | — | — |
| 213470 2002 $ED_{85}$ | 16.8 | $X$ | 198.23415 | 125.54574 | 145.19945 | 1.29320 | 0.1841468 | 0.29356696 | 2.2421496 | 21 | — | — |
| 213471 2002 $ES_{90}$ | 16.9 | $X$ | 179.08120 | 186.84573 | 114.16212 | 1.79844 | 0.0264812 | 0.29820665 | 2.2188324 | 21 | — | — |
| 213472 2002 $EJ_{95}$ | 17.5 | $X$ | 285.62629 | 299.57701 | 155.01568 | 5.80607 | 0.1912875 | 0.28780080 | 2.2719985 | 21 | 11 1.9 | 19.5 |
| 213473 2002 $EJ_{99}$ | 16.9 | $X$ | 255.25081 | 65.06206 | 147.01373 | 7.59039 | 0.0630776 | 0.29652921 | 2.2271924 | 21 | — | — |
| 213474 2002 $EU_{115}$ | 17.0 | $X$ | 259.63337 | 26.13595 | 98.01119 | 6.26606 | 0.1014503 | 0.28539386 | 2.2847550 | 21 | 11 14.6 | 19.5 |
| 213475 2002 $EN_{120}$ | 17.3 | $X$ | 161.62090 | 139.52027 | 168.51140 | 4.21973 | 0.1245941 | 0.29720926 | 2.2237937 | 21 | — | — |
| 213476 2002 $EZ_{131}$ | 17.3 | $X$ | 242.45169 | 271.12603 | 161.99191 | 3.92766 | 0.1804565 | 0.27772298 | 2.3266345 | 21 | 7 26.7 | 20.5 |
| 213477 2002 $EE_{134}$ | 17.8 | $X$ | 264.30862 | 177.25326 | 337.08363 | 2.58470 | 0.0762474 | 0.29086953 | 2.2559903 | 21 | — | — |
| 213478 2002 $EQ_{135}$ | 17.1 | $X$ | 285.85997 | 56.61192 | 88.11322 | 2.01233 | 0.1180492 | 0.29219124 | 2.2491819 | 21 | — | — |
| 213479 2002 $EY_{135}$ | 16.8 | $X$ | 151.39897 | 300.62716 | 13.61883 | 3.64550 | 0.1927201 | 0.29495555 | 2.2351071 | 21 | — | — |
| 213480 2002 $EV_{148}$ | 16.5 | $X$ | 149.58886 | 148.22845 | 175.32192 | 7.96528 | 0.2465822 | 0.29432685 | 2.2382888 | 21 | — | — |
| 213481 2002 $EE_{162}$ | 16.8 | $X$ | 303.81546 | 318.75149 | 127.56468 | 6.50815 | 0.0545149 | 0.28685051 | 2.2770137 | 21 | 12 5.9 | 19.2 |
| 213482 2002 $FY_{4}$ | 16.1 | $X$ | 166.41925 | 254.83755 | 13.93429 | 24.15138 | 0.1493270 | 0.29025607 | 2.2591679 | 21 | — | — |
| 213483 2002 $FY_{7}$ | 17.0 | $X$ | 186.60058 | 201.06914 | 23.78642 | 4.14594 | 0.0837345 | 0.28774818 | 2.2722755 | 21 | 12 25.9 | 20.0 |
| 213484 2002 $FR_{12}$ | 16.9 | $X$ | 159.97064 | 263.11391 | 15.40359 | 6.61909 | 0.1723784 | 0.28950717 | 2.2630622 | 21 | — | — |
| 213485 2002 $FD_{15}$ | 16.3 | $X$ | 300.96206 | 89.96945 | 44.65254 | 8.76681 | 0.1080371 | 0.29462710 | 2.2367679 | 21 | — | — |
| 213486 2002 $FX_{15}$ | 16.2 | $X$ | 84.99585 | 222.38830 | 72.66402 | 7.64299 | 0.2133295 | 0.28055064 | 2.3109748 | 21 | 12 12.9 | 19.6 |
| 213487 2002 $FP_{31}$ | 17.1 | $X$ | 207.10818 | 146.89840 | 32.30913 | 6.10586 | 0.1098156 | 0.28529696 | 2.2852723 | 21 | 11 15.4 | 20.1 |
| 213488 2002 $FX_{38}$ | 16.6 | $X$ | 185.04314 | 229.62316 | 14.76536 | 23.66941 | 0.1780268 | 0.29125359 | 2.2540066 | 21 | — | — |
| 213489 2002 $GC_{6}$ | 16.9 | $X$ | 242.27198 | 122.99560 | 44.24987 | 8.31920 | 0.0456352 | 0.28638156 | 2.2794987 | 21 | 12 26.3 | 19.6 |
| 213490 2002 $GO_{13}$ | 16.8 | $X$ | 247.86288 | 76.78002 | 38.93945 | 3.97595 | 0.0562767 | 0.27956289 | 2.3164150 | 21 | 10 21.2 | 19.6 |
| 213491 2002 $GO_{15}$ | 12.5 | $X$ | 286.30218 | 270.22801 | 180.38190 | 4.40839 | 0.0780992 | 0.07979825 | 5.3432703 | 21 | 10 10.0 | 19.4 |
| 213492 2002 $GX_{26}$ | 16.3 | $X$ | 177.62731 | 229.25988 | 41.87891 | 7.69991 | 0.1797775 | 0.28896981 | 2.2658669 | 21 | — | — |
| 213493 2002 $GH_{36}$ | 17.1 | $X$ | 67.33360 | 255.07727 | 15.16013 | 7.20043 | 0.1717242 | 0.27432238 | 2.3458229 | 21 | 10 18.1 | 20.2 |
| 213494 2002 $GM_{37}$ | 17.1 | $X$ | 128.95842 | 68.30380 | 217.03678 | 1.91958 | 0.1596403 | 0.28554113 | 2.2839693 | 21 | — | — |
| 213495 2002 $GS_{37}$ | 17.5 | $X$ | 158.70141 | 89.73654 | 198.92331 | 2.68325 | 0.1642602 | 0.28996235 | 2.2606933 | 21 | — | — |
| 213496 2002 $GM_{45}$ | 17.4 | $X$ | 181.70016 | 0.59371 | 224.15585 | 3.11760 | 0.1169093 | 0.28488453 | 2.2874774 | 21 | 12 16.2 | 20.5 |
| 213497 2002 $GZ_{46}$ | 17.3 | $X$ | 207.79440 | 355.55346 | 173.90278 | 2.45421 | 0.1033613 | 0.28273909 | 2.2990344 | 21 | 11 5.3 | 20.2 |
| 213498 2002 $GB_{49}$ | 17.1 | $X$ | 212.86240 | 99.73184 | 16.10852 | 6.12967 | 0.1717343 | 0.27655261 | 2.3331942 | 21 | 8 25.6 | 20.6 |
| 213499 2002 $GY_{50}$ | 16.9 | $X$ | 152.40283 | 102.02155 | 162.70504 | 5.72213 | 0.1494444 | 0.28525760 | 2.2854825 | 21 | — | — |
| 213500 2002 $GE_{52}$ | 17.6 | $X$ | 229.44784 | 4.32720 | 165.69596 | 3.76797 | 0.0670426 | 0.28537653 | 2.2848475 | 21 | 12 9.2 | 20.4 |
| 213501 2002 $GV_{76}$ | 16.1 | $X$ | 70.44512 | 208.06376 | 118.91896 | 6.86392 | 0.1419602 | 0.28228528 | 2.3014978 | 21 | — | — |
| 213502 2002 $GC_{77}$ | 16.9 | $X$ | 210.54247 | 81.85195 | 131.00186 | 4.72170 | 0.0436489 | 0.28856425 | 2.2679895 | 21 | — | — |
| 213503 2002 $GM_{80}$ | 16.6 | $X$ | 160.58200 | 228.34849 | 44.68929 | 6.40598 | 0.1263048 | 0.28754326 | 2.2733550 | 21 | — | — |
| 213504 2002 $GM_{81}$ | 16.9 | $X$ | 171.84953 | 109.30234 | 171.12389 | 10.52183 | 0.1895059 | 0.28907881 | 2.2652973 | 21 | — | — |
| 213505 2002 $GM_{85}$ | 17.6 | $X$ | 225.20506 | 131.29453 | 49.39001 | 5.35797 | 0.0742867 | 0.28612986 | 2.2808353 | 21 | 12 16.2 | 20.3 |
| 213506 2002 $GS_{85}$ | 16.7 | $X$ | 239.53818 | 62.66007 | 65.80155 | 7.35978 | 0.0464480 | 0.28110065 | 2.3079593 | 21 | 10 30.8 | 19.5 |
| 213507 2002 $GR_{86}$ | 16.7 | $X$ | 194.44640 | 41.18748 | 100.54985 | 5.88596 | 0.1106848 | 0.27614129 | 2.3355105 | 21 | 9 14.8 | 20.0 |
| 213508 2002 $GO_{91}$ | 16.6 | $X$ | 178.11910 | 86.83349 | 100.74105 | 7.23222 | 0.0459064 | 0.27992233 | 2.3144316 | 21 | 11 1.4 | 19.7 |
| 213509 2002 $GU_{91}$ | 15.9 | $X$ | 7.43490 | 294.27082 | 40.66551 | 11.29697 | 0.2036427 | 0.27276390 | 2.3547499 | 21 | 10 24.9 | 17.7 |
| 213510 2002 $GC_{93}$ | 17.0 | $X$ | 188.77950 | 19.86407 | 221.35226 | 6.01712 | 0.0987972 | 0.28815024 | 2.2701613 | 21 | — | — |
| 213511 2002 $GH_{98}$ | 16.7 | $X$ | 175.24790 | 282.09828 | 316.24391 | 6.45353 | 0.0805442 | 0.28751113 | 2.2735243 | 21 | 12 31.0 | 19.8 |
| 213512 2002 $GC_{119}$ | 17.1 | $X$ | 221.55712 | 109.92527 | 99.29859 | 3.42684 | 0.1151867 | 0.28968138 | 2.2621549 | 21 | — | — |
| 213513 2002 $GS_{122}$ | 16.9 | $X$ | 60.81944 | 240.53425 | 64.52620 | 2.66026 | 0.2302227 | 0.27643447 | 2.3338588 | 21 | 12 3.5 | 20.0 |
| 213514 2002 $GT_{126}$ | 17.0 | $X$ | 186.95965 | 77.65480 | 94.51422 | 2.83981 | 0.1488862 | 0.27905276 | 2.3192372 | 21 | 10 13.2 | 20.4 |
| 213515 2002 $GX_{138}$ | 14.7 | $X$ | 26.14158 | 356.93433 | 149.96681 | 11.27861 | 0.0657467 | 0.15196265 | 3.4778551 | 21 | 2 22.7 | 19.3 |
| 213516 2002 $GA_{141}$ | 17.7 | $X$ | 138.73395 | 109.22086 | 154.42896 | 2.42896 | 0.1894297 | 0.28217455 | 2.3020998 | 21 | 12 19.9 | 21.5 |
| 213517 2002 $GK_{142}$ | 16.7 | $X$ | 230.45412 | 341.67937 | 160.43469 | 2.97321 | 0.0970659 | 0.28042811 | 2.3116479 | 21 | 10 28.5 | 19.6 |
| 213518 2002 $GQ_{147}$ | 16.9 | $X$ | 278.85666 | 73.83928 | 58.21504 | 6.54171 | 0.0839471 | 0.28828718 | 2.2694424 | 21 | 12 28.2 | 19.2 |
| 213519 2002 $GF_{149}$ | 16.8 | $X$ | 129.70469 | 237.04993 | 48.21814 | 6.50909 | 0.1701108 | 0.28405588 | 2.2919239 | 21 | — | — |
| 213520 2002 $GC_{150}$ | 17.9 | $X$ | 257.72367 | 122.26537 | 23.87877 | 1.92479 | 0.1366118 | 0.28701429 | 2.2761473 | 21 | 12 5.5 | 20.2 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213521 2002 $GH_{157}$ | 16.9 | X | 154.19440 | 166.26060 | 140.07665 | 6.05773 | 0.1365913 | 0.29081120 | 2.2562920 | 21 | — | — |
| 213522 2002 $GM_{158}$ | 16.9 | X | 193.83720 | 0.56649 | 160.88610 | 6.56778 | 0.0617875 | 0.27807029 | 2.3246968 | 21 | 10 13.7 | 19.9 |
| 213523 2002 $GG_{159}$ | 17.0 | X | 171.36756 | 339.75218 | 210.76184 | 6.40661 | 0.0664806 | 0.27883447 | 2.3204475 | 21 | 10 23.5 | 19.9 |
| 213524 2002 $GL_{161}$ | 16.6 | X | 206.43088 | 108.40367 | 71.47846 | 7.02810 | 0.0671082 | 0.28219071 | 2.3020120 | 21 | 11 21.8 | 19.6 |
| 213525 2002 $GC_{176}$ | 16.7 | X | 120.76842 | 76.77288 | 189.90661 | 4.84665 | 0.1325282 | 0.28282423 | 2.2985730 | 21 | 12 7.5 | 20.1 |
| 213526 2002 $HW_{1}$ | 16.9 | X | 326.58691 | 65.16444 | 45.91913 | 6.63148 | 0.0536436 | 0.29213703 | 2.2494602 | 21 | — | — |
| 213527 2002 $HE_{12}$ | 16.9 | X | 179.10868 | 211.10334 | 37.74082 | 6.64356 | 0.2354650 | 0.28645288 | 2.2791203 | 21 | — | — |
| 213528 2002 $HV_{13}$ | 16.5 | X | 80.54340 | 189.37196 | 81.66547 | 24.33133 | 0.2063454 | 0.27424662 | 2.3462549 | 21 | 11 15.2 | 20.3 |
| 213529 2002 $HC_{18}$ | 17.2 | X | 105.28033 | 263.03463 | 48.99744 | 6.35135 | 0.2490307 | 0.27992015 | 2.3144436 | 21 | — | — |
| 213530 2002 $JE_{1}$ | 16.5 | X | 103.86939 | 187.33342 | 54.94190 | 6.77222 | 0.0769134 | 0.27510171 | 2.3413905 | 21 | 10 15.7 | 19.6 |
| 213531 2002 $JN_{18}$ | 16.3 | X | 339.45897 | 129.45856 | 79.22872 | 10.30345 | 0.1302777 | 0.25264945 | 2.4781284 | 21 | 2 8.9 | 19.3 |
| 213532 2002 $JF_{19}$ | 17.1 | X | 159.09187 | 102.86710 | 169.28121 | 5.18813 | 0.1424303 | 0.28488760 | 2.2874609 | 21 | — | — |
| 213533 2002 $JV_{19}$ | 17.1 | X | 84.45627 | 89.28824 | 173.69997 | 5.38405 | 0.1642634 | 0.27289550 | 2.3539928 | 21 | 10 29.1 | 20.4 |
| 213534 2002 $JX_{28}$ | 17.1 | X | 163.95922 | 116.18558 | 72.05267 | 4.68209 | 0.1545333 | 0.27664005 | 2.3327024 | 21 | 10 11.7 | 20.8 |
| 213535 2002 $JT_{29}$ | 17.3 | X | 143.10133 | 126.69239 | 105.47587 | 2.86232 | 0.1720737 | 0.27821010 | 2.3239179 | 21 | 11 15.4 | 20.9 |
| 213536 2002 $JN_{51}$ | 16.9 | X | 127.42988 | 251.81051 | 27.03198 | 3.07282 | 0.1729525 | 0.28031388 | 2.3122759 | 21 | 12 28.6 | 20.6 |
| 213537 2002 $JD_{55}$ | 16.9 | X | 190.07681 | 280.75341 | 237.34379 | 2.55244 | 0.1484703 | 0.27668830 | 2.3324312 | 21 | 9 25.3 | 20.3 |
| 213538 2002 $JJ_{63}$ | 16.9 | X | 118.24839 | 347.39416 | 225.46925 | 7.85779 | 0.1209562 | 0.27215193 | 2.3582785 | 21 | 9 21.4 | 20.5 |
| 213539 2002 $JU_{63}$ | 16.7 | X | 149.50118 | 176.51777 | 69.67520 | 5.82588 | 0.2232771 | 0.27950357 | 2.3167427 | 21 | 12 6.6 | 20.5 |
| 213540 2002 $JH_{72}$ | 16.4 | X | 100.09872 | 168.84295 | 112.00369 | 9.16370 | 0.1477624 | 0.27730538 | 2.3289698 | 21 | 12 5.8 | 19.9 |
| 213541 2002 $JL_{75}$ | 17.1 | X | 118.34375 | 168.78369 | 108.81868 | 4.95777 | 0.1493499 | 0.27880585 | 2.3206063 | 21 | 12 18.3 | 20.7 |
| 213542 2002 $JG_{76}$ | 17.1 | X | 212.22360 | 308.31510 | 236.18046 | 4.70391 | 0.1008689 | 0.28490036 | 2.2873926 | 21 | 11 30.8 | 20.1 |
| 213543 2002 $JC_{81}$ | 16.1 | X | 66.22171 | 326.37562 | 9.42838 | 7.20181 | 0.1582743 | 0.28307327 | 2.2972247 | 21 | — | — |
| 213544 2002 $JZ_{82}$ | 17.4 | X | 208.46711 | 326.20698 | 209.68715 | 1.36602 | 0.1605590 | 0.28253642 | 2.3001337 | 21 | 11 7.4 | 20.6 |
| 213545 2002 $JQ_{86}$ | 16.7 | X | 262.59009 | 272.32911 | 228.68781 | 4.12275 | 0.1055378 | 0.28429452 | 2.2906411 | 21 | 12 10.6 | 19.2 |
| 213546 2002 $JN_{95}$ | 16.9 | X | 70.84485 | 60.03471 | 231.82371 | 3.33715 | 0.1603678 | 0.27356984 | 2.3501229 | 21 | 11 18.8 | 20.1 |
| 213547 2002 $JR_{98}$ | 17.0 | X | 134.10183 | 237.35358 | 32.42574 | 2.95037 | 0.1478400 | 0.28104819 | 2.3082465 | 21 | 12 23.4 | 20.4 |
| 213548 2002 $JV_{115}$ | 17.4 | X | 86.90593 | 136.49848 | 177.19517 | 5.59709 | 0.3907731 | 0.27569146 | 2.3380503 | 21 | — | — |
| 213549 2002 $JE_{117}$ | 16.8 | X | 102.64032 | 180.96250 | 86.52141 | 7.68521 | 0.1732263 | 0.27562810 | 2.3384085 | 21 | 11 22.8 | 20.3 |
| 213550 2002 $JG_{128}$ | 16.7 | X | 93.76667 | 189.25775 | 93.64705 | 7.13115 | 0.1935787 | 0.27642370 | 2.3339195 | 21 | 12 4.6 | 20.2 |
| 213551 2002 $JB_{131}$ | 16.3 | X | 179.21886 | 48.58836 | 94.91708 | 11.42208 | 0.1976451 | 0.27304965 | 2.3531068 | 21 | 8 30.4 | 20.3 |
| 213552 2002 $JJ_{131}$ | 15.2 | X | 149.79132 | 290.22455 | 249.99454 | 9.96772 | 0.2020494 | 0.22492139 | 2.6778251 | 21 | 9 8.4 | 19.9 |
| 213553 2002 $KW_{4}$ | 17.0 | X | 143.78331 | 103.79608 | 141.50273 | 2.16363 | 0.1774358 | 0.27838028 | 2.3229707 | 21 | 12 1.8 | 20.8 |
| 213554 2002 $KU_{6}$ | 17.0 | X | 96.78771 | 147.78475 | 130.07182 | 14.35571 | 0.2610491 | 0.27520533 | 2.3408028 | 21 | 12 7.1 | 21.2 |
| 213555 2002 $LQ_{1}$ | 16.8 | X | 182.56302 | 60.71358 | 134.23985 | 5.58988 | 0.1574269 | 0.27914838 | 2.3187076 | 21 | 11 7.2 | 20.3 |
| 213556 2002 $LO_{6}$ | 16.9 | X | 78.25335 | 147.73313 | 126.56586 | 6.99624 | 0.1651448 | 0.27216861 | 2.3581822 | 21 | 11 7.4 | 20.3 |
| 213557 2002 $LE_{7}$ | 17.3 | X | 85.09526 | 147.13735 | 158.08276 | 5.40354 | 0.2364451 | 0.27595077 | 2.3365853 | 21 | 12 26.5 | 21.1 |
| 213558 2002 $LE_{10}$ | 16.8 | X | 188.33642 | 92.33058 | 125.69715 | 6.05146 | 0.1148033 | 0.28146817 | 2.3059499 | 21 | 12 14.9 | 20.0 |
| 213559 2002 $LD_{27}$ | 16.1 | X | 19.47691 | 97.32144 | 224.00804 | 7.34450 | 0.2854594 | 0.26473915 | 2.4020974 | 21 | 11 8.2 | 18.4 |
| 213560 2002 $LJ_{28}$ | 16.9 | X | 24.57751 | 103.52114 | 209.25325 | 3.90688 | 0.2533020 | 0.26669529 | 2.3903371 | 21 | 10 30.3 | 19.3 |
| 213561 2002 $LS_{29}$ | 17.5 | X | 110.71440 | 163.61643 | 136.74069 | 5.11065 | 0.2627650 | 0.27847823 | 2.3224260 | 21 | — | — |
| 213562 2002 $LH_{32}$ | 16.9 | X | 167.70558 | 82.46426 | 117.95535 | 10.01923 | 0.1571008 | 0.27750981 | 2.3278258 | 21 | 11 1.9 | 20.7 |
| 213563 2002 $LM_{39}$ | 17.0 | X | 147.31821 | 111.03661 | 121.38549 | 8.98841 | 0.1787755 | 0.27801129 | 2.3250257 | 21 | 11 21.2 | 20.9 |
| 213564 2002 $LO_{40}$ | 16.5 | X | 133.19514 | 60.21728 | 223.22454 | 9.90378 | 0.2322342 | 0.27973540 | 2.3154626 | 21 | — | — |
| 213565 2002 $LN_{49}$ | 16.4 | X | 350.39345 | 112.53247 | 206.63449 | 5.89871 | 0.1491944 | 0.26044483 | 2.4284298 | 21 | 8 9.8 | 18.7 |
| 213566 2002 $LX_{51}$ | 16.8 | X | 70.15329 | 157.70997 | 122.19494 | 7.40669 | 0.1263736 | 0.27179787 | 2.3603261 | 21 | 11 1.0 | 20.0 |
| 213567 2002 $LR_{52}$ | 16.5 | X | 0.38138 | 182.76712 | 143.31546 | 9.51835 | 0.2567227 | 0.26508424 | 2.4000122 | 21 | 10 2.5 | 18.1 |
| 213568 2002 $LX_{55}$ | 15.7 | X | 179.62919 | 177.53524 | 166.88000 | 15.79804 | 0.3063050 | 0.23820800 | 2.5773011 | 21 | 2 12.4 | 20.5 |
| 213569 2002 $MD_{5}$ | 17.2 | X | 76.05152 | 107.73455 | 157.89348 | 3.03666 | 0.1505744 | 0.26753777 | 2.3853163 | 21 | 10 20.5 | 20.4 |
| 213570 2002 $NF_{2}$ | 17.1 | X | 335.70879 | 70.22335 | 211.04850 | 1.37919 | 0.1957719 | 0.25487947 | 2.4636526 | 21 | 5 4.5 | 19.5 |
| 213571 2002 $NR_{5}$ | 17.5 | X | 63.50148 | 170.28178 | 131.91899 | 3.50745 | 0.1952341 | 0.26944835 | 2.3740272 | 21 | 11 28.3 | 20.8 |
| 213572 2002 $NC_{9}$ | 16.6 | X | 88.61283 | 229.72297 | 83.60870 | 4.83557 | 0.2544844 | 0.27443452 | 2.3451838 | 21 | — | — |
| 213573 2002 $NC_{16}$ | 16.7 | X | 310.61702 | 198.09763 | 123.07417 | 3.23075 | 0.1882332 | 0.25559828 | 2.4590315 | 21 | 5 21.4 | 19.4 |
| 213574 2002 $ND_{19}$ | 16.7 | X | 342.93590 | 157.86146 | 150.63722 | 5.12426 | 0.1995527 | 0.25785710 | 2.4446498 | 21 | 7 4.2 | 18.7 |
| 213575 2002 $ND_{21}$ | 16.9 | X | 61.67913 | 122.63989 | 166.50399 | 5.56332 | 0.1856718 | 0.26775363 | 2.3840342 | 21 | 11 8.9 | 20.1 |
| 213576 2002 $NC_{25}$ | 15.9 | X | 199.11286 | 207.28387 | 138.94343 | 16.39701 | 0.1884766 | 0.23970558 | 2.5665553 | 21 | 2 28.6 | 20.2 |
| 213577 2002 $NV_{31}$ | 17.3 | X | 58.00654 | 79.30651 | 213.57895 | 7.89666 | 0.2912582 | 0.26758244 | 2.3850509 | 21 | 11 21.9 | 20.8 |
| 213578 2002 $NR_{32}$ | 15.4 | X | 97.52756 | 177.31236 | 192.82243 | 13.21158 | 0.2504931 | 0.22494327 | 2.6776514 | 21 | — | — |
| 213579 2002 $NG_{35}$ | 16.6 | X | 352.90073 | 131.27444 | 206.11358 | 6.04079 | 0.1558363 | 0.26212549 | 2.4180385 | 21 | 9 15.5 | 18.6 |
| 213580 2002 $NM_{40}$ | 16.7 | X | 105.78133 | 270.00435 | 305.20034 | 8.13104 | 0.2363058 | 0.26579451 | 2.3957346 | 21 | 9 19.5 | 20.7 |
| 213581 2002 $NK_{46}$ | 16.8 | X | 45.12422 | 128.60934 | 176.99727 | 3.84958 | 0.1066332 | 0.26736210 | 2.3863611 | 21 | 10 27.9 | 19.6 |
| 213582 2002 $NY_{53}$ | 17.1 | X | 25.75535 | 108.81802 | 184.33526 | 2.37092 | 0.1871854 | 0.26304404 | 2.4124060 | 21 | 9 20.3 | 19.4 |
| 213583 2002 $NM_{55}$ | 16.6 | X | 234.63771 | 190.80285 | 162.76536 | 9.08284 | 0.2556569 | 0.24587937 | 2.5234110 | 21 | 4 5.1 | 21.0 |
| 213584 2002 $NN_{56}$ | 17.4 | X | 354.44826 | 133.02543 | 173.68459 | 4.39464 | 0.2858391 | 0.25945193 | 2.4346215 | 21 | 8 1.0 | 18.5 |
| 213585 2002 $NS_{60}$ | 16.7 | X | 41.45875 | 106.66226 | 176.43844 | 6.59836 | 0.0633130 | 0.26269720 | 2.4145290 | 21 | 9 11.6 | 19.6 |
| 213586 2002 $NX_{60}$ | 17.1 | X | 353.45992 | 290.75918 | 16.97931 | 3.11246 | 0.1807859 | 0.25921902 | 2.4360796 | 21 | 8 1.9 | 19.0 |
| 213587 2002 $NV_{64}$ | 17.8 | X | 47.44937 | 306.98403 | 352.43507 | 1.86758 | 0.2107531 | 0.26709149 | 2.3879726 | 21 | 11 6.2 | 20.7 |
| 213588 2002 $OH_{5}$ | 16.6 | X | 230.99933 | 173.19160 | 181.34267 | 5.73236 | 0.1862539 | 0.24640550 | 2.5198177 | 21 | 4 5.0 | 20.8 |
| 213589 2002 $OP_{9}$ | 16.5 | X | 327.55945 | 182.78729 | 165.62674 | 7.80755 | 0.2012124 | 0.25881580 | 2.4386091 | 21 | 8 2.1 | 18.6 |
| 213590 2002 $OU_{17}$ | 16.1 | X | 250.11469 | 99.28262 | 239.19167 | 6.13013 | 0.1692400 | 0.24603237 | 2.5223647 | 21 | 4 1.1 | 20.1 |
| 213591 2002 $OH_{23}$ | 15.7 | X | 186.80596 | 216.42053 | 136.58895 | 16.01274 | 0.1681130 | 0.23859220 | 2.5745335 | 21 | 2 25.6 | 19.9 |
| 213592 2002 $OP_{23}$ | 16.4 | X | 343.86480 | 4.60434 | 285.91929 | 3.26568 | 0.0725285 | 0.25501285 | 2.4627936 | 21 | 6 18.3 | 19.0 |
| 213593 2002 $PN_{11}$ | 16.2 | X | 107.44080 | 168.95291 | 167.36565 | 4.13010 | 0.1077816 | 0.22637210 | 2.6663722 | 21 | — | — |
| 213594 2002 $PA_{20}$ | 17.1 | X | 311.64846 | 79.38943 | 242.69254 | 1.71546 | 0.1686337 | 0.25460167 | 2.4654445 | 21 | 5 27.0 | 19.6 |
| 213595 2002 $PZ_{29}$ | 16.9 | X | 3.02358 | 7.84390 | 266.61709 | 3.70225 | 0.1647893 | 0.25630931 | 2.4544817 | 21 | 6 27.8 | 18.8 |
| 213596 2002 $PN_{36}$ | 17.1 | X | 54.67282 | 342.15107 | 281.68035 | 1.74038 | 0.1651348 | 0.26216685 | 2.4177842 | 21 | 9 19.9 | 20.0 |
| 213597 2002 $PA_{41}$ | 15.9 | X | 180.57287 | 194.31834 | 197.95213 | 15.35724 | 0.3097557 | 0.23842189 | 2.5757594 | 21 | 4 11.6 | 20.6 |
| 213598 2002 $PP_{47}$ | 16.3 | X | 120.93534 | 83.40430 | 273.77378 | 6.40878 | 0.1365984 | 0.28085065 | 2.3093287 | 21 | — | — |
| 213599 2002 $PX_{52}$ | 16.3 | X | 139.22309 | 300.67106 | 94.37745 | 3.89429 | 0.1286815 | 0.23772792 | 2.5807698 | 21 | 2 27.0 | 19.9 |
| 213600 2002 $PV_{53}$ | 16.2 | X | 181.04582 | 199.61270 | 137.86867 | 4.74891 | 0.2271753 | 0.23586825 | 2.5943171 | 21 | 2 3.6 | 20.6 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213601 2002 $PZ_{55}$ | 16.8 | $X$ | 351.17698 | 136.56125 | 169.06148 | 5.79532 | 0.1937202 | 0.25775999 | 2.4452638 | 21 | 7 20.3 | 18.7 |
| 213602 2002 $PZ_{62}$ | 16.1 | $X$ | 189.21522 | 175.32339 | 119.87917 | 4.05208 | 0.1954184 | 0.23384896 | 2.6092303 | 21 | — | — |
| 213603 2002 $PM_{74}$ | 16.3 | $X$ | 300.76352 | 99.91894 | 238.51304 | 5.58324 | 0.1403241 | 0.25334526 | 2.4735889 | 21 | 6 7.5 | 19.1 |
| 213604 2002 $PU_{86}$ | 16.6 | $X$ | 60.76227 | 319.12370 | 329.42013 | 4.79272 | 0.2269559 | 0.26623748 | 2.3930765 | 21 | 11 8.7 | 20.0 |
| 213605 2002 $PU_{94}$ | 16.6 | $X$ | 328.62302 | 237.62083 | 72.96448 | 3.92858 | 0.1881782 | 0.25424425 | 2.4677545 | 21 | 6 6.5 | 18.7 |
| 213606 2002 $PA_{102}$ | 15.5 | $X$ | 147.41004 | 190.70888 | 184.60472 | 10.40438 | 0.0635775 | 0.18518495 | 3.0483553 | 21 | 2 8.6 | 20.1 |
| 213607 2002 $PL_{103}$ | 16.1 | $X$ | 81.21613 | 214.17087 | 166.92834 | 12.24783 | 0.1984189 | 0.22628822 | 2.6670311 | 21 | — | — |
| 213608 2002 $PB_{120}$ | 16.8 | $X$ | 52.86688 | 24.09865 | 273.73691 | 3.08482 | 0.1959135 | 0.26560112 | 2.3968974 | 21 | 11 8.3 | 19.9 |
| 213609 2002 $PL_{121}$ | 16.2 | $X$ | 175.68076 | 158.78866 | 168.03285 | 15.59780 | 0.1396565 | 0.23362563 | 2.6108929 | 21 | 1 10.9 | 20.5 |
| 213610 2002 $PR_{121}$ | 17.0 | $X$ | 136.93490 | 89.89220 | 235.10229 | 4.76261 | 0.1681083 | 0.28037804 | 2.3119231 | 21 | — | — |
| 213611 2002 $PX_{156}$ | 17.5 | $X$ | 357.70602 | 321.08420 | 343.38527 | 0.70672 | 0.1881803 | 0.25912708 | 2.4366558 | 21 | 8 6.1 | 19.1 |
| 213612 2002 $PF_{169}$ | 17.1 | $X$ | 235.24926 | 333.72531 | 338.49398 | 1.22416 | 0.0360247 | 0.24072591 | 2.5592978 | 21 | 2 22.8 | 20.7 |
| 213613 2002 $PS_{169}$ | 16.5 | $X$ | 61.93224 | 234.51069 | 330.06373 | 6.06380 | 0.0721619 | 0.25285117 | 2.4768103 | 21 | 6 22.4 | 19.5 |
| 213614 2002 $PP_{178}$ | 16.5 | $X$ | 34.96619 | 120.61106 | 151.52992 | 6.39047 | 0.1093204 | 0.26004140 | 2.4309408 | 21 | 8 23.2 | 19.2 |
| 213615 2002 $PX_{182}$ | 16.6 | $X$ | 359.14240 | 220.58209 | 67.47743 | 7.09120 | 0.1326985 | 0.25637681 | 2.4540509 | 21 | 7 12.3 | 18.9 |
| 213616 2002 $PW_{187}$ | 16.3 | $X$ | 172.62771 | 272.79682 | 109.60097 | 3.87547 | 0.0884195 | 0.24251625 | 2.5466865 | 21 | 3 15.3 | 20.0 |
| 213617 2002 $QU_{14}$ | 17.0 | $X$ | 71.18360 | 103.73935 | 173.14454 | 8.57889 | 0.1994285 | 0.26595247 | 2.3947859 | 21 | 11 5.6 | 20.4 |
| 213618 2002 $QK_{23}$ | 16.7 | $X$ | 182.94180 | 331.89496 | 341.35118 | 1.99337 | 0.1166238 | 0.23315407 | 2.6144121 | 21 | 1 1.5 | 20.6 |
| 213619 2002 $QZ_{26}$ | 16.9 | $X$ | 96.69454 | 255.57812 | 110.11971 | 3.32724 | 0.0988611 | 0.22735413 | 2.6586886 | 21 | — | — |
| 213620 2002 $QX_{27}$ | 16.8 | $X$ | 15.57619 | 196.93037 | 67.23532 | 3.67776 | 0.0484439 | 0.25476406 | 2.4643966 | 21 | 7 2.8 | 19.7 |
| 213621 2002 $QH_{49}$ | 16.4 | $X$ | 282.66124 | 260.45209 | 115.28903 | 8.01731 | 0.2344828 | 0.25509693 | 2.4622523 | 21 | 6 19.3 | 19.6 |
| 213622 2002 $QZ_{54}$ | 16.6 | $X$ | 138.77713 | 353.58841 | 27.03317 | 3.08365 | 0.0247350 | 0.23548613 | 2.5971228 | 21 | 1 25.1 | 20.1 |
| 213623 2002 $QE_{55}$ | 17.4 | $X$ | 164.51648 | 60.64568 | 339.34202 | 2.77578 | 0.1641196 | 0.24060754 | 2.5601371 | 21 | 3 31.7 | 21.4 |
| 213624 2002 $QW_{55}$ | 17.4 | $X$ | 43.64344 | 140.34533 | 159.40919 | 1.64823 | 0.1823602 | 0.26440778 | 2.4041039 | 21 | 10 29.0 | 20.2 |
| 213625 2002 $QH_{56}$ | 17.2 | $X$ | 16.15462 | 152.67242 | 120.29582 | 3.18819 | 0.2022736 | 0.25733675 | 2.4479442 | 21 | 7 30.6 | 19.0 |
| 213626 2002 $QX_{58}$ | 17.4 | $X$ | 36.39738 | 77.74302 | 199.46128 | 3.38147 | 0.2029728 | 0.26079708 | 2.4262426 | 21 | 9 17.2 | 19.9 |
| 213627 2002 $QZ_{61}$ | 17.3 | $X$ | 32.62489 | 46.70112 | 228.09741 | 3.73937 | 0.1222903 | 0.25898068 | 2.4375740 | 21 | 8 23.1 | 20.0 |
| 213628 2002 $QQ_{65}$ | 16.6 | $X$ | 350.86612 | 189.83811 | 147.60806 | 6.69733 | 0.1181973 | 0.26258012 | 2.4152466 | 21 | 9 13.0 | 18.8 |
| 213629 Binford | 17.3 | $X$ | 281.06753 | 281.59771 | 352.55546 | 2.96152 | 0.0660724 | 0.24277318 | 2.5448894 | 21 | 2 26.0 | 20.5 |
| 213630 2002 $QR_{73}$ | 17.0 | $X$ | 30.78058 | 280.14398 | 13.70207 | 6.08599 | 0.1869548 | 0.26180473 | 2.4200131 | 21 | 9 30.8 | 19.5 |
| 213631 2002 $QQ_{78}$ | 17.3 | $X$ | 61.33659 | 287.88171 | 358.95175 | 5.23608 | 0.2308560 | 0.26642513 | 2.3919527 | 21 | 11 7.8 | 20.7 |
| 213632 2002 $QS_{100}$ | 15.3 | $X$ | 187.39076 | 323.83281 | 13.25925 | 9.64509 | 0.0491907 | 0.18569580 | 3.0427621 | 21 | 2 11.5 | 19.9 |
| 213633 2002 $QX_{108}$ | 16.4 | $X$ | 18.06743 | 288.45440 | 196.52993 | 6.80522 | 0.1999762 | 0.23218667 | 2.6216690 | 21 | — | — |
| 213634 2002 $QO_{115}$ | 17.2 | $X$ | 25.24874 | 123.33189 | 147.89698 | 2.06139 | 0.1582522 | 0.25796582 | 2.4439629 | 21 | 8 10.8 | 19.5 |
| 213635 2002 $QZ_{120}$ | 17.0 | $X$ | 3.45432 | 163.17317 | 106.87181 | 3.42016 | 0.1833312 | 0.25459617 | 2.4654799 | 21 | 6 21.6 | 18.9 |
| 213636 Gajdoš | 16.3 | $X$ | 47.42108 | 60.46463 | 7.16607 | 5.98467 | 0.1136824 | 0.22678987 | 2.6630967 | 21 | — | — |
| 213637 Lemarchal | 16.6 | $X$ | 69.39334 | 283.11030 | 162.90344 | 4.44734 | 0.1008902 | 0.23416803 | 2.6068597 | 21 | 1 23.6 | 19.7 |
| 213638 2002 $RU_{22}$ | 16.8 | $X$ | 239.86461 | 208.31693 | 145.72400 | 3.10656 | 0.1603548 | 0.24524842 | 2.5277371 | 21 | 4 14.9 | 20.8 |
| 213639 2002 $RF_{38}$ | 16.9 | $X$ | 275.73849 | 283.49039 | 68.36775 | 2.51018 | 0.2369685 | 0.25113969 | 2.4880502 | 21 | 5 9.4 | 20.4 |
| 213640 2002 $RA_{62}$ | 16.4 | $X$ | 16.38314 | 310.88363 | 19.69300 | 10.27181 | 0.3233143 | 0.26200442 | 2.4187834 | 21 | 11 19.6 | 18.9 |
| 213641 2002 $RP_{67}$ | 15.1 | $X$ | 176.10893 | 93.37683 | 312.17822 | 9.25323 | 0.1186314 | 0.18807459 | 3.0170509 | 21 | 4 17.0 | 20.0 |
| 213642 2002 $RH_{83}$ | 16.6 | $X$ | 199.17809 | 193.74589 | 174.78198 | 9.36377 | 0.2169187 | 0.23970260 | 2.5665765 | 21 | 3 26.7 | 21.1 |
| 213643 2002 $RR_{90}$ | 16.3 | $X$ | 189.31072 | 26.87655 | 348.86390 | 4.46516 | 0.0728540 | 0.23941854 | 2.5686062 | 21 | 3 22.3 | 20.0 |
| 213644 2002 $RW_{103}$ | 16.2 | $X$ | 223.77268 | 286.52628 | 7.17773 | 11.98231 | 0.2829056 | 0.23487812 | 2.6016029 | 21 | 1 19.4 | 21.1 |
| 213645 2002 $RE_{104}$ | 16.4 | $X$ | 198.78357 | 337.24243 | 31.40515 | 5.29856 | 0.2741857 | 0.23835006 | 2.5762769 | 21 | 3 27.6 | 20.9 |
| 213646 2002 $RK_{109}$ | 16.1 | $X$ | 156.96204 | 238.05866 | 174.47986 | 14.85550 | 0.0847911 | 0.24073785 | 2.5592131 | 21 | 4 5.4 | 19.8 |
| 213647 2002 $RY_{116}$ | 16.0 | $X$ | 141.43869 | 325.67570 | 320.74513 | 11.14500 | 0.1835305 | 0.22540595 | 2.6739860 | 21 | — | — |
| 213648 2002 $RU_{126}$ | 17.0 | $X$ | 30.69589 | 226.26286 | 104.02975 | 5.90402 | 0.2395850 | 0.26569270 | 2.3963466 | 21 | 12 1.2 | 19.9 |
| 213649 2002 $RX_{133}$ | 15.4 | $X$ | 32.03930 | 70.43897 | 15.89468 | 22.29974 | 0.0359394 | 0.22701137 | 2.6613642 | 21 | — | — |
| 213650 2002 $RF_{135}$ | 16.1 | $X$ | 356.65704 | 132.18634 | 134.12499 | 7.71687 | 0.1490730 | 0.25182153 | 2.4835571 | 21 | 6 2.3 | 18.5 |
| 213651 2002 $RA_{183}$ | 15.5 | $X$ | 359.07264 | 286.63224 | 266.35058 | 13.25774 | 0.0464487 | 0.23794255 | 2.5792176 | 21 | 2 20.4 | 19.1 |
| 213652 2002 $RK_{184}$ | 15.5 | $X$ | 308.47110 | 126.38551 | 313.03724 | 12.29989 | 0.1184841 | 0.21247704 | 2.7813867 | 21 | 11 6.4 | 19.0 |
| 213653 2002 $RJ_{197}$ | 17.3 | $X$ | 341.22734 | 287.29774 | 37.37491 | 1.98269 | 0.1516740 | 0.25638043 | 2.4540278 | 21 | 8 1.5 | 19.5 |
| 213654 2002 $RL_{209}$ | 16.6 | $X$ | 345.48648 | 253.36848 | 180.86679 | 8.91033 | 0.1298323 | 0.21611424 | 2.7500914 | 21 | — | — |
| 213655 2002 $RT_{215}$ | 16.5 | $X$ | 266.36697 | 209.92394 | 112.17620 | 7.56088 | 0.1940016 | 0.24528953 | 2.5274547 | 21 | 3 31.2 | 20.4 |
| 213656 2002 $RA_{235}$ | 17.3 | $X$ | 24.72480 | 83.16517 | 210.93291 | 1.52669 | 0.1702944 | 0.26018755 | 2.4300304 | 21 | 9 16.1 | 19.6 |
| 213657 2002 $RK_{243}$ | 17.0 | $X$ | 70.40684 | 25.41275 | 216.39527 | 7.54072 | 0.2201143 | 0.26193413 | 2.4192160 | 21 | 9 17.2 | 20.3 |
| 213658 2002 $RR_{243}$ | 16.1 | $X$ | 45.30721 | 9.17838 | 164.65368 | 15.40561 | 0.0582324 | 0.24531155 | 2.5273034 | 21 | 4 15.1 | 19.2 |
| 213659 2002 $RL_{250}$ | 16.6 | $X$ | 34.81511 | 170.01129 | 86.29322 | 3.81487 | 0.1508846 | 0.25676975 | 2.4515466 | 21 | 8 6.3 | 19.0 |
| 213660 2002 $SN_{4}$ | 15.9 | $X$ | 13.34758 | 74.65759 | 7.26652 | 12.42869 | 0.1429597 | 0.22030368 | 2.7151149 | 21 | — | — |
| 213661 2002 $SL_{8}$ | 17.5 | $X$ | 272.58888 | 24.13122 | 188.67315 | 23.29627 | 0.0392670 | 0.38462872 | 1.8725852 | 21 | — | — |
| 213662 2002 $SG_{11}$ | 16.2 | $X$ | 219.30296 | 304.06043 | 11.96766 | 15.04631 | 0.1514858 | 0.23564535 | 2.5959528 | 21 | 2 14.7 | 20.6 |
| 213663 2002 $SO_{46}$ | 15.4 | $X$ | 172.51937 | 308.40973 | 39.49979 | 19.30440 | 0.2253361 | 0.23146429 | 2.6271209 | 21 | 2 18.9 | 20.2 |
| 213664 2002 $SS_{49}$ | 17.0 | $X$ | 0.20170 | 260.67588 | 52.80486 | 5.32518 | 0.2017973 | 0.25667941 | 2.4521217 | 21 | 9 1.2 | 18.9 |
| 213665 2002 $SS_{50}$ | 16.1 | $X$ | 355.01192 | 212.62031 | 193.50944 | 7.76508 | 0.2207529 | 0.21148949 | 2.7900385 | 21 | 12 26.8 | 19.0 |
| 213666 2002 $SD_{60}$ | 15.2 | $X$ | 194.68226 | 333.68584 | 20.58539 | 12.40949 | 0.0660946 | 0.18702776 | 3.0282984 | 21 | 3 12.5 | 19.8 |
| 213667 2002 $TF_{9}$ | 16.4 | $X$ | 111.56473 | 300.75590 | 83.32313 | 3.48288 | 0.1610353 | 0.22884887 | 2.6470991 | 21 | 1 15.6 | 19.9 |
| 213668 2002 $TP_{23}$ | 16.5 | $X$ | 126.07208 | 192.71108 | 175.99743 | 4.60343 | 0.0938797 | 0.22765596 | 2.6563382 | 21 | 1 4.2 | 20.2 |
| 213669 2002 $TD_{38}$ | 15.8 | $X$ | 206.85807 | 136.32495 | 208.13015 | 21.50204 | 0.0757437 | 0.23425722 | 2.6061979 | 21 | 2 25.9 | 20.0 |
| 213670 2002 $TQ_{38}$ | 16.2 | $X$ | 160.06050 | 160.75245 | 219.12123 | 4.14714 | 0.1699973 | 0.23239579 | 2.6200961 | 21 | 3 3.2 | 20.4 |
| 213671 2002 $TK_{41}$ | 16.7 | $X$ | 307.93685 | 43.96860 | 50.12961 | 24.22793 | 0.1002743 | 0.36612151 | 1.9351704 | 21 | — | — |
| 213672 2002 $TZ_{41}$ | 16.5 | $X$ | 111.81474 | 177.24498 | 195.51546 | 9.44193 | 0.1562954 | 0.22499506 | 2.6772406 | 21 | — | — |
| 213673 2002 $TT_{54}$ | 16.2 | $X$ | 179.17460 | 328.75207 | 38.98604 | 12.61658 | 0.1948623 | 0.23398714 | 2.6082030 | 21 | 3 14.5 | 20.7 |
| 213674 2002 $TQ_{58}$ | 15.9 | $X$ | 73.18376 | 4.08444 | 7.60714 | 12.50216 | 0.0905823 | 0.21900992 | 2.7257971 | 21 | — | — |
| 213675 2002 $TK_{60}$ | 17.1 | $X$ | 354.15162 | 72.25024 | 26.69023 | 22.13288 | 0.0843877 | 0.37936400 | 1.8898702 | 21 | — | — |
| 213676 2002 $TC_{66}$ | 16.5 | $X$ | 94.33707 | 192.94780 | 204.18837 | 3.09153 | 0.1397569 | 0.22544210 | 2.6737001 | 21 | 1 4.9 | 19.8 |
| 213677 2002 $TX_{66}$ | 17.0 | $X$ | 280.02691 | 14.98439 | 51.33937 | 22.62381 | 0.0915102 | 0.36180720 | 1.9505238 | 21 | 10 17.0 | 18.9 |
| 213678 2002 $TD_{81}$ | 15.8 | $X$ | 24.87076 | 349.62282 | 95.12512 | 6.23290 | 0.1381881 | 0.22068033 | 2.7120247 | 21 | — | — |
| 213679 2002 $TP_{94}$ | 15.7 | $X$ | 325.69557 | 194.77138 | 1.58431 | 13.28823 | 0.1268620 | 0.23316037 | 2.6143650 | 21 | 1 8.8 | 19.4 |
| 213680 2002 $TD_{107}$ | 16.1 | $X$ | 228.44287 | 112.74468 | 213.92280 | 10.08581 | 0.1070537 | 0.23530219 | 2.5984762 | 21 | 2 27.5 | 20.2 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213681 2002 $TF_{109}$ | 16.3 | $X$ | 348.55863 | 7.67559 | 26.88414 | 4.63979 | 0.0737917 | 0.21180933 | 2.7872291 | 21 | 11 16.0 | 19.7 |
| 213682 2002 $TX_{111}$ | 16.9 | $X$ | 8.91590 | 251.63078 | 62.90186 | 4.35581 | 0.1848754 | 0.25961554 | 2.4335985 | 21 | 9 21.5 | 19.0 |
| 213683 2002 $TA_{113}$ | 16.2 | $X$ | 144.15600 | 18.19819 | 15.70121 | 10.33903 | 0.1043895 | 0.23529857 | 2.5985028 | 21 | 3 2.7 | 19.9 |
| 213684 2002 $TH_{142}$ | 16.8 | $X$ | 252.11923 | 183.77419 | 158.31440 | 4.14373 | 0.1490538 | 0.24448936 | 2.5329663 | 21 | 4 13.0 | 20.6 |
| 213685 2002 $TM_{180}$ | 17.2 | $X$ | 212.73112 | 32.19519 | 220.68818 | 20.36836 | 0.0233672 | 0.38058429 | 1.8858283 | 21 | — | — |
| 213686 2002 $TX_{209}$ | 15.9 | $X$ | 7.77995 | 201.92738 | 169.86719 | 12.54111 | 0.0765379 | 0.21051934 | 2.7986036 | 21 | 11 18.6 | 19.6 |
| 213687 2002 $TL_{210}$ | 16.7 | $X$ | 250.39233 | 312.44346 | 34.09543 | 5.77209 | 0.2093554 | 0.24355518 | 2.5394391 | 21 | 4 11.4 | 20.7 |
| 213688 2002 $TU_{221}$ | 16.4 | $X$ | 226.58586 | 288.62341 | 216.34745 | 20.16871 | 0.0599297 | 0.36980646 | 1.9222936 | 21 | 11 17.9 | 18.2 |
| 213689 2002 $TG_{226}$ | 15.8 | $X$ | 258.67912 | 149.99506 | 202.94738 | 17.32701 | 0.2133331 | 0.24308234 | 2.5427312 | 21 | 4 27.2 | 19.7 |
| 213690 2002 $TH_{229}$ | 15.3 | $X$ | 24.92843 | 195.60697 | 185.23794 | 13.93789 | 0.2047815 | 0.21129475 | 2.7917525 | 21 | — | — |
| 213691 2002 $TA_{231}$ | 16.3 | $X$ | 245.62524 | 258.52872 | 79.37679 | 7.48812 | 0.2405319 | 0.24425216 | 2.5346059 | 21 | 3 28.8 | 20.6 |
| 213692 2002 $TP_{245}$ | 16.9 | $X$ | 186.42912 | 181.67566 | 178.25882 | 4.27828 | 0.2002477 | 0.23543404 | 2.5975059 | 21 | 3 4.9 | 21.3 |
| 213693 2002 $TS_{248}$ | 16.2 | $X$ | 19.90098 | 268.72792 | 81.84956 | 1.76777 | 0.0832241 | 0.21123682 | 2.7922629 | 21 | 11 7.2 | 19.7 |
| 213694 2002 $TW_{256}$ | 16.1 | $X$ | 346.08559 | 40.11020 | 41.02012 | 8.39067 | 0.1940768 | 0.21371888 | 2.7706019 | 21 | — | — |
| 213695 2002 $TY_{256}$ | 15.8 | $X$ | 130.10519 | 339.01044 | 40.23878 | 11.41668 | 0.1517076 | 0.22845224 | 2.6501621 | 21 | 2 4.1 | 19.7 |
| 213696 2002 $TJ_{267}$ | 15.4 | $X$ | 150.43238 | 312.19458 | 38.76069 | 30.01375 | 0.2185646 | 0.22676811 | 2.6632671 | 21 | 2 6.6 | 20.3 |
| 213697 2002 $TM_{270}$ | 16.0 | $X$ | 45.50757 | 205.58428 | 248.57131 | 4.62770 | 0.0499392 | 0.22727150 | 2.6593330 | 21 | — | — |
| 213698 2002 $TA_{275}$ | 16.1 | $X$ | 277.36665 | 346.08390 | 346.16954 | 2.70496 | 0.1816841 | 0.24529696 | 2.5274036 | 21 | 4 21.6 | 19.7 |
| 213699 2002 $TU_{277}$ | 15.3 | $X$ | 89.96479 | 74.91663 | 345.18070 | 25.33037 | 0.2730174 | 0.17490790 | 3.1666236 | 21 | 3 1.9 | 19.5 |
| 213700 2002 $TB_{288}$ | 16.5 | $X$ | 310.06609 | 224.01078 | 225.30187 | 19.60669 | 0.0946956 | 0.36755462 | 1.9301370 | 21 | — | — |
| 213701 2002 $TV_{288}$ | 16.0 | $X$ | 190.00706 | 343.57167 | 19.09870 | 13.79286 | 0.2155606 | 0.23463459 | 2.6034028 | 21 | 3 16.1 | 20.5 |
| 213702 2002 $TL_{297}$ | 16.2 | $X$ | 165.13929 | 328.67430 | 24.69691 | 5.74903 | 0.1001137 | 0.22964810 | 2.6409538 | 21 | 2 2.2 | 20.1 |
| 213703 2002 $TQ_{357}$ | 16.7 | $X$ | 91.05919 | 185.36673 | 203.07273 | 2.40938 | 0.0731845 | 0.22659172 | 2.6646491 | 21 | — | — |
| 213704 2002 $TJ_{368}$ | 16.7 | $X$ | 303.40687 | 207.44499 | 96.78855 | 9.15694 | 0.0918968 | 0.24448305 | 2.5330099 | 21 | 5 5.8 | 20.0 |
| 213705 2002 $TQ_{377}$ | 16.9 | $X$ | 346.70664 | 23.90443 | 166.13750 | 1.31313 | 0.0851121 | 0.23539669 | 2.5977806 | 21 | 2 1.4 | 20.1 |
| 213706 2002 $UZ$ | 15.9 | $X$ | 263.19313 | 259.65415 | 68.34139 | 12.76827 | 0.1652617 | 0.24442647 | 2.5334007 | 21 | 4 9.9 | 19.9 |
| 213707 2002 $UF_{17}$ | 16.8 | $X$ | 149.66595 | 6.89770 | 62.29720 | 3.09912 | 0.2054020 | 0.23588076 | 2.5942254 | 21 | 4 27.9 | 20.8 |
| 213708 2002 $UZ_{25}$ | 16.1 | $X$ | 300.63707 | 79.08695 | 33.22447 | 6.37757 | 0.0729605 | 0.21218197 | 2.7839648 | 21 | 12 15.5 | 19.6 |
| 213709 2002 $UP_{35}$ | 16.4 | $X$ | 243.08313 | 276.23090 | 40.55880 | 7.59676 | 0.2061940 | 0.23754864 | 2.5820681 | 21 | 3 3.4 | 20.7 |
| 213710 2002 $UK_{38}$ | 16.4 | $X$ | 39.33495 | 328.81048 | 28.04608 | 8.48405 | 0.2340306 | 0.21245773 | 2.7815553 | 21 | — | — |
| 213711 2002 $UQ_{38}$ | 16.7 | $X$ | 232.26379 | 298.15448 | 41.97742 | 9.53447 | 0.1789992 | 0.23835195 | 2.5762633 | 21 | 3 23.8 | 21.0 |
| 213712 2002 $UM_{64}$ | 16.8 | $X$ | 49.78220 | 297.74757 | 189.85249 | 2.05939 | 0.0199861 | 0.23457324 | 2.6038566 | 21 | 2 13.0 | 20.2 |
| 213713 2002 $US_{67}$ | 16.6 | $X$ | 304.22763 | 168.32239 | 56.33619 | 7.70270 | 0.1521952 | 0.23385084 | 2.6092164 | 21 | 1 12.7 | 20.4 |
| 213714 2002 $VP_{9}$ | 15.7 | $X$ | 230.09351 | 98.25048 | 266.83343 | 7.16550 | 0.1902804 | 0.18899165 | 3.0072830 | 21 | 4 17.9 | 20.7 |
| 213715 2002 $VY_{13}$ | 16.7 | $X$ | 78.12646 | 262.65553 | 70.68061 | 24.06492 | 0.0579110 | 0.37061427 | 1.9194993 | 21 | — | — |
| 213716 2002 $VG_{15}$ | 17.3 | $X$ | 256.46891 | 84.43502 | 52.77573 | 21.89240 | 0.0682971 | 0.36633063 | 1.9344339 | 21 | 12 18.9 | 19.2 |
| 213717 2002 $VO_{19}$ | 15.4 | $X$ | 107.83298 | 43.49884 | 55.36792 | 11.18554 | 0.0734154 | 0.18101698 | 3.0949705 | 21 | 4 13.1 | 19.8 |
| 213718 2002 $VW_{38}$ | 15.7 | $X$ | 137.96330 | 305.43208 | 73.09294 | 15.05617 | 0.0884304 | 0.22793352 | 2.6541813 | 21 | 2 3.5 | 19.6 |
| 213719 2002 $VK_{46}$ | 16.5 | $X$ | 92.53302 | 303.25770 | 118.75487 | 3.53693 | 0.0778573 | 0.22668515 | 2.6639169 | 21 | 1 26.3 | 19.6 |
| 213720 2002 $VP_{48}$ | 15.8 | $X$ | 227.27163 | 270.35428 | 69.76956 | 12.62387 | 0.1949884 | 0.23595140 | 2.5937076 | 21 | 3 22.1 | 20.3 |
| 213721 2002 $VX_{51}$ | 16.1 | $X$ | 350.83674 | 308.24883 | 130.24901 | 5.44240 | 0.1404585 | 0.21409719 | 2.7673371 | 21 | — | — |
| 213722 2002 $VR_{52}$ | 16.0 | $X$ | 102.55300 | 336.06468 | 18.09353 | 4.34923 | 0.1565358 | 0.22063316 | 2.7124112 | 21 | — | — |
| 213723 2002 $VC_{56}$ | 16.0 | $X$ | 170.76651 | 304.65736 | 73.87689 | 9.68282 | 0.1746688 | 0.23368764 | 2.6104310 | 21 | 3 18.5 | 20.3 |
| 213724 2002 $VU_{63}$ | 15.5 | $X$ | 330.40847 | 162.47402 | 283.18275 | 5.36885 | 0.0693809 | 0.21133226 | 2.7914221 | 21 | 12 25.8 | 18.8 |
| 213725 2002 $VV_{74}$ | 16.1 | $X$ | 6.55734 | 249.19719 | 169.07296 | 4.75759 | 0.0613932 | 0.21382458 | 2.7696887 | 21 | — | — |
| 213726 2002 $VJ_{80}$ | 16.2 | $X$ | 53.56552 | 320.73771 | 78.91594 | 10.09873 | 0.1793997 | 0.21729889 | 2.7400871 | 21 | — | — |
| 213727 2002 $VF_{92}$ | 16.3 | $X$ | 347.89746 | 242.07788 | 207.58530 | 3.39717 | 0.0600680 | 0.21591972 | 2.7517428 | 21 | — | — |
| 213728 2002 $VV_{92}$ | 16.1 | $X$ | 190.13837 | 157.14971 | 205.73418 | 6.99781 | 0.1990045 | 0.23428026 | 2.6060270 | 21 | 3 10.3 | 20.5 |
| 213729 2002 $VQ_{117}$ | 17.0 | $X$ | 190.67786 | 219.41577 | 50.50604 | 21.67968 | 0.0521770 | 0.37884163 | 1.8916070 | 21 | — | — |
| 213730 2002 $VT_{123}$ | 16.5 | $X$ | 53.73127 | 311.56054 | 51.23952 | 4.78982 | 0.1132868 | 0.21371860 | 2.7706043 | 21 | — | — |
| 213731 2002 $VM_{124}$ | 16.0 | $X$ | 328.98714 | 267.26191 | 194.15608 | 8.15473 | 0.1107519 | 0.21272387 | 2.7792348 | 21 | — | — |
| 213732 2002 $VS_{125}$ | 15.0 | $X$ | 54.27361 | 136.45355 | 20.14625 | 9.18953 | 0.2490089 | 0.17710511 | 3.1403785 | 21 | 5 3.2 | 18.7 |
| 213733 2002 $VB_{136}$ | 16.1 | $X$ | 202.84190 | 45.32761 | 26.48193 | 5.36406 | 0.1422914 | 0.18994925 | 2.9971673 | 21 | 6 17.8 | 20.9 |
| 213734 2002 $VC_{136}$ | 14.9 | $X$ | 222.99873 | 191.72436 | 254.95445 | 16.99591 | 0.2368037 | 0.19588655 | 2.9362947 | 21 | 7 15.5 | 20.0 |
| 213735 2002 $VL_{142}$ | 16.5 | $X$ | 34.60263 | 254.10513 | 143.59796 | 2.91635 | 0.1057455 | 0.21522011 | 2.7577030 | 21 | — | — |
| 213736 2002 $VQ_{145}$ | 16.7 | $X$ | 5.49239 | 269.55517 | 116.22618 | 0.52481 | 0.0799973 | 0.20946803 | 2.8079598 | 21 | 11 30.7 | 20.3 |
| 213737 2002 $WA_{2}$ | 16.7 | $X$ | 198.81173 | 170.82205 | 191.26966 | 2.43007 | 0.2008172 | 0.23516708 | 2.5994714 | 21 | 3 17.9 | 20.9 |
| 213738 2002 $WA_{4}$ | 16.2 | $X$ | 177.96338 | 139.87103 | 216.92226 | 4.47557 | 0.1499510 | 0.22998349 | 2.6383856 | 21 | 2 18.8 | 20.4 |
| 213739 2002 $WR_{6}$ | 15.6 | $X$ | 97.23848 | 224.61379 | 33.07546 | 6.79411 | 0.0173917 | 0.20256927 | 2.8713558 | 21 | 10 10.8 | 19.6 |
| 213740 2002 $WY_{21}$ | 16.1 | $X$ | 235.50293 | 194.05422 | 112.42944 | 4.90697 | 0.0823583 | 0.23112445 | 2.6296954 | 21 | 2 16.1 | 19.9 |
| 213741 2002 $WR_{28}$ | 16.1 | $X$ | 302.21291 | 301.54087 | 201.21817 | 4.38358 | 0.0370751 | 0.21611782 | 2.7500610 | 21 | — | — |
| 213742 2002 $WC_{29}$ | 16.2 | $X$ | 306.35988 | 82.79775 | 36.30631 | 4.92050 | 0.0229428 | 0.21221994 | 2.7836327 | 21 | — | — |
| 213743 2002 $XL_{3}$ | 15.7 | $X$ | 216.86916 | 213.27522 | 216.29460 | 8.48149 | 0.0842221 | 0.19071526 | 2.9891366 | 21 | 7 1.7 | 20.3 |
| 213744 2002 $XT_{10}$ | 15.7 | $X$ | 91.64893 | 136.44057 | 207.66284 | 7.00241 | 0.0318993 | 0.21344709 | 2.7729533 | 21 | — | — |
| 213745 2002 $XD_{46}$ | 16.9 | $X$ | 81.41407 | 272.66552 | 99.44225 | 24.91060 | 0.1915241 | 0.37415871 | 1.9073577 | 21 | — | — |
| 213746 2002 $XX_{47}$ | 16.3 | $X$ | 53.77900 | 16.97395 | 31.53678 | 5.61048 | 0.1460556 | 0.21741010 | 2.7391527 | 21 | — | — |
| 213747 2002 $XR_{48}$ | 15.8 | $X$ | 305.11382 | 90.46689 | 66.50860 | 12.35582 | 0.0247255 | 0.21633302 | 2.7482370 | 21 | — | — |
| 213748 2002 $XE_{50}$ | 15.6 | $X$ | 244.50663 | 262.34408 | 63.13826 | 11.97298 | 0.1696897 | 0.23501702 | 2.6005777 | 21 | 3 20.4 | 19.9 |
| 213749 2002 $XB_{62}$ | 15.6 | $X$ | 266.16446 | 244.06361 | 59.63907 | 28.20708 | 0.2153091 | 0.23631766 | 2.5910269 | 21 | 3 21.7 | 20.3 |
| 213750 2002 $XE_{66}$ | 15.0 | $X$ | 112.48638 | 82.03586 | 46.76589 | 26.04604 | 0.3079012 | 0.17533668 | 3.1614589 | 21 | 6 13.1 | 20.5 |
| 213751 2002 $XS_{66}$ | 16.0 | $X$ | 263.76083 | 67.72645 | 253.57846 | 3.88293 | 0.3131057 | 0.24013224 | 2.5635143 | 21 | 3 12.8 | 20.5 |
| 213752 2002 $XM_{79}$ | 15.4 | $X$ | 212.71520 | 30.19667 | 63.93186 | 5.74057 | 0.2049751 | 0.18988330 | 2.9978613 | 21 | 7 22.6 | 20.5 |
| 213753 2002 $XX_{115}$ | 15.5 | $X$ | 269.50988 | 0.65146 | 30.51349 | 7.11283 | 0.0927121 | 0.18239994 | 3.0793065 | 21 | 7 15.8 | 19.9 |
| 213754 2002 $YX_{18}$ | 15.7 | $X$ | 13.87246 | 329.93926 | 101.44629 | 9.23800 | 0.2179625 | 0.21348324 | 2.7726403 | 21 | — | — |
| 213755 2003 $AM_{2}$ | 16.6 | $X$ | 127.51970 | 344.53800 | 273.99168 | 17.54870 | 0.0561807 | 0.36014998 | 1.9565027 | 21 | 12 17.2 | 18.8 |
| 213756 2003 $AX_{23}$ | 15.7 | $X$ | 146.53397 | 346.79969 | 98.68654 | 9.02399 | 0.2922145 | 0.18091344 | 3.0961512 | 21 | 5 24.1 | 21.2 |
| 213757 2003 $AA_{50}$ | 14.9 | $X$ | 89.19239 | 31.29490 | 102.69659 | 17.39164 | 0.0864689 | 0.17591463 | 3.1545306 | 21 | 5 9.4 | 19.6 |
| 213758 2003 $AB_{51}$ | 15.7 | $X$ | 161.62786 | 185.25995 | 340.15943 | 2.96884 | 0.1426682 | 0.18917134 | 3.0053784 | 21 | 9 2.6 | 20.6 |
| 213759 2003 $AE_{60}$ | 15.2 | $X$ | 140.67237 | 282.83526 | 104.77533 | 13.61754 | 0.2764017 | 0.22373467 | 2.6872858 | 21 | 3 12.1 | 19.8 |
| 213760 2003 $AE_{65}$ | 15.7 | $X$ | 127.17357 | 335.86049 | 44.11704 | 10.16939 | 0.2897087 | 0.22359092 | 2.6884375 | 21 | 2 19.8 | 20.0 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213761 2003 $AB_{66}$ | 15.4 | $X$ | 129.32850 | 338.80078 | 58.87944 | 10.42044 | 0.3181813 | 0.22599603 | 2.6693294 | 21 | 3 18.1 | 19.9 |
| 213762 2003 $AW_{66}$ | 15.3 | $X$ | 172.29788 | 30.62936 | 72.47499 | 13.15343 | 0.1587126 | 0.18364407 | 3.0653832 | 21 | 6 27.9 | 20.3 |
| 213763 2003 $AX_{79}$ | 14.8 | $X$ | 152.61778 | 61.97394 | 80.03921 | 17.46093 | 0.2850910 | 0.18268894 | 3.0760582 | 21 | 8 4.2 | 20.5 |
| 213764 2003 $AQ_{80}$ | 15.5 | $X$ | 83.91751 | 105.77484 | 54.27234 | 21.85309 | 0.2082293 | 0.17380503 | 3.1800051 | 21 | 6 12.5 | 20.2 |
| 213765 2003 $BD_{25}$ | 14.3 | $X$ | 77.36578 | 280.45049 | 301.69627 | 20.32127 | 0.2191150 | 0.17971931 | 3.1098508 | 21 | 8 20.3 | 19.0 |
| 213766 2003 $BS_{53}$ | 15.1 | $X$ | 70.80129 | 283.19284 | 294.60312 | 14.63788 | 0.1904751 | 0.18006503 | 3.1058690 | 21 | 8 6.7 | 19.4 |
| 213767 2003 $CF_{19}$ | 15.3 | $X$ | 150.95302 | 2.34062 | 140.34860 | 10.21182 | 0.0984020 | 0.18289036 | 3.0737993 | 21 | 7 23.9 | 20.1 |
| 213768 2003 $CK_{20}$ | 15.8 | $X$ | 176.77540 | 262.23021 | 190.93306 | 4.68490 | 0.1557306 | 0.18085588 | 3.0968081 | 21 | 6 20.2 | 20.9 |
| 213769 2003 $CJ_{25}$ | 15.7 | $X$ | 89.11807 | 38.56647 | 183.99788 | 19.04693 | 0.1773997 | 0.18013676 | 3.1050445 | 21 | 9 1.9 | 20.5 |
| 213770 Fignon | 15.9 | $X$ | 136.92753 | 124.30066 | 97.10331 | 7.81785 | 0.1662194 | 0.19263612 | 2.9692327 | 21 | 10 21.8 | 20.9 |
| 213771 Johndee | 15.9 | $X$ | 97.67429 | 4.77015 | 150.03719 | 1.53760 | 0.1525844 | 0.17511195 | 3.1641631 | 21 | 6 17.7 | 20.4 |
| 213772 2003 $DF_{13}$ | 15.3 | $X$ | 51.36625 | 58.51323 | 150.15698 | 6.02456 | 0.1080573 | 0.17488188 | 3.1669376 | 21 | 6 18.9 | 19.4 |
| 213773 2003 $DL_{13}$ | 14.9 | $X$ | 74.75094 | 263.68662 | 307.60653 | 14.19190 | 0.1701995 | 0.17822673 | 3.1271892 | 21 | 8 2.8 | 19.3 |
| 213774 2003 $DK_{15}$ | 14.8 | $X$ | 199.27099 | 54.42331 | 23.24067 | 26.47929 | 0.1182665 | 0.18055536 | 3.1002434 | 21 | 6 19.4 | 20.2 |
| 213775 2003 $DK_{17}$ | 15.5 | $X$ | 95.29208 | 36.88299 | 137.78505 | 12.95799 | 0.0772342 | 0.17710606 | 3.1403672 | 21 | 6 29.8 | 20.1 |
| 213776 2003 $DZ_{18}$ | 15.0 | $X$ | 191.06364 | 273.32228 | 138.00660 | 16.00280 | 0.1489132 | 0.17768767 | 3.1335108 | 21 | 5 18.3 | 20.4 |
| 213777 2003 $EN_{10}$ | 15.2 | $X$ | 95.08623 | 288.54455 | 242.50404 | 3.75944 | 0.1252708 | 0.17570924 | 3.1569884 | 21 | 7 1.1 | 19.7 |
| 213778 2003 $EE_{12}$ | 15.3 | $X$ | 166.19856 | 303.04881 | 162.30413 | 13.36035 | 0.1044915 | 0.17859607 | 3.1228763 | 21 | 6 24.4 | 20.4 |
| 213779 2003 $EP_{14}$ | 15.4 | $X$ | 161.22136 | 51.44170 | 123.06280 | 10.76737 | 0.0878105 | 0.18701432 | 3.0284435 | 21 | 9 16.0 | 20.1 |
| 213780 2003 $EW_{37}$ | 14.9 | $X$ | 94.25104 | 144.66098 | 41.55350 | 18.34300 | 0.1230007 | 0.17698118 | 3.1418442 | 21 | 7 23.6 | 19.8 |
| 213781 2003 $EB_{52}$ | 15.0 | $X$ | 82.72730 | 179.61552 | 11.01736 | 17.46730 | 0.1363510 | 0.17536607 | 3.1611056 | 21 | 7 17.5 | 19.8 |
| 213782 2003 $EV_{59}$ | 14.7 | $X$ | 99.98092 | 148.51748 | 45.45215 | 20.06181 | 0.0870064 | 0.17855368 | 3.1233705 | 21 | 8 7.9 | 19.6 |
| 213783 2003 $FF$ | 16.1 | $X$ | 92.69079 | 107.68370 | 28.49328 | 6.24311 | 0.1322631 | 0.17221924 | 3.1994962 | 21 | 5 15.4 | 20.7 |
| 213784 2003 $FY_{4}$ | 15.4 | $X$ | 111.62515 | 348.00647 | 180.90502 | 18.68795 | 0.0559862 | 0.17594266 | 3.1541956 | 21 | 7 7.7 | 20.3 |
| 213785 2003 $FZ_{4}$ | 15.1 | $X$ | 44.92001 | 224.81611 | 28.55360 | 14.72073 | 0.1604895 | 0.17745341 | 3.1362679 | 21 | 8 22.4 | 19.3 |
| 213786 2003 $FJ_{5}$ | 14.7 | $X$ | 5.33294 | 246.63890 | 18.73790 | 13.64885 | 0.1294130 | 0.17395900 | 3.1781284 | 21 | 6 19.5 | 18.7 |
| 213787 2003 $FC_{11}$ | 15.3 | $X$ | 145.28629 | 305.46925 | 178.53877 | 11.00014 | 0.1190079 | 0.17530871 | 3.1617951 | 21 | 6 26.4 | 20.4 |
| 213788 2003 $FF_{11}$ | 15.8 | $X$ | 24.64391 | 129.24198 | 179.41955 | 11.91548 | 0.2157684 | 0.17992475 | 3.1074831 | 21 | 10 3.4 | 19.2 |
| 213789 2003 $FF_{27}$ | 15.7 | $X$ | 319.29960 | 136.19832 | 196.34290 | 4.20751 | 0.1079042 | 0.17728187 | 3.1382907 | 21 | 7 4.4 | 19.8 |
| 213790 2003 $FG_{31}$ | 15.4 | $X$ | 15.97450 | 146.85062 | 178.53967 | 4.82245 | 0.0751281 | 0.18426698 | 3.0584710 | 21 | 9 24.4 | 19.1 |
| 213791 2003 $FP_{31}$ | 15.9 | $X$ | 36.71259 | 51.35506 | 178.00318 | 5.30244 | 0.0654563 | 0.17315677 | 3.1879370 | 21 | 6 19.3 | 20.1 |
| 213792 2003 $FJ_{42}$ | 14.4 | $X$ | 21.93766 | 248.51239 | 9.16416 | 22.04774 | 0.1003795 | 0.17580375 | 3.1558569 | 21 | 7 12.4 | 18.8 |
| 213793 2003 $FT_{43}$ | 15.1 | $X$ | 324.04743 | 264.18310 | 24.31446 | 5.02409 | 0.1073047 | 0.16908004 | 3.2389767 | 21 | 5 14.5 | 19.4 |
| 213794 2003 $FT_{51}$ | 15.5 | $X$ | 55.21005 | 198.46223 | 27.78315 | 11.24637 | 0.1690412 | 0.17411593 | 3.1762186 | 21 | 7 30.7 | 19.8 |
| 213795 2003 $FA_{58}$ | 15.3 | $X$ | 27.70597 | 162.41164 | 133.91381 | 4.03858 | 0.0857775 | 0.18133146 | 3.0913911 | 21 | 9 5.5 | 19.2 |
| 213796 2003 $FH_{90}$ | 15.2 | $X$ | 52.46967 | 3.07884 | 234.88951 | 9.64879 | 0.1599716 | 0.17547821 | 3.1597587 | 21 | 8 1.9 | 19.5 |
| 213797 2003 $FN_{95}$ | 15.1 | $X$ | 81.35360 | 21.65016 | 224.93748 | 9.08924 | 0.0491284 | 0.18269379 | 3.0760037 | 21 | 9 4.4 | 19.5 |
| 213798 2003 $FK_{100}$ | 15.3 | $X$ | 129.12455 | 12.17474 | 124.03711 | 6.76225 | 0.0960483 | 0.17462939 | 3.1699895 | 21 | 6 23.1 | 20.1 |
| 213799 2003 $FK_{116}$ | 15.3 | $X$ | 50.52669 | 40.80167 | 154.75444 | 6.90930 | 0.1099616 | 0.17125543 | 3.2114893 | 21 | 6 1.8 | 19.5 |
| 213800 Stefanwul | 15.3 | $X$ | 113.70988 | 76.92349 | 102.64858 | 11.48310 | 0.0549045 | 0.17813238 | 3.1282933 | 21 | 7 26.0 | 19.8 |
| 213801 2003 $GZ_{7}$ | 14.8 | $X$ | 350.27577 | 90.02134 | 181.49984 | 14.76826 | 0.0346792 | 0.17197545 | 3.2025192 | 21 | 6 7.9 | 19.4 |
| 213802 2003 $GP_{14}$ | 15.7 | $X$ | 88.36601 | 134.73149 | 30.22913 | 14.24303 | 0.1741060 | 0.17315583 | 3.1879486 | 21 | 6 21.5 | 20.5 |
| 213803 2003 $GC_{17}$ | 14.8 | $X$ | 145.85103 | 48.98234 | 63.96401 | 18.03525 | 0.3744729 | 0.17773456 | 3.1329596 | 21 | 6 25.7 | 20.7 |
| 213804 2003 $GE_{17}$ | 14.4 | $X$ | 83.52539 | 26.46994 | 162.21626 | 29.50914 | 0.1562921 | 0.17230541 | 3.1984295 | 21 | 7 14.3 | 19.5 |
| 213805 2003 $GP_{22}$ | 14.5 | $X$ | 38.80839 | 119.29925 | 149.02219 | 26.38228 | 0.2618346 | 0.17610883 | 3.1522112 | 21 | 9 11.8 | 18.4 |
| 213806 2003 $GT_{35}$ | 15.6 | $X$ | 93.31969 | 106.43505 | 85.28793 | 11.92442 | 0.1734227 | 0.17668290 | 3.1453793 | 21 | 8 2.9 | 20.4 |
| 213807 2003 $GY_{41}$ | 15.3 | $X$ | 95.88442 | 113.05136 | 53.05103 | 16.51024 | 0.1686590 | 0.17546040 | 3.1599725 | 21 | 7 1.5 | 20.1 |
| 213808 2003 $HO_{10}$ | 17.2 | $X$ | 180.66952 | 111.55515 | 177.43504 | 7.93390 | 0.1948266 | 0.30492192 | 2.1861349 | 21 | — | — |
| 213809 2003 $HA_{15}$ | 15.2 | $X$ | 13.97168 | 166.09776 | 105.22083 | 6.41514 | 0.1794318 | 0.17210724 | 3.2008842 | 21 | 7 17.5 | 18.6 |
| 213810 2003 $HG_{42}$ | 15.2 | $X$ | 106.10486 | 42.05780 | 139.31887 | 11.59494 | 0.0967405 | 0.17496443 | 3.1659414 | 21 | 7 23.1 | 19.9 |
| 213811 2003 $MA_{4}$ | 16.2 | $X$ | 50.32954 | 115.09046 | 233.87268 | 4.33063 | 0.1815565 | 0.28542904 | 2.2845672 | 21 | — | — |
| 213812 2003 $NE$ | 16.9 | $X$ | 167.79111 | 231.24751 | 117.49782 | 7.80787 | 0.3262790 | 0.30214771 | 2.1994960 | 21 | 2 5.9 | 20.4 |
| 213813 2003 $PW_{12}$ | 16.7 | $X$ | 332.65036 | 254.97713 | 126.60850 | 3.38315 | 0.1822651 | 0.27752307 | 2.3277517 | 21 | 10 19.6 | 18.3 |
| 213814 2003 $QY_{18}$ | 17.1 | $X$ | 329.86971 | 227.01403 | 148.89741 | 2.40061 | 0.2221659 | 0.27525669 | 2.3405116 | 21 | 9 29.6 | 18.4 |
| 213815 2003 $QB_{20}$ | 16.3 | $X$ | 67.50124 | 236.65266 | 132.57806 | 7.29123 | 0.1979545 | 0.28903703 | 2.2655156 | 21 | — | — |
| 213816 2003 $QQ_{21}$ | 16.3 | $X$ | 133.06712 | 202.22028 | 102.14134 | 5.64273 | 0.1221840 | 0.29085154 | 2.2560833 | 21 | — | — |
| 213817 2003 $QF_{24}$ | 16.8 | $X$ | 83.98629 | 221.16311 | 166.65570 | 7.31583 | 0.1460626 | 0.29538168 | 2.2329569 | 21 | — | — |
| 213818 2003 $QV_{26}$ | 16.3 | $X$ | 40.70496 | 358.61715 | 338.89025 | 5.19176 | 0.1893507 | 0.28012325 | 2.3133248 | 21 | 12 18.1 | 19.3 |
| 213819 2003 $QG_{32}$ | 16.8 | $X$ | 301.21956 | 36.97531 | 332.28536 | 6.40138 | 0.1225822 | 0.27105468 | 2.3646386 | 21 | 7 28.8 | 19.2 |
| 213820 2003 $QG_{49}$ | 16.9 | $X$ | 167.95944 | 286.51975 | 353.05619 | 7.10234 | 0.1215003 | 0.29484954 | 2.2356428 | 21 | — | — |
| 213821 2003 $QO_{52}$ | 17.0 | $X$ | 68.70660 | 295.47470 | 4.96648 | 4.55116 | 0.2335189 | 0.28372025 | 2.2937310 | 21 | 12 6.3 | 20.4 |
| 213822 2003 $QZ_{55}$ | 16.6 | $X$ | 23.88909 | 261.52057 | 119.83039 | 6.35966 | 0.1852970 | 0.28392986 | 2.2926020 | 21 | — | — |
| 213823 2003 $QT_{62}$ | 16.6 | $X$ | 129.87971 | 167.65764 | 136.48293 | 8.04157 | 0.1658127 | 0.29120946 | 2.2542343 | 21 | — | — |
| 213824 2003 $QD_{63}$ | 16.9 | $X$ | 13.81792 | 230.28246 | 132.18872 | 3.64615 | 0.1674625 | 0.27950045 | 2.3167600 | 21 | 12 11.3 | 19.4 |
| 213825 2003 $QW_{63}$ | 16.1 | $X$ | 334.70565 | 332.51139 | 38.14431 | 5.73977 | 0.2450191 | 0.27252681 | 2.3561154 | 21 | 10 4.7 | 17.2 |
| 213826 2003 $QK_{65}$ | 15.3 | $X$ | 129.78018 | 316.06588 | 1.22423 | 9.95402 | 0.0813870 | 0.18216243 | 3.0819826 | 21 | — | — |
| 213827 2003 $QN_{75}$ | 16.5 | $X$ | 121.16072 | 88.12338 | 249.06032 | 3.14002 | 0.1901721 | 0.29406905 | 2.2395968 | 21 | — | — |
| 213828 2003 $QU_{75}$ | 16.6 | $X$ | 130.44972 | 133.59808 | 213.36761 | 4.85213 | 0.1965415 | 0.29639288 | 2.2278753 | 21 | — | — |
| 213829 2003 $QN_{76}$ | 16.7 | $X$ | 170.39134 | 82.31633 | 231.52079 | 3.23515 | 0.2049170 | 0.29896688 | 2.2150694 | 21 | — | — |
| 213830 2003 $QY_{84}$ | 17.2 | $X$ | 41.57039 | 140.35070 | 230.79720 | 1.93236 | 0.1669051 | 0.28631589 | 2.2798472 | 21 | — | — |
| 213831 2003 $QG_{92}$ | 16.8 | $X$ | 16.00203 | 151.82203 | 190.03946 | 6.03552 | 0.1447018 | 0.27771463 | 2.3266812 | 21 | 11 11.9 | 19.2 |
| 213832 2003 $QM_{94}$ | 16.7 | $X$ | 194.90194 | 181.42399 | 102.24143 | 7.45717 | 0.1826175 | 0.29993637 | 2.2102936 | 21 | — | — |
| 213833 2003 $QN_{101}$ | 16.5 | $X$ | 2.29160 | 34.90442 | 351.12690 | 6.56241 | 0.1351059 | 0.28153826 | 2.3055671 | 21 | 12 21.1 | 19.0 |
| 213834 2003 $QD_{103}$ | 16.0 | $X$ | 200.97806 | 257.89502 | 140.25176 | 2.83053 | 0.0938055 | 0.20499437 | 2.8486653 | 21 | 5 7.0 | 20.3 |
| 213835 2003 $QZ_{110}$ | 17.3 | $X$ | 175.17732 | 307.43540 | 25.02281 | 5.90391 | 0.1838087 | 0.30243069 | 2.1981238 | 21 | 1 11.8 | 20.5 |
| 213836 2003 $RQ_{12}$ | 17.0 | $X$ | 261.04945 | 276.06421 | 135.24300 | 2.79683 | 0.2002156 | 0.26824496 | 2.3811221 | 21 | 7 16.1 | 20.0 |
| 213837 2003 $RR_{15}$ | 15.7 | $X$ | 149.11587 | 300.44036 | 287.59867 | 23.48958 | 0.0957337 | 0.27978122 | 2.3152098 | 21 | 11 11.8 | 19.6 |
| 213838 2003 $RF_{27}$ | 17.3 | $X$ | 173.19439 | 95.00213 | 210.37876 | 2.38104 | 0.1928702 | 0.29674694 | 2.2261028 | 21 | — | — |
| 213839 2003 $SM_{3}$ | 16.9 | $X$ | 126.45968 | 80.79138 | 202.17317 | 2.95887 | 0.1618441 | 0.28665349 | 2.2780569 | 21 | — | — |
| 213840 2003 $SU_{5}$ | 16.9 | $X$ | 347.36364 | 158.21958 | 200.27903 | 4.07364 | 0.2393066 | 0.27528514 | 2.3403503 | 21 | 10 19.9 | 18.1 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213841 2003 $SV_{7}$ | 16.8 | $X$ | 356.79975 | 135.85494 | 253.19568 | 3.05852 | 0.1124357 | 0.28059970 | 2.3107054 | 21 | 12 12.6 | 18.8 |
| 213842 2003 $SM_{8}$ | 17.5 | $X$ | 182.94927 | 264.00547 | 196.53389 | 2.82485 | 0.1086557 | 0.26275249 | 2.4141903 | 21 | 7 4.6 | 21.2 |
| 213843 2003 $SE_{13}$ | 17.1 | $X$ | 274.52978 | 288.13671 | 133.80265 | 1.65788 | 0.1735981 | 0.27127495 | 2.3633584 | 21 | 8 23.4 | 19.9 |
| 213844 2003 $SU_{27}$ | 16.7 | $X$ | 86.10889 | 13.31223 | 332.26366 | 4.98271 | 0.1247352 | 0.28823147 | 2.2697348 | 21 | — | — |
| 213845 2003 $SC_{50}$ | 16.7 | $X$ | 285.07062 | 178.69536 | 211.62142 | 5.64687 | 0.2190558 | 0.26943606 | 2.3740994 | 21 | 7 14.2 | 19.7 |
| 213846 2003 $SA_{52}$ | 16.8 | $X$ | 311.63197 | 300.23324 | 98.11532 | 3.60521 | 0.0896608 | 0.27357928 | 2.3500688 | 21 | 10 5.7 | 19.1 |
| 213847 2003 $SP_{52}$ | 16.3 | $X$ | 293.00822 | 221.54198 | 160.88392 | 6.24016 | 0.1170202 | 0.26840764 | 2.3801599 | 21 | 8 2.3 | 19.1 |
| 213848 2003 $ST_{54}$ | 16.3 | $X$ | 187.33043 | 127.92656 | 300.28448 | 5.58722 | 0.1055157 | 0.25968101 | 2.4331894 | 21 | 5 26.4 | 19.9 |
| 213849 2003 $SF_{55}$ | 16.5 | $X$ | 219.81922 | 237.50485 | 186.33358 | 21.55769 | 0.3369247 | 0.26091131 | 2.4255345 | 21 | 6 13.5 | 21.4 |
| 213850 2003 $SZ_{55}$ | 17.0 | $X$ | 194.22069 | 52.37808 | 214.03968 | 5.16645 | 0.1603810 | 0.29577277 | 2.2309881 | 21 | — | — |
| 213851 2003 $SE_{61}$ | 16.4 | $X$ | 344.81352 | 251.57732 | 136.00885 | 6.85978 | 0.1121999 | 0.27903601 | 2.3193300 | 21 | 11 21.1 | 18.7 |
| 213852 2003 $SY_{70}$ | 14.9 | $X$ | 27.48988 | 212.00598 | 244.61708 | 9.29022 | 0.2135058 | 0.18266909 | 3.0762811 | 21 | — | — |
| 213853 2003 $SG_{81}$ | 16.7 | $X$ | 56.86419 | 312.45691 | 32.08539 | 4.92687 | 0.1374405 | 0.28245368 | 2.3005829 | 21 | — | — |
| 213854 2003 $SK_{88}$ | 17.0 | $X$ | 84.08474 | 154.39297 | 180.25317 | 1.23448 | 0.0737977 | 0.28586960 | 2.2822194 | 21 | — | — |
| 213855 2003 $SK_{103}$ | 15.3 | $X$ | 119.14912 | 353.84208 | 6.25633 | 12.41532 | 0.0765415 | 0.18329110 | 3.0693174 | 21 | — | — |
| 213856 2003 $SA_{104}$ | 16.6 | $X$ | 208.86442 | 38.08504 | 16.77650 | 5.31859 | 0.1982483 | 0.25854701 | 2.4402990 | 21 | 5 28.6 | 20.6 |
| 213857 2003 $SH_{116}$ | 16.3 | $X$ | 147.70629 | 350.72073 | 69.21752 | 9.20593 | 0.1948618 | 0.25194500 | 2.4827456 | 21 | 4 15.7 | 20.3 |
| 213858 2003 $SZ_{120}$ | 16.6 | $X$ | 261.22944 | 345.86919 | 81.27956 | 7.08376 | 0.1369754 | 0.27045274 | 2.3681459 | 21 | 8 20.6 | 19.6 |
| 213859 2003 $SG_{127}$ | 16.3 | $X$ | 282.04878 | 299.18273 | 105.49281 | 6.77344 | 0.0942004 | 0.26986295 | 2.3715951 | 21 | 8 25.3 | 19.0 |
| 213860 2003 $SU_{131}$ | 17.2 | $X$ | 128.72930 | 278.52953 | 195.27030 | 5.40280 | 0.1465391 | 0.25377027 | 2.4708263 | 21 | 5 28.3 | 20.7 |
| 213861 2003 $SX_{133}$ | 17.0 | $X$ | 247.75877 | 353.37748 | 53.84256 | 2.41508 | 0.1726223 | 0.26501573 | 2.4004258 | 21 | 6 28.8 | 20.4 |
| 213862 2003 $SL_{147}$ | 16.5 | $X$ | 336.11154 | 68.45242 | 316.91694 | 2.21233 | 0.2268198 | 0.27323621 | 2.3520356 | 21 | 11 1.2 | 18.0 |
| 213863 2003 $SZ_{148}$ | 16.2 | $X$ | 358.70249 | 317.92182 | 21.94367 | 7.25286 | 0.1410782 | 0.27299836 | 2.3534015 | 21 | 10 5.6 | 18.1 |
| 213864 2003 $SQ_{150}$ | 16.3 | $X$ | 34.68941 | 306.36732 | 69.84469 | 7.35541 | 0.1236087 | 0.28426505 | 2.2907995 | 21 | — | — |
| 213865 2003 $SJ_{156}$ | 16.7 | $X$ | 255.40034 | 110.80031 | 292.18164 | 0.62723 | 0.1719922 | 0.26492415 | 2.4009789 | 21 | 7 1.8 | 20.1 |
| 213866 2003 $ST_{157}$ | 16.4 | $X$ | 296.27279 | 28.91596 | 0.85736 | 2.75175 | 0.1707739 | 0.26898568 | 2.3767488 | 21 | 8 11.9 | 18.9 |
| 213867 2003 $SA_{163}$ | 16.9 | $X$ | 73.08426 | 167.36842 | 174.98062 | 2.11861 | 0.1457814 | 0.28467709 | 2.2885884 | 21 | — | — |
| 213868 2003 $SQ_{165}$ | 15.9 | $X$ | 76.36320 | 260.96037 | 188.32146 | 26.66716 | 0.2390691 | 0.24014780 | 2.5634035 | 21 | 2 24.1 | 19.0 |
| 213869 2003 $SG_{170}$ | 17.7 | $X$ | 306.28157 | 309.28405 | 199.25118 | 37.00106 | 0.6036423 | 0.38877000 | 1.8592633 | 21 | — | — |
| 213870 2003 $SQ_{173}$ | 16.8 | $X$ | 222.45974 | 208.51501 | 221.87977 | 4.06198 | 0.1301404 | 0.26379038 | 2.4078536 | 21 | 7 5.8 | 20.3 |
| 213871 2003 $SE_{179}$ | 16.7 | $X$ | 214.57812 | 326.59084 | 94.36835 | 3.99734 | 0.1727351 | 0.26132524 | 2.4229724 | 21 | 6 12.9 | 20.6 |
| 213872 2003 $SX_{188}$ | 16.3 | $X$ | 323.60866 | 253.43481 | 139.23618 | 6.68188 | 0.1395749 | 0.27466649 | 2.3438632 | 21 | 10 18.4 | 18.4 |
| 213873 2003 $SN_{206}$ | 16.7 | $X$ | 316.05381 | 202.13313 | 223.77295 | 4.56485 | 0.0821987 | 0.27825473 | 2.3236694 | 21 | 11 22.9 | 18.8 |
| 213874 2003 $SO_{213}$ | 16.3 | $X$ | 179.34950 | 50.28744 | 24.14160 | 4.88904 | 0.1304268 | 0.25630674 | 2.4544981 | 21 | 5 26.8 | 20.0 |
| 213875 2003 $SA_{225}$ | 16.4 | $X$ | 206.54442 | 340.14703 | 91.27688 | 2.23112 | 0.1774975 | 0.25926021 | 2.4358215 | 21 | 6 18.7 | 20.2 |
| 213876 2003 $SO_{246}$ | 17.2 | $X$ | 192.18983 | 73.29902 | 217.75760 | 2.08094 | 0.1502559 | 0.29713636 | 2.2241574 | 21 | — | — |
| 213877 2003 $SH_{248}$ | 16.8 | $X$ | 9.21393 | 344.61871 | 2.56833 | 3.04528 | 0.0932684 | 0.27555339 | 2.3388312 | 21 | 10 28.9 | 19.2 |
| 213878 2003 $SB_{249}$ | 16.9 | $X$ | 207.81513 | 350.84483 | 68.02275 | 1.52500 | 0.2140973 | 0.25853265 | 2.4403893 | 21 | 6 2.4 | 21.0 |
| 213879 2003 $SC_{249}$ | 17.1 | $X$ | 185.49049 | 114.46588 | 192.77944 | 3.95285 | 0.1737882 | 0.29794990 | 2.2201069 | 21 | — | — |
| 213880 2003 $SM_{249}$ | 16.7 | $X$ | 266.38941 | 353.27170 | 59.87135 | 2.08769 | 0.1813322 | 0.26655734 | 2.3911617 | 21 | 7 29.1 | 19.7 |
| 213881 2003 $SO_{249}$ | 16.7 | $X$ | 315.86660 | 340.04095 | 26.67241 | 4.44400 | 0.1519728 | 0.26919370 | 2.3755242 | 21 | 8 17.9 | 18.8 |
| 213882 2003 $SQ_{250}$ | 16.3 | $X$ | 286.62446 | 346.07519 | 34.05115 | 8.04928 | 0.2430926 | 0.26554503 | 2.3972349 | 21 | 6 29.2 | 19.4 |
| 213883 2003 $SU_{263}$ | 16.6 | $X$ | 224.07284 | 15.06144 | 30.98369 | 7.12826 | 0.1104947 | 0.26086889 | 2.4257974 | 21 | 6 5.7 | 20.1 |
| 213884 2003 $SX_{269}$ | 17.5 | $X$ | 111.96303 | 205.70908 | 130.59526 | 6.65555 | 0.1501137 | 0.29012538 | 2.2598463 | 21 | — | — |
| 213885 2003 $SU_{270}$ | 16.7 | $X$ | 271.75437 | 343.03985 | 47.00559 | 6.72679 | 0.1482219 | 0.26626491 | 2.3929122 | 21 | 7 8.7 | 19.8 |
| 213886 2003 $SM_{271}$ | 17.2 | $X$ | 117.73522 | 260.47114 | 87.80279 | 6.28395 | 0.2130674 | 0.29252489 | 2.2474713 | 21 | — | — |
| 213887 2003 $SV_{275}$ | 17.9 | $X$ | 336.00656 | 203.07057 | 187.34060 | 3.36898 | 0.2402224 | 0.27530109 | 2.3402599 | 21 | 11 14.1 | 19.0 |
| 213888 2003 $SS_{288}$ | 16.9 | $X$ | 287.45798 | 195.02839 | 133.65470 | 5.66307 | 0.1194061 | 0.26146923 | 2.4220828 | 21 | 5 10.3 | 20.0 |
| 213889 2003 $SW_{300}$ | 16.5 | $X$ | 111.08006 | 51.33451 | 230.49002 | 6.28606 | 0.1090532 | 0.28392446 | 2.2926311 | 21 | 12 15.7 | 19.7 |
| 213890 2003 $SX_{303}$ | 16.5 | $X$ | 304.89867 | 247.62652 | 133.23340 | 3.19362 | 0.1733883 | 0.26961444 | 2.3730521 | 21 | 8 12.9 | 18.8 |
| 213891 2003 $SZ_{309}$ | 15.9 | $X$ | 306.52780 | 300.66601 | 159.33551 | 7.81727 | 0.1681796 | 0.22493289 | 2.6777338 | 21 | 12 6.9 | 18.7 |
| 213892 2003 $SH_{334}$ | 17.0 | $X$ | 29.33017 | 97.35805 | 193.76829 | 2.84877 | 0.0682096 | 0.26894640 | 2.3769802 | 21 | 9 5.2 | 19.5 |
| 213893 2003 $TN_{2}$ | 16.7 | $X$ | 139.85028 | 144.14322 | 46.38226 | 2.84340 | 0.1316401 | 0.26771670 | 2.3842534 | 21 | 9 19.2 | 20.2 |
| 213894 2003 $TP_{2}$ | 16.3 | $X$ | 162.07655 | 319.28625 | 76.55654 | 5.56592 | 0.2920848 | 0.24574702 | 2.5243169 | 21 | 4 4.2 | 20.8 |
| 213895 2003 $TF_{6}$ | 16.8 | $X$ | 203.33406 | 198.10142 | 98.17399 | 6.98088 | 0.2613353 | 0.30170002 | 2.2016714 | 21 | — | — |
| 213896 2003 $TL_{55}$ | 17.6 | $X$ | 178.87164 | 358.30471 | 66.61392 | 7.36969 | 0.1174649 | 0.25572535 | 2.4582169 | 21 | 5 15.1 | 21.4 |
| 213897 2003 $UP_{1}$ | 17.1 | $X$ | 359.80240 | 39.90881 | 313.97449 | 2.63561 | 0.0694777 | 0.27454523 | 2.3445533 | 21 | 10 19.6 | 19.7 |
| 213898 2003 $UU_{16}$ | 16.8 | $X$ | 320.53974 | 196.21894 | 175.29457 | 2.48166 | 0.1843087 | 0.26921365 | 2.3754068 | 21 | 8 28.9 | 18.6 |
| 213899 2003 $US_{29}$ | 17.0 | $X$ | 150.65790 | 247.68334 | 73.57534 | 7.58114 | 0.2380556 | 0.29411383 | 2.2393695 | 21 | — | — |
| 213900 2003 $UN_{34}$ | 17.1 | $X$ | 234.24683 | 242.87314 | 218.62467 | 6.91011 | 0.0482448 | 0.27007230 | 2.3703693 | 21 | 9 9.2 | 20.3 |
| 213901 2003 $UR_{48}$ | 16.5 | $X$ | 324.61454 | 305.74745 | 79.05453 | 8.19455 | 0.1250264 | 0.27138466 | 2.3627214 | 21 | 10 9.7 | 18.8 |
| 213902 2003 $UT_{48}$ | 16.5 | $X$ | 81.26097 | 267.71123 | 84.61887 | 8.24967 | 0.1361454 | 0.28564430 | 2.2834194 | 21 | — | — |
| 213903 2003 $UK_{49}$ | 15.6 | $X$ | 267.35955 | 159.19163 | 314.31749 | 9.13978 | 0.1082017 | 0.21922430 | 2.7240198 | 21 | 10 22.8 | 19.5 |
| 213904 2003 $US_{61}$ | 16.7 | $X$ | 6.90419 | 190.38990 | 158.84978 | 7.51041 | 0.1382179 | 0.27580421 | 2.3374130 | 21 | 11 6.9 | 19.1 |
| 213905 2003 $UK_{62}$ | 16.6 | $X$ | 123.79291 | 211.91989 | 109.75744 | 7.46953 | 0.1605619 | 0.29047430 | 2.2580362 | 21 | — | — |
| 213906 2003 $UZ_{64}$ | 16.2 | $X$ | 209.22270 | 0.75368 | 73.73344 | 13.30506 | 0.1354060 | 0.26076560 | 2.4264379 | 21 | 6 26.8 | 19.9 |
| 213907 2003 $US_{65}$ | 16.5 | $X$ | 264.25170 | 273.49542 | 107.18400 | 7.18515 | 0.1371755 | 0.26286710 | 2.4134885 | 21 | 6 16.8 | 19.6 |
| 213908 2003 $UF_{88}$ | 16.9 | $X$ | 79.96388 | 248.66691 | 199.03431 | 9.88205 | 0.2008060 | 0.24118038 | 2.5560817 | 21 | 2 22.2 | 19.8 |
| 213909 2003 $UC_{96}$ | 17.2 | $X$ | 179.48162 | 129.50449 | 167.99984 | 1.78365 | 0.1944257 | 0.29575383 | 2.2310834 | 21 | — | — |
| 213910 2003 $UW_{98}$ | 16.3 | $X$ | 292.71044 | 304.29624 | 108.99511 | 7.56318 | 0.1025221 | 0.26927174 | 2.3750652 | 21 | 9 25.1 | 18.9 |
| 213911 2003 $UV_{101}$ | 16.6 | $X$ | 171.78678 | 226.56470 | 132.73131 | 3.32980 | 0.0937817 | 0.24558030 | 2.5254593 | 21 | 2 11.7 | 20.2 |
| 213912 2003 $UN_{103}$ | 16.9 | $X$ | 318.10377 | 273.68432 | 112.60977 | 4.44541 | 0.1666602 | 0.27104563 | 2.3646912 | 21 | 9 22.5 | 18.9 |
| 213913 2003 $UM_{115}$ | 16.4 | $X$ | 271.33330 | 24.62582 | 3.27384 | 6.09420 | 0.1337027 | 0.26399063 | 2.4066358 | 21 | 7 7.7 | 19.5 |
| 213914 2003 $UQ_{133}$ | 16.4 | $X$ | 222.06316 | 300.19680 | 93.94428 | 6.94586 | 0.1201124 | 0.25711071 | 2.4493787 | 21 | 5 20.6 | 20.0 |
| 213915 2003 $UX_{137}$ | 16.9 | $X$ | 8.53176 | 293.29164 | 66.68264 | 4.04782 | 0.1944727 | 0.27605240 | 2.3360118 | 21 | 12 1.9 | 19.2 |
| 213916 2003 $UW_{149}$ | 16.9 | $X$ | 173.43264 | 158.48247 | 150.49046 | 4.10503 | 0.1592243 | 0.29607888 | 2.2294501 | 21 | — | — |
| 213917 2003 $UD_{150}$ | 17.0 | $X$ | 110.18275 | 170.16951 | 150.71394 | 4.55397 | 0.1575346 | 0.28708271 | 2.2757857 | 21 | — | — |
| 213918 2003 $UK_{174}$ | 17.6 | $X$ | 53.31214 | 141.74034 | 211.75319 | 2.54964 | 0.2599086 | 0.22918460 | 2.6445133 | 21 | — | — |
| 213919 2003 $UL_{178}$ | 16.2 | $X$ | 349.56436 | 324.15057 | 14.10959 | 6.55122 | 0.1376987 | 0.27005624 | 2.3704633 | 21 | 9 14.1 | 18.1 |
| 213920 2003 $UB_{185}$ | 16.8 | $X$ | 123.35572 | 210.82884 | 130.11788 | 2.13662 | 0.2394287 | 0.29216266 | 2.2493286 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 213921 2003 $UN_{185}$ | 16.7 | $X$ | 70.60343 | 41.34371 | 21.95985 | 4.60262 | 0.2062937 | 0.23655833 | 2.5892693 | 21 | 1 6.7 | 19.1 |
| 213922 2003 $UT_{201}$ | 16.7 | $X$ | 58.59164 | 263.18248 | 66.12133 | 3.83466 | 0.1860698 | 0.28034762 | 2.3120903 | 21 | 12 27.6 | 19.9 |
| 213923 2003 $UB_{205}$ | 15.6 | $X$ | 92.75906 | 48.76053 | 357.96734 | 11.27304 | 0.1322933 | 0.18386725 | 3.0629022 | 21 | 1 27.9 | 19.8 |
| 213924 2003 $UD_{218}$ | 15.4 | $X$ | 145.86069 | 161.85747 | 189.50708 | 9.10271 | 0.1447463 | 0.18440648 | 3.0569284 | 21 | 1 18.8 | 20.2 |
| 213925 2003 $UW_{223}$ | 15.5 | $X$ | 142.22868 | 334.18863 | 35.48270 | 9.12447 | 0.2037328 | 0.18464856 | 3.0542559 | 21 | 2 16.9 | 20.5 |
| 213926 2003 $UG_{257}$ | 16.4 | $X$ | 347.97961 | 314.99947 | 62.04829 | 7.83490 | 0.1194885 | 0.27386916 | 2.3484102 | 21 | 11 9.3 | 18.6 |
| 213927 2003 $UW_{265}$ | 16.4 | $X$ | 30.25664 | 214.60123 | 261.87330 | 3.93878 | 0.1749345 | 0.23452709 | 2.6041982 | 21 | — | — |
| 213928 2003 $UY_{273}$ | 16.6 | $X$ | 87.58747 | 278.14627 | 149.52358 | 5.56396 | 0.2643710 | 0.23861373 | 2.5743787 | 21 | 2 21.6 | 19.4 |
| 213929 2003 $UM_{275}$ | 16.7 | $X$ | 181.02271 | 19.70902 | 67.89412 | 7.20131 | 0.0943978 | 0.25700530 | 2.4500484 | 21 | 6 15.2 | 20.1 |
| 213930 2003 $UK_{303}$ | 15.3 | $X$ | 135.23776 | 45.45549 | 312.17889 | 8.41922 | 0.0939392 | 0.18366126 | 3.0651919 | 21 | 1 12.1 | 19.8 |
| 213931 2003 $UN_{314}$ | 16.0 | $X$ | 122.41472 | 298.56821 | 152.43120 | 10.77539 | 0.2007129 | 0.24460322 | 2.5321801 | 21 | 4 30.9 | 19.9 |
| 213932 2003 $UA_{381}$ | 17.4 | $X$ | 88.61166 | 163.25791 | 30.80545 | 9.01640 | 0.0386867 | 0.26365965 | 2.4086495 | 21 | 7 12.8 | 20.6 |
| 213933 2003 $UY_{414}$ | 17.2 | $X$ | 141.42736 | 348.59843 | 126.49338 | 3.24797 | 0.1746753 | 0.25635949 | 2.4541614 | 21 | 6 14.4 | 21.1 |
| 213934 2003 $UN_{415}$ | 16.5 | $X$ | 214.16796 | 239.15375 | 199.12394 | 13.46750 | 0.0454092 | 0.26441008 | 2.4040899 | 21 | 7 11.8 | 20.1 |
| 213935 2003 $VZ_{5}$ | 16.8 | $X$ | 62.61776 | 185.92669 | 51.03217 | 6.16721 | 0.0849908 | 0.26358311 | 2.4091158 | 21 | 8 14.9 | 19.7 |
| 213936 2003 $VL_{7}$ | 17.1 | $X$ | 121.85003 | 122.30611 | 50.96939 | 6.97324 | 0.0367167 | 0.26018581 | 2.4300412 | 21 | 7 29.5 | 20.3 |
| 213937 2003 $WR_{20}$ | 16.6 | $X$ | 88.24598 | 100.70261 | 19.99646 | 8.61410 | 0.0585934 | 0.24579801 | 2.5239678 | 21 | 4 2.7 | 19.7 |
| 213938 2003 $WS_{55}$ | 16.4 | $X$ | 125.93786 | 65.41479 | 5.10893 | 3.20739 | 0.1458800 | 0.24427192 | 2.5344692 | 21 | 3 28.7 | 19.8 |
| 213939 2003 $WW_{64}$ | 16.7 | $X$ | 6.50563 | 75.00303 | 63.88291 | 13.33469 | 0.1977105 | 0.23348541 | 2.6119381 | 21 | — | — |
| 213940 2003 $WN_{72}$ | 16.9 | $X$ | 50.03608 | 132.67813 | 340.95137 | 3.02601 | 0.1756265 | 0.23696838 | 2.5862815 | 21 | 2 3.3 | 19.3 |
| 213941 2003 $WH_{73}$ | 16.4 | $X$ | 29.65808 | 302.71663 | 53.29543 | 7.07699 | 0.2459020 | 0.27725714 | 2.3292399 | 21 | — | — |
| 213942 2003 $WT_{73}$ | 15.4 | $X$ | 22.21530 | 108.83275 | 46.29898 | 25.09664 | 0.2410771 | 0.23620607 | 2.5918430 | 21 | 2 16.1 | 18.3 |
| 213943 2003 $WA_{77}$ | 15.6 | $X$ | 289.87954 | 53.40372 | 66.97966 | 11.76444 | 0.2562968 | 0.21489416 | 2.7604908 | 21 | 11 18.4 | 18.5 |
| 213944 2003 $WS_{80}$ | 16.3 | $X$ | 2.86630 | 196.55412 | 150.38808 | 10.99377 | 0.2480648 | 0.27291239 | 2.3538957 | 21 | 11 13.7 | 18.5 |
| 213945 2003 $WE_{92}$ | 16.7 | $X$ | 326.67930 | 260.35508 | 139.38471 | 3.07874 | 0.1956168 | 0.27211386 | 2.3584985 | 21 | 11 2.4 | 18.2 |
| 213946 2003 $WU_{107}$ | 16.3 | $X$ | 94.93627 | 302.13915 | 139.80197 | 5.45246 | 0.2187023 | 0.24013300 | 2.5635089 | 21 | 3 17.6 | 19.4 |
| 213947 2003 $WV_{116}$ | 16.5 | $X$ | 113.80949 | 94.21052 | 349.95268 | 4.42333 | 0.1388765 | 0.24351230 | 2.5397372 | 21 | 3 30.2 | 19.8 |
| 213948 2003 $WL_{126}$ | 16.4 | $X$ | 358.49784 | 92.19503 | 351.25839 | 3.75955 | 0.3887857 | 0.22433393 | 2.6824980 | 21 | — | — |
| 213949 2003 $WJ_{127}$ | 16.2 | $X$ | 343.10792 | 66.82445 | 68.01744 | 12.93389 | 0.2348490 | 0.22569631 | 2.6716921 | 21 | — | — |
| 213950 2003 $WB_{136}$ | 16.5 | $X$ | 118.04376 | 27.24114 | 59.21682 | 6.46416 | 0.1712338 | 0.24416915 | 2.5351803 | 21 | 4 14.9 | 20.1 |
| 213951 2003 $WK_{167}$ | 16.4 | $X$ | 233.39791 | 322.48641 | 135.51484 | 7.60049 | 0.0797648 | 0.26671758 | 2.3902040 | 21 | 9 2.7 | 19.6 |
| 213952 2003 $WT_{193}$ | 16.8 | $X$ | 23.39255 | 256.67579 | 245.05699 | 2.95435 | 0.1299598 | 0.23625325 | 2.5914978 | 21 | 1 20.9 | 19.5 |
| 213953 2003 $XJ_{16}$ | 16.3 | $X$ | 249.75329 | 160.67545 | 199.08360 | 6.03130 | 0.1359734 | 0.25410126 | 2.4686802 | 21 | 5 3.4 | 19.9 |
| 213954 2003 $XD_{25}$ | 17.1 | $X$ | 193.21673 | 43.22406 | 32.20139 | 6.52551 | 0.0718686 | 0.25618774 | 2.4552581 | 21 | 6 12.4 | 20.7 |
| 213955 2003 $XE_{43}$ | 15.8 | $X$ | 322.02035 | 223.93016 | 2.71320 | 14.43300 | 0.0553586 | 0.23756254 | 2.5819673 | 21 | 2 23.9 | 19.3 |
| 213956 2003 $YY_{11}$ | 15.6 | $X$ | 22.80028 | 38.45764 | 66.38564 | 18.01066 | 0.1464699 | 0.22943524 | 2.6425870 | 21 | — | — |
| 213957 2003 $YS_{16}$ | 16.5 | $X$ | 48.35524 | 24.68454 | 72.91113 | 4.63335 | 0.1709876 | 0.23178357 | 2.6247077 | 21 | 1 8.6 | 18.9 |
| 213958 2003 $YF_{17}$ | 15.7 | $X$ | 221.62473 | 79.00648 | 97.37524 | 14.20068 | 0.1443641 | 0.21152813 | 2.7896986 | 21 | 11 18.1 | 20.0 |
| 213959 2003 $YL_{21}$ | 16.4 | $X$ | 297.64619 | 215.78977 | 315.75439 | 3.48846 | 0.1394649 | 0.22271657 | 2.6954692 | 21 | — | — |
| 213960 2003 $YX_{25}$ | 16.4 | $X$ | 20.49464 | 10.19548 | 62.54644 | 4.31960 | 0.2302014 | 0.22561222 | 2.6723560 | 21 | — | — |
| 213961 2003 $YA_{26}$ | 16.2 | $X$ | 348.58056 | 108.09779 | 64.09293 | 4.69242 | 0.1729461 | 0.23161094 | 2.6260118 | 21 | — | — |
| 213962 2003 $YQ_{28}$ | 16.2 | $X$ | 44.34221 | 72.94833 | 80.93660 | 7.45958 | 0.0966971 | 0.24176597 | 2.5519526 | 21 | 3 20.4 | 19.1 |
| 213963 2003 $YM_{33}$ | 16.3 | $X$ | 17.27342 | 301.81106 | 141.32621 | 3.86994 | 0.2817215 | 0.22437449 | 2.6821747 | 21 | — | — |
| 213964 2003 $YZ_{62}$ | 16.2 | $X$ | 40.30645 | 9.68576 | 103.55405 | 16.36798 | 0.2773559 | 0.23258325 | 2.6186880 | 21 | 1 14.3 | 17.8 |
| 213965 2003 $YA_{76}$ | 16.6 | $X$ | 122.68441 | 41.75735 | 32.16172 | 2.17629 | 0.1703793 | 0.24215293 | 2.5492332 | 21 | 4 2.3 | 20.2 |
| 213966 2003 $YY_{89}$ | 16.0 | $X$ | 318.10274 | 48.78128 | 83.85087 | 6.10752 | 0.1090015 | 0.22103221 | 2.7091455 | 21 | — | — |
| 213967 2003 $YD_{95}$ | 16.3 | $X$ | 274.01910 | 320.69263 | 93.96369 | 7.69338 | 0.0817936 | 0.26436319 | 2.4043742 | 21 | 8 30.4 | 19.3 |
| 213968 2003 $YS_{111}$ | 16.5 | $X$ | 347.54958 | 98.26690 | 58.02748 | 11.73232 | 0.2507921 | 0.23007348 | 2.6376976 | 21 | — | — |
| 213969 2003 $YM_{127}$ | 16.1 | $X$ | 153.08194 | 5.39180 | 54.90984 | 9.32757 | 0.0906735 | 0.24441747 | 2.5334629 | 21 | 4 12.5 | 19.8 |
| 213970 2003 $YS_{134}$ | 15.6 | $X$ | 9.10724 | 104.46012 | 59.77812 | 12.02215 | 0.1212349 | 0.23301549 | 2.6154486 | 21 | 2 2.7 | 18.7 |
| 213971 2003 $YG_{138}$ | 16.3 | $X$ | 35.18678 | 20.41198 | 83.57264 | 5.75682 | 0.0814098 | 0.22905512 | 2.6455098 | 21 | — | — |
| 213972 2003 $YK_{139}$ | 15.8 | $X$ | 104.23198 | 36.31305 | 49.27230 | 13.55894 | 0.1363099 | 0.24110123 | 2.5566411 | 21 | 3 27.4 | 19.3 |
| 213973 2003 $YU_{140}$ | 15.6 | $X$ | 154.46170 | 129.22539 | 18.52455 | 9.87937 | 0.2512831 | 0.19734927 | 2.9217678 | 21 | 8 12.7 | 20.9 |
| 213974 2003 $YV_{140}$ | 16.7 | $X$ | 36.69446 | 43.89432 | 33.78888 | 8.89645 | 0.2208357 | 0.22942324 | 2.6426791 | 21 | — | — |
| 213975 2003 $YV_{142}$ | 15.7 | $X$ | 324.78690 | 102.03849 | 58.14615 | 13.82290 | 0.1191642 | 0.22650345 | 2.6653413 | 21 | — | — |
| 213976 2003 $YS_{144}$ | 16.1 | $X$ | 75.51672 | 9.79701 | 8.98339 | 10.10911 | 0.0806034 | 0.22462231 | 2.6802016 | 21 | — | — |
| 213977 2003 $YL_{150}$ | 16.4 | $X$ | 283.69347 | 30.79761 | 129.84705 | 2.83992 | 0.1621103 | 0.21794388 | 2.7346784 | 21 | — | — |
| 213978 2003 $YN_{151}$ | 16.3 | $X$ | 318.36866 | 121.06109 | 41.52566 | 13.74267 | 0.1969466 | 0.22386621 | 2.6862330 | 21 | — | — |
| 213979 2003 $YW_{153}$ | 15.7 | $X$ | 46.98482 | 49.00400 | 63.04713 | 14.05405 | 0.1404283 | 0.23212335 | 2.6221458 | 21 | 1 28.8 | 18.7 |
| 213980 2003 $YC_{169}$ | 15.9 | $X$ | 35.73145 | 96.72739 | 80.08632 | 15.23921 | 0.0997934 | 0.24105889 | 2.5569404 | 21 | 4 12.2 | 19.0 |
| 213981 2003 $YR_{180}$ | 15.7 | $X$ | 315.75099 | 341.36994 | 113.66746 | 10.52135 | 0.2488176 | 0.21316834 | 2.7753701 | 21 | 12 10.3 | 18.1 |
| 213982 2004 $AB_{5}$ | 16.2 | $X$ | 7.53199 | 304.32617 | 119.99956 | 7.60698 | 0.3175874 | 0.22218819 | 2.6997408 | 21 | — | — |
| 213983 2004 $AH_{10}$ | 16.3 | $X$ | 251.55076 | 131.12139 | 122.11143 | 14.32072 | 0.0922573 | 0.22867831 | 2.6484152 | 21 | — | — |
| 213984 2004 $AC_{15}$ | 17.1 | $X$ | 341.41642 | 316.05946 | 45.82070 | 2.23261 | 0.2889301 | 0.26638369 | 2.3922008 | 21 | 10 8.9 | 17.9 |
| 213985 2004 $BP_{1}$ | 15.7 | $X$ | 60.98051 | 205.29668 | 260.20763 | 9.47019 | 0.1246541 | 0.23327465 | 2.6135111 | 21 | 2 4.7 | 18.8 |
| 213986 2004 $BO_{9}$ | 16.0 | $X$ | 253.79878 | 92.72400 | 128.63040 | 13.36953 | 0.1508132 | 0.22075287 | 2.7114305 | 21 | — | — |
| 213987 2004 $BA_{10}$ | 16.2 | $X$ | 33.89178 | 26.50123 | 96.83685 | 4.93247 | 0.1402339 | 0.23047352 | 2.6346445 | 21 | 1 17.0 | 18.7 |
| 213988 2004 $BZ_{12}$ | 16.6 | $X$ | 324.23252 | 14.26851 | 143.92228 | 4.51092 | 0.1656059 | 0.22390825 | 2.6858968 | 21 | — | — |
| 213989 2004 $BU_{17}$ | 16.0 | $X$ | 295.22784 | 190.94789 | 49.73628 | 12.60178 | 0.0672877 | 0.23360559 | 2.6110422 | 21 | 2 6.6 | 19.8 |
| 213990 2004 $BF_{26}$ | 16.3 | $X$ | 204.67600 | 233.72262 | 12.12258 | 10.60864 | 0.0692891 | 0.22174665 | 2.7033234 | 21 | — | — |
| 213991 2004 $BK_{42}$ | 15.8 | $X$ | 254.25873 | 230.85144 | 303.33871 | 5.03969 | 0.2002513 | 0.21371553 | 2.7706308 | 21 | 12 11.5 | 19.6 |
| 213992 2004 $BN_{44}$ | 15.4 | $X$ | 109.91772 | 336.34392 | 141.22353 | 9.70551 | 0.2690784 | 0.18354313 | 3.0665069 | 21 | 5 31.0 | 20.4 |
| 213993 2004 $BX_{47}$ | 16.9 | $X$ | 116.03611 | 103.87430 | 329.11364 | 1.74796 | 0.1066443 | 0.23849232 | 2.5752523 | 21 | 3 14.7 | 20.4 |
| 213994 2004 $BZ_{47}$ | 16.2 | $X$ | 334.75195 | 50.99640 | 119.23233 | 13.74332 | 0.0856733 | 0.22898111 | 2.6460798 | 21 | — | — |
| 213995 2004 $BU_{74}$ | 16.4 | $X$ | 121.75341 | 171.74972 | 246.84979 | 3.97590 | 0.2266901 | 0.23797380 | 2.5789918 | 21 | 3 17.9 | 20.1 |
| 213996 2004 $BC_{76}$ | 15.7 | $X$ | 319.19828 | 212.66642 | 277.10472 | 8.18667 | 0.0680225 | 0.21898642 | 2.7259921 | 21 | — | — |
| 213997 2004 $BX_{76}$ | 16.8 | $X$ | 289.30213 | 7.30501 | 138.77614 | 5.20806 | 0.1102417 | 0.21736591 | 2.7395239 | 21 | — | — |
| 213998 2004 $BL_{88}$ | 16.6 | $X$ | 42.32685 | 253.87074 | 221.03180 | 3.40121 | 0.1607200 | 0.23125979 | 2.6286694 | 21 | 1 19.8 | 19.1 |
| 213999 2004 $BC_{104}$ | 16.0 | $X$ | 318.41519 | 33.76814 | 120.12238 | 10.60433 | 0.1964606 | 0.22035800 | 2.7146687 | 21 | — | — |
| 214000 2004 $BW_{107}$ | 15.7 | $X$ | 229.96341 | 154.92987 | 123.86668 | 29.03716 | 0.0617429 | 0.22715919 | 2.6602095 | 21 | 1 8.6 | 19.7 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214001 2004 $BO_{108}$ | 15.1 | $X$ | 59.37233 | 145.32964 | 343.79184 | 14.02113 | 0.1022950 | 0.17757743 | 3.1348075 | 21 | 3 15.9 | 19.2 |
| 214002 2004 $BO_{110}$ | 15.4 | $X$ | 288.98944 | 39.79054 | 89.71635 | 9.98993 | 0.1011221 | 0.21301642 | 2.7766896 | 21 | 12 18.6 | 18.8 |
| 214003 2004 $BA_{114}$ | 15.8 | $X$ | 342.21029 | 311.30451 | 155.63301 | 16.90426 | 0.2161094 | 0.21930129 | 2.7233821 | 21 | — | — |
| 214004 2004 $CG$ | 15.2 | $X$ | 61.33761 | 69.08526 | 50.01386 | 22.21395 | 0.0844344 | 0.23409561 | 2.6073973 | 21 | 3 10.6 | 18.9 |
| 214005 2004 $CO_{2}$ | 15.4 | $X$ | 286.45876 | 343.88146 | 170.00774 | 9.47858 | 0.0942866 | 0.21471731 | 2.7620064 | 21 | — | — |
| 214006 2004 $CK_{7}$ | 16.0 | $X$ | 262.99014 | 116.11304 | 131.82653 | 8.37772 | 0.0987189 | 0.22605073 | 2.6688988 | 21 | 1 3.1 | 20.1 |
| 214007 2004 $CO_{13}$ | 16.2 | $X$ | 305.52131 | 19.74718 | 128.68301 | 3.03123 | 0.0200557 | 0.21862643 | 2.7289837 | 21 | — | — |
| 214008 2004 $CJ_{36}$ | 15.8 | $X$ | 286.33278 | 41.43790 | 80.35858 | 8.65274 | 0.1761114 | 0.21220919 | 2.7837267 | 21 | 11 25.4 | 18.9 |
| 214009 2004 $CJ_{54}$ | 16.6 | $X$ | 205.39276 | 208.01705 | 25.77273 | 1.75639 | 0.1820318 | 0.21220048 | 2.7838029 | 21 | — | — |
| 214010 2004 $CR_{54}$ | 16.0 | $X$ | 188.32534 | 268.98556 | 334.33434 | 6.81877 | 0.1774324 | 0.21115701 | 2.7929664 | 21 | 12 28.8 | 20.6 |
| 214011 2004 $CC_{63}$ | 16.1 | $X$ | 308.80970 | 51.19143 | 97.63960 | 10.26266 | 0.1162930 | 0.21920325 | 2.7241942 | 21 | — | — |
| 214012 2004 $CH_{73}$ | 15.8 | $X$ | 274.87534 | 90.34669 | 60.00741 | 8.29963 | 0.1634325 | 0.21320010 | 2.7750945 | 21 | 12 15.4 | 19.1 |
| 214013 2004 $CZ_{94}$ | 16.5 | $X$ | 257.52008 | 350.72531 | 157.60874 | 8.52123 | 0.1612743 | 0.21093113 | 2.7949600 | 21 | 11 20.9 | 20.4 |
| 214014 2004 $CC_{111}$ | 16.5 | $X$ | 278.40762 | 285.44963 | 256.76630 | 2.24695 | 0.1289537 | 0.21788782 | 2.7351475 | 21 | — | — |
| 214015 2004 $CV_{111}$ | 16.1 | $X$ | 352.50110 | 121.11038 | 57.08738 | 5.46957 | 0.0935639 | 0.23130049 | 2.6283610 | 21 | 1 27.1 | 19.3 |
| 214016 2004 $DJ$ | 16.0 | $X$ | 69.84692 | 184.45320 | 315.24786 | 11.60357 | 0.1657368 | 0.23544516 | 2.5974241 | 21 | 4 11.2 | 19.2 |
| 214017 2004 $DJ_{3}$ | 16.7 | $X$ | 272.99706 | 356.39334 | 191.92720 | 0.89305 | 0.0402143 | 0.21796174 | 2.7345291 | 21 | — | — |
| 214018 2004 $DU_{4}$ | 16.5 | $X$ | 306.73883 | 161.32374 | 12.34657 | 3.60553 | 0.0434990 | 0.22201549 | 2.7011406 | 21 | — | — |
| 214019 2004 $DC_{8}$ | 16.2 | $X$ | 142.06096 | 335.96911 | 141.61758 | 0.15369 | 0.1790689 | 0.18842472 | 3.0133122 | 21 | 6 19.5 | 21.0 |
| 214020 2004 $DG_{12}$ | 15.8 | $X$ | 230.00723 | 225.95211 | 13.43338 | 11.54802 | 0.0892349 | 0.21654957 | 2.7464045 | 21 | — | — |
| 214021 2004 $DA_{13}$ | 15.3 | $X$ | 203.52953 | 252.12783 | 349.36736 | 12.65185 | 0.1717552 | 0.21122844 | 2.7923367 | 21 | — | — |
| 214022 2004 $DB_{23}$ | 15.9 | $X$ | 195.96125 | 310.79107 | 218.83867 | 11.34048 | 0.1209811 | 0.20280087 | 2.8691693 | 21 | 10 10.2 | 20.5 |
| 214023 2004 $DA_{24}$ | 16.4 | $X$ | 353.06853 | 271.04557 | 215.56665 | 6.05137 | 0.1516305 | 0.22298780 | 2.6932830 | 21 | — | — |
| 214024 2004 $DZ_{26}$ | 16.2 | $X$ | 110.60955 | 323.95911 | 43.17038 | 3.43145 | 0.0444104 | 0.22033958 | 2.7148200 | 21 | — | — |
| 214025 2004 $DD_{35}$ | 16.0 | $X$ | 319.07100 | 317.48792 | 183.24309 | 9.25540 | 0.1330482 | 0.21954197 | 2.7213914 | 21 | — | — |
| 214026 2004 $DX_{38}$ | 16.1 | $X$ | 285.16467 | 81.87897 | 142.91833 | 11.58134 | 0.1358128 | 0.22468860 | 2.6796744 | 21 | — | — |
| 214027 2004 $DF_{42}$ | 15.6 | $X$ | 255.23036 | 43.81244 | 111.48129 | 5.64120 | 0.1171943 | 0.20822226 | 2.8191485 | 21 | 12 1.3 | 19.5 |
| 214028 2004 $DR_{49}$ | 16.0 | $X$ | 338.82921 | 319.28579 | 160.38547 | 15.25682 | 0.0421816 | 0.21734344 | 2.7397127 | 21 | — | — |
| 214029 2004 $DU_{61}$ | 15.8 | $X$ | 284.56734 | 109.79527 | 37.57928 | 4.13752 | 0.0368848 | 0.21258537 | 2.7804417 | 21 | — | — |
| 214030 2004 $ES_{1}$ | 16.3 | $X$ | 313.65309 | 284.50545 | 173.06634 | 7.77154 | 0.1983638 | 0.21248969 | 2.7812764 | 21 | 12 11.4 | 19.2 |
| 214031 2004 $EV_{1}$ | 16.3 | $X$ | 30.17277 | 293.38105 | 163.35482 | 13.33442 | 0.1396320 | 0.22314668 | 2.6920044 | 21 | — | — |
| 214032 2004 $EE_{4}$ | 15.6 | $X$ | 246.36270 | 167.25267 | 40.92012 | 13.84161 | 0.0528253 | 0.21486207 | 2.7607656 | 21 | — | — |
| 214033 2004 $EB_{6}$ | 15.6 | $X$ | 249.68222 | 84.23849 | 93.26959 | 7.09052 | 0.0895241 | 0.21103744 | 2.7940212 | 21 | 12 25.6 | 19.2 |
| 214034 2004 $EE_{12}$ | 16.1 | $X$ | 231.79272 | 76.85090 | 163.62094 | 13.17158 | 0.1892205 | 0.21639644 | 2.7477000 | 21 | — | — |
| 214035 2004 $EW_{14}$ | 15.1 | $X$ | 18.28227 | 96.86639 | 64.64967 | 9.45335 | 0.1261764 | 0.17152432 | 3.2081321 | 21 | 3 2.0 | 19.1 |
| 214036 2004 $EZ_{14}$ | 15.1 | $X$ | 58.25202 | 136.39596 | 122.53290 | 11.53827 | 0.0900187 | 0.19190893 | 2.9767287 | 21 | 9 3.7 | 19.2 |
| 214037 2004 $EZ_{41}$ | 15.8 | $X$ | 150.30116 | 151.50367 | 132.17724 | 5.94067 | 0.0081788 | 0.21242705 | 2.7818231 | 21 | — | — |
| 214038 2004 $EN_{49}$ | 16.3 | $X$ | 184.05570 | 191.49991 | 40.99833 | 3.12869 | 0.1348677 | 0.20703421 | 2.8299232 | 21 | 12 13.7 | 20.6 |
| 214039 2004 $EY_{54}$ | 15.3 | $X$ | 242.46656 | 324.01281 | 251.33558 | 9.23389 | 0.2066352 | 0.21448021 | 2.7640415 | 21 | — | — |
| 214040 2004 $EC_{58}$ | 16.0 | $X$ | 209.80062 | 180.72681 | 45.83021 | 10.08750 | 0.0999997 | 0.21141615 | 2.7906837 | 21 | — | — |
| 214041 2004 $EY_{60}$ | 16.0 | $X$ | 70.15927 | 258.70672 | 173.27687 | 11.73201 | 0.0491008 | 0.22493346 | 2.6777293 | 21 | 1 3.8 | 19.7 |
| 214042 2004 $EX_{62}$ | 16.4 | $X$ | 179.27860 | 11.44056 | 209.44673 | 5.84244 | 0.2013808 | 0.20511654 | 2.8475340 | 21 | 11 23.1 | 21.1 |
| 214043 2004 $EH_{63}$ | 16.3 | $X$ | 218.34949 | 39.29142 | 198.69534 | 5.56635 | 0.0518531 | 0.21420669 | 2.7663940 | 21 | — | — |
| 214044 2004 $EU_{65}$ | 15.3 | $X$ | 146.88786 | 275.08253 | 45.86024 | 17.24316 | 0.1093955 | 0.21690333 | 2.7434174 | 21 | — | — |
| 214045 2004 $EV_{66}$ | 15.2 | $X$ | 355.12579 | 91.54851 | 191.06456 | 8.81523 | 0.1150585 | 0.18313109 | 3.0711049 | 21 | 6 25.5 | 19.0 |
| 214046 2004 $EZ_{68}$ | 16.0 | $X$ | 70.13561 | 257.75916 | 168.41564 | 13.55203 | 0.0866435 | 0.22556674 | 2.6727151 | 21 | — | — |
| 214047 2004 $EP_{74}$ | 15.9 | $X$ | 278.13317 | 346.16762 | 159.48774 | 3.97097 | 0.0730311 | 0.20926036 | 2.8098172 | 21 | 12 25.6 | 19.5 |
| 214048 2004 $EH_{84}$ | 16.2 | $X$ | 236.76667 | 254.01374 | 304.47337 | 3.28900 | 0.0074704 | 0.21241453 | 2.7819323 | 21 | — | — |
| 214049 2004 $EK_{115}$ | 15.7 | $X$ | 351.64082 | 349.68976 | 104.19634 | 11.48437 | 0.2074646 | 0.21849042 | 2.7301161 | 21 | — | — |
| 214050 2004 $FU$ | 15.9 | $X$ | 203.44201 | 238.44604 | 184.34802 | 2.45733 | 0.1146287 | 0.18911294 | 3.0059971 | 21 | 6 8.7 | 20.6 |
| 214051 2004 $FB_{19}$ | 15.9 | $X$ | 248.49879 | 86.94912 | 184.99343 | 9.36673 | 0.2925533 | 0.22132041 | 2.7067931 | 21 | 1 8.1 | 20.9 |
| 214052 2004 $FX_{26}$ | 15.6 | $X$ | 10.14869 | 65.58064 | 183.32813 | 8.25550 | 0.0353939 | 0.18279587 | 3.0748585 | 21 | 6 5.5 | 19.8 |
| 214053 2004 $FR_{33}$ | 15.8 | $X$ | 169.90953 | 237.72748 | 233.32508 | 7.62338 | 0.2163647 | 0.19110917 | 2.9850277 | 21 | 7 5.7 | 20.9 |
| 214054 2004 $FY_{37}$ | 16.5 | $X$ | 222.88227 | 205.10097 | 20.87493 | 5.65312 | 0.0706848 | 0.21392399 | 2.7688306 | 21 | — | — |
| 214055 2004 $FS_{50}$ | 15.6 | $X$ | 172.81029 | 261.01452 | 37.63054 | 12.77247 | 0.1894334 | 0.21197882 | 2.7857432 | 21 | — | — |
| 214056 2004 $FR_{51}$ | 15.6 | $X$ | 227.18479 | 192.13296 | 14.80603 | 10.93123 | 0.0101333 | 0.21280012 | 2.7785708 | 21 | — | — |
| 214057 2004 $FH_{52}$ | 15.9 | $X$ | 166.44461 | 37.99512 | 200.36187 | 8.34838 | 0.2229814 | 0.20473464 | 2.8510740 | 21 | 12 2.6 | 20.9 |
| 214058 2004 $FD_{69}$ | 16.5 | $X$ | 168.22931 | 170.82048 | 190.63128 | 12.61836 | 0.1752201 | 0.22664045 | 2.6642671 | 21 | 2 16.5 | 20.9 |
| 214059 2004 $FO_{84}$ | 16.4 | $X$ | 258.25082 | 95.37521 | 61.36414 | 9.79794 | 0.1617173 | 0.21041392 | 2.7995382 | 21 | 11 29.7 | 20.1 |
| 214060 2004 $FC_{88}$ | 16.0 | $X$ | 201.77238 | 193.91494 | 53.01052 | 8.82039 | 0.1737249 | 0.21122814 | 2.7923394 | 21 | — | — |
| 214061 2004 $FY_{94}$ | 16.0 | $X$ | 199.99202 | 196.91831 | 40.73151 | 14.25772 | 0.1494497 | 0.21042950 | 2.7994001 | 21 | — | — |
| 214062 2004 $FY_{96}$ | 16.2 | $X$ | 11.84749 | 21.14460 | 88.27230 | 7.38277 | 0.1461244 | 0.22287270 | 2.6942102 | 21 | — | — |
| 214063 2004 $FK_{97}$ | 15.8 | $X$ | 190.77836 | 247.26821 | 39.83240 | 10.46576 | 0.0606855 | 0.21676228 | 2.7446075 | 21 | — | — |
| 214064 2004 $FR_{99}$ | 16.1 | $X$ | 70.22233 | 30.57305 | 168.61047 | 7.90364 | 0.1356117 | 0.18375292 | 3.0641726 | 21 | 7 6.7 | 20.3 |
| 214065 2004 $FR_{108}$ | 16.2 | $X$ | 314.14249 | 291.00734 | 187.38967 | 8.12836 | 0.2472827 | 0.21317502 | 2.7753122 | 21 | — | — |
| 214066 2004 $FU_{109}$ | 15.7 | $X$ | 111.87811 | 183.47174 | 21.54573 | 4.13578 | 0.1543944 | 0.18944091 | 3.0025266 | 21 | 9 5.8 | 20.3 |
| 214067 2004 $FK_{111}$ | 15.9 | $X$ | 264.21853 | 308.65752 | 213.25495 | 5.51655 | 0.0128484 | 0.20985641 | 2.8044942 | 21 | — | — |
| 214068 2004 $GX_{1}$ | 15.6 | $X$ | 349.23997 | 66.00298 | 195.55278 | 9.66935 | 0.1711602 | 0.17620409 | 3.1510749 | 21 | 5 15.8 | 19.3 |
| 214069 2004 $GX_{6}$ | 16.8 | $X$ | 47.25741 | 15.08137 | 30.25931 | 7.00701 | 0.0186185 | 0.21548679 | 2.7554273 | 21 | — | — |
| 214070 2004 $GF_{9}$ | 15.0 | $X$ | 28.60870 | 357.66808 | 220.78898 | 17.00565 | 0.1531492 | 0.17661657 | 3.1461668 | 21 | 5 30.5 | 18.7 |
| 214071 2004 $GQ_{29}$ | 15.2 | $X$ | 334.63023 | 252.12084 | 31.52565 | 9.75348 | 0.0283310 | 0.17919434 | 3.1159216 | 21 | 5 30.2 | 19.5 |
| 214072 2004 $GW_{31}$ | 15.6 | $X$ | 214.38244 | 297.55857 | 226.47608 | 7.21888 | 0.1542638 | 0.20160780 | 2.8804776 | 21 | 10 19.5 | 20.1 |
| 214073 2004 $GX_{45}$ | 16.6 | $X$ | 77.73495 | 175.34258 | 190.75957 | 5.57278 | 0.0586191 | 0.20944438 | 2.8081712 | 21 | — | — |
| 214074 2004 $GT_{56}$ | 16.1 | $X$ | 283.36648 | 5.75523 | 12.66344 | 10.92394 | 0.0869325 | 0.18697675 | 3.0288492 | 21 | 7 19.9 | 20.4 |
| 214075 2004 $GP_{72}$ | 15.9 | $X$ | 158.01549 | 238.20126 | 55.86623 | 9.80777 | 0.0959155 | 0.20920349 | 2.8103264 | 21 | — | — |
| 214076 2004 $GD_{84}$ | 16.5 | $X$ | 210.23261 | 295.76775 | 181.60439 | 1.28462 | 0.0352701 | 0.19073365 | 2.9889444 | 21 | 8 28.7 | 20.7 |
| 214077 2004 $GQ_{88}$ | 15.1 | $X$ | 288.92705 | 291.71231 | 48.22207 | 14.74842 | 0.0628591 | 0.17736745 | 3.1372811 | 21 | 6 5.7 | 19.5 |
| 214078 2004 $HH_{12}$ | 15.2 | $X$ | 224.17072 | 353.24507 | 158.33229 | 11.76000 | 0.0953091 | 0.19974644 | 2.8983446 | 21 | 10 24.8 | 19.6 |
| 214079 2004 $HW_{25}$ | 15.6 | $X$ | 48.03237 | 163.55494 | 53.85968 | 11.43292 | 0.2068688 | 0.17903392 | 3.1177826 | 21 | 7 10.5 | 19.5 |
| 214080 2004 $HH_{31}$ | 15.6 | $X$ | 347.04519 | 129.01280 | 138.43676 | 10.86944 | 0.1922006 | 0.17582208 | 3.1556375 | 21 | 5 19.9 | 19.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214081 Balavoine | 15.6 | X | 245.23106 | 1.14949 | 76.21098 | 8.67252 | 0.1207694 | 0.19129188 | 2.9831267 | 21 | 8 12.5 | 20.1 |
| 214082 2004 $HB_{41}$ | 15.7 | X | 123.67974 | 148.28631 | 48.48495 | 9.64933 | 0.0743223 | 0.18893314 | 3.0079039 | 21 | 9 4.3 | 20.3 |
| 214083 2004 $HH_{57}$ | 16.5 | X | 59.06474 | 165.11637 | 158.75667 | 2.35686 | 0.0318006 | 0.19649429 | 2.9302371 | 21 | 11 15.9 | 20.5 |
| 214084 2004 $HJ_{62}$ | 16.6 | X | 44.65673 | 276.84292 | 1.30368 | 5.96092 | 0.2135422 | 0.24204858 | 2.5499658 | 21 | 10 1.4 | 19.7 |
| 214085 2004 $HX_{74}$ | 15.7 | X | 54.43947 | 147.41731 | 129.43228 | 5.13484 | 0.0522413 | 0.18670585 | 3.0317782 | 21 | 9 14.5 | 19.8 |
| 214086 2004 $JW_{2}$ | 14.6 | X | 12.34942 | 291.27249 | 45.86277 | 10.11143 | 0.3907596 | 0.18502153 | 3.0501500 | 21 | 11 16.3 | 17.4 |
| 214087 2004 $JC_{6}$ | 14.8 | X | 40.56125 | 36.89109 | 176.74533 | 27.99699 | 0.1535512 | 0.17446603 | 3.1719680 | 21 | 6 15.2 | 19.3 |
| 214088 2004 $JN_{13}$ | 15.3 | X | 133.18082 | 279.14089 | 85.11066 | 13.33926 | 0.6900053 | 0.20039028 | 2.8921331 | 21 | 3 11.2 | 21.5 |
| 214089 2004 $JK_{20}$ | 15.5 | X | 24.61329 | 243.79742 | 58.32341 | 10.14970 | 0.2118934 | 0.18404032 | 3.0609816 | 21 | 9 29.2 | 19.1 |
| 214090 2004 $JW_{21}$ | 15.8 | X | 353.78434 | 188.19318 | 42.61625 | 1.64942 | 0.1290778 | 0.17187382 | 3.2037816 | 21 | 4 14.9 | 19.7 |
| 214091 2004 $JG_{31}$ | 15.3 | X | 29.51011 | 47.10327 | 228.96658 | 10.05937 | 0.1492969 | 0.18119911 | 3.0928961 | 21 | 8 14.4 | 19.2 |
| 214092 2004 $JY_{31}$ | 17.2 | X | 295.77240 | 33.38703 | 94.89684 | 24.47702 | 0.0540927 | 0.37449604 | 1.9062121 | 21 | — | — |
| 214093 2004 $JQ_{43}$ | 12.5 | X | 80.90018 | 282.31450 | 11.65106 | 16.80276 | 0.0498941 | 0.08404462 | 5.1617399 | 21 | 10 20.4 | 19.4 |
| 214094 2004 $KY_{6}$ | 15.8 | X | 35.35138 | 108.32712 | 225.11195 | 9.04594 | 0.1001448 | 0.19279155 | 2.9676366 | 21 | 11 5.5 | 19.6 |
| 214095 2004 $LT_{4}$ | 15.4 | X | 43.04152 | 114.36035 | 157.92997 | 13.60617 | 0.1270075 | 0.18242930 | 3.0789761 | 21 | 9 1.4 | 19.4 |
| 214096 2004 $LQ_{11}$ | 15.1 | X | 33.39094 | 10.36671 | 255.68106 | 16.76173 | 0.1775037 | 0.18144697 | 3.0900789 | 21 | 8 7.8 | 19.1 |
| 214097 2004 $NO_{9}$ | 15.2 | X | 52.30503 | 180.95779 | 113.79279 | 13.65362 | 0.1848032 | 0.18267959 | 3.0761632 | 21 | 10 27.9 | 19.6 |
| 214098 2004 $NV_{15}$ | 15.5 | X | 25.36737 | 117.81313 | 135.42375 | 14.55661 | 0.2420088 | 0.17405548 | 3.1769539 | 21 | 7 21.5 | 18.9 |
| 214099 2004 $NN_{17}$ | 14.5 | X | 230.61708 | 215.67686 | 112.39830 | 19.56678 | 0.1354396 | 0.15640283 | 3.4117168 | 21 | 3 21.6 | 20.2 |
| 214100 2004 $OY_{5}$ | 15.5 | X | 73.03225 | 187.30771 | 78.20983 | 9.73676 | 0.2710106 | 0.18394263 | 3.0620654 | 21 | 10 24.9 | 20.3 |
| 214101 2004 $OQ_{12}$ | 15.7 | X | 50.42667 | 208.15850 | 73.35062 | 2.17194 | 0.1593297 | 0.18099739 | 3.0951937 | 21 | 9 29.6 | 19.8 |
| 214102 2004 $PD_{58}$ | 15.2 | X | 39.78701 | 16.69855 | 283.22855 | 4.29689 | 0.1518273 | 0.17851497 | 3.1238221 | 21 | 10 3.2 | 19.2 |
| 214103 2004 $PP_{65}$ | 16.4 | X | 101.84364 | 50.16702 | 251.91673 | 2.25170 | 0.1763308 | 0.24602555 | 2.5224114 | 21 | 12 28.9 | 20.4 |
| 214104 2004 $PR_{75}$ | 15.4 | X | 74.72136 | 114.85798 | 173.49669 | 12.75639 | 0.3391511 | 0.18397045 | 3.0617566 | 21 | 11 27.1 | 20.6 |
| 214105 2004 $QK_{9}$ | 17.1 | X | 85.71518 | 320.44274 | 4.29649 | 19.38958 | 0.0746146 | 0.36549749 | 1.9373724 | 21 | — | — |
| 214106 2004 $QN_{18}$ | 15.2 | X | 9.92870 | 235.55472 | 81.45664 | 17.93393 | 0.2493202 | 0.17721090 | 3.1391286 | 21 | 9 30.8 | 18.8 |
| 214107 2004 $RV_{29}$ | 17.3 | X | 178.18839 | 223.19494 | 157.65819 | 5.06947 | 0.2173493 | 0.26791211 | 2.3830939 | 21 | 3 22.5 | 21.2 |
| 214108 2004 $RX_{93}$ | 16.5 | X | 28.50968 | 156.57291 | 244.57928 | 4.62853 | 0.2091636 | 0.24543498 | 2.5264560 | 21 | — | — |
| 214109 2004 $RF_{154}$ | 17.1 | X | 284.59058 | 143.61636 | 323.02038 | 5.59850 | 0.0668213 | 0.29892708 | 2.2152660 | 21 | 12 4.3 | 19.4 |
| 214110 2004 $RL_{181}$ | 15.2 | X | 160.72146 | 15.57292 | 190.63538 | 16.61717 | 0.0528687 | 0.17845185 | 3.1245587 | 21 | 10 20.7 | 19.9 |
| 214111 2004 $RS_{194}$ | 17.2 | X | 209.14987 | 126.43724 | 241.18023 | 2.95086 | 0.1359187 | 0.26897612 | 2.3768051 | 21 | 3 29.7 | 20.8 |
| 214112 2004 $RM_{306}$ | 14.5 | X | 53.78064 | 275.62462 | 40.48095 | 16.48888 | 0.2760216 | 0.17741226 | 3.1367529 | 21 | 11 27.2 | 19.1 |
| 214113 2004 $RP_{339}$ | 15.2 | X | 300.79991 | 241.62409 | 81.71845 | 11.74560 | 0.2427483 | 0.16379386 | 3.3082956 | 21 | 5 10.3 | 19.8 |
| 214114 2004 $SY_{22}$ | 17.2 | X | 228.73656 | 194.03149 | 358.53193 | 4.41611 | 0.0443346 | 0.30071811 | 2.2064614 | 21 | — | — |
| 214115 2004 $TO_{45}$ | 16.9 | X | 245.58563 | 341.49994 | 348.97671 | 1.39930 | 0.2016131 | 0.26944619 | 2.3740399 | 21 | 3 15.6 | 20.8 |
| 214116 2004 $TU_{59}$ | 15.4 | X | 94.77147 | 263.42972 | 27.36941 | 8.53229 | 0.1163343 | 0.18067889 | 3.0988301 | 21 | 11 22.7 | 20.1 |
| 214117 2004 $TW_{146}$ | 17.1 | X | 268.88909 | 106.25760 | 353.22571 | 5.58600 | 0.0555375 | 0.29148484 | 2.2528143 | 21 | 10 28.5 | 19.7 |
| 214118 2004 $VM_{18}$ | 17.0 | X | 282.88274 | 97.92244 | 320.79080 | 1.29901 | 0.1961053 | 0.22500779 | 2.6771395 | 21 | 8 23.7 | 20.4 |
| 214119 2004 $VH_{64}$ | 15.2 | X | 316.42650 | 99.23568 | 50.07900 | 29.25896 | 0.3329692 | 0.23144439 | 2.6272715 | 21 | — | — |
| 214120 2004 $VZ_{73}$ | 17.9 | X | 89.63298 | 263.27581 | 136.20275 | 2.82106 | 0.1206223 | 0.30947526 | 2.1646387 | 21 | — | — |
| 214121 2004 $XA_{28}$ | 17.6 | X | 209.43651 | 59.15029 | 54.72258 | 3.03515 | 0.1778719 | 0.27601677 | 2.3362128 | 21 | 8 18.0 | 21.1 |
| 214122 2004 $XJ_{49}$ | 17.7 | X | 147.00271 | 299.50576 | 34.15305 | 3.18568 | 0.1079367 | 0.30326552 | 2.1940879 | 21 | — | — |
| 214123 2004 $XQ_{59}$ | 16.9 | X | 86.98214 | 4.74699 | 52.29434 | 5.40906 | 0.0818559 | 0.30647941 | 2.1787222 | 21 | — | — |
| 214124 2004 $XG_{85}$ | 16.4 | X | 290.79589 | 15.71363 | 95.71198 | 10.43127 | 0.0470639 | 0.28846582 | 2.2685054 | 21 | 12 21.1 | 18.9 |
| 214125 2004 $XA_{86}$ | 16.9 | X | 283.44824 | 335.51370 | 114.37911 | 5.89920 | 0.0877172 | 0.28397288 | 2.2923705 | 21 | 11 5.6 | 19.3 |
| 214126 2004 $XW_{90}$ | 16.9 | X | 131.93437 | 261.06081 | 274.58287 | 5.78704 | 0.1746711 | 0.27123350 | 2.3635992 | 21 | 8 21.4 | 20.7 |
| 214127 2004 $XE_{96}$ | 17.7 | X | 296.19125 | 125.21151 | 340.26093 | 1.90046 | 0.1671943 | 0.28832712 | 2.2692328 | 21 | 12 12.9 | 19.2 |
| 214128 2004 $XU_{108}$ | 17.0 | X | 290.97578 | 7.62547 | 41.78722 | 2.92946 | 0.2281973 | 0.28085844 | 2.3092860 | 21 | 8 23.9 | 19.3 |
| 214129 2004 $XV_{162}$ | 16.5 | X | 120.92076 | 326.59098 | 58.49681 | 4.87804 | 0.1367174 | 0.30580900 | 2.1819052 | 21 | 1 7.3 | 18.7 |
| 214130 2004 $YX_{9}$ | 17.9 | X | 150.99178 | 326.59721 | 74.55677 | 4.12488 | 0.1087254 | 0.31891747 | 2.1216994 | 21 | 3 7.2 | 20.5 |
| 214131 2005 $AN$ | 17.5 | X | 216.02760 | 289.34192 | 206.19055 | 2.21170 | 0.1188146 | 0.27820740 | 2.3239330 | 21 | 9 26.9 | 20.6 |
| 214132 2005 $AC_{4}$ | 16.8 | X | 344.43934 | 91.86582 | 56.18329 | 6.04849 | 0.0656508 | 0.30247903 | 2.1978896 | 21 | — | — |
| 214133 2005 $AV_{8}$ | 17.2 | X | 59.91051 | 318.92204 | 108.14875 | 5.69255 | 0.1272384 | 0.30354104 | 2.1927600 | 21 | — | — |
| 214134 2005 $AP_{9}$ | 17.1 | X | 291.98911 | 274.56295 | 190.55891 | 4.90456 | 0.1141939 | 0.28560311 | 2.2836389 | 21 | 12 8.4 | 19.3 |
| 214135 2005 $AC_{18}$ | 15.6 | X | 113.95064 | 282.89330 | 309.84005 | 23.38075 | 0.2051867 | 0.27187864 | 2.3598586 | 21 | 10 6.9 | 20.0 |
| 214136 Alinghi | 17.3 | X | 309.87544 | 17.31855 | 123.58309 | 4.26048 | 0.0815380 | 0.29518038 | 2.2339720 | 21 | — | — |
| 214137 2005 $AO_{28}$ | 16.6 | X | 119.34820 | 346.70124 | 34.08330 | 4.25758 | 0.2009941 | 0.30532655 | 2.1842030 | 21 | 1 10.1 | 18.8 |
| 214138 2005 $AH_{35}$ | 16.8 | X | 267.14614 | 324.05876 | 130.72219 | 6.60321 | 0.0999682 | 0.28108438 | 2.3080484 | 21 | 10 15.8 | 19.4 |
| 214139 2005 $AW_{46}$ | 17.0 | X | 131.82503 | 78.70722 | 105.78400 | 3.59545 | 0.1621125 | 0.26947846 | 2.3738504 | 21 | 9 5.1 | 20.5 |
| 214140 2005 $AX_{47}$ | 16.8 | X | 116.76647 | 301.39669 | 289.63168 | 6.53794 | 0.2308187 | 0.27369767 | 2.3493911 | 21 | 10 19.9 | 20.8 |
| 214141 2005 $AN_{53}$ | 17.1 | X | 234.32575 | 254.50587 | 227.38123 | 2.67278 | 0.1415623 | 0.27788780 | 2.3257145 | 21 | 9 26.8 | 20.1 |
| 214142 2005 $AQ_{57}$ | 15.7 | X | 332.06639 | 29.28733 | 73.92889 | 14.54915 | 0.1391446 | 0.23266335 | 2.6180870 | 21 | — | — |
| 214143 2005 $AP_{60}$ | 17.2 | X | 170.40476 | 186.18679 | 346.99549 | 2.08486 | 0.1449674 | 0.27396578 | 2.3478580 | 21 | 9 26.0 | 20.7 |
| 214144 2005 $AR_{65}$ | 17.7 | X | 259.25109 | 295.32692 | 216.35135 | 1.37703 | 0.0888509 | 0.28719563 | 2.2751891 | 21 | 12 23.6 | 19.9 |
| 214145 2005 $AC_{69}$ | 16.8 | X | 45.23806 | 35.39353 | 14.62164 | 8.11864 | 0.0599466 | 0.29731294 | 2.2232767 | 21 | — | — |
| 214146 2005 $AE_{70}$ | 17.1 | X | 219.62310 | 119.37384 | 75.67425 | 2.39954 | 0.0624701 | 0.28684091 | 2.2770645 | 21 | 12 30.6 | 19.9 |
| 214147 2005 $AO_{80}$ | 17.0 | X | 136.77152 | 101.51185 | 109.54726 | 6.37099 | 0.1445591 | 0.27367686 | 2.3495102 | 21 | 10 15.6 | 20.6 |
| 214148 2005 $BS_{4}$ | 17.2 | X | 186.45298 | 181.00219 | 336.31592 | 3.00611 | 0.1928274 | 0.27505780 | 2.3416397 | 21 | 9 18.9 | 20.9 |
| 214149 2005 $BW_{8}$ | 16.9 | X | 176.76607 | 192.30619 | 350.89257 | 3.73356 | 0.1311964 | 0.27697542 | 2.3308191 | 21 | 10 15.4 | 20.3 |
| 214150 2005 $BJ_{11}$ | 17.7 | X | 218.97865 | 33.55510 | 87.75620 | 2.22307 | 0.1378004 | 0.27453913 | 2.3445881 | 21 | 9 10.4 | 21.0 |
| 214151 2005 $BM_{11}$ | 16.7 | X | 106.66841 | 77.89415 | 122.45594 | 5.90394 | 0.1708104 | 0.26558975 | 2.3969659 | 21 | 8 31.8 | 20.2 |
| 214152 2005 $BU_{22}$ | 17.0 | X | 123.09694 | 36.30001 | 105.42213 | 3.63840 | 0.1342939 | 0.26150481 | 2.4218631 | 21 | 6 26.3 | 20.2 |
| 214153 2005 $BU_{28}$ | 17.2 | X | 154.31812 | 189.85460 | 16.66595 | 3.92130 | 0.1622806 | 0.27582609 | 2.3372894 | 21 | 10 23.1 | 20.7 |
| 214154 2005 $CJ_{5}$ | 17.3 | X | 170.12673 | 8.16504 | 111.52742 | 2.15520 | 0.1424815 | 0.26475260 | 2.4020160 | 21 | 7 17.4 | 20.8 |
| 214155 2005 $CF_{11}$ | 16.9 | X | 37.50264 | 294.81991 | 119.21118 | 6.71184 | 0.1303738 | 0.29368887 | 2.2415292 | 21 | — | — |
| 214156 2005 $CJ_{11}$ | 17.3 | X | 124.76149 | 47.45268 | 100.25627 | 3.19293 | 0.1156173 | 0.26139780 | 2.4225240 | 21 | 7 4.4 | 20.8 |
| 214157 2005 $CC_{13}$ | 17.5 | X | 114.19536 | 172.07077 | 63.05071 | 2.07767 | 0.1440644 | 0.27294055 | 2.3537338 | 21 | 10 21.3 | 21.0 |
| 214158 2005 $CJ_{16}$ | 17.1 | X | 206.61052 | 328.18974 | 140.94267 | 2.65102 | 0.1655033 | 0.27120982 | 2.3637368 | 21 | 8 8.1 | 20.6 |
| 214159 2005 $CA_{19}$ | 16.6 | X | 143.33437 | 86.51169 | 129.92395 | 6.00408 | 0.1857803 | 0.27421263 | 2.3464488 | 21 | 10 28.6 | 20.4 |
| 214160 2005 $CL_{19}$ | 17.0 | X | 177.33281 | 248.95644 | 262.28630 | 1.33841 | 0.1045271 | 0.27164777 | 2.3611955 | 21 | 9 4.9 | 20.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214161 2005 $CQ_{20}$ | 16.5 | X | 297.20341 | 295.25144 | 123.36080 | 5.57207 | 0.0577186 | 0.27665118 | 2.3326399 | 21 | 10 15.9 | 19.1 |
| 214162 2005 $CU_{20}$ | 17.1 | X | 195.16829 | 336.28871 | 209.98929 | 1.30855 | 0.0897858 | 0.27915192 | 2.3186879 | 21 | 11 13.1 | 20.0 |
| 214163 2005 $CL_{22}$ | 16.6 | X | 129.49191 | 125.25417 | 86.01986 | 8.42870 | 0.1423292 | 0.27213883 | 2.3583543 | 21 | 10 9.8 | 20.3 |
| 214164 2005 $CB_{23}$ | 16.7 | X | 254.36099 | 9.84700 | 91.71828 | 6.66769 | 0.1714930 | 0.27772080 | 2.3266467 | 21 | 9 25.1 | 19.6 |
| 214165 2005 $CQ_{23}$ | 16.7 | X | 233.92859 | 218.15231 | 221.25526 | 6.33516 | 0.0809962 | 0.27112029 | 2.3642571 | 21 | 8 4.4 | 19.9 |
| 214166 2005 $CM_{31}$ | 15.9 | X | 106.32927 | 297.38959 | 118.74474 | 4.51758 | 0.1129638 | 0.18529070 | 3.0471953 | 21 | 2 19.9 | 20.1 |
| 214167 2005 $CU_{36}$ | 16.6 | X | 146.97965 | 136.25858 | 101.57409 | 2.52333 | 0.2041147 | 0.27716019 | 2.3297831 | 21 | 11 25.0 | 20.3 |
| 214168 2005 $CO_{37}$ | 17.1 | X | 164.38466 | 296.75560 | 245.04827 | 1.35837 | 0.1555609 | 0.27252186 | 2.3561439 | 21 | 9 30.7 | 20.8 |
| 214169 2005 $CQ_{49}$ | 16.5 | X | 148.53387 | 0.43413 | 173.03064 | 2.15995 | 0.1562057 | 0.26836794 | 2.3803946 | 21 | 9 4.9 | 20.0 |
| 214170 2005 $CS_{50}$ | 17.1 | X | 162.30947 | 350.08519 | 170.74306 | 1.43287 | 0.1239680 | 0.26886333 | 2.3774698 | 21 | 9 1.8 | 20.7 |
| 214171 2005 $CE_{52}$ | 17.0 | X | 259.80308 | 275.57277 | 168.62255 | 5.77398 | 0.1733009 | 0.27495116 | 2.3422451 | 21 | 9 2.9 | 20.0 |
| 214172 2005 $CM_{53}$ | 17.0 | X | 170.36500 | 166.84927 | 34.05743 | 3.33180 | 0.1044851 | 0.27684878 | 2.3315298 | 21 | 11 2.8 | 20.1 |
| 214173 2005 $CW_{53}$ | 17.0 | X | 211.83901 | 328.08310 | 133.41515 | 1.74349 | 0.1449565 | 0.26953404 | 2.3735240 | 21 | 8 4.7 | 20.3 |
| 214174 2005 $CG_{63}$ | 17.3 | X | 190.27868 | 105.28830 | 87.58893 | 4.42003 | 0.0929632 | 0.27959035 | 2.3162633 | 21 | 11 16.6 | 20.4 |
| 214175 2005 $CJ_{63}$ | 17.1 | X | 185.98770 | 247.42660 | 224.28034 | 3.47426 | 0.1010882 | 0.26666009 | 2.3905474 | 21 | 7 22.6 | 20.6 |
| 214176 2005 $CA_{67}$ | 16.7 | X | 188.94588 | 82.60851 | 86.89758 | 3.53778 | 0.1058153 | 0.27404251 | 2.3474198 | 21 | 10 14.5 | 19.9 |
| 214177 2005 $CK_{68}$ | 17.1 | X | 205.19520 | 314.74761 | 146.02925 | 1.71308 | 0.1474815 | 0.26880771 | 2.3777977 | 21 | 7 27.4 | 20.5 |
| 214178 2005 $CZ_{68}$ | 17.4 | X | 163.76651 | 25.15488 | 131.94426 | 2.09006 | 0.1244157 | 0.26879972 | 2.3778448 | 21 | 8 29.9 | 20.9 |
| 214179 2005 $CQ_{69}$ | 17.8 | X | 133.25018 | 110.70208 | 43.49793 | 1.79407 | 0.1301266 | 0.26380443 | 2.4077681 | 21 | 7 24.9 | 21.4 |
| 214180 Mabaglioni | 15.9 | X | 332.11875 | 16.13064 | 222.02260 | 11.05732 | 0.1086181 | 0.23915552 | 2.5704891 | 21 | 3 8.3 | 19.2 |
| 214181 2005 $CV_{78}$ | 17.5 | X | 144.21906 | 111.62545 | 52.92583 | 2.13298 | 0.1249936 | 0.26651270 | 2.3914288 | 21 | 8 19.8 | 21.0 |
| 214182 2005 $ED_{1}$ | 17.1 | X | 327.07672 | 241.94070 | 337.22317 | 3.28858 | 0.2264431 | 0.24272969 | 2.5451933 | 21 | 1 20.6 | 20.3 |
| 214183 2005 $EC_{7}$ | 16.4 | X | 68.76403 | 75.37854 | 161.24014 | 8.73715 | 0.1655093 | 0.26126805 | 2.4233260 | 21 | 9 2.3 | 19.5 |
| 214184 2005 $EO_{7}$ | 16.9 | X | 46.65795 | 40.43235 | 163.49382 | 3.16416 | 0.1213171 | 0.25294488 | 2.4761985 | 21 | 6 3.5 | 19.6 |
| 214185 2005 $EE_{9}$ | 17.1 | X | 162.47975 | 107.40897 | 144.45533 | 7.39919 | 0.0838170 | 0.28536740 | 2.2848962 | 21 | — | — |
| 214186 2005 $EG_{10}$ | 17.0 | X | 253.72917 | 137.56616 | 319.41833 | 2.76318 | 0.1307878 | 0.27390579 | 2.3482008 | 21 | 9 18.8 | 19.9 |
| 214187 2005 $EJ_{10}$ | 17.5 | X | 176.26036 | 178.49550 | 284.24306 | 0.96662 | 0.1810989 | 0.26270165 | 2.4145017 | 21 | 7 1.3 | 21.4 |
| 214188 2005 $EO_{11}$ | 17.2 | X | 143.13183 | 68.24689 | 98.32000 | 2.25206 | 0.1089583 | 0.26687944 | 2.3892374 | 21 | 8 20.4 | 20.6 |
| 214189 2005 $EF_{13}$ | 17.1 | X | 146.01419 | 79.16575 | 45.64124 | 4.10899 | 0.1711275 | 0.26103665 | 2.4247579 | 21 | 7 1.5 | 20.9 |
| 214190 2005 $ER_{13}$ | 16.5 | X | 82.64612 | 249.93663 | 20.05383 | 4.98191 | 0.1350536 | 0.27024499 | 2.3693594 | 21 | 10 30.4 | 19.8 |
| 214191 2005 $EP_{14}$ | 16.5 | X | 132.09043 | 43.29270 | 153.18110 | 7.18735 | 0.0670324 | 0.26767642 | 2.3844926 | 21 | 9 14.9 | 19.6 |
| 214192 2005 $EW_{17}$ | 17.1 | X | 12.17400 | 268.67049 | 35.53978 | 1.01694 | 0.0299151 | 0.26491271 | 2.4010481 | 21 | 8 25.1 | 19.7 |
| 214193 2005 $EC_{22}$ | 17.1 | X | 110.94861 | 225.50630 | 341.12417 | 2.33532 | 0.1401752 | 0.26548058 | 2.3976229 | 21 | 9 9.0 | 20.5 |
| 214194 2005 $EX_{28}$ | 16.7 | X | 146.90402 | 40.97112 | 150.24782 | 7.19636 | 0.0543133 | 0.26786260 | 2.3833875 | 21 | 9 26.0 | 19.9 |
| 214195 2005 $EW_{29}$ | 17.4 | X | 158.79997 | 22.23024 | 121.78776 | 6.95283 | 0.0871920 | 0.26642882 | 2.3919307 | 21 | 8 6.3 | 20.6 |
| 214196 2005 $EP_{30}$ | 16.2 | X | 140.71670 | 343.59125 | 347.41925 | 14.35440 | 0.1042266 | 0.22490037 | 2.6779920 | 21 | — | — |
| 214197 2005 $EM_{38}$ | 15.5 | X | 96.93591 | 307.21959 | 336.59459 | 24.60353 | 0.2018209 | 0.27489889 | 2.3425420 | 21 | 12 5.4 | 19.8 |
| 214198 2005 $ET_{38}$ | 17.1 | X | 215.66479 | 24.38639 | 80.40327 | 2.21097 | 0.1437629 | 0.26949767 | 2.3737376 | 21 | 8 14.2 | 20.4 |
| 214199 2005 $EQ_{40}$ | 16.7 | X | 80.05090 | 143.28643 | 137.35185 | 3.39824 | 0.1566228 | 0.27038927 | 2.3685165 | 21 | 11 14.6 | 20.0 |
| 214200 2005 $EO_{41}$ | 16.5 | X | 217.14073 | 314.05162 | 173.93919 | 5.21580 | 0.1332027 | 0.27140302 | 2.3626149 | 21 | 9 16.3 | 19.7 |
| 214201 2005 $EQ_{49}$ | 16.8 | X | 56.32952 | 8.80186 | 220.15889 | 2.52604 | 0.1372982 | 0.25903749 | 2.4372176 | 21 | 7 29.0 | 19.5 |
| 214202 2005 $EU_{50}$ | 16.7 | X | 79.81565 | 238.09718 | 338.94250 | 5.66028 | 0.0646328 | 0.26187162 | 2.4196010 | 21 | 8 6.0 | 19.6 |
| 214203 2005 $EM_{54}$ | 17.1 | X | 65.12755 | 49.50186 | 170.99739 | 1.23912 | 0.1219323 | 0.25937239 | 2.4351192 | 21 | 7 28.4 | 19.9 |
| 214204 2005 $EB_{60}$ | 16.8 | X | 52.67421 | 180.16950 | 297.04921 | 5.40298 | 0.1810449 | 0.24452603 | 2.5327130 | 21 | 2 10.3 | 19.0 |
| 214205 2005 $EZ_{60}$ | 16.5 | X | 87.07156 | 186.61158 | 309.89562 | 5.36802 | 0.1336906 | 0.25175126 | 2.4840192 | 21 | 5 1.0 | 19.6 |
| 214206 2005 $EV_{63}$ | 17.3 | X | 103.63572 | 132.63216 | 159.71227 | 4.98424 | 0.2520996 | 0.27646792 | 2.3336706 | 21 | 12 26.6 | 21.3 |
| 214207 2005 $EW_{64}$ | 17.3 | X | 159.03552 | 108.86374 | 44.44932 | 1.85872 | 0.1299708 | 0.26617842 | 2.3934305 | 21 | 8 20.4 | 20.9 |
| 214208 2005 $EQ_{66}$ | 17.8 | X | 43.11266 | 96.61456 | 168.66812 | 2.86055 | 0.1575485 | 0.26180475 | 2.4200130 | 21 | 9 3.7 | 20.2 |
| 214209 2005 $EN_{71}$ | 16.7 | X | 160.01068 | 109.86240 | 94.22549 | 5.60129 | 0.0977185 | 0.27543356 | 2.3395095 | 21 | 10 29.4 | 20.1 |
| 214210 2005 $EX_{71}$ | 16.7 | X | 143.59469 | 69.33597 | 76.71891 | 3.59292 | 0.0607512 | 0.26424607 | 2.4050846 | 21 | 7 20.4 | 19.9 |
| 214211 2005 $EO_{73}$ | 17.4 | X | 77.26642 | 148.26374 | 68.79513 | 2.23212 | 0.1340992 | 0.26089569 | 2.4256312 | 21 | 8 13.4 | 20.5 |
| 214212 2005 $ED_{74}$ | 17.3 | X | 175.84037 | 359.53481 | 132.47383 | 2.83677 | 0.1234655 | 0.26608411 | 2.3939960 | 21 | 8 8.7 | 20.8 |
| 214213 2005 $EQ_{78}$ | 17.2 | X | 129.90417 | 139.22837 | 43.85919 | 2.82213 | 0.1579423 | 0.26464677 | 2.4026563 | 21 | 8 31.7 | 20.9 |
| 214214 2005 $EQ_{79}$ | 16.4 | X | 123.97094 | 46.17878 | 107.12767 | 8.25893 | 0.0954930 | 0.25908157 | 2.4369411 | 21 | 7 8.9 | 19.7 |
| 214215 2005 $EK_{81}$ | 16.9 | X | 15.73342 | 133.93332 | 177.41744 | 6.24482 | 0.1299892 | 0.26671413 | 2.3902246 | 21 | 9 21.2 | 19.3 |
| 214216 2005 $ES_{84}$ | 17.4 | X | 179.07937 | 58.79670 | 69.68241 | 2.23825 | 0.1345003 | 0.26709273 | 2.3879653 | 21 | 8 7.9 | 20.9 |
| 214217 2005 $EJ_{85}$ | 16.9 | X | 152.39870 | 40.81841 | 131.00746 | 3.22598 | 0.1237659 | 0.26780278 | 2.3837425 | 21 | 9 6.9 | 20.4 |
| 214218 2005 $EV_{85}$ | 16.3 | X | 205.02676 | 355.69247 | 151.76685 | 6.69870 | 0.0583058 | 0.27296912 | 2.3535695 | 21 | 10 8.7 | 19.4 |
| 214219 2005 $EV_{91}$ | 17.0 | X | 26.46412 | 289.93613 | 339.22991 | 4.31043 | 0.1715592 | 0.26046056 | 2.4283320 | 21 | 8 13.2 | 19.3 |
| 214220 2005 $EQ_{94}$ | 17.0 | X | 73.43401 | 4.28405 | 193.26790 | 0.95580 | 0.1246050 | 0.25738527 | 2.4476365 | 21 | 7 8.1 | 19.8 |
| 214221 2005 $ET_{100}$ | 16.5 | X | 131.41573 | 66.18497 | 45.96170 | 11.11436 | 0.1006111 | 0.25445161 | 2.4664136 | 21 | 5 21.9 | 19.9 |
| 214222 2005 $EU_{109}$ | 17.6 | X | 167.40222 | 146.63216 | 2.92035 | 1.08511 | 0.1283392 | 0.26810950 | 2.3819241 | 21 | 8 23.5 | 21.3 |
| 214223 2005 $EZ_{124}$ | 16.4 | X | 230.67581 | 139.35899 | 4.84356 | 7.90218 | 0.1599617 | 0.21519950 | 2.7578791 | 21 | 10 12.5 | 20.6 |
| 214224 2005 $EZ_{133}$ | 17.1 | X | 216.46862 | 356.16120 | 102.32278 | 1.34894 | 0.1686754 | 0.26908377 | 2.3761712 | 21 | 8 3.9 | 20.8 |
| 214225 2005 $EU_{135}$ | 17.1 | X | 62.33521 | 82.93203 | 142.27765 | 3.03842 | 0.1666124 | 0.25799529 | 2.4437767 | 21 | 8 7.8 | 19.9 |
| 214226 2005 $EW_{142}$ | 16.7 | X | 138.62901 | 342.31401 | 158.68420 | 6.86340 | 0.0800750 | 0.25833533 | 2.4416319 | 21 | 7 7.6 | 20.1 |
| 214227 2005 $EK_{147}$ | 17.4 | X | 100.27365 | 13.90923 | 128.38425 | 1.75839 | 0.1218209 | 0.25373013 | 2.4710869 | 21 | 5 28.5 | 20.5 |
| 214228 2005 $EP_{148}$ | 17.1 | X | 119.14853 | 39.73180 | 115.37852 | 3.27273 | 0.1288419 | 0.25777105 | 2.4451938 | 21 | 7 9.3 | 20.5 |
| 214229 2005 $EG_{151}$ | 16.9 | X | 123.19610 | 103.34996 | 64.09134 | 3.22398 | 0.1313502 | 0.25956938 | 2.4338870 | 21 | 8 1.1 | 20.4 |
| 214230 2005 $EG_{152}$ | 17.6 | X | 55.25605 | 91.68927 | 47.09960 | 4.11242 | 0.1310217 | 0.24472704 | 2.5313260 | 21 | 3 17.8 | 20.1 |
| 214231 2005 $EA_{154}$ | 15.9 | X | 53.54616 | 222.29024 | 33.69518 | 22.61680 | 0.1619545 | 0.26423269 | 2.4051658 | 21 | 9 21.1 | 19.2 |
| 214232 2005 $EL_{155}$ | 17.5 | X | 185.87969 | 247.34182 | 180.60127 | 1.45046 | 0.1553043 | 0.25541340 | 2.4602180 | 21 | 5 26.4 | 21.2 |
| 214233 2005 $EX_{159}$ | 17.0 | X | 138.19503 | 294.12135 | 189.87277 | 0.86895 | 0.1303307 | 0.25757840 | 2.4464129 | 21 | 6 19.0 | 20.5 |
| 214234 2005 $EQ_{164}$ | 17.1 | X | 3.55238 | 163.09267 | 126.85308 | 2.30018 | 0.1869723 | 0.25720216 | 2.4487981 | 21 | 7 26.4 | 18.7 |
| 214235 2005 $EL_{176}$ | 17.1 | X | 333.90746 | 117.67066 | 174.08301 | 6.52833 | 0.0935956 | 0.25546168 | 2.4599080 | 21 | 6 1.9 | 19.9 |
| 214236 2005 $EQ_{176}$ | 17.3 | X | 127.58702 | 113.75084 | 8.10068 | 2.17250 | 0.1599883 | 0.25508357 | 2.4623383 | 21 | 6 7.1 | 20.8 |
| 214237 2005 $EF_{181}$ | 16.8 | X | 219.46080 | 87.05061 | 41.56398 | 4.49390 | 0.0599978 | 0.27459335 | 2.3442794 | 21 | 9 30.7 | 19.8 |
| 214238 2005 $ES_{182}$ | 16.8 | X | 192.58919 | 33.66133 | 44.33516 | 3.12081 | 0.1774528 | 0.26140395 | 2.4224861 | 21 | 6 14.0 | 20.8 |
| 214239 2005 $ET_{182}$ | 16.9 | X | 64.63092 | 155.18653 | 59.87852 | 2.42665 | 0.1362285 | 0.25780742 | 2.4449639 | 21 | 7 23.0 | 19.8 |
| 214240 2005 $ES_{183}$ | 16.8 | X | 79.33393 | 82.85969 | 182.73620 | 6.25153 | 0.0856754 | 0.26763951 | 2.3847118 | 21 | 10 15.6 | 19.8 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214241 2005 $EP_{186}$ | 17.0 | X | 81.06002 | 113.63528 | 87.15208 | 6.64202 | 0.1492997 | 0.25692793 | 2.4505402 | 21 | 7 29.1 | 20.1 |
| 214242 2005 $ED_{187}$ | 17.0 | X | 38.91576 | 31.70572 | 228.66325 | 1.71747 | 0.1606750 | 0.25717728 | 2.4489560 | 21 | 8 19.5 | 19.5 |
| 214243 2005 $EM_{215}$ | 16.5 | X | 48.78160 | 284.29399 | 333.02563 | 6.47678 | 0.1124243 | 0.26212129 | 2.4180644 | 21 | 8 24.9 | 19.0 |
| 214244 2005 $EH_{229}$ | 17.4 | X | 121.08305 | 152.41134 | 21.72530 | 1.50554 | 0.1203508 | 0.26362016 | 2.4088900 | 21 | 8 6.4 | 20.7 |
| 214245 2005 $EL_{235}$ | 17.4 | X | 26.92219 | 243.60755 | 24.62490 | 2.58894 | 0.1866746 | 0.25822365 | 2.4423358 | 21 | 8 15.3 | 19.5 |
| 214246 2005 $EO_{252}$ | 16.4 | X | 125.14619 | 209.64659 | 196.38449 | 6.20758 | 0.1365526 | 0.23967244 | 2.5667918 | 21 | 2 21.8 | 20.0 |
| 214247 2005 $EA_{257}$ | 16.8 | X | 352.80071 | 67.31768 | 274.57301 | 1.44566 | 0.2364427 | 0.26478511 | 2.4018194 | 21 | 10 1.0 | 18.3 |
| 214248 2005 $EL_{270}$ | 16.5 | X | 110.30712 | 351.89486 | 167.75602 | 7.09121 | 0.0858787 | 0.25604683 | 2.4561588 | 21 | 6 28.9 | 19.9 |
| 214249 2005 $EQ_{283}$ | 16.4 | X | 215.60998 | 26.45613 | 91.03291 | 7.66792 | 0.0773817 | 0.27000687 | 2.3707523 | 21 | 9 10.3 | 19.7 |
| 214250 2005 $EU_{287}$ | 16.9 | X | 90.74178 | 80.45361 | 203.41146 | 6.82211 | 0.1015058 | 0.27446142 | 2.3450306 | 21 | 11 25.1 | 20.1 |
| 214251 2005 $EH_{292}$ | 16.7 | X | 36.55979 | 138.65881 | 120.93695 | 7.25334 | 0.1206216 | 0.25737833 | 2.4476805 | 21 | 8 9.4 | 19.2 |
| 214252 2005 $EU_{294}$ | 15.7 | X | 334.02047 | 106.54755 | 134.22190 | 14.71731 | 0.1198791 | 0.24168156 | 2.5525467 | 21 | 3 21.7 | 18.9 |
| 214253 2005 $EO_{306}$ | 17.1 | X | 168.67493 | 10.37951 | 171.96446 | 1.70304 | 0.0789507 | 0.27358575 | 2.3500318 | 21 | 10 8.7 | 20.3 |
| 214254 2005 $EV_{313}$ | 17.0 | X | 306.53101 | 320.60261 | 43.55120 | 1.46209 | 0.0293044 | 0.26426872 | 2.4049472 | 21 | 8 11.4 | 19.9 |
| 214255 2005 $ER_{327}$ | 16.0 | X | 141.35866 | 204.26830 | 207.08581 | 6.22329 | 0.0981030 | 0.24168991 | 2.5524880 | 21 | 3 14.7 | 19.7 |
| 214256 2005 $FA_{2}$ | 16.8 | X | 130.87636 | 88.17111 | 13.15932 | 14.86718 | 0.1140085 | 0.25457470 | 2.4656185 | 21 | 5 4.7 | 20.5 |
| 214257 2005 $GP$ | 17.2 | X | 329.12386 | 315.48292 | 223.41074 | 0.35666 | 0.0790090 | 0.23471999 | 2.6027712 | 21 | — | — |
| 214258 2005 $GM_{6}$ | 16.6 | X | 355.46318 | 208.91973 | 82.50672 | 4.23017 | 0.1418831 | 0.25363165 | 2.4717265 | 21 | 7 9.2 | 18.7 |
| 214259 2005 $GO_{8}$ | 17.3 | X | 175.10858 | 141.28381 | 357.12173 | 1.05312 | 0.1302575 | 0.26880820 | 2.3777948 | 21 | 8 16.7 | 20.7 |
| 214260 2005 $GT_{8}$ | 16.1 | X | 286.75482 | 241.30555 | 37.75112 | 29.17690 | 0.2050434 | 0.23975627 | 2.5661935 | 21 | 3 12.6 | 20.5 |
| 214261 2005 $GE_{11}$ | 15.7 | X | 265.11276 | 248.69805 | 36.99049 | 15.06442 | 0.0933816 | 0.24056435 | 2.5604435 | 21 | 2 26.9 | 19.7 |
| 214262 2005 $GB_{14}$ | 17.2 | X | 82.95966 | 113.22302 | 166.89162 | 4.94218 | 0.2207717 | 0.27104276 | 2.3647079 | 21 | 11 23.3 | 20.8 |
| 214263 2005 $GD_{16}$ | 17.1 | X | 238.52886 | 260.61988 | 169.51174 | 6.46661 | 0.0910899 | 0.26753358 | 2.3853412 | 21 | 7 28.1 | 20.3 |
| 214264 2005 $GU_{24}$ | 16.5 | X | 16.18786 | 217.84275 | 192.95140 | 5.76915 | 0.0248147 | 0.22227693 | 2.6990222 | 21 | — | — |
| 214265 2005 $GU_{31}$ | 16.1 | X | 276.24814 | 296.82227 | 7.95897 | 7.38402 | 0.3303404 | 0.24104578 | 2.5570332 | 21 | 3 5.1 | 20.5 |
| 214266 2005 $GA_{39}$ | 16.4 | X | 276.18156 | 225.66656 | 158.29417 | 7.57155 | 0.0967579 | 0.26139461 | 2.4225437 | 21 | 7 12.9 | 19.6 |
| 214267 2005 $GS_{39}$ | 16.7 | X | 345.25835 | 204.47942 | 32.11974 | 12.71855 | 0.2258304 | 0.24359239 | 2.5391805 | 21 | 3 19.4 | 19.3 |
| 214268 2005 $GH_{40}$ | 17.0 | X | 236.96631 | 127.09544 | 180.08385 | 2.72301 | 0.1524105 | 0.23610062 | 2.5926146 | 21 | 2 12.9 | 21.2 |
| 214269 2005 $GQ_{42}$ | 16.6 | X | 135.85232 | 81.72664 | 86.73094 | 7.08385 | 0.0783311 | 0.26246189 | 2.4159719 | 21 | 8 13.9 | 20.1 |
| 214270 2005 $GO_{45}$ | 16.3 | X | 316.63468 | 86.57266 | 197.02291 | 9.48273 | 0.2115327 | 0.24491375 | 2.5300393 | 21 | 4 3.0 | 19.4 |
| 214271 2005 $GV_{51}$ | 16.5 | X | 93.07333 | 40.93470 | 38.93487 | 3.51895 | 0.1523860 | 0.23808617 | 2.5781802 | 21 | 3 1.9 | 19.5 |
| 214272 2005 $GA_{52}$ | 15.9 | X | 7.03001 | 139.16336 | 35.72607 | 13.53653 | 0.1053611 | 0.23873879 | 2.5734796 | 21 | 2 17.1 | 19.1 |
| 214273 2005 $GG_{53}$ | 16.0 | X | 350.77442 | 123.18808 | 37.32468 | 14.18726 | 0.1127335 | 0.23341574 | 2.6124578 | 21 | — | — |
| 214274 2005 $GF_{57}$ | 17.1 | X | 284.45873 | 125.62536 | 98.85387 | 1.63656 | 0.0354641 | 0.23335330 | 2.6129238 | 21 | 1 3.3 | 20.7 |
| 214275 2005 $GK_{63}$ | 16.2 | X | 90.09573 | 165.34750 | 42.51243 | 13.86260 | 0.0849169 | 0.26223291 | 2.4173781 | 21 | 8 16.4 | 19.7 |
| 214276 2005 $GQ_{63}$ | 16.9 | X | 69.96308 | 124.76062 | 90.32906 | 10.61602 | 0.1424589 | 0.25854514 | 2.4403107 | 21 | 8 2.5 | 20.0 |
| 214277 2005 $GM_{67}$ | 16.9 | X | 262.02523 | 98.50005 | 192.75667 | 3.43382 | 0.2559261 | 0.23623723 | 2.5916150 | 21 | 2 9.3 | 21.3 |
| 214278 2005 $GZ_{68}$ | 16.8 | X | 64.46795 | 106.16477 | 25.54531 | 2.05520 | 0.0721666 | 0.24267092 | 2.5456043 | 21 | 3 15.7 | 19.8 |
| 214279 2005 $GQ_{75}$ | 16.9 | X | 7.33924 | 20.91599 | 236.88492 | 0.92155 | 0.1090214 | 0.25180302 | 2.4836788 | 21 | 6 10.1 | 19.3 |
| 214280 2005 $GR_{76}$ | 17.2 | X | 121.65414 | 275.93021 | 35.13617 | 3.93047 | 0.1316586 | 0.27921414 | 2.3183435 | 21 | — | — |
| 214281 2005 $GC_{88}$ | 16.4 | X | 305.53885 | 255.32844 | 238.75062 | 6.44378 | 0.1363438 | 0.22491268 | 2.6778943 | 21 | — | — |
| 214282 2005 $GU_{99}$ | 16.7 | X | 243.01997 | 100.37416 | 211.76155 | 4.91289 | 0.1271483 | 0.23567526 | 2.5957332 | 21 | 2 24.8 | 20.9 |
| 214283 2005 $GS_{107}$ | 16.9 | X | 141.76898 | 23.91375 | 25.47936 | 5.82827 | 0.0646152 | 0.24192839 | 2.5508103 | 21 | 3 12.2 | 20.3 |
| 214284 2005 $GR_{132}$ | 16.9 | X | 322.34506 | 155.10118 | 177.31873 | 6.35406 | 0.1124818 | 0.25619750 | 2.4551958 | 21 | 7 8.7 | 19.6 |
| 214285 2005 $GD_{154}$ | 16.5 | X | 191.34527 | 144.50215 | 188.95646 | 11.38490 | 0.1229431 | 0.23187970 | 2.6239822 | 21 | 1 31.9 | 20.8 |
| 214286 2005 $GK_{155}$ | 17.0 | X | 47.72418 | 282.13428 | 192.73554 | 4.88703 | 0.2569169 | 0.23977482 | 2.5660611 | 21 | 2 1.7 | 18.8 |
| 214287 2005 $GB_{158}$ | 16.9 | X | 298.14473 | 253.66640 | 37.58880 | 11.41056 | 0.2701783 | 0.24229539 | 2.5482338 | 21 | 3 17.8 | 20.7 |
| 214288 2005 $GK_{174}$ | 16.9 | X | 109.16416 | 312.75056 | 183.34645 | 7.03703 | 0.1336339 | 0.25137446 | 2.4865008 | 21 | 6 2.9 | 20.4 |
| 214289 2005 $GK_{182}$ | 16.1 | X | 249.61513 | 167.03673 | 117.52645 | 12.70312 | 0.1792948 | 0.23143569 | 2.6273373 | 21 | 1 28.7 | 20.3 |
| 214290 2005 $GT_{206}$ | 16.7 | X | 147.61377 | 153.45653 | 186.22989 | 2.04267 | 0.1392764 | 0.22520657 | 2.6755640 | 21 | — | — |
| 214291 2005 $GQ_{209}$ | 14.6 | X | 188.65398 | 270.49020 | 71.73906 | 21.61120 | 0.0829248 | 0.17515122 | 3.1636901 | 21 | 2 27.4 | 19.9 |
| 214292 2005 $GX_{215}$ | 17.1 | X | 89.40312 | 311.75359 | 244.18304 | 2.21314 | 0.1364612 | 0.25919520 | 2.4362288 | 21 | 7 29.5 | 20.3 |
| 214293 2005 $HK_{1}$ | 17.2 | X | 15.32252 | 342.71667 | 204.39762 | 5.57675 | 0.2196278 | 0.24318649 | 2.5420051 | 21 | 3 2.8 | 19.3 |
| 214294 2005 $HA_{5}$ | 16.6 | X | 317.65561 | 136.73085 | 79.76909 | 10.64230 | 0.2547576 | 0.23542908 | 2.5975424 | 21 | 1 2.9 | 20.3 |
| 214295 2005 $HC_{5}$ | 16.7 | X | 22.07666 | 94.26726 | 76.00313 | 14.60273 | 0.1205739 | 0.23898784 | 2.5716914 | 21 | 3 9.4 | 19.8 |
| 214296 2005 $HN_{5}$ | 16.2 | X | 260.49805 | 168.72684 | 122.12403 | 3.82093 | 0.1765590 | 0.23468015 | 2.6030658 | 21 | 2 14.8 | 20.4 |
| 214297 2005 $HV_{9}$ | 16.3 | X | 1.27811 | 17.77826 | 151.20443 | 6.83250 | 0.1916027 | 0.23681523 | 2.5873964 | 21 | 1 11.8 | 19.1 |
| 214298 2005 $HG_{10}$ | 15.7 | X | 336.84489 | 140.73005 | 48.11849 | 29.46003 | 0.1225751 | 0.23403235 | 2.6078671 | 21 | 1 14.0 | 19.6 |
| 214299 2005 $JU$ | 16.1 | X | 315.64064 | 92.89372 | 137.95676 | 5.03729 | 0.1219094 | 0.23682035 | 2.5873590 | 21 | 2 6.1 | 19.3 |
| 214300 2005 $JW$ | 16.3 | X | 338.51981 | 57.34485 | 156.08789 | 5.89124 | 0.0954756 | 0.23842245 | 2.5757554 | 21 | 2 18.4 | 19.3 |
| 214301 2005 $JU_{2}$ | 16.9 | X | 122.92043 | 4.43762 | 50.15059 | 2.69513 | 0.0488025 | 0.23599248 | 2.5934065 | 21 | 2 21.3 | 20.3 |
| 214302 2005 $JA_{4}$ | 17.0 | X | 62.54215 | 191.90001 | 68.12149 | 3.28051 | 0.1706034 | 0.26141243 | 2.4224337 | 21 | 9 29.0 | 20.0 |
| 214303 2005 $JH_{14}$ | 16.3 | X | 8.19836 | 316.37226 | 237.94954 | 5.97769 | 0.1067224 | 0.24199718 | 2.5503269 | 21 | 3 6.9 | 19.3 |
| 214304 2005 $JK_{15}$ | 16.2 | X | 128.38842 | 122.45595 | 209.84381 | 4.21243 | 0.1195349 | 0.22012793 | 2.7165599 | 21 | — | — |
| 214305 2005 $JL_{15}$ | 17.0 | X | 356.41200 | 353.63283 | 202.10256 | 2.03418 | 0.1646824 | 0.23961883 | 2.5671747 | 21 | 2 12.6 | 19.8 |
| 214306 2005 $JW_{19}$ | 16.0 | X | 182.15002 | 283.59540 | 57.22352 | 3.08579 | 0.2561811 | 0.22751326 | 2.6574488 | 21 | 2 11.8 | 20.6 |
| 214307 2005 $JF_{22}$ | 16.3 | X | 45.38108 | 273.36118 | 49.70415 | 9.26069 | 0.2061179 | 0.26758685 | 2.3850247 | 21 | 12 3.9 | 19.4 |
| 214308 2005 $JZ_{22}$ | 16.6 | X | 39.69162 | 141.05740 | 10.82589 | 4.31737 | 0.0870134 | 0.24335682 | 2.5408189 | 21 | 3 5.5 | 19.4 |
| 214309 2005 $JP_{23}$ | 16.2 | X | 334.09321 | 143.84837 | 206.98517 | 8.00912 | 0.2198854 | 0.26220619 | 2.4175424 | 21 | 8 19.5 | 18.1 |
| 214310 2005 $JE_{30}$ | 17.0 | X | 77.06959 | 289.58709 | 334.48455 | 0.87766 | 0.1606793 | 0.26772541 | 2.3842017 | 21 | 10 19.4 | 20.3 |
| 214311 2005 $JP_{30}$ | 16.0 | X | 36.35322 | 169.31155 | 1.96887 | 11.87542 | 0.0990208 | 0.24402991 | 2.5361446 | 21 | 3 25.9 | 18.8 |
| 214312 2005 $JM_{31}$ | 16.3 | X | 308.11863 | 5.06333 | 278.40023 | 7.12078 | 0.2366328 | 0.24219810 | 2.5489162 | 21 | 3 14.8 | 20.0 |
| 214313 2005 $JT_{33}$ | 16.3 | X | 259.08891 | 268.61971 | 49.69708 | 4.90496 | 0.3121879 | 0.23551309 | 2.5969247 | 21 | 3 10.5 | 20.8 |
| 214314 2005 $JX_{33}$ | 16.4 | X | 234.44608 | 228.74037 | 76.76262 | 1.24661 | 0.0918623 | 0.23301520 | 2.6154508 | 21 | 2 12.5 | 20.3 |
| 214315 2005 $JC_{38}$ | 15.5 | X | 302.00850 | 58.99414 | 167.93897 | 15.32213 | 0.1173523 | 0.23309524 | 2.6148520 | 21 | 1 15.2 | 19.5 |
| 214316 2005 $JF_{38}$ | 16.0 | X | 273.18113 | 109.70155 | 170.45050 | 14.06894 | 0.1752461 | 0.23390112 | 2.6088424 | 21 | 2 11.8 | 20.2 |
| 214317 2005 $JQ_{42}$ | 16.6 | X | 292.44996 | 94.47957 | 196.70397 | 7.69271 | 0.1991148 | 0.23998802 | 2.5645412 | 21 | 3 14.5 | 20.4 |
| 214318 2005 $JS_{42}$ | 16.0 | X | 284.28921 | 34.62392 | 210.19844 | 10.35490 | 0.1127984 | 0.23563951 | 2.5959957 | 21 | 1 16.4 | 19.9 |
| 214319 2005 $JQ_{43}$ | 16.5 | X | 312.74510 | 62.74545 | 209.33961 | 13.54789 | 0.1636323 | 0.24021234 | 2.5629444 | 21 | 3 18.5 | 19.8 |
| 214320 2005 $JR_{47}$ | 16.6 | X | 213.62295 | 181.34638 | 192.01443 | 3.36395 | 0.0141500 | 0.24418781 | 2.5350511 | 21 | 4 17.9 | 19.8 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214321 2005 $JQ_{51}$ | 16.5 | $X$ | 90.31424 | 3.24250 | 75.28281 | 3.61921 | 0.0289543 | 0.23505134 | 2.6003246 | 21 | 2 6.6 | 19.8 |
| 214322 2005 $JM_{55}$ | 16.5 | $X$ | 77.96360 | 173.16056 | 175.49693 | 6.39177 | 0.0482510 | 0.21425009 | 2.7660204 | 21 | — | — |
| 214323 2005 $JW_{55}$ | 16.3 | $X$ | 299.42257 | 248.35220 | 64.75790 | 8.41807 | 0.1979132 | 0.24286712 | 2.5442331 | 21 | 4 24.6 | 19.7 |
| 214324 2005 $JL_{56}$ | 16.1 | $X$ | 182.25056 | 185.23161 | 174.40623 | 13.81528 | 0.1938188 | 0.23053297 | 2.6341915 | 21 | 2 28.7 | 20.5 |
| 214325 2005 $JT_{61}$ | 16.1 | $X$ | 316.48521 | 333.63887 | 241.57746 | 4.44863 | 0.1696828 | 0.23477410 | 2.6023713 | 21 | 1 10.9 | 19.6 |
| 214326 2005 $JG_{66}$ | 16.2 | $X$ | 274.96099 | 249.25624 | 50.32302 | 8.81318 | 0.1514054 | 0.23882486 | 2.5728612 | 21 | 3 17.6 | 20.0 |
| 214327 2005 $JQ_{66}$ | 16.0 | $X$ | 252.81099 | 320.38708 | 9.92948 | 4.83422 | 0.2287159 | 0.23875503 | 2.5733628 | 21 | 3 23.2 | 20.2 |
| 214328 2005 $JR_{67}$ | 16.1 | $X$ | 261.81298 | 266.88395 | 42.79253 | 14.15768 | 0.1889258 | 0.23725882 | 2.5841703 | 21 | 3 16.1 | 20.4 |
| 214329 2005 $JQ_{71}$ | 15.9 | $X$ | 353.99303 | 13.02515 | 180.40064 | 11.89394 | 0.0189408 | 0.23534125 | 2.5981886 | 21 | 2 21.9 | 19.4 |
| 214330 2005 $JS_{76}$ | 17.0 | $X$ | 223.30252 | 236.79545 | 30.99026 | 1.20994 | 0.1331963 | 0.22576140 | 2.6711785 | 21 | — | — |
| 214331 2005 $JA_{77}$ | 16.2 | $X$ | 293.12059 | 27.01581 | 194.04802 | 12.64596 | 0.1129913 | 0.23004940 | 2.6378817 | 21 | — | — |
| 214332 2005 $JZ_{78}$ | 16.6 | $X$ | 254.70818 | 290.60327 | 45.41619 | 7.67978 | 0.1843418 | 0.24065066 | 2.5598313 | 21 | 4 6.2 | 20.5 |
| 214333 2005 $JZ_{81}$ | 16.4 | $X$ | 269.74306 | 179.40504 | 99.87941 | 9.75694 | 0.0583005 | 0.23584221 | 2.5945080 | 21 | 2 23.9 | 20.1 |
| 214334 2005 $JE_{84}$ | 16.8 | $X$ | 46.59868 | 311.73551 | 190.77324 | 1.50865 | 0.1394830 | 0.24014181 | 2.5634462 | 21 | 3 6.3 | 19.4 |
| 214335 2005 $JJ_{85}$ | 15.9 | $X$ | 23.40426 | 79.45854 | 96.73064 | 8.85886 | 0.1045876 | 0.23991899 | 2.5650331 | 21 | 3 16.6 | 18.8 |
| 214336 2005 $JX_{90}$ | 16.1 | $X$ | 270.10251 | 33.91851 | 252.52910 | 10.65609 | 0.1664242 | 0.23558820 | 2.5963726 | 21 | 2 13.9 | 20.4 |
| 214337 2005 $JV_{93}$ | 16.7 | $X$ | 350.41751 | 294.06693 | 242.62360 | 3.96312 | 0.2877734 | 0.23600245 | 2.5933335 | 21 | — | — |
| 214338 2005 $JO_{103}$ | 16.9 | $X$ | 117.73693 | 120.87437 | 21.15633 | 7.22853 | 0.0952549 | 0.25542609 | 2.4601365 | 21 | 6 14.9 | 20.4 |
| 214339 2005 $JO_{104}$ | 16.1 | $X$ | 318.01564 | 328.86754 | 237.17140 | 11.33900 | 0.1135129 | 0.23310785 | 2.6147577 | 21 | 1 8.2 | 19.7 |
| 214340 2005 $JD_{107}$ | 15.5 | $X$ | 228.85201 | 160.32573 | 150.12712 | 14.03537 | 0.1846282 | 0.23084558 | 2.6318128 | 21 | 2 9.5 | 19.9 |
| 214341 2005 $JK_{107}$ | 16.0 | $X$ | 174.81760 | 230.33648 | 63.19313 | 13.77399 | 0.1536234 | 0.22097806 | 2.7095881 | 21 | — | — |
| 214342 2005 $JK_{109}$ | 16.6 | $X$ | 354.36785 | 202.32890 | 19.92458 | 6.67218 | 0.1540427 | 0.24201202 | 2.5502226 | 21 | 3 22.3 | 19.1 |
| 214343 2005 $JE_{117}$ | 16.2 | $X$ | 114.63524 | 239.46786 | 111.82978 | 7.15221 | 0.0573610 | 0.22107784 | 2.7087728 | 21 | — | — |
| 214344 2005 $JQ_{126}$ | 17.0 | $X$ | 50.46534 | 294.44034 | 350.03927 | 5.14330 | 0.2037302 | 0.25915618 | 2.4364734 | 21 | 10 17.7 | 20.0 |
| 214345 2005 $JQ_{131}$ | 16.0 | $X$ | 353.61157 | 110.87835 | 111.59650 | 14.12819 | 0.1099699 | 0.24118658 | 2.5560379 | 21 | 4 1.6 | 19.2 |
| 214346 2005 $JS_{138}$ | 16.6 | $X$ | 333.94129 | 347.17600 | 230.74682 | 4.52022 | 0.1849006 | 0.23796700 | 2.5790409 | 21 | 2 2.6 | 19.9 |
| 214347 2005 $JF_{145}$ | 16.7 | $X$ | 18.01382 | 323.78037 | 203.42362 | 3.32160 | 0.1600810 | 0.23794842 | 2.5791751 | 21 | 2 13.2 | 19.3 |
| 214348 2005 $JT_{145}$ | 15.9 | $X$ | 18.63960 | 148.45868 | 49.69975 | 13.98996 | 0.0730538 | 0.24156318 | 2.5533806 | 21 | 4 9.5 | 18.9 |
| 214349 2005 $JL_{146}$ | 16.1 | $X$ | 225.20518 | 248.17375 | 89.17446 | 13.07231 | 0.0331602 | 0.23877363 | 2.5732292 | 21 | 3 22.8 | 19.9 |
| 214350 2005 $JJ_{156}$ | 16.8 | $X$ | 177.12113 | 233.04651 | 103.49801 | 0.35005 | 0.0523829 | 0.22927078 | 2.6438506 | 21 | 1 19.4 | 20.4 |
| 214351 2005 $JY_{159}$ | 17.0 | $X$ | 201.93142 | 317.11854 | 42.04031 | 5.31617 | 0.1504628 | 0.23794661 | 2.5791882 | 21 | 3 18.8 | 21.1 |
| 214352 2005 $JX_{163}$ | 15.8 | $X$ | 225.82582 | 235.19515 | 34.85110 | 15.10601 | 0.0853536 | 0.22842792 | 2.6503502 | 21 | — | — |
| 214353 2005 $JM_{167}$ | 16.1 | $X$ | 308.29901 | 26.14202 | 222.30147 | 7.53948 | 0.1727254 | 0.23633680 | 2.5908871 | 21 | 2 9.0 | 19.8 |
| 214354 2005 $JB_{176}$ | 16.3 | $X$ | 274.45339 | 185.99625 | 106.31212 | 14.45748 | 0.1564986 | 0.23875977 | 2.5733288 | 21 | 3 8.5 | 20.3 |
| 214355 2005 $JY_{180}$ | 16.7 | $X$ | 32.46086 | 326.22756 | 179.20851 | 8.14039 | 0.0765842 | 0.23549336 | 2.5970697 | 21 | 2 11.3 | 19.8 |
| 214356 2005 $KK$ | 17.1 | $X$ | 14.83191 | 70.99095 | 157.80038 | 2.74393 | 0.1140579 | 0.24696155 | 2.5160339 | 21 | 5 12.3 | 19.6 |
| 214357 2005 $KR_{1}$ | 16.3 | $X$ | 127.79444 | 265.99784 | 133.30559 | 4.60005 | 0.1028670 | 0.23210739 | 2.6222659 | 21 | 2 15.3 | 19.7 |
| 214358 2005 $KT_{6}$ | 16.3 | $X$ | 337.36612 | 228.00709 | 19.06890 | 4.07289 | 0.2096627 | 0.24155971 | 2.5534051 | 21 | 3 18.2 | 18.8 |
| 214359 2005 $KU_{7}$ | 16.1 | $X$ | 138.14916 | 266.71039 | 88.04389 | 7.27883 | 0.0481857 | 0.22450257 | 2.6811545 | 21 | — | — |
| 214360 2005 $KZ_{7}$ | 15.8 | $X$ | 266.15916 | 15.59591 | 231.48420 | 14.59635 | 0.1190718 | 0.22861759 | 2.6488841 | 21 | 1 1.1 | 20.0 |
| 214361 2005 $KF_{9}$ | 16.0 | $X$ | 258.27842 | 279.21075 | 53.96243 | 5.98591 | 0.2341317 | 0.23789420 | 2.5795670 | 21 | 4 2.1 | 20.2 |
| 214362 2005 $KW_{9}$ | 15.4 | $X$ | 291.23136 | 354.84977 | 261.53114 | 14.43630 | 0.1581649 | 0.23530989 | 2.5984195 | 21 | 1 30.4 | 19.4 |
| 214363 2005 $KD_{13}$ | 16.6 | $X$ | 6.10926 | 44.76341 | 175.18608 | 5.76583 | 0.0294291 | 0.24202290 | 2.5501462 | 21 | 4 17.3 | 19.7 |
| 214364 2005 $LG$ | 16.0 | $X$ | 13.21496 | 352.18522 | 195.90580 | 12.46424 | 0.1137631 | 0.24013405 | 2.5635014 | 21 | 3 7.3 | 18.8 |
| 214365 2005 $LJ_{2}$ | 15.7 | $X$ | 206.74343 | 224.10281 | 105.17604 | 15.38987 | 0.1686859 | 0.22924022 | 2.6440856 | 21 | 2 17.2 | 20.2 |
| 214366 2005 $LL_{2}$ | 16.2 | $X$ | 266.84333 | 95.84120 | 213.41074 | 13.46721 | 0.1282453 | 0.23723722 | 2.5843272 | 21 | 3 16.0 | 20.3 |
| 214367 2005 $LC_{3}$ | 16.5 | $X$ | 265.90625 | 152.15523 | 124.87189 | 10.48761 | 0.1973603 | 0.23222433 | 2.6213855 | 21 | 2 1.7 | 20.7 |
| 214368 2005 $LD_{5}$ | 15.9 | $X$ | 256.84523 | 100.15814 | 205.34049 | 7.93226 | 0.1834912 | 0.23414622 | 2.6070215 | 21 | 2 25.7 | 20.1 |
| 214369 2005 $LZ_{5}$ | 15.8 | $X$ | 238.87063 | 244.51795 | 95.87158 | 15.70424 | 0.1337970 | 0.23684819 | 2.5871563 | 21 | 4 6.6 | 20.1 |
| 214370 2005 $LL_{6}$ | 16.2 | $X$ | 47.95631 | 351.67098 | 182.21423 | 5.89977 | 0.1242424 | 0.24452276 | 2.5327356 | 21 | 4 23.5 | 18.9 |
| 214371 2005 $LO_{6}$ | 15.8 | $X$ | 212.34467 | 20.84222 | 257.06294 | 8.70658 | 0.2041768 | 0.21957966 | 2.7210800 | 21 | — | — |
| 214372 2005 $LN_{7}$ | 16.0 | $X$ | 249.88904 | 251.46938 | 68.34813 | 9.22809 | 0.1917589 | 0.23573793 | 2.5952732 | 21 | 3 15.3 | 20.3 |
| 214373 2005 $LZ_{7}$ | 16.8 | $X$ | 229.59774 | 124.35040 | 186.77541 | 12.53365 | 0.2401371 | 0.22945660 | 2.6424230 | 21 | 2 7.7 | 21.6 |
| 214374 2005 $LS_{9}$ | 16.0 | $X$ | 192.90938 | 243.62500 | 101.77146 | 12.77695 | 0.0942908 | 0.23072966 | 2.6326943 | 21 | 2 22.4 | 20.1 |
| 214375 2005 $LC_{10}$ | 16.6 | $X$ | 16.36051 | 97.54831 | 113.98004 | 5.81861 | 0.1050038 | 0.24401322 | 2.5362602 | 21 | 4 21.7 | 19.3 |
| 214376 2005 $LF_{20}$ | 13.0 | $X$ | 355.31007 | 228.43233 | 149.31313 | 8.17680 | 0.0601664 | 0.08270870 | 5.2171730 | 21 | 10 18.0 | 19.6 |
| 214377 2005 $LS_{21}$ | 15.5 | $X$ | 226.09962 | 232.83305 | 247.16323 | 10.26028 | 0.0797587 | 0.19299544 | 2.9655461 | 21 | 9 10.4 | 20.1 |
| 214378 Kleinmann | 15.8 | $X$ | 337.49959 | 12.03479 | 228.00102 | 8.16078 | 0.1175677 | 0.23916331 | 2.5704333 | 21 | 3 18.9 | 18.9 |
| 214379 2005 $LX_{30}$ | 16.6 | $X$ | 337.03236 | 157.95534 | 92.73731 | 3.73235 | 0.1419596 | 0.24102835 | 2.5571564 | 21 | 4 3.9 | 19.5 |
| 214380 2005 $LZ_{30}$ | 15.7 | $X$ | 349.95935 | 349.14663 | 222.93978 | 12.34697 | 0.1083559 | 0.23710255 | 2.5853057 | 21 | 2 27.9 | 19.0 |
| 214381 2005 $LH_{34}$ | 15.7 | $X$ | 94.86142 | 107.73697 | 239.39496 | 10.16736 | 0.0442905 | 0.21670601 | 2.7450826 | 21 | — | — |
| 214382 2005 $LY_{36}$ | 16.4 | $X$ | 300.72417 | 171.93336 | 114.06738 | 6.47719 | 0.1426884 | 0.23949917 | 2.5680297 | 21 | 3 30.6 | 19.8 |
| 214383 2005 $LA_{44}$ | 15.7 | $X$ | 275.23959 | 45.43585 | 253.92640 | 8.67993 | 0.1949637 | 0.23676434 | 2.5877671 | 21 | 3 4.3 | 19.9 |
| 214384 2005 $LM_{47}$ | 16.1 | $X$ | 79.16756 | 233.21073 | 52.13143 | 2.80363 | 0.0664258 | 0.20453888 | 2.8528929 | 21 | 10 29.4 | 20.1 |
| 214385 2005 $LO_{49}$ | 16.3 | $X$ | 247.24722 | 203.15408 | 137.51317 | 6.12287 | 0.1707347 | 0.23824393 | 2.5770419 | 21 | 4 6.3 | 20.3 |
| 214386 2005 $MU_{1}$ | 15.2 | $X$ | 8.43592 | 65.69013 | 162.72599 | 24.67581 | 0.2382122 | 0.24246391 | 2.5470530 | 21 | 4 30.5 | 17.7 |
| 214387 2005 $MG_{2}$ | 15.7 | $X$ | 302.66896 | 238.65033 | 83.95671 | 8.20596 | 0.2610940 | 0.24281394 | 2.5446046 | 21 | 5 2.3 | 19.0 |
| 214388 2005 $MS_{12}$ | 16.3 | $X$ | 199.88428 | 219.26201 | 127.92202 | 12.78346 | 0.1292277 | 0.23142182 | 2.6274422 | 21 | 3 3.2 | 20.5 |
| 214389 2005 $MR_{16}$ | 17.4 | $X$ | 63.07144 | 173.96497 | 152.44775 | 1.64615 | 0.1807802 | 0.26122439 | 2.4235960 | 21 | 12 24.5 | 20.8 |
| 214390 2005 $MQ_{23}$ | 15.4 | $X$ | 211.89983 | 124.49679 | 205.07668 | 14.50263 | 0.1215698 | 0.22962197 | 2.6411542 | 21 | 2 14.6 | 19.9 |
| 214391 2005 $MY_{26}$ | 15.3 | $X$ | 220.20833 | 216.49036 | 142.92769 | 6.52434 | 0.0857729 | 0.17011962 | 3.2257679 | 21 | 4 13.7 | 20.3 |
| 214392 2005 $MV_{38}$ | 16.4 | $X$ | 75.34185 | 40.22410 | 276.63423 | 1.01358 | 0.0549058 | 0.19920063 | 2.9036365 | 21 | 11 29.9 | 20.5 |
| 214393 2005 $MK_{52}$ | 16.5 | $X$ | 24.65483 | 138.40534 | 143.84027 | 3.07483 | 0.0733822 | 0.18538981 | 3.0461093 | 21 | 8 11.2 | 20.4 |
| 214394 2005 $NR_{2}$ | 16.5 | $X$ | 156.45059 | 143.34621 | 172.44068 | 1.60961 | 0.2233328 | 0.21327553 | 2.7744401 | 21 | — | — |
| 214395 2005 $NT_{11}$ | 16.4 | $X$ | 312.55180 | 146.42263 | 95.98419 | 11.34573 | 0.1505320 | 0.23557856 | 2.5964435 | 21 | 2 16.3 | 20.0 |
| 214396 2005 $NF_{14}$ | 16.1 | $X$ | 233.37882 | 242.93525 | 194.84511 | 2.19291 | 0.0559290 | 0.17940734 | 3.1134549 | 21 | 8 2.9 | 20.7 |
| 214397 2005 $NV_{14}$ | 16.0 | $X$ | 309.45188 | 49.54800 | 208.22561 | 12.46457 | 0.2107071 | 0.23541460 | 2.5976489 | 21 | 2 15.9 | 19.8 |
| 214398 2005 $NX_{20}$ | 16.7 | $X$ | 91.97827 | 286.66115 | 350.92058 | 5.95630 | 0.1921392 | 0.26100231 | 2.4249706 | 21 | 11 21.9 | 20.6 |
| 214399 2005 $NO_{22}$ | 16.2 | $X$ | 52.50346 | 106.98155 | 197.00817 | 1.38712 | 0.1118922 | 0.19339666 | 2.9614432 | 21 | 10 24.4 | 20.0 |
| 214400 2005 $NW_{47}$ | 15.1 | $X$ | 199.91833 | 309.59462 | 110.80802 | 13.98553 | 0.1058323 | 0.17624292 | 3.1506120 | 21 | 6 4.9 | 20.2 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214401 2005 $NV_{48}$ | 15.4 | X | 21.43891 | 155.20531 | 179.55875 | 10.27692 | 0.1072169 | 0.19253145 | 2.9703088 | 21 | 10 20.9 | 19.2 |
| 214402 2005 $NB_{54}$ | 15.4 | X | 297.11514 | 134.72486 | 150.72531 | 5.73607 | 0.1589905 | 0.17233309 | 3.1980869 | 21 | 3 29.6 | 19.8 |
| 214403 2005 $NG_{58}$ | 16.4 | X | 136.71990 | 142.74107 | 161.64358 | 5.23567 | 0.1496478 | 0.20904926 | 2.8117085 | 21 | — | — |
| 214404 2005 $NS_{67}$ | 15.8 | X | 148.18019 | 254.73159 | 76.25843 | 7.96811 | 0.1868114 | 0.21331619 | 2.7740876 | 21 | — | — |
| 214405 2005 $NG_{77}$ | 15.7 | X | 282.15387 | 161.19954 | 226.47326 | 8.10503 | 0.0928207 | 0.18312662 | 3.0711549 | 21 | 7 23.8 | 20.1 |
| 214406 2005 $NH_{85}$ | 16.1 | X | 84.70109 | 261.81143 | 118.14647 | 6.44317 | 0.0561078 | 0.21306600 | 2.7762588 | 21 | — | — |
| 214407 2005 $NN_{85}$ | 15.9 | X | 159.08920 | 281.05815 | 134.07638 | 1.72094 | 0.1045366 | 0.16956218 | 3.2328339 | 21 | 4 17.7 | 20.8 |
| 214408 2005 $NH_{87}$ | 17.7 | X | 49.95266 | 184.56210 | 157.41419 | 1.36015 | 0.1890680 | 0.26118574 | 2.4238352 | 21 | 12 30.9 | 21.1 |
| 214409 2005 $NQ_{87}$ | 16.7 | X | 59.14282 | 168.98204 | 142.59554 | 2.59289 | 0.0689050 | 0.19727542 | 2.9224969 | 21 | 11 6.5 | 20.7 |
| 214410 2005 $OG_{2}$ | 15.6 | X | 176.51285 | 198.66961 | 111.84355 | 18.87014 | 0.1378176 | 0.21628041 | 2.7486826 | 21 | — | — |
| 214411 2005 $OL_{2}$ | 16.5 | X | 199.20593 | 213.34923 | 76.70846 | 9.12806 | 0.1953290 | 0.21717101 | 2.7411627 | 21 | — | — |
| 214412 2005 $OY_{16}$ | 15.8 | X | 326.86464 | 146.81945 | 194.44458 | 9.05519 | 0.0698911 | 0.18289551 | 3.0737416 | 21 | 7 29.9 | 19.9 |
| 214413 2005 $OB_{17}$ | 15.5 | X | 293.38776 | 157.30721 | 188.12379 | 10.38052 | 0.0715161 | 0.17807356 | 3.1289822 | 21 | 6 19.5 | 20.0 |
| 214414 2005 $OV_{26}$ | 16.4 | X | 206.14372 | 181.29153 | 107.27331 | 6.20607 | 0.1370118 | 0.21683588 | 2.7439864 | 21 | — | — |
| 214415 2005 $OZ_{27}$ | 16.2 | X | 254.41094 | 263.80108 | 353.16667 | 8.55929 | 0.0899494 | 0.21758813 | 2.7376584 | 21 | 1 9.0 | 20.4 |
| 214416 2005 $PK$ | 15.9 | X | 257.91288 | 241.92469 | 131.47128 | 10.18244 | 0.0125914 | 0.17890111 | 3.1193255 | 21 | 6 18.9 | 20.4 |
| 214417 2005 $PJ_{4}$ | 15.3 | X | 311.43029 | 297.62948 | 357.85150 | 16.07822 | 0.1026850 | 0.17401432 | 3.1774549 | 21 | 4 29.9 | 19.8 |
| 214418 2005 $PH_{15}$ | 15.0 | X | 66.34300 | 257.44795 | 335.39148 | 19.50140 | 0.1649973 | 0.18370641 | 3.0646897 | 21 | 8 21.5 | 19.2 |
| 214419 2005 $PZ_{15}$ | 15.9 | X | 25.86685 | 272.19578 | 59.06853 | 2.80989 | 0.1712560 | 0.19056727 | 2.9906839 | 21 | 10 30.2 | 19.5 |
| 214420 2005 $PF_{22}$ | 15.4 | X | 18.93631 | 135.92747 | 162.09317 | 9.50918 | 0.0777998 | 0.18384486 | 3.0631509 | 21 | 8 23.2 | 19.4 |
| 214421 2005 $QN_{2}$ | 16.7 | X | 201.33586 | 102.82247 | 225.23805 | 5.26990 | 0.1390406 | 0.28341760 | 2.2953637 | 21 | 1 28.8 | 20.2 |
| 214422 2005 $QE_{6}$ | 15.5 | X | 275.78990 | 236.27770 | 163.09270 | 17.02977 | 0.2268757 | 0.17822845 | 3.1271691 | 21 | 7 12.3 | 20.3 |
| 214423 2005 $QY_{10}$ | 15.9 | X | 61.42936 | 107.48913 | 151.72197 | 5.06576 | 0.0745494 | 0.18561685 | 3.0436248 | 21 | 9 2.9 | 20.1 |
| 214424 2005 $QG_{16}$ | 16.2 | X | 327.34548 | 344.59308 | 333.34363 | 0.35595 | 0.1582869 | 0.17796339 | 3.1302733 | 21 | 6 22.2 | 19.9 |
| 214425 2005 $QL_{16}$ | 15.1 | X | 152.87316 | 330.97862 | 152.82689 | 9.60810 | 0.0403682 | 0.17375735 | 3.1805869 | 21 | 6 29.6 | 19.9 |
| 214426 2005 $QZ_{18}$ | 15.8 | X | 8.41787 | 229.14717 | 69.76368 | 2.60573 | 0.1521785 | 0.18044234 | 3.1015378 | 21 | 8 13.9 | 19.4 |
| 214427 2005 $QS_{27}$ | 15.2 | X | 303.12888 | 179.44720 | 122.00097 | 6.20254 | 0.1035989 | 0.16868193 | 3.2440710 | 21 | 5 5.4 | 19.7 |
| 214428 2005 $QG_{28}$ | 15.7 | X | 27.97584 | 240.96382 | 17.59299 | 9.02417 | 0.1180931 | 0.17632624 | 3.1496195 | 21 | 7 22.5 | 19.7 |
| 214429 2005 $QT_{42}$ | 16.0 | X | 16.29420 | 279.26575 | 42.89017 | 2.94825 | 0.2031927 | 0.18667771 | 3.0320829 | 21 | 10 5.9 | 19.2 |
| 214430 2005 $QJ_{54}$ | 15.8 | X | 346.73102 | 189.35065 | 169.35856 | 11.72087 | 0.1441774 | 0.18590884 | 3.0404370 | 21 | 9 25.5 | 19.1 |
| 214431 2005 $QN_{54}$ | 15.9 | X | 278.93593 | 113.63861 | 226.41271 | 0.49526 | 0.1937497 | 0.17249292 | 3.1961111 | 21 | 5 8.1 | 20.5 |
| 214432 2005 $QA_{57}$ | 16.0 | X | 280.18648 | 139.70329 | 170.74700 | 5.13148 | 0.1304347 | 0.17022291 | 3.2244629 | 21 | 4 12.9 | 20.7 |
| 214433 2005 $QF_{67}$ | 15.5 | X | 316.48021 | 292.88763 | 39.77564 | 2.87877 | 0.1215594 | 0.17756882 | 3.1349088 | 21 | 6 29.1 | 19.4 |
| 214434 2005 $QY_{73}$ | 15.0 | X | 335.30350 | 179.52474 | 189.63771 | 17.53889 | 0.1358708 | 0.18295931 | 3.0730269 | 21 | 9 15.7 | 18.6 |
| 214435 2005 $QM_{78}$ | 15.6 | X | 38.14137 | 138.18714 | 182.96024 | 10.33108 | 0.1075355 | 0.18856036 | 3.0118669 | 21 | 10 27.1 | 19.6 |
| 214436 2005 $QU_{83}$ | 15.2 | X | 316.39222 | 189.88385 | 187.84529 | 9.56970 | 0.2210743 | 0.18065060 | 3.0991537 | 21 | 8 13.2 | 18.9 |
| 214437 2005 $QY_{106}$ | 14.9 | X | 161.85048 | 320.75115 | 16.10667 | 9.92953 | 0.1067167 | 0.15164561 | 3.4827007 | 21 | 1 24.4 | 20.4 |
| 214438 2005 $QF_{115}$ | 15.2 | X | 335.35448 | 177.04375 | 184.55278 | 12.09399 | 0.1238465 | 0.18212252 | 3.0824328 | 21 | 9 5.9 | 18.9 |
| 214439 2005 $QS_{121}$ | 15.6 | X | 33.77829 | 66.74172 | 171.94803 | 9.53164 | 0.0234605 | 0.17486419 | 3.1671512 | 21 | 6 23.4 | 20.1 |
| 214440 2005 $QR_{140}$ | 16.2 | X | 346.43062 | 131.68029 | 175.07013 | 8.30221 | 0.0496669 | 0.17869762 | 3.1216931 | 21 | 7 15.4 | 20.4 |
| 214441 2005 $QN_{149}$ | 15.3 | X | 72.96874 | 192.26208 | 87.34151 | 11.05293 | 0.0955658 | 0.19135909 | 2.9824281 | 21 | 10 21.9 | 19.7 |
| 214442 2005 $QQ_{175}$ | 15.4 | X | 298.13600 | 207.14211 | 160.55816 | 9.63967 | 0.0869611 | 0.17732061 | 3.1378336 | 21 | 7 21.7 | 19.7 |
| 214443 2005 $QZ_{187}$ | 16.0 | X | 39.12059 | 71.83493 | 175.85781 | 5.13358 | 0.0680704 | 0.17671761 | 3.1449675 | 21 | 7 16.2 | 20.1 |
| 214444 2005 $RH_{4}$ | 15.8 | X | 356.56635 | 132.68892 | 187.05924 | 5.11002 | 0.1368874 | 0.17933201 | 3.1143268 | 21 | 8 17.4 | 19.4 |
| 214445 2005 $RS_{18}$ | 15.7 | X | 47.55489 | 82.63661 | 166.03351 | 2.44454 | 0.1646441 | 0.17984487 | 3.1084032 | 21 | 8 12.9 | 19.7 |
| 214446 2005 $ST_{3}$ | 14.7 | X | 332.85696 | 268.44801 | 37.10838 | 17.76675 | 0.2138823 | 0.17304854 | 3.1892661 | 21 | 6 4.4 | 18.6 |
| 214447 2005 $SA_{9}$ | 14.9 | X | 11.30554 | 250.92759 | 34.66343 | 14.25817 | 0.1167162 | 0.18066442 | 3.0989956 | 21 | 8 3.2 | 18.9 |
| 214448 2005 $SX_{23}$ | 15.0 | X | 11.41765 | 153.31398 | 145.66732 | 11.28494 | 0.0767224 | 0.17967834 | 3.1103236 | 21 | 8 13.0 | 19.0 |
| 214449 2005 $SC_{31}$ | 15.5 | X | 271.65625 | 229.47465 | 179.05294 | 8.87912 | 0.2462529 | 0.17549630 | 3.1595415 | 21 | 7 15.9 | 20.2 |
| 214450 2005 $SU_{47}$ | 15.0 | X | 19.95392 | 289.67153 | 1.04337 | 9.76812 | 0.1543573 | 0.17893933 | 3.1188813 | 21 | 8 25.8 | 18.6 |
| 214451 2005 $SL_{56}$ | 16.2 | X | 352.80123 | 164.23488 | 150.15042 | 1.18413 | 0.2020331 | 0.17753523 | 3.1353042 | 21 | 8 3.8 | 19.5 |
| 214452 2005 $SC_{70}$ | 14.8 | X | 290.06861 | 167.26790 | 183.59457 | 13.56630 | 0.1292717 | 0.17117288 | 3.2125217 | 21 | 6 14.2 | 19.5 |
| 214453 2005 $SO_{73}$ | 14.9 | X | 50.00107 | 266.19065 | 38.68292 | 17.60285 | 0.2194973 | 0.18652915 | 3.0336927 | 21 | 11 4.9 | 19.0 |
| 214454 2005 $SE_{77}$ | 16.0 | X | 40.41855 | 180.31056 | 111.39941 | 1.28198 | 0.1436512 | 0.18394548 | 3.0620337 | 21 | 9 26.0 | 19.8 |
| 214455 2005 $SL_{80}$ | 15.7 | X | 336.92350 | 244.61316 | 71.48395 | 1.94807 | 0.1730234 | 0.17734355 | 3.1375630 | 21 | 7 5.8 | 19.0 |
| 214456 2005 $SL_{81}$ | 16.1 | X | 64.98320 | 111.42738 | 147.57101 | 2.02807 | 0.1386334 | 0.18300405 | 3.0725262 | 21 | 9 16.7 | 20.2 |
| 214457 2005 $SZ_{89}$ | 15.0 | X | 297.08435 | 143.66234 | 203.45164 | 17.15978 | 0.2614628 | 0.17330624 | 3.1861038 | 21 | 5 29.8 | 19.6 |
| 214458 2005 $SS_{99}$ | 15.8 | X | 43.10930 | 278.20152 | 1.16305 | 12.87643 | 0.3339202 | 0.18461021 | 3.0546790 | 21 | 10 10.4 | 19.8 |
| 214459 2005 $SX_{114}$ | 15.5 | X | 259.19943 | 53.86063 | 3.54595 | 9.90349 | 0.0735186 | 0.17551339 | 3.1593365 | 21 | 8 10.2 | 20.1 |
| 214460 2005 $SM_{128}$ | 15.2 | X | 2.45383 | 83.52322 | 213.07025 | 14.42657 | 0.1685247 | 0.17704001 | 3.1411482 | 21 | 7 24.8 | 19.1 |
| 214461 2005 $SN_{130}$ | 15.0 | X | 255.71356 | 321.63926 | 59.31620 | 13.05213 | 0.0525607 | 0.16947765 | 3.2339088 | 21 | 6 18.9 | 19.7 |
| 214462 2005 $SL_{132}$ | 15.1 | X | 357.45971 | 302.67543 | 23.83320 | 15.50955 | 0.2407182 | 0.18009351 | 3.1055416 | 21 | 9 10.9 | 18.2 |
| 214463 2005 $SK_{138}$ | 16.2 | X | 7.66813 | 229.12406 | 59.34158 | 2.02991 | 0.1273413 | 0.17712478 | 3.1401459 | 21 | 7 27.0 | 19.8 |
| 214464 2005 $SW_{146}$ | 15.3 | X | 340.31104 | 155.36265 | 197.14958 | 17.40991 | 0.2256446 | 0.18089569 | 3.0963537 | 21 | 8 26.1 | 18.6 |
| 214465 2005 $SO_{166}$ | 15.1 | X | 31.45741 | 255.95908 | 74.14125 | 10.55677 | 0.1341391 | 0.18717410 | 3.0267198 | 21 | 11 2.9 | 19.0 |
| 214466 2005 $SY_{169}$ | 15.1 | X | 38.84649 | 48.69886 | 243.47218 | 4.49759 | 0.1229877 | 0.18274249 | 3.0754572 | 21 | 9 18.3 | 19.1 |
| 214467 2005 $ST_{196}$ | 16.2 | X | 30.65488 | 178.85416 | 87.28680 | 1.59841 | 0.2261173 | 0.17974788 | 3.1095212 | 21 | 8 18.6 | 19.6 |
| 214468 2005 $SH_{202}$ | 15.6 | X | 338.50114 | 324.07287 | 6.44848 | 7.09513 | 0.1782139 | 0.17980681 | 3.1088419 | 21 | 7 31.5 | 19.1 |
| 214469 2005 $SG_{213}$ | 14.9 | X | 20.14255 | 84.49791 | 210.77942 | 16.29233 | 0.1903869 | 0.17814247 | 3.1281752 | 21 | 8 27.9 | 18.8 |
| 214470 2005 $SU_{221}$ | 15.3 | X | 296.36704 | 267.16608 | 100.39261 | 10.82990 | 0.2490221 | 0.17706002 | 3.1409116 | 21 | 6 25.4 | 19.3 |
| 214471 2005 $SO_{249}$ | 15.5 | X | 340.74478 | 249.53756 | 47.07662 | 6.95161 | 0.1920063 | 0.17568666 | 3.1572589 | 21 | 6 13.2 | 19.1 |
| 214472 2005 $SO_{282}$ | 14.8 | X | 261.63316 | 67.57649 | 74.48010 | 12.18925 | 0.1253607 | 0.12655896 | 3.9289284 | 21 | 11 10.3 | 20.4 |
| 214473 2005 $TH_{2}$ | 15.3 | X | 310.90597 | 223.04676 | 73.74307 | 5.39967 | 0.1392424 | 0.16993782 | 3.2280681 | 21 | 5 3.7 | 19.6 |
| 214474 2005 $TB_{14}$ | 15.6 | X | 287.07852 | 283.49496 | 105.15879 | 6.19789 | 0.1405240 | 0.17831518 | 3.1261549 | 21 | 7 27.4 | 19.7 |
| 214475 Chrisbayus | 15.3 | X | 66.39086 | 216.78214 | 47.42306 | 11.11464 | 0.1450168 | 0.18612139 | 3.0381218 | 21 | 9 30.7 | 19.6 |
| 214476 Stephencolbert | 15.1 | X | 347.30407 | 146.17464 | 156.20815 | 9.45735 | 0.0663273 | 0.17436363 | 3.1732098 | 21 | 7 10.8 | 19.3 |
| 214477 2005 $TX_{44}$ | 15.1 | X | 15.37031 | 281.38434 | 52.11892 | 26.19256 | 0.2693599 | 0.18250840 | 3.0780865 | 21 | 11 1.9 | 18.5 |
| 214478 2005 $TR_{63}$ | 15.8 | X | 46.50359 | 270.60696 | 30.81524 | 2.30092 | 0.2506224 | 0.18650178 | 3.0339894 | 21 | 11 1.5 | 19.9 |
| 214479 2005 $TB_{73}$ | 14.6 | X | 3.89749 | 256.66350 | 59.71188 | 15.53032 | 0.1998676 | 0.18003386 | 3.1062275 | 21 | 9 10.5 | 18.2 |
| 214480 2005 $TH_{74}$ | 14.4 | X | 202.84724 | 164.62319 | 185.95160 | 18.59614 | 0.1780947 | 0.15544352 | 3.4257392 | 21 | 3 13.9 | 20.2 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214481 2005 $TQ_{99}$ | 15.4 | $X$ | 39.18512 | 78.42151 | 212.94805 | 9.91560 | 0.2046990 | 0.18325783 | 3.0696889 | 21 | 9 30.3 | 19.3 |
| 214482 2005 $TF_{106}$ | 15.2 | $X$ | 211.33371 | 133.19542 | 218.14101 | 14.46227 | 0.0954847 | 0.15675591 | 3.4065918 | 21 | 3 21.7 | 20.6 |
| 214483 2005 $TV_{168}$ | 14.6 | $X$ | 230.08116 | 154.75875 | 19.76824 | 2.69134 | 0.1401902 | 0.12576691 | 3.9454068 | 21 | 11 9.1 | 20.5 |
| 214484 2005 $TW_{190}$ | 15.1 | $X$ | 316.67498 | 149.00800 | 183.18233 | 12.54164 | 0.1044017 | 0.17112193 | 3.2131594 | 21 | 6 30.1 | 19.5 |
| 214485 Dupouy | 15.1 | $X$ | 9.56735 | 78.67313 | 223.98132 | 6.22396 | 0.1568240 | 0.17665422 | 3.1457199 | 21 | 8 17.3 | 18.8 |
| 214486 2005 $UF_{10}$ | 14.7 | $X$ | 44.07713 | 219.33787 | 53.80815 | 14.08014 | 0.3157314 | 0.18243727 | 3.0788864 | 21 | 10 9.5 | 18.8 |
| 214487 Baranivka | 15.4 | $X$ | 341.36985 | 258.82628 | 63.36666 | 6.36860 | 0.1400056 | 0.17549092 | 3.1596061 | 21 | 7 26.7 | 19.1 |
| 214488 2005 $UL_{45}$ | 15.4 | $X$ | 312.14824 | 157.54272 | 193.96505 | 12.27440 | 0.1197246 | 0.17455031 | 3.1709468 | 21 | 7 15.2 | 19.7 |
| 214489 2005 $UD_{48}$ | 17.5 | $X$ | 183.48713 | 280.08989 | 132.33640 | 3.13979 | 0.1633229 | 0.28559169 | 2.2836997 | 21 | 5 3.4 | 21.0 |
| 214490 2005 $UW_{53}$ | 15.1 | $X$ | 18.16829 | 89.67325 | 207.60459 | 25.34747 | 0.2116564 | 0.17874100 | 3.1211880 | 21 | 8 28.5 | 19.0 |
| 214491 2005 $UB_{127}$ | 15.3 | $X$ | 37.97423 | 246.99485 | 46.35339 | 17.04138 | 0.2249161 | 0.17954826 | 3.1118256 | 21 | 10 11.9 | 19.3 |
| 214492 2005 $UA_{208}$ | 15.8 | $X$ | 334.59158 | 168.12172 | 137.45555 | 1.01309 | 0.1731691 | 0.17222937 | 3.1993708 | 21 | 6 16.7 | 19.3 |
| 214493 2005 $US_{251}$ | 15.2 | $X$ | 358.63269 | 277.15995 | 38.64341 | 10.57886 | 0.2741712 | 0.17766545 | 3.1337719 | 21 | 8 28.6 | 18.1 |
| 214494 2005 $UD_{253}$ | 16.0 | $X$ | 62.75348 | 6.44763 | 32.01904 | 7.27627 | 0.0286352 | 0.19864266 | 2.9090713 | 21 | — | — |
| 214495 2005 $UO_{435}$ | 15.6 | $X$ | 163.04543 | 88.93562 | 70.77704 | 3.92855 | 0.1564220 | 0.17089918 | 3.2159508 | 21 | 8 29.1 | 20.8 |
| 214496 2005 $VW_{52}$ | 16.3 | $X$ | 215.18136 | 186.22744 | 183.32310 | 4.89139 | 0.1733043 | 0.22106122 | 2.7089085 | 21 | 4 11.9 | 20.7 |
| 214497 2005 $VK_{82}$ | 17.0 | $X$ | 345.90680 | 79.82281 | 28.89422 | 21.58089 | 0.0797549 | 0.38062153 | 1.8857053 | 21 | — | — |
| 214498 2005 $WZ_{4}$ | 15.2 | $X$ | 319.77511 | 244.91142 | 116.97443 | 14.70050 | 0.3140110 | 0.17594654 | 3.1541492 | 21 | 7 15.6 | 18.3 |
| 214499 2005 $WG_{52}$ | 15.2 | $X$ | 354.23989 | 255.99682 | 68.79949 | 13.07189 | 0.2434849 | 0.17528164 | 3.1621206 | 21 | 8 30.3 | 18.5 |
| 214500 2005 $WA_{154}$ | 15.1 | $X$ | 334.06028 | 235.84845 | 93.70589 | 6.08401 | 0.1619918 | 0.17397593 | 3.1779223 | 21 | 7 20.6 | 18.7 |
| 214501 2005 $WZ_{192}$ | 15.5 | $X$ | 9.48384 | 197.52049 | 128.01786 | 8.82280 | 0.2508541 | 0.17947071 | 3.1127219 | 21 | 10 5.0 | 18.7 |
| 214502 2005 $WN_{195}$ | 16.8 | $X$ | 290.17807 | 47.82405 | 70.13918 | 24.16159 | 0.0798062 | 0.37124748 | 1.9173160 | 21 | — | — |
| 214503 2005 $XA_{61}$ | 17.7 | $X$ | 274.35128 | 85.01602 | 249.21937 | 3.18477 | 0.2201506 | 0.28739721 | 2.2741251 | 21 | 4 12.4 | 21.0 |
| 214504 2005 $YG$ | 16.7 | $X$ | 343.83582 | 48.39600 | 26.93918 | 21.74145 | 0.0962348 | 0.37512188 | 1.9040914 | 21 | — | — |
| 214505 2005 $YJ_{120}$ | 16.7 | $X$ | 344.62762 | 162.53801 | 252.41887 | 2.61483 | 0.1228157 | 0.24441471 | 2.5334820 | 21 | 12 19.6 | 19.4 |
| 214506 2005 $YW_{236}$ | 13.7 | $X$ | 329.05991 | 113.12901 | 149.08297 | 2.04049 | 0.0191775 | 0.08380500 | 5.1715743 | 21 | 5 6.1 | 20.4 |
| 214507 2006 $AF_{19}$ | 16.2 | $X$ | 352.05203 | 187.30882 | 152.23216 | 4.43649 | 0.1078227 | 0.22554262 | 2.6729057 | 21 | 9 12.6 | 19.2 |
| 214508 2006 $AF_{84}$ | 12.6 | $X$ | 313.54720 | 241.58576 | 40.75263 | 16.08448 | 0.0637312 | 0.08499705 | 5.1231076 | 21 | 5 4.7 | 19.3 |
| 214509 2006 $BO_{89}$ | 16.5 | $X$ | 25.70767 | 308.55230 | 358.74100 | 2.24621 | 0.1238562 | 0.22600655 | 2.6692466 | 21 | 9 25.9 | 19.5 |
| 214510 2006 $BZ_{164}$ | 16.2 | $X$ | 159.71558 | 348.09514 | 330.40086 | 4.65367 | 0.1327805 | 0.18387754 | 3.0627879 | 21 | — | — |
| 214511 2006 $BA_{213}$ | 12.7 | $X$ | 314.62756 | 137.94426 | 157.35573 | 16.24202 | 0.0727447 | 0.08218929 | 5.2391309 | 21 | 5 24.0 | 19.6 |
| 214512 2006 $BL_{264}$ | 16.7 | $X$ | 350.01268 | 226.89530 | 52.40385 | 3.00325 | 0.1962480 | 0.27237859 | 2.3569701 | 21 | 5 31.8 | 18.3 |
| 214513 2006 $CM_{15}$ | 15.1 | $X$ | 194.92060 | 140.53760 | 118.25995 | 11.96255 | 0.0635857 | 0.18213395 | 3.0823038 | 21 | — | — |
| 214514 2006 $DB_{20}$ | 12.8 | $X$ | 242.65285 | 229.26351 | 142.62273 | 16.39477 | 0.0583829 | 0.08355555 | 5.1818620 | 21 | 5 30.6 | 20.0 |
| 214515 2006 $DX_{194}$ | 16.4 | $X$ | 198.19515 | 89.74006 | 285.35756 | 0.94536 | 0.0877307 | 0.20386984 | 2.8591311 | 21 | 4 4.1 | 20.8 |
| 214516 2006 $EH_{63}$ | 15.9 | $X$ | 168.58264 | 19.50853 | 192.10502 | 14.90800 | 0.0254113 | 0.22807801 | 2.6530602 | 21 | 11 13.2 | 19.7 |
| 214517 2006 $FO$ | 15.3 | $X$ | 321.17094 | 356.69049 | 159.96206 | 7.75677 | 0.1310556 | 0.18308390 | 3.0716326 | 21 | — | — |
| 214518 2006 $GC_{33}$ | 16.2 | $X$ | 321.67557 | 281.55724 | 140.01473 | 3.01103 | 0.0926941 | 0.22778445 | 2.6553392 | 21 | 11 15.2 | 19.1 |
| 214519 2006 $HU_{26}$ | 17.1 | $X$ | 67.46990 | 205.98231 | 133.09357 | 7.79675 | 0.1799178 | 0.28799683 | 2.2709675 | 21 | — | — |
| 214520 2006 $HG_{78}$ | 17.1 | $X$ | 232.51297 | 123.45770 | 188.79909 | 3.19977 | 0.1004360 | 0.31638504 | 2.1330060 | 21 | 2 4.4 | 20.1 |
| 214521 2006 $HO_{92}$ | 17.1 | $X$ | 314.50797 | 292.15039 | 124.92223 | 4.39577 | 0.1184178 | 0.28598380 | 2.2816119 | 21 | 11 9.3 | 19.1 |
| 214522 2006 $HF_{97}$ | 17.3 | $X$ | 324.65748 | 86.97377 | 39.65074 | 4.19280 | 0.0998361 | 0.30240383 | 2.1982539 | 21 | — | — |
| 214523 2006 $JD_{17}$ | 17.7 | $X$ | 324.31441 | 118.91894 | 112.07326 | 1.77880 | 0.0701125 | 0.31892180 | 2.1216801 | 21 | 2 10.2 | 19.9 |
| 214524 2006 $JC_{35}$ | 17.2 | $X$ | 146.60341 | 238.92497 | 89.50071 | 5.70639 | 0.1780564 | 0.30038408 | 2.2080968 | 21 | — | — |
| 214525 2006 $KH_{4}$ | 17.7 | $X$ | 260.84176 | 159.02707 | 68.97824 | 5.57894 | 0.1114471 | 0.30631740 | 2.1794903 | 21 | — | — |
| 214526 2006 $KD_{6}$ | 18.0 | $X$ | 14.96864 | 4.87728 | 66.41526 | 1.11186 | 0.0558499 | 0.29900201 | 2.2148958 | 21 | — | — |
| 214527 2006 $KV_{7}$ | 17.0 | $X$ | 126.16893 | 301.30566 | 65.12185 | 5.02297 | 0.1544463 | 0.30396955 | 2.1906988 | 21 | — | — |
| 214528 2006 $KS_{41}$ | 15.7 | $X$ | 196.49044 | 169.15819 | 77.88601 | 15.47314 | 0.0998252 | 0.23205669 | 2.6226479 | 21 | — | — |
| 214529 2006 $KU_{41}$ | 16.8 | $X$ | 190.42056 | 304.14337 | 50.11133 | 3.03115 | 0.2452451 | 0.31372788 | 2.1450330 | 21 | 2 24.9 | 20.3 |
| 214530 2006 $KG_{50}$ | 17.8 | $X$ | 344.72155 | 253.83627 | 204.66787 | 4.34730 | 0.0636246 | 0.29895179 | 2.2151439 | 21 | — | — |
| 214531 2006 $KZ_{94}$ | 16.9 | $X$ | 223.94164 | 219.26860 | 219.96013 | 7.28479 | 0.0800820 | 0.27267189 | 2.3552796 | 21 | 7 22.8 | 20.3 |
| 214532 2006 $KP_{98}$ | 17.4 | $X$ | 311.40900 | 185.07502 | 183.97333 | 6.00246 | 0.1188371 | 0.27221040 | 2.3579409 | 21 | 8 13.4 | 19.9 |
| 214533 2006 $LF_{5}$ | 17.0 | $X$ | 174.89062 | 182.54467 | 110.26651 | 8.22653 | 0.1661902 | 0.29382702 | 2.2408265 | 21 | — | — |
| 214534 2006 $LC_{6}$ | 17.1 | $X$ | 125.29918 | 211.50845 | 77.61573 | 2.94811 | 0.2122053 | 0.28525795 | 2.2854806 | 21 | — | — |
| 214535 2006 $MR_{3}$ | 16.9 | $X$ | 194.33053 | 192.78340 | 70.27453 | 5.34325 | 0.1131799 | 0.29692777 | 2.2251989 | 21 | — | — |
| 214536 2006 $ME_{6}$ | 16.3 | $X$ | 44.51131 | 173.05294 | 109.15572 | 7.57869 | 0.1067866 | 0.26885470 | 2.3775206 | 21 | 9 27.4 | 19.1 |
| 214537 2006 $MV_{9}$ | 16.6 | $X$ | 302.50688 | 142.83147 | 173.02731 | 2.24880 | 0.2128786 | 0.25510023 | 2.4622311 | 21 | 4 27.1 | 19.5 |
| 214538 2006 $ON_{3}$ | 16.8 | $X$ | 65.84983 | 138.29135 | 203.68360 | 5.50916 | 0.2541409 | 0.28051958 | 2.3111453 | 21 | — | — |
| 214539 2006 $OW_{7}$ | 17.1 | $X$ | 0.70766 | 130.97917 | 193.29821 | 1.90373 | 0.1928227 | 0.26605557 | 2.3941672 | 21 | 9 17.4 | 18.8 |
| 214540 2006 $OB_{9}$ | 16.6 | $X$ | 93.06503 | 186.71095 | 154.29206 | 7.15357 | 0.1732196 | 0.28431108 | 2.2905522 | 21 | — | — |
| 214541 2006 $OE_{9}$ | 17.0 | $X$ | 327.98497 | 70.77947 | 262.86729 | 0.76224 | 0.1984243 | 0.26001459 | 2.4311079 | 21 | 7 11.1 | 19.0 |
| 214542 2006 $OV_{9}$ | 17.7 | $X$ | 53.45214 | 261.59034 | 22.42103 | 1.37094 | 0.1795138 | 0.27004995 | 2.3705001 | 21 | 10 20.5 | 20.7 |
| 214543 2006 $OY_{9}$ | 17.1 | $X$ | 62.19140 | 165.29148 | 169.45984 | 2.13213 | 0.2274595 | 0.27941960 | 2.3172068 | 21 | — | — |
| 214544 2006 $OP_{13}$ | 16.7 | $X$ | 15.47913 | 181.99597 | 150.33138 | 8.40536 | 0.2344166 | 0.27006191 | 2.3704301 | 21 | 11 12.3 | 19.1 |
| 214545 2006 $OV_{17}$ | 16.4 | $X$ | 279.98901 | 317.98733 | 46.20867 | 7.04906 | 0.1495471 | 0.25680643 | 2.4513131 | 21 | 6 11.6 | 19.6 |
| 214546 2006 $OF_{20}$ | 16.5 | $X$ | 13.03524 | 245.17781 | 47.01251 | 7.53489 | 0.1265573 | 0.26307319 | 2.4122278 | 21 | 8 20.6 | 19.0 |
| 214547 2006 $OC_{21}$ | 17.4 | $X$ | 282.94328 | 85.19246 | 220.87788 | 0.18593 | 0.1410915 | 0.24466301 | 2.5317676 | 21 | 3 31.1 | 20.8 |
| 214548 2006 $PL_{7}$ | 17.0 | $X$ | 328.15954 | 308.00785 | 17.71540 | 1.54867 | 0.2012699 | 0.25959150 | 2.4337487 | 21 | 6 27.9 | 19.0 |
| 214549 2006 $PB_{9}$ | 17.1 | $X$ | 92.25756 | 93.46071 | 145.83173 | 1.77717 | 0.1554581 | 0.26951312 | 2.3736469 | 21 | 10 4.5 | 20.3 |
| 214550 2006 $PD_{14}$ | 16.7 | $X$ | 27.72356 | 265.32442 | 69.92367 | 7.65528 | 0.1375547 | 0.27151134 | 2.3619864 | 21 | 11 18.2 | 19.3 |
| 214551 2006 $PF_{15}$ | 15.8 | $X$ | 327.94042 | 173.22129 | 184.36680 | 2.61954 | 0.0963310 | 0.19701668 | 2.9250551 | 21 | 8 23.2 | 19.4 |
| 214552 2006 $PG_{16}$ | 17.2 | $X$ | 146.84800 | 114.49962 | 178.82910 | 4.23575 | 0.2190286 | 0.28739626 | 2.2741301 | 21 | — | — |
| 214553 2006 $PL_{16}$ | 16.5 | $X$ | 319.24304 | 248.37142 | 125.36780 | 8.70601 | 0.2512555 | 0.26212644 | 2.4180327 | 21 | 8 20.8 | 18.2 |
| 214554 2006 $PD_{20}$ | 17.2 | $X$ | 74.92999 | 249.72199 | 60.55272 | 6.38978 | 0.2653088 | 0.27742302 | 2.3283113 | 21 | 12 26.4 | 20.9 |
| 214555 2006 $PR_{23}$ | 16.9 | $X$ | 166.24452 | 200.83801 | 91.42503 | 7.86134 | 0.1388454 | 0.29180234 | 2.2511799 | 21 | — | — |
| 214556 2006 $PD_{35}$ | 17.2 | $X$ | 198.48712 | 175.17590 | 84.14639 | 7.37730 | 0.1785893 | 0.29408182 | 2.2395320 | 21 | — | — |
| 214557 2006 $PS_{35}$ | 16.6 | $X$ | 71.18305 | 244.00002 | 79.81114 | 7.56878 | 0.1429852 | 0.27916394 | 2.3186214 | 21 | 12 29.0 | 19.9 |
| 214558 2006 $QB_{1}$ | 16.3 | $X$ | 340.36429 | 245.39531 | 294.58790 | 11.88471 | 0.1945714 | 0.23487117 | 2.6016542 | 21 | — | — |
| 214559 2006 $QS_{1}$ | 17.3 | $X$ | 117.62734 | 127.66824 | 151.50661 | 2.97826 | 0.1598160 | 0.28236582 | 2.3010601 | 21 | 12 20.3 | 20.9 |
| 214560 2006 $QG_{5}$ | 15.5 | $X$ | 136.78630 | 268.47640 | 173.97750 | 9.53312 | 0.0775007 | 0.17556612 | 3.1587038 | 21 | 4 25.9 | 20.3 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214561 2006 $QU_5$ | 16.4 | $X$ | 23.56796 | 251.22912 | 90.72905 | 7.21636 | 0.1740136 | 0.27084617 | 2.3658520 | 21 | 11 27.3 | 19.0 |
| 214562 2006 $QE_8$ | 15.9 | $X$ | 23.68042 | 258.74916 | 141.16248 | 4.24042 | 0.0970266 | 0.21328011 | 2.7744004 | 21 | — | — |
| 214563 2006 $QD_{10}$ | 16.4 | $X$ | 124.79631 | 271.15359 | 97.46391 | 3.03894 | 0.0983500 | 0.22591844 | 2.6699406 | 21 | 1 4.1 | 20.0 |
| 214564 2006 $QD_{13}$ | 17.1 | $X$ | 81.72103 | 242.19419 | 50.04569 | 6.04110 | 0.2340814 | 0.27599748 | 2.3363217 | 21 | 12 7.2 | 20.8 |
| 214565 2006 $QH_{13}$ | 17.4 | $X$ | 176.64083 | 163.68513 | 111.02392 | 8.47149 | 0.2372921 | 0.29129852 | 2.2537749 | 21 | — | — |
| 214566 2006 $QU_{13}$ | 15.2 | $X$ | 194.54057 | 200.70688 | 162.11855 | 15.51221 | 0.1673529 | 0.17427869 | 3.1742407 | 21 | 3 22.3 | 20.4 |
| 214567 2006 $QK_{16}$ | 16.2 | $X$ | 15.82225 | 351.07571 | 335.30264 | 9.94310 | 0.2623167 | 0.26807119 | 2.3821510 | 21 | 10 31.2 | 18.7 |
| 214568 2006 $QV_{21}$ | 17.1 | $X$ | 355.25735 | 295.90358 | 34.64701 | 1.92792 | 0.1557120 | 0.26502771 | 2.4003534 | 21 | 9 13.1 | 18.9 |
| 214569 2006 $QZ_{25}$ | 16.0 | $X$ | 167.96322 | 188.85393 | 205.21976 | 13.60177 | 0.1486036 | 0.23956120 | 2.5675864 | 21 | 3 25.9 | 20.1 |
| 214570 2006 $QN_{28}$ | 15.9 | $X$ | 140.18412 | 203.70515 | 166.20663 | 14.52811 | 0.1207484 | 0.22879321 | 2.6475284 | 21 | 1 24.8 | 19.9 |
| 214571 2006 $QK_{35}$ | 17.4 | $X$ | 46.28444 | 277.51027 | 27.30070 | 1.70417 | 0.1933133 | 0.27036258 | 2.3686724 | 21 | 11 10.2 | 20.4 |
| 214572 2006 $QV_{36}$ | 17.0 | $X$ | 36.71205 | 237.72198 | 40.14689 | 2.82308 | 0.1929842 | 0.26577014 | 2.3958811 | 21 | 9 19.8 | 19.5 |
| 214573 2006 $QH_{38}$ | 16.0 | $X$ | 157.22045 | 329.82834 | 3.23578 | 13.88736 | 0.2600752 | 0.22683727 | 2.6627257 | 21 | 1 17.4 | 20.6 |
| 214574 2006 $QU_{38}$ | 17.0 | $X$ | 58.38610 | 167.89038 | 124.57899 | 5.19745 | 0.2043232 | 0.27093448 | 2.3653379 | 21 | 11 12.6 | 20.2 |
| 214575 2006 $QJ_{42}$ | 16.9 | $X$ | 42.01247 | 193.77811 | 104.78443 | 3.19113 | 0.1024886 | 0.26764548 | 2.3846763 | 21 | 10 13.7 | 19.6 |
| 214576 2006 $QL_{45}$ | 17.2 | $X$ | 355.15240 | 336.98932 | 352.78390 | 2.10001 | 0.1809174 | 0.26315031 | 2.4117565 | 21 | 9 12.1 | 19.1 |
| 214577 2006 $QN_{45}$ | 17.4 | $X$ | 30.97239 | 331.38792 | 326.78854 | 0.43325 | 0.1805305 | 0.26587053 | 2.3952780 | 21 | 10 6.4 | 19.8 |
| 214578 2006 $QB_{46}$ | 16.3 | $X$ | 13.47549 | 278.42514 | 40.02906 | 7.35255 | 0.1334688 | 0.26455473 | 2.4032135 | 21 | 9 30.9 | 18.7 |
| 214579 2006 $QB_{48}$ | 17.0 | $X$ | 99.09139 | 141.55568 | 152.00715 | 11.68761 | 0.1838869 | 0.27801668 | 2.3249957 | 21 | 12 22.1 | 20.8 |
| 214580 2006 $QB_{50}$ | 15.4 | $X$ | 258.95700 | 172.87348 | 152.35512 | 12.40352 | 0.1117057 | 0.17882351 | 3.1202279 | 21 | 4 11.2 | 20.2 |
| 214581 2006 $QG_{51}$ | 16.9 | $X$ | 350.76543 | 261.19467 | 65.55530 | 2.30241 | 0.1950300 | 0.26266540 | 2.4147238 | 21 | 8 28.9 | 18.5 |
| 214582 2006 $QJ_{52}$ | 16.4 | $X$ | 334.77141 | 235.77762 | 119.90930 | 5.01571 | 0.1493687 | 0.26364371 | 2.4087466 | 21 | 9 9.2 | 18.4 |
| 214583 2006 $QL_{52}$ | 16.7 | $X$ | 20.43313 | 194.92146 | 102.56094 | 2.81720 | 0.1450574 | 0.26395998 | 2.4068221 | 21 | 9 12.0 | 19.1 |
| 214584 2006 $QN_{55}$ | 16.1 | $X$ | 229.28601 | 148.95989 | 149.74612 | 14.33592 | 0.0350098 | 0.23489888 | 2.6014496 | 21 | 1 29.7 | 19.8 |
| 214585 2006 $QM_{62}$ | 17.0 | $X$ | 38.07245 | 246.21766 | 83.02621 | 4.17575 | 0.1922343 | 0.27184301 | 2.3600649 | 21 | 12 2.9 | 19.7 |
| 214586 2006 $QU_{67}$ | 16.5 | $X$ | 49.39156 | 161.33745 | 145.54313 | 2.45816 | 0.0209685 | 0.20250813 | 2.8719336 | 21 | 10 12.9 | 20.5 |
| 214587 2006 $QT_{74}$ | 16.1 | $X$ | 50.82776 | 181.39832 | 6.51675 | 2.60325 | 0.0317435 | 0.24730784 | 2.5136846 | 21 | 5 6.2 | 19.0 |
| 214588 2006 $QX_{81}$ | 16.1 | $X$ | 88.15190 | 192.98613 | 169.68982 | 5.00290 | 0.1427888 | 0.21684562 | 2.7439042 | 21 | — | — |
| 214589 2006 $QO_{82}$ | 17.3 | $X$ | 28.14784 | 119.76092 | 193.75242 | 1.63851 | 0.2386149 | 0.26645162 | 2.3917942 | 21 | 11 3.7 | 19.6 |
| 214590 2006 $QC_{89}$ | 16.0 | $X$ | 356.89098 | 297.03388 | 51.39181 | 2.72315 | 0.0767746 | 0.19785871 | 2.9167504 | 21 | 9 28.7 | 19.6 |
| 214591 2006 $QN_{110}$ | 16.4 | $X$ | 114.32745 | 2.22397 | 48.94351 | 5.49477 | 0.0809005 | 0.22965054 | 2.6409352 | 21 | 2 12.9 | 19.9 |
| 214592 2006 $QX_{125}$ | 16.1 | $X$ | 66.36213 | 350.95347 | 23.74893 | 9.38259 | 0.1546713 | 0.21602266 | 2.7508686 | 21 | — | — |
| 214593 2006 $QH_{131}$ | 16.8 | $X$ | 77.26325 | 284.55833 | 28.36490 | 8.58418 | 0.2089817 | 0.27588024 | 2.3369835 | 21 | 12 27.1 | 20.5 |
| 214594 2006 $QS_{132}$ | 16.0 | $X$ | 251.99279 | 133.59561 | 191.49052 | 14.92163 | 0.1588938 | 0.24575993 | 2.5242285 | 21 | 3 18.9 | 19.9 |
| 214595 2006 $QC_{136}$ | 16.1 | $X$ | 354.34577 | 38.47135 | 252.64098 | 5.43683 | 0.0925344 | 0.25558542 | 2.4591140 | 21 | 7 6.5 | 18.6 |
| 214596 2006 $QF_{148}$ | 17.1 | $X$ | 78.31432 | 124.22903 | 124.51722 | 2.07431 | 0.1410196 | 0.26357143 | 2.4091869 | 21 | 9 28.8 | 20.3 |
| 214597 2006 $QO_{148}$ | 16.6 | $X$ | 359.82426 | 38.84171 | 30.10623 | 4.81810 | 0.0770343 | 0.21148991 | 2.7900347 | 21 | — | — |
| 214598 2006 $QX_{148}$ | 16.9 | $X$ | 80.80729 | 215.31310 | 49.84992 | 3.72347 | 0.1845892 | 0.26828909 | 2.3808610 | 21 | 10 28.7 | 20.3 |
| 214599 2006 $QO_{161}$ | 16.7 | $X$ | 112.23970 | 174.81623 | 172.34716 | 9.52534 | 0.1332468 | 0.21899047 | 2.7259585 | 21 | — | — |
| 214600 2006 $QW_{162}$ | 16.0 | $X$ | 323.62503 | 303.06593 | 313.88127 | 5.09160 | 0.1089284 | 0.24333760 | 2.5409527 | 21 | 3 22.3 | 19.2 |
| 214601 2006 $QY_{165}$ | 16.0 | $X$ | 94.46008 | 136.47305 | 232.99144 | 5.49411 | 0.0364005 | 0.21909408 | 2.7250990 | 21 | — | — |
| 214602 2006 $QM_{167}$ | 15.8 | $X$ | 36.31093 | 297.56076 | 137.75076 | 7.84978 | 0.0652016 | 0.22064592 | 2.7123066 | 21 | — | — |
| 214603 2006 $QD_{182}$ | 16.1 | $X$ | 29.29171 | 323.16604 | 91.88180 | 6.48159 | 0.0777333 | 0.21407067 | 2.7675656 | 21 | — | — |
| 214604 2006 $RW_6$ | 16.9 | $X$ | 92.42158 | 102.74863 | 201.49354 | 7.62315 | 0.2630895 | 0.27607653 | 2.3358757 | 21 | 12 31.9 | 21.0 |
| 214605 2006 $RR_{11}$ | 16.0 | $X$ | 199.65745 | 154.11969 | 169.77466 | 14.41756 | 0.1063507 | 0.23081841 | 2.6320194 | 21 | 1 28.7 | 20.2 |
| 214606 2006 $RE_{19}$ | 16.4 | $X$ | 167.29801 | 200.91951 | 186.26205 | 11.59994 | 0.2435954 | 0.23228504 | 2.6209288 | 21 | 3 24.4 | 20.9 |
| 214607 2006 $RF_{22}$ | 16.2 | $X$ | 66.53136 | 264.93819 | 38.70987 | 5.40914 | 0.3074402 | 0.27116108 | 2.3640200 | 21 | 12 13.8 | 19.9 |
| 214608 2006 $RB_{23}$ | 15.7 | $X$ | 174.96375 | 236.65965 | 130.46518 | 13.04767 | 0.2398426 | 0.23306348 | 2.6150895 | 21 | 3 9.6 | 20.2 |
| 214609 2006 $RE_{33}$ | 16.8 | $X$ | 41.98716 | 191.01308 | 127.44579 | 0.93379 | 0.2290851 | 0.26832630 | 2.3806409 | 21 | 11 28.4 | 19.8 |
| 214610 2006 $RL_{34}$ | 16.3 | $X$ | 150.06614 | 321.48655 | 355.26341 | 2.80092 | 0.1693670 | 0.22118386 | 2.7079071 | 21 | — | — |
| 214611 2006 $RH_{36}$ | 15.9 | $X$ | 138.03051 | 165.72565 | 210.83784 | 13.24210 | 0.1925352 | 0.22643264 | 2.6658970 | 21 | 2 5.9 | 20.1 |
| 214612 2006 $RS_{36}$ | 16.1 | $X$ | 34.90206 | 200.23978 | 204.17340 | 9.26626 | 0.1751351 | 0.21367098 | 2.7710159 | 21 | — | — |
| 214613 2006 $RA_{39}$ | 17.0 | $X$ | 78.05051 | 307.49137 | 356.46166 | 1.81870 | 0.2263538 | 0.27331242 | 2.3515983 | 21 | 12 17.7 | 20.6 |
| 214614 2006 $RN_{44}$ | 17.1 | $X$ | 264.97178 | 277.13800 | 25.10572 | 3.66170 | 0.1240807 | 0.23858684 | 2.5745721 | 21 | 3 10.0 | 20.8 |
| 214615 2006 $RP_{51}$ | 15.7 | $X$ | 271.20351 | 37.30880 | 19.77637 | 9.77694 | 0.0748617 | 0.18928666 | 3.0041576 | 21 | 8 26.3 | 19.9 |
| 214616 2006 $RQ_{52}$ | 16.4 | $X$ | 170.14242 | 264.77757 | 27.63132 | 4.03228 | 0.0387588 | 0.21646600 | 2.7471113 | 21 | — | — |
| 214617 2006 $RP_{56}$ | 16.6 | $X$ | 240.12352 | 265.83570 | 173.83539 | 1.78717 | 0.1305205 | 0.18641682 | 3.0349112 | 21 | 8 5.0 | 21.0 |
| 214618 2006 $RP_{58}$ | 16.6 | $X$ | 178.50953 | 248.53036 | 17.40345 | 4.16195 | 0.0274651 | 0.21481416 | 2.7611762 | 21 | — | — |
| 214619 2006 $RC_{65}$ | 16.2 | $X$ | 38.29298 | 210.01601 | 202.56856 | 1.35783 | 0.0651662 | 0.21691883 | 2.7432868 | 21 | — | — |
| 214620 2006 $RG_{66}$ | 16.5 | $X$ | 34.09983 | 209.62033 | 109.92969 | 8.45263 | 0.1151994 | 0.26715325 | 2.3876046 | 21 | 11 4.4 | 19.4 |
| 214621 2006 $RQ_{76}$ | 16.6 | $X$ | 49.93815 | 290.89287 | 100.73051 | 1.78606 | 0.0788424 | 0.21348896 | 2.7725907 | 21 | — | — |
| 214622 2006 $RC_{79}$ | 16.3 | $X$ | 296.51406 | 3.54372 | 115.14984 | 1.61724 | 0.0248205 | 0.20912226 | 2.8110541 | 21 | 12 21.2 | 20.1 |
| 214623 2006 $RT_{84}$ | 16.4 | $X$ | 154.20379 | 332.76187 | 323.43623 | 0.99173 | 0.0551031 | 0.21613751 | 2.7498940 | 21 | — | — |
| 214624 2006 $RE_{85}$ | 16.6 | $X$ | 334.45849 | 215.83897 | 10.30823 | 1.12243 | 0.1330865 | 0.23729996 | 2.5838717 | 21 | 2 24.8 | 19.8 |
| 214625 2006 $RC_{91}$ | 16.9 | $X$ | 158.73545 | 147.45469 | 190.52709 | 4.14708 | 0.0867038 | 0.22400994 | 2.6850839 | 21 | 1 4.4 | 20.8 |
| 214626 2006 $RU_{91}$ | 17.1 | $X$ | 355.64483 | 279.55786 | 8.59800 | 5.17210 | 0.1941369 | 0.25438551 | 2.4668409 | 21 | 7 3.5 | 19.1 |
| 214627 2006 $RR_{93}$ | 16.6 | $X$ | 194.18647 | 45.43216 | 226.66712 | 5.00753 | 0.0363737 | 0.21727734 | 2.7402684 | 21 | — | — |
| 214628 2006 $RU_{96}$ | 15.9 | $X$ | 292.13393 | 236.53694 | 10.76447 | 3.51395 | 0.1507490 | 0.23260829 | 2.6185001 | 21 | 1 27.8 | 19.6 |
| 214629 2006 $RO_{98}$ | 15.9 | $X$ | 33.45440 | 323.53356 | 31.38150 | 15.69237 | 0.1525868 | 0.20286372 | 2.8685767 | 21 | 12 6.5 | 19.8 |
| 214630 2006 $RU_{98}$ | 16.4 | $X$ | 117.70166 | 215.65934 | 84.95550 | 0.48010 | 0.0514364 | 0.21354727 | 2.7720860 | 21 | 12 30.5 | 20.5 |
| 214631 2006 $RH_{99}$ | 15.7 | $X$ | 74.79547 | 316.09341 | 3.26807 | 12.06127 | 0.0419684 | 0.20717378 | 2.8286520 | 21 | 11 29.2 | 19.9 |
| 214632 2006 $RT_{101}$ | 16.9 | $X$ | 148.58495 | 177.25789 | 98.40432 | 6.09664 | 0.1500422 | 0.28340171 | 2.2954495 | 21 | — | — |
| 214633 2006 $RP_{120}$ | 17.5 | $X$ | 347.80340 | 266.87992 | 28.84799 | 2.47863 | 0.1814121 | 0.25362258 | 2.4717855 | 21 | 6 26.6 | 19.4 |
| 214634 2006 $SR_4$ | 15.6 | $X$ | 184.45434 | 149.49969 | 199.36386 | 12.83771 | 0.1954089 | 0.22815947 | 2.6524287 | 21 | 2 15.9 | 20.2 |
| 214635 2006 $SY_4$ | 16.0 | $X$ | 96.61880 | 131.59257 | 233.82548 | 4.34688 | 0.0771434 | 0.21763764 | 2.7372432 | 21 | — | — |
| 214636 2006 $SB_{12}$ | 15.1 | $X$ | 248.46816 | 46.51960 | 2.82443 | 12.54098 | 0.1211626 | 0.18368344 | 3.0649451 | 21 | 7 11.1 | 19.9 |
| 214637 2006 $SN_{18}$ | 16.2 | $X$ | 205.70140 | 178.15405 | 137.92009 | 3.79041 | 0.1058785 | 0.22900069 | 2.6459290 | 21 | 1 27.3 | 20.1 |
| 214638 2006 $SY_{19}$ | 15.4 | $X$ | 274.59753 | 310.73340 | 22.11470 | 5.36147 | 0.1783567 | 0.17815063 | 3.1280797 | 21 | 4 25.4 | 20.2 |
| 214639 2006 $SU_{23}$ | 16.1 | $X$ | 107.67998 | 315.44647 | 40.95209 | 6.26284 | 0.0293700 | 0.21871342 | 2.7282600 | 21 | — | — |
| 214640 2006 $SB_{41}$ | 16.4 | $X$ | 134.99437 | 205.89574 | 77.30277 | 1.58605 | 0.0379541 | 0.21033753 | 2.8002160 | 21 | 12 27.6 | 20.4 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214641 2006 $SY_{52}$ | 15.9 | X | 296.39972 | 61.97228 | 83.99733 | 4.44880 | 0.0149888 | 0.21434770 | 2.7651806 | 21 | — | — |
| 214642 2006 $SA_{56}$ | 15.7 | X | 217.75780 | 285.93310 | 169.77848 | 10.61361 | 0.0500782 | 0.18689557 | 3.0297262 | 21 | 8 7.1 | 20.2 |
| 214643 2006 $SA_{57}$ | 16.3 | X | 76.61622 | 286.79291 | 20.66809 | 10.38877 | 0.1007287 | 0.20264009 | 2.8706867 | 21 | 11 24.0 | 20.5 |
| 214644 2006 $SM_{60}$ | 16.1 | X | 81.42715 | 296.36242 | 89.68394 | 6.84343 | 0.0804361 | 0.21731989 | 2.7399107 | 21 | — | — |
| 214645 2006 $SA_{62}$ | 15.8 | X | 264.57935 | 8.86054 | 13.96363 | 13.68159 | 0.1882886 | 0.18458311 | 3.0549780 | 21 | 6 13.0 | 20.7 |
| 214646 2006 $SA_{67}$ | 16.1 | X | 106.11078 | 315.59016 | 168.95008 | 1.08444 | 0.1562684 | 0.17192319 | 3.2031682 | 21 | 5 21.3 | 20.8 |
| 214647 2006 $SL_{69}$ | 16.2 | X | 59.77195 | 175.47572 | 162.32346 | 3.02818 | 0.0336034 | 0.20673141 | 2.8326858 | 21 | 12 5.8 | 20.1 |
| 214648 2006 $SQ_{71}$ | 16.6 | X | 165.04764 | 241.62917 | 64.40350 | 2.16288 | 0.1400104 | 0.21950483 | 2.7216983 | 21 | — | — |
| 214649 2006 $SB_{72}$ | 16.4 | X | 203.31186 | 212.23437 | 44.55222 | 5.46010 | 0.0748204 | 0.21581397 | 2.7526416 | 21 | — | — |
| 214650 2006 $SK_{74}$ | 16.3 | X | 230.74203 | 244.64412 | 166.53611 | 5.69227 | 0.1465979 | 0.18008826 | 3.1056019 | 21 | 6 19.6 | 21.2 |
| 214651 2006 $SK_{75}$ | 15.6 | X | 34.96672 | 92.12432 | 182.73525 | 10.27689 | 0.0701064 | 0.18779683 | 3.0200251 | 21 | 8 14.3 | 19.6 |
| 214652 2006 $SR_{75}$ | 15.8 | X | 141.47445 | 57.87322 | 38.31997 | 9.25106 | 0.0939066 | 0.17145033 | 3.2090551 | 21 | 5 16.5 | 20.6 |
| 214653 2006 $SZ_{76}$ | 16.2 | X | 113.52820 | 178.62160 | 192.82551 | 12.43653 | 0.1787456 | 0.21974078 | 2.7197497 | 21 | 1 4.8 | 20.1 |
| 214654 2006 $SW_{82}$ | 17.0 | X | 267.33821 | 155.45178 | 128.37993 | 1.20919 | 0.0949758 | 0.23504807 | 2.6003487 | 21 | 2 19.9 | 20.7 |
| 214655 2006 $SV_{93}$ | 16.3 | X | 138.99332 | 140.32754 | 196.10943 | 10.60413 | 0.0935508 | 0.21850658 | 2.7299815 | 21 | — | — |
| 214656 2006 $SV_{98}$ | 16.8 | X | 269.86642 | 74.37651 | 195.15003 | 5.92210 | 0.1278452 | 0.23223333 | 2.6213178 | 21 | 1 31.3 | 20.8 |
| 214657 2006 $SQ_{101}$ | 17.3 | X | 266.41909 | 37.23771 | 18.16125 | 2.72323 | 0.1910557 | 0.25682372 | 2.4512031 | 21 | 7 30.8 | 20.5 |
| 214658 2006 $ST_{101}$ | 15.8 | X | 11.65063 | 140.29674 | 160.35480 | 9.50285 | 0.0567468 | 0.19250842 | 2.9705457 | 21 | 8 14.5 | 19.5 |
| 214659 2006 $SX_{108}$ | 16.7 | X | 113.16946 | 332.36665 | 24.93228 | 6.76538 | 0.0862031 | 0.21748609 | 2.7385146 | 21 | — | — |
| 214660 2006 $SV_{110}$ | 16.1 | X | 38.99039 | 217.17394 | 110.04604 | 7.86098 | 0.2224766 | 0.26944561 | 2.3740433 | 21 | 12 6.3 | 19.1 |
| 214661 2006 $SM_{111}$ | 16.2 | X | 157.41785 | 326.18415 | 23.11882 | 13.14086 | 0.2361468 | 0.22656285 | 2.6648754 | 21 | 2 5.1 | 20.8 |
| 214662 2006 $SF_{115}$ | 16.2 | X | 152.39093 | 123.36109 | 186.77066 | 3.38654 | 0.1082742 | 0.21934696 | 2.7230042 | 21 | — | — |
| 214663 2006 $SZ_{119}$ | 15.8 | X | 26.93216 | 300.98574 | 99.82720 | 6.49655 | 0.0354561 | 0.21038219 | 2.7998197 | 21 | — | — |
| 214664 2006 $SS_{122}$ | 15.7 | X | 307.43955 | 9.86089 | 204.43946 | 11.59939 | 0.1270218 | 0.23035599 | 2.6355406 | 21 | 1 4.8 | 19.7 |
| 214665 2006 $SF_{128}$ | 16.2 | X | 84.65414 | 295.02865 | 77.34473 | 5.67722 | 0.1352933 | 0.21718153 | 2.7410742 | 21 | — | — |
| 214666 2006 $SM_{130}$ | 16.0 | X | 257.92839 | 269.70144 | 30.36354 | 8.14703 | 0.1057068 | 0.23499451 | 2.6007438 | 21 | 3 4.3 | 19.9 |
| 214667 2006 $SW_{137}$ | 15.4 | X | 197.24278 | 312.14274 | 119.53535 | 15.66592 | 0.2051760 | 0.17919769 | 3.1158828 | 21 | 6 13.4 | 20.9 |
| 214668 2006 $SL_{142}$ | 16.2 | X | 9.71808 | 68.36899 | 14.90705 | 4.97001 | 0.1012892 | 0.21610431 | 2.7501756 | 21 | — | — |
| 214669 2006 $SZ_{147}$ | 15.8 | X | 127.30919 | 306.93572 | 195.65385 | 16.70243 | 0.1630777 | 0.17789070 | 3.1311261 | 21 | 7 3.2 | 21.1 |
| 214670 2006 $SU_{159}$ | 16.0 | X | 94.40990 | 166.75710 | 44.10850 | 4.26637 | 0.0303635 | 0.18521224 | 3.0480559 | 21 | 8 9.2 | 20.3 |
| 214671 2006 $SN_{161}$ | 16.4 | X | 28.27856 | 325.62684 | 97.51962 | 1.76096 | 0.0577574 | 0.21267498 | 2.7796607 | 21 | — | — |
| 214672 2006 $SA_{182}$ | 15.8 | X | 167.80479 | 266.81908 | 70.65068 | 15.29558 | 0.0663720 | 0.22457096 | 2.6806101 | 21 | 1 12.9 | 19.8 |
| 214673 2006 $SU_{182}$ | 16.7 | X | 81.65023 | 164.47510 | 198.99952 | 3.30171 | 0.1062278 | 0.21347374 | 2.7727226 | 21 | — | — |
| 214674 2006 $SV_{185}$ | 16.0 | X | 114.00679 | 178.03452 | 29.17538 | 3.48011 | 0.1002382 | 0.18637506 | 3.0353645 | 21 | 9 5.2 | 20.5 |
| 214675 2006 $SZ_{187}$ | 17.2 | X | 23.97855 | 47.48582 | 30.47603 | 4.42603 | 0.1887274 | 0.21428664 | 2.7657058 | 21 | — | — |
| 214676 2006 $SA_{189}$ | 16.2 | X | 351.80864 | 33.98263 | 50.57906 | 4.27141 | 0.0658581 | 0.21150289 | 2.7899206 | 21 | — | — |
| 214677 2006 $SU_{189}$ | 16.2 | X | 122.86814 | 163.85374 | 169.96511 | 5.00558 | 0.0384512 | 0.21805548 | 2.7337453 | 21 | — | — |
| 214678 2006 $SR_{197}$ | 16.1 | X | 35.70153 | 2.16568 | 37.58461 | 6.52628 | 0.0421091 | 0.21360546 | 2.7715826 | 21 | — | — |
| 214679 2006 $SC_{200}$ | 16.7 | X | 343.45141 | 109.91333 | 308.88053 | 1.10023 | 0.0553019 | 0.20357169 | 2.8619220 | 21 | 12 7.9 | 20.3 |
| 214680 2006 $SK_{204}$ | 16.2 | X | 133.53546 | 0.35734 | 161.60264 | 4.38439 | 0.0563744 | 0.18491537 | 3.0513173 | 21 | 7 26.0 | 20.6 |
| 214681 2006 $SQ_{207}$ | 16.2 | X | 174.60331 | 265.74734 | 8.92456 | 10.96778 | 0.1734726 | 0.21578312 | 2.7529040 | 21 | — | — |
| 214682 2006 $SH_{211}$ | 15.4 | X | 324.65806 | 227.03010 | 157.41128 | 12.52985 | 0.0720042 | 0.19418756 | 2.9533966 | 21 | 9 27.6 | 19.1 |
| 214683 2006 $SA_{212}$ | 16.2 | X | 201.08041 | 211.05960 | 42.65535 | 4.53521 | 0.0508098 | 0.21406208 | 2.7676397 | 21 | — | — |
| 214684 2006 $SR_{216}$ | 16.2 | X | 331.45925 | 191.27010 | 41.43186 | 6.08209 | 0.1005546 | 0.23677521 | 2.5876879 | 21 | 3 8.9 | 19.3 |
| 214685 2006 $SC_{217}$ | 16.3 | X | 299.09721 | 195.25973 | 175.83746 | 9.30287 | 0.1298166 | 0.18846111 | 3.0129243 | 21 | 7 21.2 | 20.4 |
| 214686 2006 $SL_{225}$ | 16.5 | X | 282.39154 | 6.96647 | 47.33474 | 1.95800 | 0.0988488 | 0.19443151 | 2.9509257 | 21 | 8 31.2 | 20.4 |
| 214687 2006 $SD_{245}$ | 16.0 | X | 296.05905 | 49.55342 | 20.34865 | 13.02887 | 0.0199846 | 0.19921616 | 2.9034856 | 21 | 10 18.2 | 19.9 |
| 214688 2006 $SN_{247}$ | 17.3 | X | 64.79121 | 270.09061 | 17.83030 | 4.36454 | 0.1765500 | 0.26856191 | 2.3792483 | 21 | 11 7.2 | 20.5 |
| 214689 2006 $SV_{261}$ | 16.2 | X | 131.30286 | 258.96935 | 39.30620 | 4.34629 | 0.0831093 | 0.20994089 | 2.8037419 | 21 | — | — |
| 214690 2006 $SJ_{262}$ | 16.1 | X | 211.01559 | 50.51072 | 197.12672 | 7.73454 | 0.1170187 | 0.21456225 | 2.7633369 | 21 | — | — |
| 214691 2006 $SK_{269}$ | 16.5 | X | 264.20682 | 118.09962 | 173.29734 | 2.24940 | 0.1138177 | 0.23282300 | 2.6168900 | 21 | 2 23.9 | 20.4 |
| 214692 2006 $SU_{278}$ | 15.9 | X | 180.26369 | 141.56084 | 15.54022 | 7.69662 | 0.1468319 | 0.19209397 | 2.9748168 | 21 | 9 11.9 | 20.8 |
| 214693 2006 $SX_{282}$ | 16.6 | X | 40.58127 | 308.75680 | 84.44680 | 3.07173 | 0.1092889 | 0.21332819 | 2.7739836 | 21 | — | — |
| 214694 2006 $SX_{284}$ | 16.3 | X | 177.45804 | 237.43801 | 124.48436 | 4.94278 | 0.2258186 | 0.23038908 | 2.6352882 | 21 | 3 3.4 | 20.8 |
| 214695 2006 $SP_{294}$ | 16.1 | X | 308.91840 | 229.64996 | 289.52627 | 1.87349 | 0.0190377 | 0.21857838 | 2.7293836 | 21 | — | — |
| 214696 2006 $SD_{295}$ | 16.5 | X | 29.54534 | 244.19979 | 190.96122 | 4.68326 | 0.0209641 | 0.21784795 | 2.7354812 | 21 | — | — |
| 214697 2006 $SO_{296}$ | 17.2 | X | 279.38001 | 88.47822 | 222.69783 | 1.84490 | 0.0984353 | 0.24357071 | 2.5393312 | 21 | 4 8.0 | 20.5 |
| 214698 2006 $SX_{303}$ | 16.7 | X | 174.36854 | 189.03149 | 142.08499 | 2.11254 | 0.0779259 | 0.22545669 | 2.6735848 | 21 | 1 12.3 | 20.6 |
| 214699 2006 $SB_{308}$ | 15.6 | X | 160.38804 | 247.82019 | 206.39502 | 15.61981 | 0.1061616 | 0.17557406 | 3.1586086 | 21 | 6 4.9 | 20.7 |
| 214700 2006 $SE_{336}$ | 16.1 | X | 331.64850 | 35.77726 | 66.96304 | 5.40890 | 0.0301170 | 0.21058707 | 2.7980035 | 21 | — | — |
| 214701 2006 $SM_{338}$ | 15.6 | X | 161.96269 | 208.17430 | 41.36328 | 9.43836 | 0.0918433 | 0.20889560 | 2.8130871 | 21 | 12 14.1 | 19.9 |
| 214702 2006 $SK_{339}$ | 16.5 | X | 57.62482 | 222.29546 | 144.44593 | 4.41978 | 0.1050384 | 0.21000339 | 2.8031856 | 21 | — | — |
| 214703 2006 $SW_{343}$ | 15.4 | X | 187.68895 | 244.33804 | 215.62642 | 10.49842 | 0.1087060 | 0.18010749 | 3.1053808 | 21 | 7 7.3 | 20.4 |
| 214704 2006 $SW_{345}$ | 16.6 | X | 253.66353 | 315.49950 | 339.05044 | 5.41680 | 0.1429240 | 0.23459502 | 2.6036955 | 21 | 2 15.3 | 20.4 |
| 214705 2006 $SF_{353}$ | 16.1 | X | 178.01769 | 199.25279 | 108.61241 | 4.27473 | 0.0774022 | 0.22128357 | 2.7070936 | 21 | — | — |
| 214706 2006 $SS_{358}$ | 16.5 | X | 169.15640 | 301.50148 | 49.00372 | 5.73216 | 0.1239659 | 0.22744723 | 2.6579631 | 21 | 2 5.3 | 20.6 |
| 214707 2006 $SJ_{383}$ | 15.9 | X | 147.97991 | 324.43151 | 161.14162 | 10.90428 | 0.1833770 | 0.17687125 | 3.1431459 | 21 | 7 4.4 | 21.3 |
| 214708 2006 $ST_{387}$ | 15.3 | X | 159.41766 | 335.32454 | 149.21335 | 9.87537 | 0.0231430 | 0.18142889 | 3.0902842 | 21 | 7 7.1 | 19.8 |
| 214709 2006 $SZ_{389}$ | 16.4 | X | 195.41486 | 183.19870 | 119.25204 | 13.05161 | 0.1795218 | 0.22265056 | 2.6960018 | 21 | 1 5.2 | 20.9 |
| 214710 2006 $SO_{392}$ | 15.8 | X | 184.59613 | 3.94566 | 53.48184 | 9.66655 | 0.1288915 | 0.17411119 | 3.1762762 | 21 | 5 14.9 | 20.9 |
| 214711 2006 $SS_{393}$ | 16.8 | X | 19.42371 | 82.12068 | 213.26730 | 13.01278 | 0.2114854 | 0.25998479 | 2.4312937 | 21 | 9 10.1 | 19.3 |
| 214712 2006 $SW_{394}$ | 16.8 | X | 54.92135 | 57.66623 | 257.22319 | 0.98885 | 0.0663999 | 0.20089158 | 2.8873198 | 21 | 11 4.3 | 20.6 |
| 214713 2006 $SO_{409}$ | 16.5 | X | 195.83069 | 311.59200 | 323.83215 | 1.75799 | 0.2718312 | 0.22595434 | 2.6696578 | 21 | — | — |
| 214714 2006 $TJ$ | 16.2 | X | 50.45581 | 352.58662 | 46.21234 | 9.20355 | 0.1803632 | 0.21337299 | 2.7735952 | 21 | — | — |
| 214715 Silvanofuso | 15.5 | X | 247.56037 | 247.54922 | 171.46280 | 9.92850 | 0.0931097 | 0.18760042 | 3.0221326 | 21 | 7 21.7 | 20.1 |
| 214716 2006 $TD_{8}$ | 15.4 | X | 144.83282 | 356.24459 | 126.75764 | 12.47990 | 0.0263392 | 0.17600118 | 3.1534963 | 21 | 6 18.9 | 20.0 |
| 214717 2006 $TE_{8}$ | 14.8 | X | 143.33804 | 269.26822 | 221.85198 | 24.25852 | 0.1562762 | 0.17456976 | 3.1707114 | 21 | 7 1.2 | 20.3 |
| 214718 2006 $TM_{8}$ | 16.3 | X | 265.01556 | 240.77650 | 41.63435 | 3.50422 | 0.1992657 | 0.23311399 | 2.6147118 | 21 | 2 8.1 | 20.4 |
| 214719 2006 $TY_{9}$ | 15.0 | X | 353.80237 | 211.76854 | 28.94514 | 16.28886 | 0.0375040 | 0.17216302 | 3.2001928 | 21 | 4 30.6 | 19.3 |
| 214720 2006 $TB_{11}$ | 15.7 | X | 229.41033 | 92.71565 | 206.40701 | 14.09492 | 0.0805735 | 0.22874700 | 2.6478850 | 21 | 1 27.1 | 19.9 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214721 2006 $TZ_{13}$ | 15.8 | X | 257.51544 | 353.80661 | 31.77342 | 8.90017 | 0.1488924 | 0.18231413 | 3.0802726 | 21 | 6 14.4 | 20.6 |
| 214722 2006 $TO_{15}$ | 16.3 | X | 328.05119 | 152.04970 | 231.85518 | 1.63021 | 0.0980985 | 0.19450101 | 2.9502228 | 21 | 9 27.7 | 19.8 |
| 214723 2006 $TY_{16}$ | 15.9 | X | 74.29490 | 341.74533 | 31.51841 | 12.62688 | 0.0968346 | 0.21229118 | 2.7830099 | 21 | — | — |
| 214724 2006 $TH_{17}$ | 16.2 | X | 282.66164 | 289.29570 | 55.17068 | 1.97500 | 0.1369237 | 0.18017320 | 3.1046258 | 21 | 5 25.3 | 20.7 |
| 214725 2006 $TE_{18}$ | 15.6 | X | 126.71342 | 120.86354 | 41.92209 | 9.62384 | 0.0506040 | 0.18109215 | 3.0941139 | 21 | 7 21.3 | 20.2 |
| 214726 2006 $TP_{19}$ | 16.1 | X | 81.72616 | 173.97505 | 217.73254 | 5.81389 | 0.1187091 | 0.21558385 | 2.7546002 | 21 | — | — |
| 214727 2006 $TS_{19}$ | 16.4 | X | 119.10798 | 303.69562 | 350.57424 | 1.57528 | 0.0435043 | 0.20549200 | 2.8440645 | 21 | 12 22.4 | 20.4 |
| 214728 2006 $TM_{21}$ | 16.1 | X | 127.47583 | 298.41748 | 40.68425 | 6.49453 | 0.0563693 | 0.21463290 | 2.7627305 | 21 | — | — |
| 214729 2006 $TH_{24}$ | 16.5 | X | 260.37937 | 51.75791 | 244.92840 | 3.40912 | 0.1358822 | 0.23518431 | 2.5993444 | 21 | 2 22.8 | 20.6 |
| 214730 2006 $TN_{24}$ | 15.6 | X | 332.51769 | 306.91106 | 16.16801 | 10.03053 | 0.0457519 | 0.18409176 | 3.0604115 | 21 | 7 21.4 | 19.8 |
| 214731 2006 $TG_{25}$ | 15.6 | X | 194.49890 | 256.59057 | 215.52609 | 9.36748 | 0.0605117 | 0.18280627 | 3.0747419 | 21 | 7 29.9 | 20.4 |
| 214732 2006 $TM_{30}$ | 16.1 | X | 266.02720 | 285.58433 | 39.74106 | 5.54571 | 0.1474299 | 0.17403380 | 3.1772178 | 21 | 4 12.6 | 20.9 |
| 214733 2006 $TB_{31}$ | 15.1 | X | 202.91620 | 206.81939 | 211.47789 | 10.75028 | 0.0746077 | 0.17566061 | 3.1575710 | 21 | 6 4.6 | 20.0 |
| 214734 2006 $TA_{33}$ | 16.0 | X | 164.69336 | 151.72129 | 32.24843 | 2.29824 | 0.0783882 | 0.19181463 | 2.9777043 | 21 | 9 28.6 | 20.5 |
| 214735 2006 $TU_{37}$ | 16.3 | X | 88.98031 | 271.38621 | 26.36883 | 3.35597 | 0.1534581 | 0.20150611 | 2.8814466 | 21 | 12 2.9 | 20.6 |
| 214736 2006 $TY_{38}$ | 16.2 | X | 314.18774 | 244.02648 | 43.09242 | 6.24502 | 0.1925728 | 0.24255174 | 2.5464381 | 21 | 4 9.6 | 19.2 |
| 214737 2006 $TK_{39}$ | 16.3 | X | 1.61943 | 309.11609 | 38.72553 | 2.48733 | 0.0528907 | 0.19254826 | 2.9701359 | 21 | 10 2.7 | 20.2 |
| 214738 2006 $TB_{41}$ | 16.1 | X | 155.33715 | 201.87600 | 21.48630 | 3.55400 | 0.0340821 | 0.19754729 | 2.9198149 | 21 | 11 5.1 | 20.2 |
| 214739 2006 $TQ_{42}$ | 16.0 | X | 147.27440 | 188.43748 | 41.87430 | 10.44322 | 0.0262445 | 0.19642022 | 2.9309737 | 21 | 11 4.6 | 20.1 |
| 214740 2006 $TT_{43}$ | 15.7 | X | 157.13617 | 22.35604 | 227.70531 | 7.26241 | 0.1728123 | 0.20333887 | 2.8641062 | 21 | 12 8.9 | 20.5 |
| 214741 2006 $TH_{46}$ | 15.7 | X | 113.46189 | 43.69019 | 212.54389 | 8.55520 | 0.0268648 | 0.19493864 | 2.9458056 | 21 | 10 27.7 | 19.8 |
| 214742 2006 $TL_{51}$ | 16.0 | X | 73.61044 | 222.80584 | 61.92889 | 11.04780 | 0.0753277 | 0.19282730 | 2.9672697 | 21 | 10 24.6 | 20.2 |
| 214743 2006 $TP_{51}$ | 15.3 | X | 121.62878 | 306.71021 | 214.75508 | 10.98355 | 0.0143328 | 0.17658478 | 3.1465445 | 21 | 7 5.2 | 19.9 |
| 214744 2006 $TQ_{51}$ | 16.3 | X | 338.74026 | 270.69941 | 123.73841 | 2.98363 | 0.0572513 | 0.19453073 | 2.9499222 | 21 | 10 30.9 | 20.1 |
| 214745 2006 $TA_{55}$ | 16.1 | X | 171.55695 | 237.58888 | 119.99245 | 6.04826 | 0.1266332 | 0.22707254 | 2.6608862 | 21 | 2 15.3 | 20.1 |
| 214746 2006 $TY_{56}$ | 15.9 | X | 242.47066 | 257.22740 | 141.92742 | 3.84052 | 0.0900804 | 0.17942195 | 3.1132859 | 21 | 6 22.5 | 20.6 |
| 214747 2006 $TU_{57}$ | 16.8 | X | 131.50782 | 167.36900 | 184.38529 | 1.17402 | 0.1351036 | 0.22117070 | 2.7080145 | 21 | — | — |
| 214748 2006 $TR_{59}$ | 15.6 | X | 54.41481 | 320.67791 | 246.47499 | 4.23312 | 0.0813555 | 0.17373007 | 3.1809198 | 21 | 6 17.6 | 19.7 |
| 214749 2006 $TO_{60}$ | 15.5 | X | 130.66230 | 185.83371 | 35.35658 | 11.52345 | 0.0722381 | 0.19107429 | 2.9853910 | 21 | 10 9.8 | 20.0 |
| 214750 2006 $TS_{67}$ | 15.1 | X | 150.04096 | 268.13159 | 201.63336 | 17.56975 | 0.0423954 | 0.17606953 | 3.1526801 | 21 | 6 8.8 | 20.0 |
| 214751 2006 $TJ_{71}$ | 15.4 | X | 257.46649 | 57.22655 | 10.73158 | 10.41639 | 0.0420584 | 0.18845351 | 3.0130053 | 21 | 8 27.0 | 19.7 |
| 214752 2006 $TR_{71}$ | 16.1 | X | 152.81782 | 53.48437 | 224.31087 | 6.48282 | 0.0559234 | 0.21025871 | 2.8009158 | 21 | — | — |
| 214753 2006 $TD_{75}$ | 17.0 | X | 265.83156 | 285.86299 | 54.01784 | 2.93142 | 0.1975230 | 0.24417053 | 2.5351708 | 21 | 4 18.8 | 20.7 |
| 214754 2006 $TC_{77}$ | 16.2 | X | 116.35651 | 179.93561 | 174.70436 | 13.41977 | 0.1488334 | 0.21727808 | 2.7402621 | 21 | — | — |
| 214755 2006 $TJ_{78}$ | 15.5 | X | 312.84127 | 294.15522 | 356.42230 | 9.06488 | 0.0479077 | 0.17561344 | 3.1581364 | 21 | 5 6.2 | 19.9 |
| 214756 2006 $TW_{79}$ | 15.6 | X | 187.83370 | 255.28783 | 252.95128 | 8.60634 | 0.0216386 | 0.18905396 | 3.0066223 | 21 | 9 6.4 | 20.1 |
| 214757 2006 $TD_{89}$ | 15.5 | X | 68.60245 | 196.66411 | 21.59872 | 7.70953 | 0.0845700 | 0.17939295 | 3.1136214 | 21 | 7 24.7 | 19.9 |
| 214758 2006 $TY_{93}$ | 15.4 | X | 181.58314 | 18.21683 | 61.71886 | 7.93337 | 0.0205112 | 0.17494777 | 3.1661424 | 21 | 6 7.3 | 19.9 |
| 214759 2006 $TH_{95}$ | 15.6 | X | 289.17109 | 355.69969 | 31.16219 | 10.83617 | 0.0941397 | 0.18753228 | 3.0228646 | 21 | 8 8.5 | 19.8 |
| 214760 2006 $TM_{103}$ | 16.8 | X | 128.43033 | 111.39314 | 211.15495 | 3.24270 | 0.0978405 | 0.21302902 | 2.7765800 | 21 | — | — |
| 214761 2006 $TN_{103}$ | 15.9 | X | 255.88963 | 184.11635 | 174.99338 | 0.79274 | 0.0973512 | 0.17594872 | 3.1541232 | 21 | 5 17.9 | 20.4 |
| 214762 2006 $TU_{108}$ | 16.1 | X | 192.94138 | 160.53174 | 98.27214 | 10.16086 | 0.1095494 | 0.21403879 | 2.7678405 | 21 | — | — |
| 214763 2006 $TZ_{109}$ | 16.2 | X | 32.71947 | 74.91548 | 193.38261 | 0.78028 | 0.0320215 | 0.18198588 | 3.0839755 | 21 | 7 31.2 | 20.4 |
| 214764 2006 $TN_{120}$ | 15.4 | X | 151.93375 | 346.45565 | 118.73723 | 9.49093 | 0.1170068 | 0.17340363 | 3.1849107 | 21 | 6 11.2 | 20.4 |
| 214765 2006 $UG_{6}$ | 16.3 | X | 183.04346 | 131.71037 | 192.72185 | 6.77360 | 0.0662682 | 0.22295943 | 2.6935114 | 21 | 1 12.1 | 20.3 |
| 214766 2006 $UT_{7}$ | 16.3 | X | 240.71776 | 233.46489 | 91.53942 | 3.90892 | 0.2150996 | 0.23588674 | 2.5941815 | 21 | 3 9.3 | 20.6 |
| 214767 2006 $UO_{9}$ | 15.5 | X | 231.00625 | 185.47146 | 198.33742 | 3.82739 | 0.0851742 | 0.17397278 | 3.1779606 | 21 | 5 22.7 | 20.3 |
| 214768 2006 $UQ_{10}$ | 15.8 | X | 167.35996 | 245.70304 | 50.07588 | 5.58260 | 0.1480123 | 0.21718658 | 2.7410317 | 21 | — | — |
| 214769 2006 $UA_{47}$ | 15.7 | X | 332.66581 | 257.95509 | 74.76212 | 2.81673 | 0.2388256 | 0.18704021 | 3.0281640 | 21 | 7 13.8 | 18.8 |
| 214770 2006 $UP_{59}$ | 15.4 | X | 135.37484 | 127.40314 | 356.74856 | 9.96885 | 0.0496429 | 0.17522648 | 3.1627842 | 21 | 6 8.9 | 20.2 |
| 214771 2006 $UR_{62}$ | 15.9 | X | 192.75046 | 21.72752 | 35.46033 | 2.43240 | 0.0990585 | 0.17363843 | 3.1820389 | 21 | 5 22.4 | 20.9 |
| 214772 UNICEF | 16.0 | X | 209.81858 | 153.44263 | 264.37841 | 7.62866 | 0.0587293 | 0.17923017 | 3.1155063 | 21 | 6 11.8 | 20.6 |
| 214773 2006 $UU_{64}$ | 15.9 | X | 83.24899 | 292.82624 | 66.91194 | 14.02469 | 0.2172966 | 0.21076654 | 2.7964149 | 21 | — | — |
| 214774 2006 $UC_{67}$ | 15.9 | X | 168.70162 | 248.64257 | 61.53481 | 7.64628 | 0.1087305 | 0.22016456 | 2.7162586 | 21 | — | — |
| 214775 2006 $UL_{71}$ | 16.4 | X | 275.36083 | 299.81279 | 101.42687 | 2.48349 | 0.0355397 | 0.18664128 | 3.0324775 | 21 | 8 13.2 | 20.6 |
| 214776 2006 $UD_{75}$ | 16.1 | X | 174.77821 | 254.74425 | 23.90047 | 8.85733 | 0.0647611 | 0.21645136 | 2.7472351 | 21 | — | — |
| 214777 2006 $UQ_{75}$ | 16.5 | X | 255.85922 | 295.35929 | 92.76728 | 2.66244 | 0.0334472 | 0.18193309 | 3.0845721 | 21 | 7 1.7 | 20.9 |
| 214778 2006 $UX_{79}$ | 16.6 | X | 174.74111 | 282.37394 | 58.36574 | 5.38737 | 0.1083288 | 0.22593837 | 2.6697835 | 21 | 1 28.5 | 20.6 |
| 214779 2006 $UB_{80}$ | 16.1 | X | 345.20017 | 225.65332 | 116.29019 | 3.20454 | 0.0969216 | 0.19013636 | 2.9952008 | 21 | 8 31.5 | 19.7 |
| 214780 2006 $UD_{80}$ | 15.9 | X | 71.76761 | 198.62235 | 122.37164 | 3.06628 | 0.0764902 | 0.20270269 | 2.8700957 | 21 | 12 4.6 | 19.9 |
| 214781 2006 $UB_{85}$ | 15.1 | X | 267.16767 | 147.73533 | 238.78809 | 9.65543 | 0.0598056 | 0.17921359 | 3.1156985 | 21 | 7 8.5 | 19.6 |
| 214782 2006 $UR_{90}$ | 15.6 | X | 62.19047 | 239.76898 | 41.47753 | 8.70056 | 0.0932543 | 0.18992231 | 2.9974508 | 21 | 10 7.5 | 19.7 |
| 214783 2006 $UR_{92}$ | 15.8 | X | 349.11596 | 102.46550 | 199.48602 | 9.07115 | 0.0175408 | 0.18190022 | 3.0849437 | 21 | 7 13.3 | 20.2 |
| 214784 2006 $UG_{105}$ | 17.1 | X | 111.41756 | 144.75596 | 194.98143 | 6.45562 | 0.1429962 | 0.27971440 | 2.3155785 | 21 | — | — |
| 214785 2006 $UZ_{116}$ | 16.0 | X | 317.50996 | 51.61828 | 233.31567 | 0.39024 | 0.0323850 | 0.17447894 | 3.1718115 | 21 | 5 10.5 | 20.3 |
| 214786 2006 $US_{132}$ | 16.2 | X | 158.15128 | 321.30907 | 47.30613 | 2.88458 | 0.2086456 | 0.22721242 | 2.6597940 | 21 | 2 22.5 | 20.5 |
| 214787 2006 $UE_{135}$ | 16.0 | X | 299.78877 | 226.72575 | 49.54582 | 8.88026 | 0.1789320 | 0.23780951 | 2.5801794 | 21 | 3 12.9 | 19.6 |
| 214788 2006 $UC_{136}$ | 16.5 | X | 20.18306 | 149.84045 | 166.45521 | 2.35484 | 0.0881977 | 0.19130797 | 2.9829593 | 21 | 9 21.0 | 20.3 |
| 214789 2006 $US_{137}$ | 16.7 | X | 226.53024 | 225.62991 | 18.50894 | 5.61839 | 0.1048334 | 0.28095490 | 2.3087574 | 21 | — | — |
| 214790 2006 $UR_{162}$ | 16.5 | X | 19.11274 | 217.03350 | 137.96052 | 2.71762 | 0.0839790 | 0.19925051 | 2.9031519 | 21 | 11 10.2 | 20.2 |
| 214791 2006 $UZ_{174}$ | 16.0 | X | 210.77085 | 195.34313 | 100.26242 | 5.28340 | 0.0419305 | 0.22632477 | 2.6667440 | 21 | 1 7.1 | 19.6 |
| 214792 2006 $UT_{175}$ | 15.8 | X | 207.77708 | 114.19492 | 149.02851 | 8.19012 | 0.0286875 | 0.21871277 | 2.7282655 | 21 | — | — |
| 214793 2006 $UX_{175}$ | 15.2 | X | 173.10267 | 271.33130 | 175.43390 | 9.15210 | 0.2099722 | 0.17462515 | 3.1700408 | 21 | 6 10.9 | 20.7 |
| 214794 2006 $UA_{178}$ | 15.8 | X | 359.66796 | 194.79871 | 118.27915 | 4.34010 | 0.1320555 | 0.18889981 | 3.0082577 | 21 | 8 16.8 | 19.1 |
| 214795 2006 $UF_{180}$ | 15.7 | X | 190.58465 | 312.01358 | 39.21207 | 14.42370 | 0.2923036 | 0.23028121 | 2.6361111 | 21 | 3 8.3 | 20.7 |
| 214796 2006 $UT_{180}$ | 15.9 | X | 205.00462 | 165.89792 | 181.70326 | 13.57098 | 0.1259315 | 0.23201500 | 2.6229620 | 21 | 3 4.4 | 20.1 |
| 214797 2006 $UB_{182}$ | 15.8 | X | 253.36634 | 136.60246 | 188.25306 | 13.51037 | 0.1118608 | 0.23606299 | 2.5928901 | 21 | 3 26.0 | 19.7 |
| 214798 2006 $US_{188}$ | 14.8 | X | 115.72022 | 243.27272 | 282.13915 | 15.15570 | 0.1760936 | 0.17791222 | 3.1308736 | 21 | 7 21.1 | 19.7 |
| 214799 2006 $UU_{197}$ | 16.0 | X | 5.85244 | 260.98022 | 44.54512 | 3.01361 | 0.0160319 | 0.18321697 | 3.0701452 | 21 | 8 12.7 | 20.2 |
| 214800 2006 $UO_{202}$ | 16.2 | X | 113.96840 | 274.87562 | 92.98399 | 7.16876 | 0.0571973 | 0.21785225 | 2.7354452 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214801 2006 $UD_{203}$ | 15.6 | $X$ | 267.71037 | 193.42228 | 61.76816 | 14.33536 | 0.1399806 | 0.22892351 | 2.6465237 | 21 | 1 14.3 | 19.9 |
| 214802 2006 $UT_{204}$ | 15.3 | $X$ | 3.08794 | 298.19892 | 33.29031 | 10.97638 | 0.1187832 | 0.18914085 | 3.0057013 | 21 | 9 20.7 | 18.9 |
| 214803 2006 $UK_{209}$ | 16.7 | $X$ | 113.35232 | 175.46500 | 162.57493 | 2.12906 | 0.0213201 | 0.21155642 | 2.7894500 | 21 | — | — |
| 214804 2006 $UP_{210}$ | 15.8 | $X$ | 265.98715 | 20.87713 | 20.17961 | 9.63997 | 0.1166823 | 0.18233359 | 3.0800535 | 21 | 7 21.9 | 20.3 |
| 214805 2006 $UJ_{220}$ | 14.6 | $X$ | 187.72921 | 17.19511 | 63.63826 | 22.64322 | 0.0632524 | 0.17410579 | 3.1763419 | 21 | 6 13.5 | 19.5 |
| 214806 2006 $UO_{221}$ | 16.1 | $X$ | 304.37740 | 59.92817 | 44.47124 | 6.63868 | 0.0146224 | 0.20514320 | 2.8472873 | 21 | 12 12.8 | 19.9 |
| 214807 2006 $UE_{226}$ | 15.5 | $X$ | 201.61322 | 230.25330 | 218.09824 | 8.50153 | 0.0621413 | 0.18041460 | 3.1018557 | 21 | 7 9.3 | 20.2 |
| 214808 2006 $UX_{226}$ | 16.2 | $X$ | 207.08761 | 150.81742 | 191.69328 | 11.66333 | 0.0315009 | 0.23502951 | 2.6004856 | 21 | 2 26.3 | 19.9 |
| 214809 2006 $UP_{228}$ | 16.2 | $X$ | 84.39524 | 337.67626 | 44.03169 | 2.74657 | 0.0776903 | 0.21485383 | 2.7608362 | 21 | — | — |
| 214810 2006 $UF_{230}$ | 16.1 | $X$ | 45.71973 | 254.68234 | 145.99457 | 4.52128 | 0.0916229 | 0.21305469 | 2.7763571 | 21 | — | — |
| 214811 2006 $UV_{233}$ | 16.6 | $X$ | 18.17237 | 250.23859 | 210.93347 | 3.05030 | 0.0488066 | 0.21989876 | 2.7184470 | 21 | — | — |
| 214812 2006 $UJ_{242}$ | 16.1 | $X$ | 140.76957 | 83.98724 | 21.27092 | 6.93614 | 0.1363277 | 0.17250657 | 3.1959425 | 21 | 5 30.2 | 21.1 |
| 214813 2006 $UO_{260}$ | 15.8 | $X$ | 137.36084 | 344.11789 | 203.21051 | 3.20768 | 0.0203235 | 0.18695579 | 3.0290755 | 21 | 8 28.6 | 20.1 |
| 214814 2006 $UE_{263}$ | 15.6 | $X$ | 80.29845 | 38.02817 | 217.67213 | 9.74163 | 0.0571300 | 0.18845671 | 3.0129712 | 21 | 9 17.0 | 19.9 |
| 214815 2006 $UX_{281}$ | 16.2 | $X$ | 105.74732 | 117.37896 | 165.43144 | 1.14058 | 0.1028450 | 0.19940054 | 2.9016954 | 21 | 11 27.8 | 20.6 |
| 214816 2006 $UG_{287}$ | 16.2 | $X$ | 351.91224 | 41.99357 | 31.06241 | 6.43389 | 0.0243769 | 0.20880993 | 2.8138565 | 21 | — | — |
| 214817 2006 $UF_{328}$ | 15.7 | $X$ | 46.48221 | 247.11571 | 82.50366 | 10.07318 | 0.0911683 | 0.20048010 | 2.8912693 | 21 | 11 17.6 | 19.6 |
| 214818 2006 $UC_{332}$ | 16.4 | $X$ | 204.53188 | 132.86611 | 139.62513 | 5.49876 | 0.0380429 | 0.21966537 | 2.7203722 | 21 | — | — |
| 214819 Gianotti | 15.3 | $X$ | 283.21747 | 352.59395 | 22.35643 | 16.56617 | 0.0600223 | 0.18131379 | 3.0915918 | 21 | 7 20.6 | 19.9 |
| 214820 Faustocoppi | 16.1 | $X$ | 126.52246 | 311.92693 | 18.01274 | 13.42091 | 0.1507589 | 0.21349517 | 2.7725370 | 21 | — | — |
| 214821 2006 $VJ_{16}$ | 15.6 | $X$ | 105.49660 | 190.47736 | 41.83172 | 10.89116 | 0.0491389 | 0.18742734 | 3.0239929 | 21 | 9 24.8 | 20.0 |
| 214822 2006 $VN_{19}$ | 15.5 | $X$ | 43.52240 | 199.57982 | 44.09489 | 9.83172 | 0.1236113 | 0.17811212 | 3.1285306 | 21 | 7 28.4 | 19.6 |
| 214823 2006 $VU_{25}$ | 16.0 | $X$ | 215.44211 | 347.66707 | 356.16847 | 1.49425 | 0.2327984 | 0.23310076 | 2.6148107 | 21 | 3 9.8 | 20.4 |
| 214824 2006 $VD_{32}$ | 15.9 | $X$ | 128.83173 | 145.41832 | 43.06461 | 4.23710 | 0.0380664 | 0.18609528 | 3.0384060 | 21 | 8 24.3 | 20.2 |
| 214825 2006 $VS_{41}$ | 15.3 | $X$ | 336.36914 | 211.43605 | 67.13854 | 5.50987 | 0.0879968 | 0.17350687 | 3.1836472 | 21 | 5 23.1 | 19.4 |
| 214826 2006 $VQ_{51}$ | 15.9 | $X$ | 39.20137 | 67.18786 | 268.95395 | 3.65352 | 0.1455131 | 0.19476453 | 2.9475610 | 21 | 11 20.6 | 19.8 |
| 214827 2006 $VO_{71}$ | 16.6 | $X$ | 334.66697 | 48.57212 | 224.73984 | 4.11470 | 0.0423213 | 0.23826964 | 2.5768565 | 21 | 5 13.3 | 19.8 |
| 214828 2006 $VE_{73}$ | 15.6 | $X$ | 298.17257 | 258.14778 | 81.35687 | 3.41070 | 0.1219304 | 0.17587687 | 3.1549820 | 21 | 6 10.9 | 19.8 |
| 214829 2006 $VF_{80}$ | 15.5 | $X$ | 358.32160 | 180.36518 | 99.89056 | 6.13298 | 0.1283074 | 0.17761033 | 3.1344203 | 21 | 6 28.3 | 19.1 |
| 214830 2006 $VG_{80}$ | 15.1 | $X$ | 173.46823 | 266.17861 | 214.70169 | 9.64407 | 0.0298236 | 0.17752472 | 3.1354280 | 21 | 7 17.6 | 19.8 |
| 214831 2006 $VX_{92}$ | 17.5 | $X$ | 60.13706 | 226.15121 | 185.69740 | 4.52487 | 0.1304876 | 0.27992868 | 2.3143966 | 21 | — | — |
| 214832 2006 $VC_{93}$ | 15.4 | $X$ | 88.82287 | 122.58240 | 80.94195 | 13.03605 | 0.0738958 | 0.17721012 | 3.1391377 | 21 | 7 30.0 | 20.0 |
| 214833 2006 $VT_{106}$ | 15.2 | $X$ | 41.19158 | 111.55484 | 108.35899 | 10.08055 | 0.0244771 | 0.17392943 | 3.1784887 | 21 | 6 10.3 | 19.6 |
| 214834 2006 $VQ_{109}$ | 15.5 | $X$ | 253.41899 | 273.23011 | 129.95832 | 10.74117 | 0.1010805 | 0.17989707 | 3.1078018 | 21 | 7 8.7 | 20.0 |
| 214835 2006 $VO_{119}$ | 16.3 | $X$ | 45.03147 | 296.98178 | 75.75925 | 3.18311 | 0.0799222 | 0.20279603 | 2.8692150 | 21 | — | — |
| 214836 2006 $VY_{126}$ | 16.6 | $X$ | 151.84145 | 333.22841 | 12.16235 | 4.09336 | 0.2152133 | 0.22121479 | 2.7076547 | 21 | 1 21.4 | 20.9 |
| 214837 2006 $VV_{128}$ | 15.8 | $X$ | 349.04072 | 345.97586 | 9.58602 | 5.80141 | 0.1205450 | 0.19031035 | 2.9933749 | 21 | 9 25.1 | 19.1 |
| 214838 2006 $VV_{134}$ | 16.3 | $X$ | 336.44385 | 323.37333 | 92.22920 | 3.15026 | 0.0571023 | 0.19917668 | 2.9038693 | 21 | 11 23.6 | 19.9 |
| 214839 2006 $VW_{141}$ | 16.1 | $X$ | 189.60692 | 29.30413 | 230.05892 | 7.17149 | 0.1830534 | 0.21180934 | 2.7872289 | 21 | — | — |
| 214840 2006 $VB_{144}$ | 15.0 | $X$ | 248.98723 | 7.91607 | 28.84849 | 24.29976 | 0.1717884 | 0.17958760 | 3.1113711 | 21 | 6 12.9 | 20.2 |
| 214841 2006 $VQ_{147}$ | 15.1 | $X$ | 269.94380 | 355.61489 | 59.12191 | 16.92252 | 0.0743926 | 0.18337878 | 3.0683389 | 21 | 8 25.4 | 19.7 |
| 214842 2006 $VG_{150}$ | 15.7 | $X$ | 225.41644 | 9.73816 | 38.70001 | 15.71969 | 0.0913909 | 0.17698570 | 3.1417908 | 21 | 6 12.8 | 20.7 |
| 214843 2006 $VO_{170}$ | 15.5 | $X$ | 351.44512 | 89.83967 | 171.39376 | 1.21109 | 0.1151835 | 0.16854687 | 3.2458037 | 21 | 5 22.6 | 19.5 |
| 214844 2006 $WM_{45}$ | 16.4 | $X$ | 118.32119 | 155.26791 | 172.81769 | 4.41591 | 0.0703042 | 0.21155924 | 2.7894252 | 21 | — | — |
| 214845 2006 $WQ_{67}$ | 16.2 | $X$ | 356.02580 | 198.05568 | 136.37822 | 4.35862 | 0.1202974 | 0.18656425 | 3.0333121 | 21 | 9 8.6 | 19.7 |
| 214846 2006 $WO_{74}$ | 15.6 | $X$ | 230.48392 | 319.47964 | 49.12400 | 6.03074 | 0.1656547 | 0.17108442 | 3.2136291 | 21 | 4 28.1 | 20.7 |
| 214847 2006 $WN_{92}$ | 16.9 | $X$ | 50.86455 | 151.07748 | 153.05422 | 1.47630 | 0.1017837 | 0.25946868 | 2.4345167 | 21 | 10 31.3 | 20.0 |
| 214848 2006 $WS_{94}$ | 16.0 | $X$ | 354.33624 | 228.25937 | 96.06866 | 3.87554 | 0.1200434 | 0.18590737 | 3.0404531 | 21 | 8 23.0 | 19.6 |
| 214849 2006 $WY_{95}$ | 16.4 | $X$ | 38.37808 | 99.99124 | 201.54394 | 3.31993 | 0.1154251 | 0.18960282 | 3.0008170 | 21 | 10 1.4 | 20.3 |
| 214850 2006 $WB_{96}$ | 17.2 | $X$ | 222.66411 | 336.68310 | 3.29153 | 3.89381 | 0.0648433 | 0.30111344 | 2.2045297 | 21 | 3 6.9 | 20.2 |
| 214851 2006 $WU_{101}$ | 16.5 | $X$ | 129.24385 | 200.09838 | 142.99807 | 5.90517 | 0.1696037 | 0.21665980 | 2.7454728 | 21 | — | — |
| 214852 2006 $WU_{102}$ | 15.8 | $X$ | 25.29476 | 191.62720 | 70.99346 | 6.23906 | 0.1213840 | 0.17656912 | 3.1467305 | 21 | 7 22.2 | 19.7 |
| 214853 2006 $WL_{106}$ | 16.0 | $X$ | 338.50845 | 222.65751 | 112.79333 | 2.13681 | 0.0394805 | 0.18131913 | 3.0915312 | 21 | 8 12.9 | 20.2 |
| 214854 2006 $WF_{185}$ | 15.8 | $X$ | 91.62748 | 24.74556 | 216.94266 | 5.04686 | 0.1034752 | 0.18470209 | 3.0536658 | 21 | 9 20.3 | 20.3 |
| 214855 2006 $WF_{203}$ | 15.7 | $X$ | 335.35748 | 15.07245 | 298.72257 | 1.68046 | 0.0784766 | 0.17655675 | 3.1468775 | 21 | 7 7.9 | 19.6 |
| 214856 2006 $XM_{39}$ | 15.3 | $X$ | 353.11001 | 260.02673 | 51.10742 | 12.27351 | 0.0617141 | 0.18153524 | 3.0890772 | 21 | 8 5.7 | 19.5 |
| 214857 2006 $XY_{58}$ | 17.0 | $X$ | 226.45298 | 51.69890 | 356.49724 | 1.69428 | 0.1600262 | 0.23882917 | 2.5728303 | 21 | 6 8.9 | 21.0 |
| 214858 2006 $XR_{63}$ | 15.6 | $X$ | 313.29508 | 209.98099 | 186.10744 | 9.22773 | 0.1418638 | 0.18810786 | 3.0166951 | 21 | 9 14.6 | 19.1 |
| 214859 2006 $YN_{7}$ | 16.3 | $X$ | 229.63685 | 182.57582 | 196.52396 | 9.31888 | 0.1773296 | 0.23816513 | 2.5776103 | 21 | 5 6.2 | 20.4 |
| 214860 2006 $YG_{12}$ | 15.3 | $X$ | 350.25179 | 225.43526 | 91.29728 | 11.26639 | 0.0939809 | 0.17889989 | 3.1193396 | 21 | 8 6.0 | 19.2 |
| 214861 2006 $YL_{22}$ | 15.8 | $X$ | 280.17502 | 300.03172 | 79.67964 | 8.38626 | 0.1215343 | 0.17602749 | 3.1531820 | 21 | 7 9.2 | 20.2 |
| 214862 2006 $YL_{39}$ | 15.6 | $X$ | 57.49754 | 141.14423 | 94.58694 | 10.83516 | 0.0695209 | 0.17769291 | 3.1334491 | 21 | 7 28.9 | 19.8 |
| 214863 2006 $YB_{55}$ | 16.6 | $X$ | 93.38090 | 270.07776 | 164.71833 | 4.50237 | 0.0491552 | 0.21446716 | 2.7641537 | 21 | 2 10.6 | 20.3 |
| 214864 2007 $EF_{1}$ | 16.7 | $X$ | 208.79010 | 91.79529 | 168.11736 | 6.52165 | 0.0835919 | 0.26433424 | 2.4045498 | 21 | — | — |
| 214865 2007 $EW_{56}$ | 17.5 | $X$ | 153.63922 | 171.96250 | 8.93206 | 19.78084 | 0.0337899 | 0.37151411 | 1.9163986 | 21 | 9 30.3 | 19.4 |
| 214866 2007 $EZ_{124}$ | 15.3 | $X$ | 203.52535 | 181.19751 | 14.40802 | 13.01243 | 0.1190851 | 0.24469018 | 2.5315802 | 21 | 11 22.4 | 19.1 |
| 214867 2007 $HN_{17}$ | 15.5 | $X$ | 164.04800 | 247.75255 | 38.91148 | 15.98401 | 0.2835337 | 0.17864064 | 3.1223568 | 21 | — | — |
| 214868 2007 $PF_{7}$ | 17.5 | $X$ | 42.70160 | 27.53980 | 292.78884 | 2.10410 | 0.1749034 | 0.29234664 | 2.2483848 | 21 | 11 27.6 | 20.2 |
| 214869 2007 $PA_{8}$ | 16.4 | $X$ | 289.89145 | 293.83697 | 141.33408 | 1.99630 | 0.6531843 | 0.20505821 | 2.8480740 | 21 | 7 17.1 | 20.9 |
| 214870 2007 $PE_{17}$ | 16.8 | $X$ | 69.94865 | 8.73058 | 12.76756 | 7.05301 | 0.1606320 | 0.30258634 | 2.1973699 | 21 | — | — |
| 214871 2007 $PH_{35}$ | 16.5 | $X$ | 261.89036 | 18.46718 | 350.93014 | 5.29048 | 0.2546888 | 0.26644525 | 2.3918323 | 21 | 5 13.3 | 20.3 |
| 214872 2007 $QV_{6}$ | 17.3 | $X$ | 316.62021 | 232.29415 | 164.96684 | 6.48963 | 0.1432733 | 0.28497603 | 2.2869877 | 21 | 10 11.3 | 19.2 |
| 214873 2007 $RM_{18}$ | 17.4 | $X$ | 263.16673 | 318.38280 | 181.49155 | 21.62174 | 0.0585779 | 0.36620441 | 1.9348784 | 21 | — | — |
| 214874 2007 $RP_{42}$ | 15.0 | $X$ | 254.40051 | 247.62526 | 7.48299 | 11.15065 | 0.0998360 | 0.17750982 | 3.1356034 | 21 | 1 14.2 | 20.0 |
| 214875 2007 $RG_{95}$ | 17.1 | $X$ | 211.12051 | 291.24731 | 126.25961 | 2.66263 | 0.2230613 | 0.26266473 | 2.4147280 | 21 | 6 3.4 | 21.2 |
| 214876 2007 $RH_{105}$ | 17.2 | $X$ | 235.89677 | 290.88586 | 96.33764 | 2.19864 | 0.1924151 | 0.26422153 | 2.4052335 | 21 | 5 19.3 | 20.9 |
| 214877 2007 $RY_{110}$ | 17.1 | $X$ | 335.10862 | 243.98900 | 185.75881 | 5.78454 | 0.1774421 | 0.29066353 | 2.2570561 | 21 | — | — |
| 214878 2007 $RM_{142}$ | 16.6 | $X$ | 333.76680 | 313.98478 | 14.99689 | 5.86398 | 0.2671778 | 0.27381734 | 2.3487065 | 21 | 7 8.3 | 18.0 |
| 214879 2007 $RB_{149}$ | 17.4 | $X$ | 154.78989 | 56.83785 | 198.32900 | 20.60335 | 0.0456900 | 0.36741872 | 1.9306129 | 21 | — | — |
| 214880 2007 $RP_{157}$ | 17.2 | $X$ | 16.40217 | 7.76326 | 40.59470 | 7.71958 | 0.1757754 | 0.29673991 | 2.2261380 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214881 2007 $RT_{178}$ | 17.6 | $X$ | 74.23122 | 337.04880 | 89.59959 | 3.77842 | 0.1307693 | 0.31018307 | 2.1613445 | 21 | — | — |
| 214882 2007 $RC_{218}$ | 16.8 | $X$ | 285.00020 | 214.71244 | 196.80526 | 6.26709 | 0.1008846 | 0.27401350 | 2.3475854 | 21 | 9 4.1 | 19.3 |
| 214883 Yuanxikun | 16.7 | $X$ | 238.94502 | 13.23449 | 23.39172 | 7.73219 | 0.2159748 | 0.26715589 | 2.3875889 | 21 | 5 30.7 | 20.5 |
| 214884 2007 $RE_{244}$ | 16.2 | $X$ | 304.61299 | 198.62926 | 176.45398 | 14.30884 | 0.2358793 | 0.27416281 | 2.3467331 | 21 | 7 20.0 | 18.8 |
| 214885 2007 $RB_{265}$ | 16.8 | $X$ | 332.60734 | 137.11794 | 339.76114 | 6.16841 | 0.2024539 | 0.22943357 | 2.6425998 | 21 | — | — |
| 214886 2007 $RC_{269}$ | 18.1 | $X$ | 188.25465 | 285.87571 | 55.28808 | 2.45310 | 0.1355956 | 0.31587725 | 2.1352914 | 21 | 1 29.7 | 20.9 |
| 214887 2007 $RT_{270}$ | 16.0 | $X$ | 110.13599 | 66.03628 | 44.74448 | 1.39089 | 0.1650197 | 0.17272733 | 3.1932188 | 21 | 5 9.5 | 20.7 |
| 214888 2007 $RT_{271}$ | 16.5 | $X$ | 106.62293 | 39.89224 | 51.89197 | 8.35835 | 0.1525323 | 0.24156523 | 2.5533662 | 21 | 4 6.5 | 19.9 |
| 214889 2007 $RM_{284}$ | 16.8 | $X$ | 0.92471 | 272.65230 | 190.41509 | 12.25248 | 0.2339876 | 0.22682250 | 2.6628414 | 21 | — | — |
| 214890 2007 $RG_{291}$ | 16.9 | $X$ | 116.80895 | 311.98124 | 258.17938 | 1.41055 | 0.1468186 | 0.26891545 | 2.3771626 | 21 | 9 20.1 | 20.5 |
| 214891 2007 $RV_{300}$ | 17.1 | $X$ | 209.70582 | 235.23321 | 178.08230 | 6.13647 | 0.0988871 | 0.26369914 | 2.4084090 | 21 | 6 1.9 | 20.7 |
| 214892 2007 $SU_2$ | 16.9 | $X$ | 238.43116 | 278.65944 | 215.05649 | 21.35449 | 0.0952912 | 0.35807209 | 1.9640645 | 21 | 11 10.2 | 18.7 |
| 214893 2007 $SJ_7$ | 17.1 | $X$ | 252.50391 | 293.63736 | 175.19450 | 7.59692 | 0.1756199 | 0.27983513 | 2.3149124 | 21 | 9 29.0 | 19.9 |
| 214894 2007 $TF_{16}$ | 16.4 | $X$ | 96.12935 | 170.95341 | 205.70698 | 2.72421 | 0.1867166 | 0.23168863 | 2.6254247 | 21 | — | — |
| 214895 2007 $TD_{22}$ | 15.9 | $X$ | 69.62954 | 267.64562 | 95.13188 | 9.73696 | 0.1650094 | 0.22431407 | 2.6826563 | 21 | — | — |
| 214896 2007 $TZ_{28}$ | 17.0 | $X$ | 166.47352 | 267.40525 | 211.07878 | 6.50406 | 0.0896896 | 0.26370670 | 2.4083630 | 21 | 7 9.5 | 20.5 |
| 214897 2007 $TN_{43}$ | 17.1 | $X$ | 321.78321 | 40.77156 | 47.99728 | 7.44797 | 0.0489628 | 0.28869398 | 2.2673100 | 21 | — | — |
| 214898 2007 $TD_{58}$ | 17.4 | $X$ | 176.54716 | 88.36829 | 24.58507 | 1.36081 | 0.1255025 | 0.26315602 | 2.4117216 | 21 | 7 15.1 | 20.9 |
| 214899 2007 $TM_{81}$ | 17.0 | $X$ | 310.76519 | 239.27180 | 179.32388 | 6.34891 | 0.1643223 | 0.28098413 | 2.3085973 | 21 | 10 30.5 | 18.8 |
| 214900 2007 $TP_{88}$ | 16.2 | $X$ | 249.74963 | 322.41917 | 60.20748 | 1.03611 | 0.1878984 | 0.19087793 | 2.9874380 | 21 | 5 29.9 | 20.8 |
| 214901 2007 $TQ_{95}$ | 16.6 | $X$ | 154.38289 | 242.27712 | 84.72635 | 4.79946 | 0.1983429 | 0.23705996 | 2.5856153 | 21 | — | — |
| 214902 2007 $TM_{135}$ | 17.1 | $X$ | 239.22537 | 321.34913 | 143.65373 | 2.30301 | 0.1704711 | 0.27980911 | 2.3150559 | 21 | 9 7.4 | 20.1 |
| 214903 2007 $TE_{136}$ | 16.8 | $X$ | 246.71550 | 295.89468 | 194.31949 | 6.09124 | 0.0993089 | 0.28201739 | 2.3029550 | 21 | 11 2.9 | 19.4 |
| 214904 2007 $TB_{143}$ | 16.7 | $X$ | 293.85881 | 306.99753 | 90.10298 | 7.02412 | 0.1344049 | 0.27413982 | 2.3468643 | 21 | 8 28.2 | 19.2 |
| 214905 2007 $TV_{144}$ | 16.7 | $X$ | 181.35002 | 26.32352 | 41.40599 | 3.15312 | 0.0968637 | 0.25946409 | 2.4345454 | 21 | 5 19.7 | 20.2 |
| 214906 2007 $TU_{147}$ | 15.1 | $X$ | 136.30690 | 2.33267 | 48.15929 | 5.46685 | 0.1023556 | 0.17569147 | 3.1572013 | 21 | 3 20.5 | 19.8 |
| 214907 2007 $TU_{160}$ | 16.5 | $X$ | 90.83540 | 23.57543 | 349.44872 | 5.40688 | 0.2735766 | 0.22954478 | 2.6417463 | 21 | — | — |
| 214908 2007 $TS_{163}$ | 17.1 | $X$ | 245.20363 | 14.05669 | 47.61731 | 1.97519 | 0.1767754 | 0.26858296 | 2.3791240 | 21 | 7 15.4 | 20.3 |
| 214909 2007 $TD_{180}$ | 17.0 | $X$ | 32.01183 | 2.45225 | 39.86205 | 7.72411 | 0.1288277 | 0.29463761 | 2.2367147 | 21 | — | — |
| 214910 2007 $TP_{181}$ | 14.9 | $X$ | 266.82771 | 252.67681 | 131.90569 | 10.20651 | 0.3095500 | 0.12517620 | 3.9578095 | 21 | 6 8.1 | 21.1 |
| 214911 Viehboeck | 17.5 | $X$ | 203.95046 | 237.69391 | 195.41728 | 2.55284 | 0.1366800 | 0.26538538 | 2.3981963 | 21 | 6 19.8 | 21.1 |
| 214912 2007 $TX_{233}$ | 16.2 | $X$ | 177.31464 | 66.00154 | 57.74049 | 9.69604 | 0.2008159 | 0.18940552 | 3.0029006 | 21 | 7 30.5 | 21.4 |
| 214913 2007 $TL_{240}$ | 16.4 | $X$ | 145.94155 | 265.84071 | 45.86017 | 3.67153 | 0.1090719 | 0.23181710 | 2.6244546 | 21 | — | — |
| 214914 2007 $TQ_{241}$ | 18.1 | $X$ | 176.11779 | 254.79614 | 55.09446 | 2.43726 | 0.0910273 | 0.30702495 | 2.1761405 | 21 | — | — |
| 214915 2007 $TH_{257}$ | 17.2 | $X$ | 228.64766 | 5.51887 | 137.76109 | 3.02738 | 0.0805050 | 0.28193352 | 2.3034117 | 21 | 10 30.7 | 20.1 |
| 214916 2007 $TN_{257}$ | 17.6 | $X$ | 178.05071 | 60.17597 | 39.93502 | 2.80494 | 0.1556466 | 0.26116627 | 2.4239556 | 21 | 6 29.6 | 21.4 |
| 214917 2007 $TY_{266}$ | 15.9 | $X$ | 153.12580 | 48.90820 | 33.72803 | 3.72086 | 0.0987026 | 0.18368763 | 3.0648985 | 21 | 5 12.5 | 20.6 |
| 214918 2007 $TD_{338}$ | 16.8 | $X$ | 297.29104 | 310.17146 | 94.39012 | 5.32164 | 0.1511562 | 0.27631120 | 2.3345529 | 21 | 9 12.2 | 19.1 |
| 214919 2007 $TG_{363}$ | 17.2 | $X$ | 123.41031 | 300.96710 | 57.33354 | 6.85936 | 0.1715027 | 0.30484225 | 2.1865157 | 21 | — | — |
| 214920 2007 $UB_{18}$ | 16.4 | $X$ | 131.32855 | 216.58707 | 167.19504 | 2.67345 | 0.2077841 | 0.23930294 | 2.5694334 | 21 | 2 11.6 | 20.1 |
| 214921 2007 $UY_{25}$ | 17.3 | $X$ | 127.31117 | 122.97518 | 60.69788 | 4.64986 | 0.0736407 | 0.26767487 | 2.3845018 | 21 | 8 24.5 | 20.5 |
| 214922 2007 $UJ_{43}$ | 16.5 | $X$ | 307.84637 | 81.73352 | 54.68696 | 4.39971 | 0.0357379 | 0.22525372 | 2.6751906 | 21 | — | — |
| 214923 2007 $UK_{50}$ | 16.6 | $X$ | 104.58523 | 16.08834 | 136.20376 | 4.87826 | 0.1349516 | 0.25325666 | 2.4741658 | 21 | 6 18.9 | 19.9 |
| 214924 2007 $UZ_{51}$ | 16.5 | $X$ | 27.38777 | 47.44374 | 77.01525 | 5.64822 | 0.0750677 | 0.23409151 | 2.6074277 | 21 | 1 8.7 | 19.5 |
| 214925 2007 $UL_{85}$ | 17.2 | $X$ | 310.64416 | 224.29791 | 206.76864 | 1.31679 | 0.0990656 | 0.28246326 | 2.3005309 | 21 | 11 21.4 | 19.4 |
| 214926 2007 $UJ_{98}$ | 17.2 | $X$ | 42.81625 | 9.41464 | 47.86225 | 5.09160 | 0.0107036 | 0.29799145 | 2.2199005 | 21 | — | — |
| 214927 2007 $UJ_{111}$ | 17.7 | $X$ | 197.56366 | 255.43602 | 204.08475 | 1.48776 | 0.1462807 | 0.26529729 | 2.3987271 | 21 | 7 17.8 | 21.3 |
| 214928 Carrara | 17.3 | $X$ | 327.27646 | 123.13614 | 251.14615 | 4.19536 | 0.0161803 | 0.27494712 | 2.3422681 | 21 | 9 25.4 | 20.1 |
| 214929 2007 $VF_{27}$ | 16.5 | $X$ | 131.29360 | 44.66431 | 87.07519 | 7.34143 | 0.0391181 | 0.25788939 | 2.4444457 | 21 | 6 11.7 | 19.7 |
| 214930 2007 $VU_{44}$ | 16.7 | $X$ | 124.85105 | 206.02492 | 17.15699 | 8.51672 | 0.0863855 | 0.27624981 | 2.3348988 | 21 | 10 13.1 | 19.7 |
| 214931 2007 $VT_{61}$ | 16.7 | $X$ | 188.88851 | 191.11245 | 47.29717 | 8.04884 | 0.0649917 | 0.29059233 | 2.2574248 | 21 | — | — |
| 214932 2007 $VX_{163}$ | 17.4 | $X$ | 336.36211 | 10.05586 | 42.47808 | 3.86607 | 0.0869423 | 0.28296472 | 2.2978121 | 21 | 12 9.2 | 19.7 |
| 214933 2007 $VW_{164}$ | 17.1 | $X$ | 109.77580 | 337.78449 | 243.46761 | 4.07101 | 0.1914230 | 0.26840855 | 2.3801545 | 21 | 9 29.8 | 20.9 |
| 214934 2007 $VT_{165}$ | 17.7 | $X$ | 163.73154 | 65.48812 | 226.08376 | 4.14443 | 0.0270440 | 0.29619154 | 2.2288848 | 21 | — | — |
| 214935 2007 $VJ_{167}$ | 16.5 | $X$ | 101.38377 | 18.70009 | 56.15022 | 4.05648 | 0.1674559 | 0.23907347 | 2.5710772 | 21 | 3 9.7 | 19.7 |
| 214936 2007 $VN_{193}$ | 16.0 | $X$ | 76.10603 | 235.84857 | 100.49229 | 5.58748 | 0.0744095 | 0.20851669 | 2.8164940 | 21 | 12 28.7 | 20.0 |
| 214937 2007 $VG_{213}$ | 16.1 | $X$ | 17.72747 | 2.14114 | 123.38088 | 3.63423 | 0.0661734 | 0.23319659 | 2.6140943 | 21 | — | — |
| 214938 2007 $VN_{220}$ | 16.6 | $X$ | 136.37428 | 176.94826 | 201.35859 | 2.73349 | 0.1445933 | 0.23602298 | 2.5931831 | 21 | 2 2.5 | 20.3 |
| 214939 2007 $VT_{244}$ | 17.2 | $X$ | 356.97241 | 199.92404 | 227.48433 | 5.51687 | 0.0688458 | 0.29078439 | 2.2564306 | 21 | — | — |
| 214940 2007 $VK_{251}$ | 16.3 | $X$ | 4.59537 | 276.08006 | 142.43064 | 8.77009 | 0.0717977 | 0.21779947 | 2.7358871 | 21 | — | — |
| 214941 2007 $VO_{253}$ | 16.9 | $X$ | 335.88073 | 237.22717 | 152.99508 | 4.17995 | 0.1636653 | 0.27964984 | 2.3159348 | 21 | 11 10.4 | 18.7 |
| 214942 2007 $VE_{256}$ | 17.1 | $X$ | 354.44144 | 336.28054 | 203.80335 | 13.05186 | 0.1972986 | 0.23806626 | 2.5783239 | 21 | 1 11.8 | 20.3 |
| 214943 2007 $VC_{263}$ | 17.4 | $X$ | 242.24488 | 156.25380 | 318.04221 | 2.60909 | 0.0181822 | 0.27599354 | 2.3363439 | 21 | 10 15.1 | 20.2 |
| 214944 2007 $VQ_{270}$ | 15.8 | $X$ | 55.85664 | 106.23672 | 2.50881 | 11.86191 | 0.1147960 | 0.23662599 | 2.5887757 | 21 | 2 7.4 | 18.8 |
| 214945 2007 $VP_{275}$ | 16.3 | $X$ | 29.15228 | 296.89906 | 69.68754 | 2.98140 | 0.0986411 | 0.21256167 | 2.7806485 | 21 | 12 12.6 | 19.7 |
| 214946 2007 $VX_{283}$ | 17.0 | $X$ | 76.93187 | 2.80978 | 229.22974 | 1.98854 | 0.1489274 | 0.26448855 | 2.4036144 | 21 | 9 3.5 | 20.0 |
| 214947 2007 $VA_{309}$ | 16.5 | $X$ | 66.31453 | 264.45315 | 212.79119 | 10.70560 | 0.1442451 | 0.23871510 | 2.5736498 | 21 | 3 3.4 | 19.5 |
| 214948 2007 $VX_{311}$ | 16.4 | $X$ | 164.33271 | 75.79888 | 305.56964 | 7.53814 | 0.0823934 | 0.23492443 | 2.6012610 | 21 | 2 28.9 | 20.2 |
| 214949 2007 $VO_{312}$ | 16.5 | $X$ | 13.79663 | 34.94027 | 48.24407 | 2.92110 | 0.0475020 | 0.21822689 | 2.7323136 | 21 | — | — |
| 214950 2007 $WU_{20}$ | 16.1 | $X$ | 38.90509 | 340.65309 | 112.25969 | 13.97155 | 0.0188738 | 0.22025501 | 2.7155149 | 21 | — | — |
| 214951 2007 $WX_{34}$ | 16.1 | $X$ | 302.54525 | 170.37074 | 54.22836 | 15.90862 | 0.0706088 | 0.23622901 | 2.5916751 | 21 | 1 23.7 | 19.9 |
| 214952 2007 $WO_{42}$ | 17.1 | $X$ | 96.78704 | 187.79317 | 103.07483 | 4.06436 | 0.1251643 | 0.28460839 | 2.2889568 | 21 | 12 13.6 | 20.2 |
| 214953 Giugavazzi | 16.6 | $X$ | 138.86226 | 194.80754 | 62.88303 | 7.56933 | 0.0786727 | 0.28696649 | 2.2764001 | 21 | 12 14.1 | 19.6 |
| 214954 2007 $WO_{58}$ | 16.8 | $X$ | 169.24873 | 287.46171 | 262.97443 | 4.53029 | 0.0512905 | 0.27491074 | 2.3424747 | 21 | 10 19.2 | 20.0 |
| 214955 2007 $XK_{14}$ | 16.8 | $X$ | 23.39808 | 61.94646 | 223.45212 | 5.73824 | 0.1570633 | 0.26619966 | 2.3933032 | 21 | 8 27.2 | 19.1 |
| 214956 2007 $XL_{25}$ | 16.1 | $X$ | 348.34372 | 331.60309 | 98.84473 | 5.54357 | 0.0486192 | 0.21255836 | 2.7806773 | 21 | 12 31.3 | 19.7 |
| 214957 2007 $XT_{29}$ | 16.8 | $X$ | 217.27347 | 243.41586 | 202.42647 | 5.62240 | 0.1164332 | 0.26445773 | 2.4038011 | 21 | 7 21.1 | 20.4 |
| 214958 2007 $XE_{34}$ | 16.8 | $X$ | 64.31243 | 79.49330 | 28.30783 | 4.79843 | 0.1297179 | 0.23721763 | 2.5844695 | 21 | 2 19.5 | 19.6 |
| 214959 2007 $XS_{37}$ | 15.7 | $X$ | 305.22909 | 92.36511 | 59.88243 | 10.28950 | 0.0586884 | 0.21916645 | 2.7244991 | 21 | — | — |
| 214960 2007 $XX_{42}$ | 16.7 | $X$ | 266.11032 | 87.11731 | 32.17271 | 2.35967 | 0.0372636 | 0.20634497 | 2.8362213 | 21 | 11 10.1 | 20.6 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 214961 2007 $XD_{53}$ | 15.4 | $X$ | 123.07057 | 53.22237 | 121.48780 | 9.89000 | 0.0773000 | 0.17967482 | 3.1103641 | 21 | 8 1.9 | 20.0 |
| 214962 2007 $YE_{11}$ | 15.3 | $X$ | 16.62250 | 229.08701 | 114.06281 | 10.66257 | 0.0477314 | 0.19018118 | 2.9947301 | 21 | 10 21.5 | 19.5 |
| 214963 2007 $YD_{39}$ | 16.0 | $X$ | 324.93584 | 132.24739 | 93.75760 | 14.54234 | 0.1143117 | 0.23342993 | 2.6123520 | 21 | 2 18.7 | 19.5 |
| 214964 2007 $YX_{46}$ | 16.1 | $X$ | 57.11910 | 275.16487 | 113.37159 | 4.24686 | 0.1273994 | 0.21409934 | 2.7673186 | 21 | — | — |
| 214965 2007 $YN_{58}$ | 15.0 | $X$ | 231.40663 | 279.41341 | 121.39568 | 12.35642 | 0.1160509 | 0.18025160 | 3.1037255 | 21 | 6 11.4 | 19.9 |
| 214966 2007 $YE_{61}$ | 15.6 | $X$ | 209.79729 | 53.88148 | 66.93332 | 9.84455 | 0.0994681 | 0.18850505 | 3.0124561 | 21 | 9 1.3 | 20.3 |
| 214967 2007 $YD_{62}$ | 15.8 | $X$ | 174.01339 | 324.07660 | 330.02646 | 8.88782 | 0.1634795 | 0.21445071 | 2.7642950 | 21 | — | — |
| 214968 2007 $YD_{68}$ | 16.0 | $X$ | 76.52555 | 276.64263 | 118.51173 | 6.25113 | 0.0712697 | 0.22038743 | 2.7144270 | 21 | — | — |
| 214969 2007 $YE_{68}$ | 16.9 | $X$ | 198.08934 | 235.80032 | 126.95736 | 2.88395 | 0.1238563 | 0.23930629 | 2.5694094 | 21 | 3 18.1 | 20.8 |
| 214970 2008 $AT$ | 15.4 | $X$ | 359.13693 | 194.48625 | 70.50906 | 16.88300 | 0.0415590 | 0.17244676 | 3.1966814 | 21 | 6 9.6 | 19.6 |
| 214971 2008 $AW_{4}$ | 15.7 | $X$ | 264.81643 | 284.59027 | 128.75048 | 14.11435 | 0.1218814 | 0.18762816 | 3.0218347 | 21 | 8 1.9 | 20.0 |
| 214972 2008 $AY_{11}$ | 15.6 | $X$ | 189.26442 | 315.78225 | 129.46286 | 12.81564 | 0.0840053 | 0.17864863 | 3.1222638 | 21 | 6 23.5 | 20.5 |
| 214973 2008 $AZ_{15}$ | 16.0 | $X$ | 324.22649 | 9.81664 | 277.18961 | 6.83198 | 0.1895058 | 0.24434911 | 2.5339354 | 21 | 4 20.9 | 19.0 |
| 214974 2008 $AX_{56}$ | 16.2 | $X$ | 159.69167 | 157.48986 | 134.31389 | 4.95765 | 0.0444863 | 0.21373664 | 2.7704484 | 21 | — | — |
| 214975 2008 $AL_{59}$ | 16.6 | $X$ | 324.93290 | 282.26846 | 155.56254 | 2.42911 | 0.0456982 | 0.20420921 | 2.8559625 | 21 | 12 6.5 | 20.2 |
| 214976 2008 $AF_{66}$ | 16.1 | $X$ | 37.30314 | 141.89795 | 98.86620 | 2.44884 | 0.0860600 | 0.17440090 | 3.1727576 | 21 | 7 7.2 | 20.1 |
| 214977 2008 $AD_{68}$ | 15.7 | $X$ | 24.95239 | 209.11933 | 128.29821 | 9.60090 | 0.0196422 | 0.19355531 | 2.9598247 | 21 | 10 22.0 | 19.9 |
| 214978 2008 $AG_{68}$ | 15.7 | $X$ | 102.64040 | 91.52614 | 131.72765 | 8.29781 | 0.0720562 | 0.18392101 | 3.0623053 | 21 | 9 9.8 | 20.2 |
| 214979 2008 $AM_{70}$ | 16.5 | $X$ | 218.49170 | 194.07078 | 94.53868 | 3.90771 | 0.0845730 | 0.22706860 | 2.6609170 | 21 | 1 7.3 | 20.3 |
| 214980 2008 $AL_{72}$ | 15.4 | $X$ | 185.78795 | 349.09000 | 105.66925 | 13.42672 | 0.0631370 | 0.17989323 | 3.1078461 | 21 | 7 1.3 | 20.1 |
| 214981 2008 $AP_{72}$ | 14.9 | $X$ | 359.31263 | 185.20803 | 110.10315 | 17.72737 | 0.0836609 | 0.18009995 | 3.1054675 | 21 | 7 20.8 | 18.8 |
| 214982 2008 $AC_{77}$ | 15.9 | $X$ | 5.38630 | 357.49313 | 61.94568 | 4.52398 | 0.0843438 | 0.20949456 | 2.8077227 | 21 | — | — |
| 214983 2008 $AG_{80}$ | 16.6 | $X$ | 49.00293 | 203.78835 | 182.19283 | 0.40480 | 0.0843810 | 0.20942091 | 2.8083809 | 21 | — | — |
| 214984 2008 $AB_{81}$ | 16.0 | $X$ | 284.12668 | 285.72884 | 141.82954 | 11.94169 | 0.0940632 | 0.19238431 | 2.9718231 | 21 | 9 22.6 | 20.0 |
| 214985 2008 $AP_{110}$ | 15.4 | $X$ | 66.12206 | 131.64560 | 123.73368 | 12.26091 | 0.0882564 | 0.18336817 | 3.0684573 | 21 | 9 9.1 | 19.7 |
| 214986 2008 $AY_{114}$ | 16.5 | $X$ | 161.17257 | 137.43102 | 153.59540 | 5.81246 | 0.0503172 | 0.21161251 | 2.7889570 | 21 | — | — |
| 214987 2008 $AO_{117}$ | 16.0 | $X$ | 340.29410 | 212.81882 | 72.31138 | 2.51816 | 0.1346654 | 0.17117906 | 3.2124444 | 21 | 6 2.8 | 19.9 |
| 214988 2008 $BH_{14}$ | 15.8 | $X$ | 8.06642 | 282.37353 | 42.18158 | 10.38989 | 0.1065024 | 0.18856764 | 3.0117894 | 21 | 9 19.2 | 19.6 |
| 214989 2008 $BP_{18}$ | 15.6 | $X$ | 123.96918 | 1.99858 | 146.09842 | 4.57248 | 0.0651592 | 0.17701018 | 3.1415011 | 21 | 6 28.6 | 20.2 |
| 214990 2008 $BB_{42}$ | 15.5 | $X$ | 224.18906 | 31.82735 | 86.88762 | 11.24434 | 0.0948787 | 0.18909229 | 3.0062159 | 21 | 9 15.6 | 20.2 |
| 214991 2008 $CM_{21}$ | 16.2 | $X$ | 1.89519 | 232.85616 | 106.99928 | 5.82258 | 0.1729422 | 0.19092201 | 2.9869782 | 21 | 10 2.6 | 19.5 |
| 214992 2008 $CJ_{23}$ | 15.4 | $X$ | 221.92937 | 285.43919 | 156.49379 | 12.05480 | 0.0190562 | 0.17911753 | 3.1168124 | 21 | 7 28.8 | 19.9 |
| 214993 2008 $CM_{28}$ | 15.6 | $X$ | 18.30522 | 132.47953 | 103.49438 | 7.83473 | 0.0897210 | 0.16828642 | 3.2491519 | 21 | 6 2.9 | 19.8 |
| 214994 2008 $CR_{38}$ | 15.7 | $X$ | 305.96468 | 253.63676 | 136.87263 | 10.97700 | 0.0855938 | 0.18773748 | 3.0206615 | 21 | 9 5.1 | 19.6 |
| 214995 2008 $CS_{45}$ | 15.8 | $X$ | 53.11306 | 161.78015 | 164.92583 | 12.53841 | 0.0483784 | 0.19637456 | 2.9314280 | 21 | 11 16.7 | 20.0 |
| 214996 2008 $CU_{45}$ | 15.4 | $X$ | 233.78537 | 231.31442 | 167.69344 | 9.41451 | 0.0723796 | 0.17569687 | 3.1571366 | 21 | 6 14.9 | 20.3 |
| 214997 2008 $CK_{47}$ | 15.4 | $X$ | 332.24962 | 169.51998 | 164.92443 | 16.84524 | 0.0549440 | 0.18167905 | 3.0874468 | 21 | 7 30.5 | 19.7 |
| 214998 2008 $CT_{77}$ | 15.9 | $X$ | 347.55390 | 306.82637 | 111.86436 | 7.16008 | 0.0721073 | 0.20245544 | 2.8724320 | 21 | 12 14.8 | 19.5 |
| 214999 2008 $CY_{129}$ | 16.1 | $X$ | 316.06074 | 260.87152 | 164.11735 | 6.33198 | 0.0733339 | 0.19627642 | 2.9324051 | 21 | 11 6.4 | 19.8 |
| 215000 2008 $CQ_{137}$ | 15.9 | $X$ | 343.45143 | 182.77967 | 145.99343 | 11.10455 | 0.1134080 | 0.17825754 | 3.1268288 | 21 | 8 7.6 | 19.6 |
| 215001 2008 $CO_{149}$ | 15.6 | $X$ | 301.51771 | 224.01314 | 171.63691 | 11.86472 | 0.1420660 | 0.18649753 | 3.0340355 | 21 | 8 25.2 | 19.4 |
| 215002 2008 $CE_{158}$ | 15.8 | $X$ | 324.51190 | 223.89333 | 164.99486 | 11.08611 | 0.0047597 | 0.18849958 | 3.0125143 | 21 | 10 5.6 | 20.0 |
| 215003 2008 $CQ_{162}$ | 16.3 | $X$ | 297.90524 | 210.42544 | 173.95474 | 1.07021 | 0.1199259 | 0.18509309 | 3.0493638 | 21 | 8 8.9 | 20.2 |
| 215004 2008 $CW_{198}$ | 17.3 | $X$ | 113.60228 | 283.00088 | 354.01738 | 4.53981 | 0.2184994 | 0.26183159 | 2.4198476 | 21 | 12 12.7 | 21.3 |
| 215005 2008 $DL_{6}$ | 16.4 | $X$ | 258.12226 | 177.04936 | 142.93127 | 9.91190 | 0.0933387 | 0.23740413 | 2.5831158 | 21 | 3 30.2 | 20.2 |
| 215006 2008 $DN_{31}$ | 15.4 | $X$ | 209.32849 | 28.25150 | 84.14286 | 11.08469 | 0.0564443 | 0.18491547 | 3.0513162 | 21 | 8 23.6 | 20.0 |
| 215007 2008 $DC_{34}$ | 15.4 | $X$ | 340.56058 | 189.10823 | 186.51862 | 9.09434 | 0.0716306 | 0.18960647 | 3.0007786 | 21 | 10 7.7 | 19.1 |
| 215008 2008 $DT_{65}$ | 15.9 | $X$ | 173.51095 | 288.84459 | 111.45378 | 16.42836 | 0.1803591 | 0.23835670 | 2.5762291 | 21 | 4 19.3 | 20.4 |
| 215009 2008 $DR_{79}$ | 14.8 | $X$ | 245.88929 | 356.01667 | 55.12026 | 16.45493 | 0.0666774 | 0.17683664 | 3.1435561 | 21 | 7 16.0 | 19.6 |
| 215010 2008 $EU_{18}$ | 15.6 | $X$ | 182.73665 | 288.88970 | 158.76368 | 9.15490 | 0.0652170 | 0.17575251 | 3.1564702 | 21 | 6 19.4 | 20.5 |
| 215011 2008 $ES_{19}$ | 15.7 | $X$ | 239.67980 | 17.07585 | 14.33429 | 9.56129 | 0.0941446 | 0.17555963 | 3.1587817 | 21 | 6 7.7 | 20.5 |
| 215012 2008 $EG_{103}$ | 15.2 | $X$ | 271.95459 | 280.76398 | 93.70747 | 6.61546 | 0.0859904 | 0.17367268 | 3.1816206 | 21 | 6 26.9 | 19.6 |
| 215013 2008 $GX_{67}$ | 15.8 | $X$ | 292.67642 | 259.90741 | 14.49257 | 11.83892 | 0.1967203 | 0.22058336 | 2.7128194 | 21 | 3 2.2 | 19.8 |
| 215014 2008 $SM_{1}$ | 15.9 | $X$ | 253.75930 | 161.83513 | 206.65245 | 8.27713 | 0.2514703 | 0.20968174 | 2.8060515 | 21 | 5 10.3 | 20.5 |
| 215015 2008 $TP_{120}$ | 15.2 | $X$ | 167.91657 | 185.30738 | 125.07364 | 6.09171 | 0.1163628 | 0.17884585 | 3.1199680 | 21 | — | — |
| 215016 Catherinegriffin | 15.8 | $X$ | 288.34221 | 249.00010 | 283.88865 | 13.68929 | 0.0664035 | 0.24619235 | 2.5212719 | 21 | — | — |
| 215017 2008 $XD_{49}$ | 16.1 | $X$ | 342.73040 | 127.00697 | 314.75400 | 21.25258 | 0.0967232 | 0.22873553 | 2.6479735 | 21 | — | — |
| 215018 2008 $YS_{51}$ | 18.0 | $X$ | 197.90125 | 297.46144 | 330.74497 | 2.98366 | 0.0939132 | 0.31171684 | 2.1542489 | 21 | — | — |
| 215019 2008 $YB_{159}$ | 15.9 | $X$ | 234.79150 | 98.52330 | 21.10775 | 5.91242 | 0.0388787 | 0.19831822 | 2.9122432 | 21 | 10 1.8 | 20.0 |
| 215020 2009 $BE_{14}$ | 13.0 | $X$ | 219.32962 | 334.41680 | 40.69161 | 12.12557 | 0.0332774 | 0.08379045 | 5.1721729 | 21 | 5 7.5 | 19.9 |
| 215021 Fanjingshan | 16.2 | $X$ | 322.62917 | 123.96434 | 358.03590 | 13.26103 | 0.2032517 | 0.22663210 | 2.6643326 | 21 | — | — |
| 215022 2009 $BA_{73}$ | 15.9 | $X$ | 339.67414 | 269.62123 | 137.75673 | 12.25046 | 0.0226814 | 0.21245633 | 2.7815675 | 21 | 11 22.6 | 19.8 |
| 215023 2009 $BR_{76}$ | 15.8 | $X$ | 15.82942 | 199.17623 | 147.83842 | 7.25328 | 0.0544363 | 0.20985853 | 2.8044754 | 21 | 10 26.5 | 19.5 |
| 215024 2009 $BV_{81}$ | 15.4 | $X$ | 280.75479 | 146.46690 | 87.59205 | 15.35461 | 0.0666038 | 0.23939151 | 2.5687996 | 21 | 1 5.9 | 19.1 |
| 215025 2009 $BG_{86}$ | 16.9 | $X$ | 257.46997 | 129.61752 | 124.60514 | 5.10628 | 0.1426830 | 0.23856506 | 2.5747288 | 21 | — | — |
| 215026 2009 $BP_{108}$ | 16.1 | $X$ | 9.92396 | 281.04722 | 61.78020 | 3.09411 | 0.0573384 | 0.20183178 | 2.8783461 | 21 | 10 10.2 | 19.8 |
| 215027 2009 $BK_{111}$ | 17.2 | $X$ | 100.16166 | 6.22740 | 142.12684 | 1.17354 | 0.1618039 | 0.26433648 | 2.4045362 | 21 | 6 11.3 | 20.3 |
| 215028 2009 $BO_{112}$ | 17.1 | $X$ | 73.49309 | 98.50675 | 158.46425 | 6.85982 | 0.0964737 | 0.27069360 | 2.3667410 | 21 | 9 28.8 | 20.1 |
| 215029 2009 $BF_{130}$ | 16.0 | $X$ | 226.19424 | 161.98670 | 358.30457 | 9.43537 | 0.0576285 | 0.21010247 | 2.8023042 | 21 | 11 6.4 | 20.1 |
| 215030 2009 $BF_{170}$ | 16.1 | $X$ | 231.10117 | 44.24615 | 308.04523 | 4.29585 | 0.1450172 | 0.17944496 | 3.1130198 | 21 | 4 7.3 | 21.1 |
| 215031 2009 $BA_{179}$ | 16.5 | $X$ | 57.81019 | 96.67151 | 173.43950 | 6.71759 | 0.1033662 | 0.26803118 | 2.3823881 | 21 | 9 25.4 | 19.2 |
| 215032 2009 $BD_{179}$ | 15.3 | $X$ | 34.57524 | 86.16870 | 190.27428 | 9.45837 | 0.0426724 | 0.18471089 | 3.0535688 | 21 | 8 12.3 | 19.6 |
| 215033 2009 $CP_{12}$ | 15.8 | $X$ | 146.13182 | 325.56909 | 206.71602 | 4.25366 | 0.0503281 | 0.19542649 | 2.9409012 | 21 | 8 21.9 | 20.2 |
| 215034 2009 $CR_{12}$ | 16.9 | $X$ | 180.70491 | 312.34615 | 172.09291 | 6.85865 | 0.0622131 | 0.27356349 | 2.3501592 | 21 | 8 3.6 | 20.3 |
| 215035 2009 $CD_{28}$ | 16.2 | $X$ | 292.70355 | 319.07473 | 127.83397 | 5.48634 | 0.1285453 | 0.21285318 | 2.7781090 | 21 | 10 28.4 | 19.5 |
| 215036 2009 $CC_{39}$ | 17.1 | $X$ | 84.38054 | 359.86136 | 188.73139 | 4.07139 | 0.1487012 | 0.26282319 | 2.4137572 | 21 | 7 14.3 | 20.3 |
| 215037 2009 $CR_{40}$ | 17.3 | $X$ | 345.73303 | 112.00266 | 307.33383 | 5.96985 | 0.1341638 | 0.22217747 | 2.6998276 | 21 | 12 22.2 | 20.2 |
| 215038 2009 $CZ_{43}$ | 17.2 | $X$ | 115.02590 | 297.44303 | 182.76177 | 1.23435 | 0.1414252 | 0.25703877 | 2.4498357 | 21 | 5 19.6 | 20.4 |
| 215039 2009 $CM_{53}$ | 16.3 | $X$ | 30.15752 | 261.01303 | 137.84846 | 6.83915 | 0.1050063 | 0.22702610 | 2.6612491 | 21 | — | — |
| 215040 2009 $CS_{59}$ | 16.1 | $X$ | 77.54008 | 354.76826 | 84.04070 | 7.25485 | 0.1361505 | 0.24206034 | 2.5498832 | 21 | 1 31.7 | 18.9 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215041 2009 $CA_{60}$ | 15.5 | X | 53.77549 | 200.22212 | 22.01048 | 16.32869 | 0.0613373 | 0.17770777 | 3.1332745 | 21 | 7 5.3 | 20.0 |
| 215042 2009 $DK_{3}$ | 16.7 | X | 75.25156 | 4.16349 | 185.06754 | 5.94421 | 0.1966196 | 0.26133113 | 2.4229360 | 21 | 7 10.1 | 19.7 |
| 215043 2009 $DF_{4}$ | 16.3 | X | 91.69360 | 331.34649 | 180.68633 | 9.11085 | 0.1609801 | 0.25813524 | 2.4428934 | 21 | 6 6.3 | 19.6 |
| 215044 Joãoalves | 17.8 | X | 132.01788 | 140.49652 | 335.78738 | 0.87927 | 0.1375338 | 0.26170751 | 2.4206124 | 21 | 6 2.1 | 21.3 |
| 215045 2009 $DQ_{6}$ | 17.6 | X | 157.66819 | 267.12796 | 161.88777 | 1.73820 | 0.1401217 | 0.26151994 | 2.4217697 | 21 | 4 29.1 | 21.1 |
| 215046 2009 $DS_{9}$ | 15.3 | X | 151.82660 | 110.61504 | 7.75654 | 17.04298 | 0.1542850 | 0.18370476 | 3.0647080 | 21 | 6 29.2 | 20.5 |
| 215047 2009 $DE_{17}$ | 16.8 | X | 40.68136 | 240.36391 | 359.06720 | 5.51446 | 0.0832272 | 0.26173089 | 2.4204683 | 21 | 7 12.2 | 19.5 |
| 215048 2009 $DZ_{18}$ | 16.5 | X | 352.27035 | 335.34444 | 146.30937 | 3.28792 | 0.0166701 | 0.22844178 | 2.6502430 | 21 | — | — |
| 215049 2009 $DQ_{34}$ | 15.5 | X | 5.25041 | 198.37113 | 73.09684 | 2.05099 | 0.1842634 | 0.17645056 | 3.1481399 | 21 | 6 29.7 | 18.8 |
| 215050 2009 $DU_{40}$ | 16.7 | X | 253.55604 | 252.86064 | 317.71238 | 1.82837 | 0.1017674 | 0.22774453 | 2.6556494 | 21 | — | — |
| 215051 2009 $DL_{41}$ | 16.7 | X | 30.75916 | 3.51096 | 179.25461 | 3.46122 | 0.1274713 | 0.25269063 | 2.4778592 | 21 | 4 1.9 | 19.0 |
| 215052 2009 $DA_{47}$ | 15.6 | X | 105.13809 | 118.49559 | 345.47500 | 24.40199 | 0.2611394 | 0.17498605 | 3.1656806 | 21 | 4 25.0 | 20.9 |
| 215053 2009 $DL_{47}$ | 16.2 | X | 131.54883 | 242.48007 | 33.06191 | 8.68296 | 0.1384837 | 0.20929218 | 2.8095325 | 21 | 12 16.2 | 20.8 |
| 215054 2009 $DJ_{64}$ | 16.7 | X | 104.61884 | 164.92871 | 121.80533 | 7.13333 | 0.1140945 | 0.28512439 | 2.2861943 | 21 | 12 16.2 | 20.0 |
| 215055 2009 $DR_{70}$ | 17.7 | X | 159.73842 | 238.89120 | 221.09807 | 0.71245 | 0.1439411 | 0.26475125 | 2.4020242 | 21 | 6 10.6 | 21.3 |
| 215056 2009 $DN_{75}$ | 15.8 | X | 21.55995 | 116.40699 | 119.63895 | 2.18947 | 0.1019020 | 0.17610183 | 3.1522947 | 21 | 6 7.6 | 19.6 |
| 215057 2009 $DE_{83}$ | 17.2 | X | 173.36249 | 113.60089 | 55.78874 | 2.80117 | 0.1424512 | 0.27631299 | 2.3345428 | 21 | 9 25.9 | 20.6 |
| 215058 2009 $DW_{94}$ | 15.1 | X | 322.48980 | 201.28845 | 13.86584 | 16.10945 | 0.0806240 | 0.15784153 | 3.3909537 | 21 | 2 22.9 | 19.9 |
| 215059 2009 $DK_{113}$ | 16.7 | X | 209.50079 | 190.59206 | 80.67929 | 1.31458 | 0.1209106 | 0.22481654 | 2.6786576 | 21 | — | — |
| 215060 2009 $DN_{119}$ | 15.7 | X | 7.10254 | 42.88959 | 174.62934 | 5.38944 | 0.1139677 | 0.16982545 | 3.2294919 | 21 | 4 21.8 | 19.6 |
| 215061 2009 $DM_{124}$ | 16.3 | X | 280.65622 | 231.79760 | 130.36886 | 2.72865 | 0.0734274 | 0.18345944 | 3.0674395 | 21 | 6 23.9 | 20.6 |
| 215062 2009 $DC_{125}$ | 16.2 | X | 32.49358 | 235.11712 | 140.25777 | 3.16263 | 0.0775955 | 0.21157626 | 2.7892756 | 21 | 12 24.9 | 19.8 |
| 215063 2009 $DQ_{125}$ | 17.0 | X | 231.33946 | 338.69040 | 36.97031 | 2.65753 | 0.0513238 | 0.25446225 | 2.4663449 | 21 | 5 9.9 | 20.3 |
| 215064 2009 $DC_{126}$ | 16.7 | X | 165.35557 | 188.81778 | 195.88365 | 2.50099 | 0.0437450 | 0.24193307 | 2.5507774 | 21 | 3 3.7 | 20.2 |
| 215065 2009 $DR_{126}$ | 16.5 | X | 283.67364 | 130.35046 | 202.33897 | 2.18024 | 0.1906925 | 0.25542527 | 2.4601418 | 21 | 4 28.7 | 19.7 |
| 215066 2009 $DX_{126}$ | 16.9 | X | 24.70314 | 321.96509 | 318.57227 | 3.81452 | 0.0625687 | 0.26721303 | 2.3872485 | 21 | 8 12.8 | 19.6 |
| 215067 2009 $DY_{126}$ | 16.4 | X | 260.30999 | 345.28475 | 208.74993 | 3.99098 | 0.0505707 | 0.22160797 | 2.7044511 | 21 | — | — |
| 215068 2009 $DU_{129}$ | 15.7 | X | 353.37081 | 94.97497 | 185.17486 | 13.10032 | 0.1555216 | 0.17672973 | 3.1448238 | 21 | 6 18.3 | 19.5 |
| 215069 2009 $DV_{129}$ | 16.8 | X | 289.90784 | 139.71060 | 321.29989 | 1.23035 | 0.2108223 | 0.21189203 | 2.7865037 | 21 | 10 27.6 | 19.9 |
| 215070 2009 $DD_{130}$ | 17.7 | X | 160.33304 | 99.13974 | 199.87504 | 3.57186 | 0.1534689 | 0.29738981 | 2.2228935 | 21 | — | — |
| 215071 2009 $ET_{3}$ | 16.7 | X | 104.08418 | 206.72499 | 5.58973 | 8.29531 | 0.1449005 | 0.26959633 | 2.3731584 | 21 | 9 11.6 | 20.1 |
| 215072 2009 $EV_{10}$ | 17.1 | X | 58.35280 | 217.80886 | 16.86226 | 4.99145 | 0.1798721 | 0.26466253 | 2.4025609 | 21 | 8 20.5 | 19.9 |
| 215073 2009 $EC_{20}$ | 15.7 | X | 290.81208 | 46.97956 | 111.01705 | 10.14282 | 0.0274644 | 0.22300201 | 2.6931685 | 21 | — | — |
| 215074 2009 $EV_{20}$ | 16.0 | X | 162.52595 | 110.22609 | 4.95126 | 5.80126 | 0.1332948 | 0.18398699 | 3.0615731 | 21 | 7 4.1 | 21.0 |
| 215075 2009 $EY_{20}$ | 17.3 | X | 104.73442 | 264.82856 | 344.45994 | 1.60282 | 0.1929045 | 0.27324865 | 2.3519641 | 21 | 11 1.3 | 21.0 |
| 215076 2009 $FP_{3}$ | 16.4 | X | 174.71456 | 70.04555 | 180.67135 | 5.08163 | 0.0390356 | 0.21486193 | 2.7607669 | 21 | — | — |
| 215077 2009 $FY_{15}$ | 16.9 | X | 331.73156 | 45.07481 | 100.60790 | 4.66585 | 0.1480554 | 0.22696137 | 2.6617551 | 21 | — | — |
| 215078 2009 $FL_{18}$ | 16.9 | X | 62.21233 | 340.49336 | 248.37379 | 2.30555 | 0.1582727 | 0.26196330 | 2.4190365 | 21 | 8 10.8 | 19.8 |
| 215079 2009 $FO_{18}$ | 15.6 | X | 173.86268 | 310.56420 | 198.09394 | 10.18832 | 0.0562509 | 0.19183367 | 2.9775073 | 21 | 8 22.3 | 20.2 |
| 215080 Kaohsiung | 16.8 | X | 227.27387 | 176.37890 | 8.05062 | 4.47450 | 0.1350571 | 0.21158128 | 2.7892315 | 21 | 11 30.1 | 21.0 |
| 215081 2009 $FU_{21}$ | 17.0 | X | 54.08922 | 106.20450 | 132.49606 | 2.64444 | 0.0884447 | 0.26220716 | 2.4175364 | 21 | 8 1.7 | 19.8 |
| 215082 2009 $FT_{22}$ | 17.0 | X | 54.51634 | 103.30638 | 157.35330 | 3.19515 | 0.1255480 | 0.26593304 | 2.3949026 | 21 | 9 10.3 | 19.8 |
| 215083 2009 $FH_{23}$ | 15.5 | X | 14.06180 | 220.88906 | 45.72543 | 5.38540 | 0.1541521 | 0.17746349 | 3.1361491 | 21 | 7 9.9 | 19.1 |
| 215084 2009 $FX_{29}$ | 16.2 | X | 88.94576 | 223.55399 | 224.29213 | 8.38990 | 0.0111303 | 0.23721444 | 2.5844927 | 21 | 2 9.4 | 19.8 |
| 215085 2009 $FZ_{36}$ | 16.2 | X | 176.12351 | 143.20437 | 88.58372 | 4.04200 | 0.0999759 | 0.21188054 | 2.7866045 | 21 | 12 8.3 | 20.5 |
| 215086 2009 $FJ_{43}$ | 15.2 | X | 60.73825 | 141.43618 | 88.33701 | 17.43190 | 0.0548200 | 0.18019081 | 3.1044235 | 21 | 7 23.4 | 19.6 |
| 215087 2009 $FL_{43}$ | 15.3 | X | 76.30643 | 129.61482 | 58.43057 | 13.35653 | 0.1848701 | 0.17829177 | 3.1264286 | 21 | 7 9.1 | 19.8 |
| 215088 2220 *P–L* | 15.8 | X | 227.99158 | 15.62928 | 0.96007 | 14.25587 | 0.1767301 | 0.17415470 | 3.1757471 | 21 | 4 29.1 | 21.1 |
| 215089 Hermanfrid | 14.7 | X | 253.80803 | 233.81132 | 162.55691 | 3.21854 | 0.2397203 | 0.12603758 | 3.9397562 | 21 | 6 15.9 | 20.7 |
| 215090 2823 *P–L* | 17.3 | X | 251.07841 | 158.25186 | 184.31873 | 4.52337 | 0.1870728 | 0.30259507 | 2.1973276 | 21 | 4 3.3 | 20.6 |
| 215091 6228 *P–L* | 16.9 | X | 340.20311 | 181.52324 | 192.68419 | 6.83958 | 0.1635085 | 0.29140506 | 2.2532255 | 21 | 10 27.5 | 18.4 |
| 215092 6256 *P–L* | 16.7 | X | 271.91296 | 350.12846 | 355.27286 | 6.16910 | 0.1807754 | 0.23892774 | 2.5721226 | 21 | 5 2.0 | 20.5 |
| 215093 6823 *P–L* | 17.0 | X | 256.67873 | 217.77872 | 140.28540 | 1.78250 | 0.1943221 | 0.25478446 | 2.4642651 | 21 | 5 2.6 | 20.7 |
| 215094 5043 *T–2* | 15.5 | X | 133.71278 | 8.37112 | 327.81498 | 11.44416 | 0.2435100 | 0.23342171 | 2.6124133 | 21 | — | — |
| 215095 3131 *T–3* | 14.8 | X | 321.18779 | 128.91600 | 193.29233 | 23.40456 | 0.2693864 | 0.17697590 | 3.1419067 | 21 | 6 1.2 | 18.9 |
| 215096 3259 *T–3* | 17.2 | X | 279.00545 | 217.80301 | 175.34577 | 1.98068 | 0.1967833 | 0.26600559 | 2.3944671 | 21 | 7 14.2 | 20.3 |
| 215097 5049 *T–3* | 16.9 | X | 332.18066 | 245.40133 | 121.88519 | 7.10643 | 0.1950743 | 0.26818272 | 2.3814905 | 21 | 9 23.2 | 18.7 |
| 215098 5053 *T–3* | 16.7 | X | 350.21524 | 253.75619 | 97.44269 | 6.41279 | 0.1355620 | 0.26845360 | 2.3798882 | 21 | 10 8.0 | 18.9 |
| 215099 1981 $EN_{36}$ | 16.1 | X | 331.96885 | 250.67714 | 218.57610 | 7.88202 | 0.1702675 | 0.21492506 | 2.7602262 | 21 | — | — |
| 215100 1992 *RD* | 16.1 | X | 156.39956 | 148.64580 | 130.40414 | 26.47704 | 0.2322660 | 0.28359695 | 2.2943958 | 21 | — | — |
| 215101 1995 *LB* | 16.5 | X | 167.32177 | 80.53241 | 238.47104 | 20.09834 | 0.0827237 | 0.36390799 | 1.9430098 | 21 | — | — |
| 215102 1995 $OC_{7}$ | 16.7 | X | 24.00003 | 213.24361 | 135.38688 | 5.70491 | 0.1186887 | 0.23266808 | 2.6180515 | 21 | 11 20.9 | 20.0 |
| 215103 1995 $UZ_{15}$ | 15.5 | X | 267.59647 | 336.30995 | 69.17907 | 10.10630 | 0.0867397 | 0.18131544 | 3.0915731 | 21 | 8 2.8 | 20.0 |
| 215104 1995 $UL_{18}$ | 16.7 | X | 195.74588 | 255.43508 | 209.61746 | 4.95893 | 0.1079689 | 0.25894446 | 2.4378013 | 21 | 7 23.6 | 20.4 |
| 215105 1995 $UV_{52}$ | 16.5 | X | 189.85132 | 181.98635 | 268.18622 | 1.18700 | 0.1394592 | 0.25662200 | 2.4524875 | 21 | 6 28.1 | 20.2 |
| 215106 1995 $VQ_{2}$ | 17.0 | X | 356.56536 | 287.27254 | 45.17290 | 1.96783 | 0.1935245 | 0.26382604 | 2.4076366 | 21 | 9 22.2 | 18.8 |
| 215107 1996 $RX_{15}$ | 12.9 | X | 328.84769 | 89.00706 | 342.50659 | 4.22776 | 0.0377133 | 0.08325866 | 5.1941735 | 21 | 11 10.8 | 19.7 |
| 215108 1996 $RC_{18}$ | 16.7 | X | 339.32880 | 284.63275 | 147.71902 | 2.97078 | 0.1189639 | 0.28385356 | 2.2930129 | 21 | — | — |
| 215109 1996 $VM_{15}$ | 17.5 | X | 127.65195 | 63.48791 | 221.94933 | 4.97571 | 0.1125342 | 0.28177876 | 2.3042550 | 21 | — | — |
| 215110 1997 $NO_{5}$ | 12.7 | X | 277.90115 | 271.72538 | 71.36721 | 25.20011 | 0.1056789 | 0.08342352 | 5.1873281 | 21 | 5 28.1 | 19.5 |
| 215111 1997 $WK_{56}$ | 16.5 | X | 122.12038 | 126.07003 | 227.93992 | 5.09325 | 0.0806978 | 0.21780958 | 2.7358024 | 21 | — | — |
| 215112 1997 $XR_{7}$ | 15.6 | X | 236.02800 | 91.77340 | 230.36823 | 13.02689 | 0.2081739 | 0.22828453 | 2.6514599 | 21 | 2 24.0 | 20.4 |
| 215113 1998 $DD_{2}$ | 16.7 | X | 161.78123 | 109.16514 | 347.42433 | 8.35144 | 0.3195280 | 0.18474116 | 3.0532353 | 21 | 6 15.5 | 22.4 |
| 215114 1998 $DJ_{8}$ | 17.2 | X | 153.22352 | 201.28322 | 298.76230 | 1.29498 | 0.1259536 | 0.26933706 | 2.3746812 | 21 | 7 26.6 | 20.5 |
| 215115 1998 *EO* | 17.3 | X | 315.66908 | 265.91343 | 184.93900 | 6.14319 | 0.0594879 | 0.28260513 | 2.2997609 | 21 | 12 28.7 | 19.9 |
| 215116 1998 $MG_{44}$ | 16.5 | X | 47.96352 | 336.71026 | 285.99573 | 7.86730 | 0.1920470 | 0.26060590 | 2.4274291 | 21 | 9 9.1 | 19.5 |
| 215117 1998 $RQ_{10}$ | 16.9 | X | 319.87546 | 256.60881 | 356.62271 | 5.72419 | 0.1629369 | 0.28788130 | 2.2715750 | 21 | 2 27.1 | 19.4 |
| 215118 1998 $TO_{12}$ | 17.2 | X | 283.25473 | 105.88323 | 222.80480 | 0.37285 | 0.1622879 | 0.24507239 | 2.5289474 | 21 | 4 27.4 | 20.5 |
| 215119 1998 $WU_{38}$ | 17.3 | X | 11.44450 | 37.51723 | 66.68478 | 2.96315 | 0.1530851 | 0.22387621 | 2.6861530 | 21 | — | — |
| 215120 1999 $JG_{4}$ | 16.7 | X | 209.21086 | 34.12304 | 252.62406 | 7.82682 | 0.2842036 | 0.29694192 | 2.2251282 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215121 1999 $JB_{11}$ | 18.4 | $X$ | 302.18165 | 30.91563 | 216.47472 | 37.09607 | 0.2545997 | 0.39415591 | 1.8422873 | 21 | — | — |
| 215122 1999 $LG_{4}$ | 16.1 | $X$ | 247.46245 | 79.86585 | 248.22956 | 24.36697 | 0.2593472 | 0.30377405 | 2.1916386 | 21 | 2 24.3 | 20.5 |
| 215123 1999 $RS_{41}$ | 17.2 | $X$ | 190.69843 | 106.83533 | 167.76619 | 22.48699 | 0.0870668 | 0.37608469 | 1.9008402 | 21 | — | — |
| 215124 1999 $RV_{73}$ | 14.7 | $X$ | 31.23966 | 61.88344 | 250.82130 | 14.68852 | 0.2837611 | 0.18162137 | 3.0881004 | 21 | 10 27.0 | 18.6 |
| 215125 1999 $RY_{78}$ | 17.2 | $X$ | 41.28940 | 182.74857 | 166.09095 | 8.20214 | 0.1357181 | 0.27654382 | 2.3332435 | 21 | 12 25.3 | 20.3 |
| 215126 1999 $RX_{122}$ | 15.7 | $X$ | 1.08640 | 112.81923 | 209.24130 | 12.48091 | 0.3312837 | 0.17948224 | 3.1125886 | 21 | 9 8.8 | 18.3 |
| 215127 1999 $RG_{135}$ | 16.7 | $X$ | 121.28120 | 314.72955 | 337.63210 | 12.81987 | 0.2166990 | 0.28248656 | 2.3004044 | 21 | — | — |
| 215128 1999 $RO_{138}$ | 16.0 | $X$ | 65.67046 | 81.51238 | 261.43268 | 11.46330 | 0.1938975 | 0.23334276 | 2.6130025 | 21 | — | — |
| 215129 1999 $RW_{153}$ | 16.6 | $X$ | 324.22405 | 159.80321 | 201.38404 | 5.92162 | 0.1543397 | 0.26802062 | 2.3824506 | 21 | 8 21.3 | 18.8 |
| 215130 1999 $RB_{199}$ | 14.6 | $X$ | 4.12457 | 60.58458 | 238.48557 | 13.74447 | 0.2159329 | 0.17818477 | 3.1276801 | 21 | 8 1.6 | 18.1 |
| 215131 1999 $RH_{237}$ | 16.8 | $X$ | 25.39205 | 274.53926 | 82.25323 | 5.66838 | 0.2489710 | 0.27436479 | 2.3455812 | 21 | — | — |
| 215132 1999 $TQ_{4}$ | 17.0 | $X$ | 83.48115 | 176.98173 | 202.75607 | 22.02317 | 0.0642191 | 0.37252547 | 1.9129285 | 21 | — | — |
| 215133 1999 $TU_{33}$ | 15.2 | $X$ | 344.81429 | 151.17115 | 205.46003 | 9.93591 | 0.2313856 | 0.17712063 | 3.1401950 | 21 | 9 12.9 | 18.5 |
| 215134 1999 $TG_{65}$ | 16.0 | $X$ | 320.05802 | 91.98742 | 224.69336 | 0.43967 | 0.0707156 | 0.17195165 | 3.2028147 | 21 | 6 19.6 | 20.2 |
| 215135 1999 $TA_{124}$ | 16.7 | $X$ | 284.67675 | 226.54500 | 179.66625 | 6.08829 | 0.1822381 | 0.26461088 | 2.4028736 | 21 | 8 12.2 | 19.6 |
| 215136 1999 $TY_{163}$ | 17.0 | $X$ | 38.82238 | 179.15612 | 169.20253 | 5.96527 | 0.2546797 | 0.27426513 | 2.3461493 | 21 | — | — |
| 215137 1999 $TW_{171}$ | 16.9 | $X$ | 280.57599 | 187.12666 | 193.11150 | 2.11964 | 0.2190938 | 0.26171353 | 2.4205753 | 21 | 6 24.6 | 20.2 |
| 215138 1999 $TL_{206}$ | 16.4 | $X$ | 217.51184 | 3.03343 | 28.84850 | 8.31778 | 0.1852071 | 0.25309012 | 2.4752511 | 21 | 5 7.5 | 20.3 |
| 215139 1999 $TS_{218}$ | 15.5 | $X$ | 338.25996 | 102.57647 | 211.49649 | 4.83857 | 0.1908900 | 0.17261548 | 3.1945981 | 21 | 7 3.1 | 19.1 |
| 215140 1999 $TP_{260}$ | 17.1 | $X$ | 52.10765 | 39.24046 | 276.44580 | 2.67745 | 0.1787728 | 0.27260081 | 2.3556890 | 21 | 11 30.2 | 20.2 |
| 215141 1999 $TS_{280}$ | 15.2 | $X$ | 274.25285 | 198.24559 | 175.46258 | 19.42142 | 0.1478935 | 0.17154869 | 3.2078282 | 21 | 6 20.4 | 20.2 |
| 215142 1999 $UO_{39}$ | 15.9 | $X$ | 6.61003 | 96.93227 | 167.31755 | 2.30994 | 0.0636012 | 0.16938443 | 3.2350951 | 21 | 6 20.4 | 20.1 |
| 215143 1999 $UN_{50}$ | 16.7 | $X$ | 31.76422 | 216.53300 | 139.82468 | 3.87582 | 0.2457628 | 0.27359699 | 2.3499674 | 21 | — | — |
| 215144 1999 $UV_{51}$ | 16.3 | $X$ | 84.29670 | 281.92445 | 62.90464 | 22.81173 | 0.2861874 | 0.27895343 | 2.3197877 | 21 | — | — |
| 215145 1999 $UM_{57}$ | 17.6 | $X$ | 100.81180 | 64.10197 | 219.32502 | 1.43316 | 0.2074513 | 0.27317455 | 2.3523895 | 21 | 12 11.3 | 21.5 |
| 215146 1999 $VA_{28}$ | 16.2 | $X$ | 321.61970 | 137.99760 | 233.65295 | 8.30894 | 0.0976867 | 0.26413718 | 2.4057456 | 21 | 9 4.3 | 18.8 |
| 215147 1999 $VK_{66}$ | 16.8 | $X$ | 221.38586 | 358.34658 | 55.18500 | 7.13295 | 0.1401523 | 0.25614738 | 2.4555160 | 21 | 6 11.4 | 20.5 |
| 215148 1999 $VJ_{69}$ | 16.5 | $X$ | 84.01050 | 99.67377 | 216.20853 | 9.01005 | 0.1727231 | 0.27523955 | 2.3406088 | 21 | — | — |
| 215149 1999 $VC_{114}$ | 14.7 | $X$ | 343.81602 | 112.57468 | 227.33456 | 25.02866 | 0.2789882 | 0.17618947 | 3.1512492 | 21 | 8 5.3 | 18.3 |
| 215150 1999 $VJ_{117}$ | 17.7 | $X$ | 104.58663 | 93.67308 | 180.74939 | 2.38685 | 0.1819579 | 0.27520235 | 2.3408197 | 21 | 12 2.8 | 21.2 |
| 215151 1999 $VP_{150}$ | 15.2 | $X$ | 6.63517 | 90.18316 | 227.94031 | 14.63738 | 0.2480786 | 0.17568376 | 3.1572936 | 21 | 9 6.1 | 18.6 |
| 215152 1999 $VF_{174}$ | 16.8 | $X$ | 13.49019 | 175.70418 | 228.03713 | 19.97460 | 0.0773997 | 0.36495626 | 1.9392874 | 21 | — | — |
| 215153 1999 $VX_{193}$ | 15.7 | $X$ | 327.64684 | 330.40964 | 38.96607 | 17.61432 | 0.2563247 | 0.22036679 | 2.7145965 | 21 | 9 9.6 | 18.4 |
| 215154 1999 $XR_{139}$ | 17.6 | $X$ | 28.07880 | 282.87971 | 77.19530 | 1.94954 | 0.2528787 | 0.27247927 | 2.3563894 | 21 | — | — |
| 215155 1999 $XH_{146}$ | 17.2 | $X$ | 30.13788 | 250.01405 | 70.78877 | 6.95697 | 0.1971957 | 0.26772154 | 2.3842246 | 21 | 11 11.2 | 19.9 |
| 215156 1999 $XX_{215}$ | 16.2 | $X$ | 356.90129 | 96.42115 | 103.44719 | 14.31606 | 0.1304481 | 0.23870062 | 2.5737539 | 21 | 3 2.3 | 19.3 |
| 215157 1999 $XY_{251}$ | 17.3 | $X$ | 316.95225 | 155.19484 | 213.30155 | 3.29373 | 0.2275106 | 0.26370711 | 2.4083604 | 21 | 8 6.9 | 19.2 |
| 215158 2000 $AE_{59}$ | 14.5 | $X$ | 38.88681 | 76.99287 | 312.70017 | 10.85422 | 0.3351228 | 0.18058606 | 3.0998920 | 21 | — | — |
| 215159 2000 $AU_{91}$ | 16.0 | $X$ | 17.57322 | 236.17629 | 283.36259 | 3.41180 | 0.1898715 | 0.23468437 | 2.6030346 | 21 | 1 31.3 | 18.4 |
| 215160 2000 $AY_{102}$ | 15.5 | $X$ | 212.39933 | 277.08836 | 121.10485 | 5.18519 | 0.1843095 | 0.25299253 | 2.4758876 | 21 | 5 13.9 | 19.6 |
| 215161 2000 $AS_{178}$ | 16.0 | $X$ | 42.51884 | 294.47879 | 209.03116 | 6.95600 | 0.1728456 | 0.23789497 | 2.5795614 | 21 | 2 27.9 | 18.4 |
| 215162 2000 $BB_{5}$ | 15.5 | $X$ | 110.34589 | 50.07135 | 58.99641 | 17.87637 | 0.1517231 | 0.24380643 | 2.5376942 | 21 | 5 4.2 | 19.0 |
| 215163 2000 $BC_{9}$ | 15.1 | $X$ | 158.63763 | 8.00923 | 303.85633 | 8.68349 | 0.0847627 | 0.18110083 | 3.0940151 | 21 | — | — |
| 215164 2000 $CN_{15}$ | 15.5 | $X$ | 180.88210 | 240.19381 | 286.67800 | 13.56127 | 0.2009022 | 0.21119752 | 2.7926092 | 21 | 9 14.6 | 20.5 |
| 215165 2000 $CG_{22}$ | 15.9 | $X$ | 208.84685 | 210.50516 | 304.23954 | 6.01286 | 0.2103699 | 0.21255161 | 2.7807361 | 21 | 9 27.6 | 20.6 |
| 215166 2000 $CQ_{40}$ | 16.6 | $X$ | 15.71363 | 23.13783 | 102.07820 | 4.29554 | 0.2450150 | 0.23043128 | 2.6349665 | 21 | — | — |
| 215167 2000 $EL_{26}$ | 18.6 | $X$ | 199.55681 | 96.84407 | 152.34477 | 26.97294 | 0.3088621 | 0.44857157 | 1.6901097 | 21 | — | — |
| 215168 2000 $EU_{29}$ | 15.7 | $X$ | 320.98162 | 227.12823 | 352.91391 | 11.13859 | 0.1349950 | 0.23275321 | 2.6174131 | 21 | 2 1.6 | 19.2 |
| 215169 2000 $EM_{112}$ | 16.2 | $X$ | 338.02140 | 12.96956 | 195.00170 | 4.59504 | 0.1726112 | 0.23298853 | 2.6156504 | 21 | 1 29.9 | 19.3 |
| 215170 2000 $FR_{9}$ | 16.1 | $X$ | 203.52675 | 135.99180 | 190.38594 | 11.87988 | 0.1303681 | 0.22738369 | 2.6584582 | 21 | 2 4.7 | 20.6 |
| 215171 2000 $FX_{23}$ | 16.0 | $X$ | 256.36299 | 142.40101 | 112.54540 | 10.52435 | 0.1922483 | 0.22402799 | 2.6849396 | 21 | — | — |
| 215172 2000 $GQ_{67}$ | 16.1 | $X$ | 299.32516 | 2.94953 | 182.94929 | 3.29417 | 0.1195866 | 0.22197196 | 2.7014938 | 21 | — | — |
| 215173 2000 $GO_{73}$ | 15.1 | $X$ | 144.33294 | 174.45153 | 219.69141 | 12.89450 | 0.1861652 | 0.22744056 | 2.6580150 | 21 | 3 4.8 | 19.5 |
| 215174 2000 $GU_{100}$ | 16.9 | $X$ | 303.10650 | 299.53786 | 210.41924 | 8.24933 | 0.3830432 | 0.22156743 | 2.7047810 | 21 | — | — |
| 215175 2000 $GS_{117}$ | 16.9 | $X$ | 261.90869 | 114.38974 | 187.75955 | 3.20394 | 0.1708917 | 0.23232177 | 2.6206525 | 21 | 3 1.3 | 20.9 |
| 215176 2000 $GQ_{120}$ | 16.2 | $X$ | 198.53853 | 185.92167 | 170.96110 | 2.47046 | 0.2277206 | 0.23057415 | 2.6338779 | 21 | 3 12.5 | 20.7 |
| 215177 2000 $GM_{163}$ | 16.2 | $X$ | 345.17511 | 48.98235 | 102.73798 | 2.82985 | 0.1138134 | 0.22521913 | 2.6754645 | 21 | — | — |
| 215178 2000 $GO_{166}$ | 16.3 | $X$ | 279.04967 | 18.18389 | 203.49660 | 1.02532 | 0.1140787 | 0.22346380 | 2.6894570 | 21 | — | — |
| 215179 2000 $GQ_{171}$ | 16.2 | $X$ | 295.03553 | 13.65339 | 194.84322 | 9.61109 | 0.1989600 | 0.22384040 | 2.6864395 | 21 | — | — |
| 215180 2000 $HX_{2}$ | 16.6 | $X$ | 318.87606 | 28.01638 | 130.73558 | 3.97722 | 0.1095460 | 0.21959927 | 2.7209180 | 21 | — | — |
| 215181 2000 $HE_{3}$ | 16.6 | $X$ | 302.02308 | 131.64464 | 34.73679 | 1.57509 | 0.1624300 | 0.22015573 | 2.7163312 | 21 | — | — |
| 215182 2000 $HE_{67}$ | 16.0 | $X$ | 237.96502 | 178.25527 | 35.84027 | 9.50734 | 0.0826041 | 0.21660734 | 2.7459162 | 21 | — | — |
| 215183 2000 $HB_{74}$ | 16.5 | $X$ | 319.54035 | 13.33148 | 181.81979 | 1.19675 | 0.0721956 | 0.22585785 | 2.6704180 | 21 | 1 6.1 | 19.9 |
| 215184 2000 $HX_{103}$ | 16.0 | $X$ | 258.28119 | 155.30395 | 104.25079 | 15.16254 | 0.2273737 | 0.22210753 | 2.7003943 | 21 | 1 5.1 | 20.7 |
| 215185 2000 $JD_{83}$ | 16.4 | $X$ | 307.34018 | 309.23823 | 230.91011 | 7.11036 | 0.0800754 | 0.22077922 | 2.7112148 | 21 | — | — |
| 215186 2000 $KX$ | 16.1 | $X$ | 240.12236 | 9.93435 | 235.91792 | 11.69873 | 0.1683663 | 0.21899541 | 2.7259175 | 21 | — | — |
| 215187 2000 $LQ_{25}$ | 15.8 | $X$ | 239.30505 | 211.82613 | 73.40992 | 8.70884 | 0.3242551 | 0.21893325 | 2.7264334 | 21 | 1 18.6 | 20.9 |
| 215188 2000 $NM$ | 15.4 | $X$ | 264.68815 | 71.34884 | 273.34368 | 22.28009 | 0.6636540 | 0.22384737 | 2.6863838 | 21 | 3 11.9 | 21.6 |
| 215189 2000 $NK_{10}$ | 17.4 | $X$ | 243.03276 | 217.14932 | 113.59865 | 4.06868 | 0.2685176 | 0.31537261 | 2.1375686 | 21 | 3 8.1 | 20.9 |
| 215190 2000 $PU_{3}$ | 16.3 | $X$ | 250.64125 | 288.42162 | 61.01258 | 2.18437 | 0.2064348 | 0.31876651 | 2.1223692 | 21 | 4 9.6 | 19.3 |
| 215191 2000 $QQ_{47}$ | 16.8 | $X$ | 159.20456 | 234.66688 | 142.85454 | 3.40839 | 0.1304661 | 0.30879435 | 2.1678197 | 21 | 2 14.7 | 19.7 |
| 215192 2000 $QV_{155}$ | 15.4 | $X$ | 19.66627 | 164.01611 | 211.54653 | 9.36999 | 0.1444020 | 0.19562302 | 2.9389311 | 21 | 12 13.4 | 19.1 |
| 215193 2000 $QM_{173}$ | 16.8 | $X$ | 238.26272 | 202.88203 | 188.35074 | 6.92988 | 0.2184012 | 0.27293563 | 2.3537621 | 21 | 5 25.3 | 20.6 |
| 215194 2000 $SN_{18}$ | 16.8 | $X$ | 232.38464 | 342.85424 | 299.27108 | 7.64481 | 0.1703859 | 0.30648404 | 2.1787002 | 21 | — | — |
| 215195 2000 $SA_{22}$ | 15.8 | $X$ | 25.55731 | 98.25622 | 188.53751 | 27.21084 | 0.3236998 | 0.23402511 | 2.6079209 | 21 | 9 30.6 | 18.3 |
| 215196 2000 $SK_{30}$ | 16.7 | $X$ | 208.30080 | 290.31101 | 355.36465 | 6.68264 | 0.1047849 | 0.30397577 | 2.1906689 | 21 | — | — |
| 215197 2000 $SN_{42}$ | 18.4 | $X$ | 141.32037 | 284.48621 | 173.69504 | 4.37274 | 0.1185646 | 0.40913745 | 1.7970351 | 21 | 5 8.9 | 20.0 |
| 215198 2000 $SZ_{69}$ | 17.5 | $X$ | 50.11683 | 302.59613 | 40.75547 | 7.32325 | 0.2204603 | 0.28906499 | 2.2653695 | 21 | — | — |
| 215199 2000 $SB_{130}$ | 12.3 | $X$ | 266.64552 | 123.47852 | 224.84469 | 18.07279 | 0.2149025 | 0.08291239 | 5.2086249 | 21 | 5 8.1 | 19.4 |
| 215200 2000 $SB_{134}$ | 15.2 | $X$ | 266.92668 | 160.33837 | 227.72751 | 9.91825 | 0.1169955 | 0.17992334 | 3.1074993 | 21 | 7 2.3 | 19.8 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215201 2000 $SX_{139}$ | 14.9 | $X$ | 52.91439 | 117.08822 | 222.38999 | 9.48656 | 0.1098412 | 0.19296512 | 2.9658568 | 21 | 12 7.4 | 19.0 |
| 215202 2000 $SZ_{159}$ | 16.1 | $X$ | 177.46106 | 81.39418 | 222.73684 | 18.85421 | 0.3217486 | 0.20936227 | 2.8089054 | 21 | — | — |
| 215203 2000 $SO_{191}$ | 17.6 | $X$ | 165.79916 | 287.54645 | 32.62309 | 5.30568 | 0.2133053 | 0.30276718 | 2.1964948 | 21 | — | — |
| 215204 2000 $SL_{208}$ | 17.6 | $X$ | 218.93755 | 138.24379 | 199.11869 | 3.45022 | 0.1974035 | 0.31050007 | 2.1598732 | 21 | 2 23.9 | 21.1 |
| 215205 2000 $SB_{224}$ | 15.6 | $X$ | 255.38669 | 3.38285 | 25.70522 | 7.61769 | 0.1631471 | 0.17719829 | 3.1392774 | 21 | 6 15.1 | 20.4 |
| 215206 2000 $SY_{248}$ | 17.7 | $X$ | 197.26962 | 283.10826 | 68.25453 | 1.28268 | 0.1868304 | 0.30985707 | 2.1628602 | 21 | 2 24.2 | 21.1 |
| 215207 2000 $SO_{269}$ | 16.6 | $X$ | 110.69531 | 319.19692 | 56.76794 | 6.03008 | 0.1528168 | 0.29846732 | 2.2175403 | 21 | — | — |
| 215208 2000 $SC_{300}$ | 15.2 | $X$ | 330.15039 | 159.55980 | 206.07199 | 12.19196 | 0.1059183 | 0.18468120 | 3.0538961 | 21 | 9 1.9 | 19.2 |
| 215209 2000 $SL_{339}$ | 15.4 | $X$ | 198.29177 | 282.58405 | 34.84662 | 19.64197 | 0.3340333 | 0.21230596 | 2.7828807 | 21 | 2 6.0 | 21.0 |
| 215210 2000 $SB_{351}$ | 15.2 | $X$ | 324.26258 | 304.02671 | 61.02196 | 17.36106 | 0.1460141 | 0.18481490 | 3.0524231 | 21 | 9 1.6 | 19.2 |
| 215211 2000 $SF_{356}$ | 15.2 | $X$ | 170.07897 | 266.21627 | 71.09849 | 12.87993 | 0.2122880 | 0.20918591 | 2.8104839 | 21 | 1 30.9 | 20.0 |
| 215212 2000 $TC_{11}$ | 16.4 | $X$ | 2.63376 | 295.09297 | 22.35985 | 5.37044 | 0.1304713 | 0.23135511 | 2.6279473 | 21 | 9 3.3 | 19.1 |
| 215213 2000 $TV_{18}$ | 15.4 | $X$ | 31.88536 | 125.04293 | 205.54658 | 10.11091 | 0.1005465 | 0.18863503 | 3.0110721 | 21 | 10 28.1 | 19.3 |
| 215214 2000 $TH_{20}$ | 15.3 | $X$ | 71.24189 | 223.13047 | 125.24453 | 9.79135 | 0.0923456 | 0.19658394 | 2.9293462 | 21 | — | — |
| 215215 2000 $TU_{35}$ | 16.9 | $X$ | 257.17569 | 142.91192 | 333.69790 | 1.66788 | 0.1913348 | 0.28131065 | 2.3068106 | 21 | 10 12.7 | 19.7 |
| 215216 2000 $UE_{9}$ | 16.2 | $X$ | 166.04007 | 88.73973 | 230.22875 | 6.01521 | 0.1608740 | 0.29814959 | 2.2191155 | 21 | — | — |
| 215217 2000 $UX_{16}$ | 16.9 | $X$ | 61.03993 | 344.54589 | 41.28747 | 4.05677 | 0.1380321 | 0.29246582 | 2.2477740 | 21 | — | — |
| 215218 2000 $UH_{20}$ | 15.5 | $X$ | 336.41091 | 224.60748 | 139.06378 | 1.13259 | 0.1813113 | 0.18414296 | 3.0598441 | 21 | 9 10.3 | 18.7 |
| 215219 2000 $UR_{112}$ | 15.5 | $X$ | 16.38050 | 274.28749 | 62.86894 | 11.99027 | 0.1490983 | 0.18533542 | 3.0467052 | 21 | 10 22.6 | 19.3 |
| 215220 2000 $VJ_{13}$ | 17.1 | $X$ | 17.19570 | 324.18264 | 91.00634 | 3.60858 | 0.1287751 | 0.28937674 | 2.2637422 | 21 | — | — |
| 215221 2000 $WA_{19}$ | 16.5 | $X$ | 162.55322 | 262.14689 | 71.09420 | 6.02648 | 0.2089083 | 0.29840935 | 2.2178275 | 21 | 1 2.2 | 19.6 |
| 215222 2000 $WE_{29}$ | 14.7 | $X$ | 327.76109 | 272.83826 | 83.73368 | 22.58196 | 0.3088163 | 0.18148352 | 3.0896640 | 21 | 7 29.5 | 17.9 |
| 215223 2000 $WM_{127}$ | 15.3 | $X$ | 238.74834 | 179.61682 | 233.78460 | 7.96893 | 0.0747454 | 0.17376999 | 3.1804326 | 21 | 7 6.7 | 20.0 |
| 215224 2000 $WX_{131}$ | 16.5 | $X$ | 265.99535 | 27.08413 | 74.32435 | 6.84577 | 0.1755733 | 0.27785207 | 2.3259138 | 21 | 10 10.8 | 19.2 |
| 215225 2000 $WP_{140}$ | 17.0 | $X$ | 237.89587 | 19.97776 | 71.86637 | 3.37579 | 0.1930312 | 0.27223607 | 2.3577926 | 21 | 8 16.6 | 20.3 |
| 215226 2000 $WY_{160}$ | 14.8 | $X$ | 338.45533 | 272.93371 | 104.12887 | 11.21052 | 0.1561410 | 0.18348946 | 3.0671050 | 21 | 10 9.9 | 18.4 |
| 215227 2000 $WZ_{181}$ | 15.4 | $X$ | 264.18966 | 295.09243 | 109.87486 | 17.48119 | 0.2488873 | 0.17719278 | 3.1393425 | 21 | 7 4.8 | 20.3 |
| 215228 2000 $YX_{8}$ | 17.3 | $X$ | 87.47218 | 358.40877 | 175.66452 | 1.15185 | 0.1211809 | 0.25938496 | 2.4350405 | 21 | 6 24.2 | 20.4 |
| 215229 2000 $YO_{39}$ | 17.0 | $X$ | 161.21073 | 8.07949 | 134.15472 | 5.83063 | 0.1660080 | 0.26520560 | 2.3992799 | 21 | 8 7.7 | 20.7 |
| 215230 2000 $YL_{44}$ | 16.6 | $X$ | 338.50123 | 331.29741 | 100.69229 | 7.23901 | 0.1594742 | 0.28269216 | 2.2992889 | 21 | — | — |
| 215231 2001 $AX_{11}$ | 17.0 | $X$ | 230.34371 | 289.04936 | 191.70338 | 1.94628 | 0.1498868 | 0.27163685 | 2.3612588 | 21 | 9 19.6 | 20.3 |
| 215232 2001 $AK_{12}$ | 15.5 | $X$ | 135.75895 | 300.12433 | 289.43792 | 12.23358 | 0.1101737 | 0.22484181 | 2.6784569 | 21 | 10 23.1 | 19.8 |
| 215233 2001 $AZ_{21}$ | 16.7 | $X$ | 311.27477 | 359.50027 | 76.88822 | 7.35786 | 0.0738530 | 0.27889034 | 2.3201375 | 21 | 11 30.4 | 19.1 |
| 215234 2001 $AN_{25}$ | 15.8 | $X$ | 142.58754 | 261.58678 | 301.33005 | 21.36434 | 0.2800563 | 0.26789794 | 2.3831779 | 21 | 9 26.9 | 20.6 |
| 215235 2001 $BA_{30}$ | 16.1 | $X$ | 346.42635 | 211.79342 | 305.39964 | 4.97944 | 0.0570015 | 0.24325085 | 2.5415567 | 21 | — | — |
| 215236 2001 $BP_{76}$ | 16.4 | $X$ | 241.43854 | 300.21399 | 141.32259 | 6.87287 | 0.0827424 | 0.26709435 | 2.3879556 | 21 | 8 19.6 | 19.5 |
| 215237 2001 $DJ_{2}$ | 16.0 | $X$ | 292.08016 | 83.69762 | 333.98469 | 7.07614 | 0.1324234 | 0.22193404 | 2.7018015 | 21 | 9 14.2 | 19.1 |
| 215238 2001 $DJ_{14}$ | 16.7 | $X$ | 341.64869 | 276.35122 | 322.91923 | 5.51412 | 0.1235989 | 0.29820344 | 2.2188483 | 21 | 3 14.4 | 19.0 |
| 215239 2001 $DG_{15}$ | 16.8 | $X$ | 223.75750 | 19.22919 | 78.07583 | 6.09730 | 0.1909839 | 0.26756566 | 2.3851506 | 21 | 8 9.6 | 20.5 |
| 215240 2001 $DY_{29}$ | 15.8 | $X$ | 330.43635 | 5.70134 | 145.67455 | 14.49486 | 0.1754277 | 0.23734291 | 2.5835599 | 21 | — | — |
| 215241 2001 $DW_{64}$ | 16.8 | $X$ | 131.01736 | 49.28044 | 168.62441 | 5.65293 | 0.0524878 | 0.26773104 | 2.3841682 | 21 | 10 12.0 | 20.0 |
| 215242 2001 $DD_{70}$ | 16.0 | $X$ | 54.21352 | 260.43499 | 338.34316 | 9.84147 | 0.2417215 | 0.25635439 | 2.4541939 | 21 | 8 28.4 | 18.8 |
| 215243 2001 $DG_{97}$ | 12.7 | $X$ | 291.49425 | 324.78550 | 145.46348 | 9.98837 | 0.1315348 | 0.08230593 | 5.2341798 | 21 | 11 3.2 | 19.4 |
| 215244 2001 $EN_{14}$ | 15.9 | $X$ | 83.25463 | 100.17549 | 119.61597 | 11.38164 | 0.1871668 | 0.25790910 | 2.4443212 | 21 | 9 3.7 | 19.4 |
| 215245 2001 $FW_{187}$ | 17.1 | $X$ | 263.28952 | 29.46509 | 26.34601 | 3.87263 | 0.1203579 | 0.26257985 | 2.4152483 | 21 | 8 8.1 | 20.1 |
| 215246 2001 $GW$ | 17.1 | $X$ | 46.81066 | 96.33443 | 34.13853 | 2.72440 | 0.1035177 | 0.24209337 | 2.5496513 | 21 | 2 16.6 | 19.7 |
| 215247 2001 $KY_{17}$ | 16.3 | $X$ | 34.35632 | 344.57875 | 195.72322 | 8.74634 | 0.1418166 | 0.24192109 | 2.5508616 | 21 | 4 7.7 | 18.6 |
| 215248 2001 $KJ_{34}$ | 16.4 | $X$ | 310.12969 | 224.51997 | 75.65710 | 7.39711 | 0.1958351 | 0.24387642 | 2.5372086 | 21 | 4 22.5 | 19.5 |
| 215249 2001 $KD_{58}$ | 15.6 | $X$ | 277.75241 | 28.45327 | 211.23018 | 13.00009 | 0.1207563 | 0.23393677 | 2.6085773 | 21 | 1 3.1 | 19.8 |
| 215250 2001 $KS_{62}$ | 15.5 | $X$ | 35.26392 | 188.89919 | 124.16382 | 11.12189 | 0.3365142 | 0.25510482 | 2.4622016 | 21 | 11 29.1 | 18.9 |
| 215251 2001 $LK_{18}$ | 16.2 | $X$ | 264.75147 | 118.84278 | 131.33349 | 16.17417 | 0.2426532 | 0.23252747 | 2.6191068 | 21 | — | — |
| 215252 2001 $MB_{12}$ | 16.2 | $X$ | 289.83132 | 216.95934 | 78.77622 | 10.52381 | 0.1620731 | 0.23698048 | 2.5861934 | 21 | 3 29.9 | 20.0 |
| 215253 2001 $MG_{18}$ | 15.9 | $X$ | 314.29838 | 247.36649 | 45.91659 | 5.74427 | 0.2732186 | 0.24007708 | 2.5639069 | 21 | 4 5.6 | 19.2 |
| 215254 2001 $MK_{31}$ | 16.2 | $X$ | 339.14519 | 110.86865 | 135.97417 | 9.66565 | 0.0812468 | 0.24207038 | 2.5498127 | 21 | 4 12.2 | 19.3 |
| 215255 2001 $NJ$ | 14.7 | $X$ | 249.85839 | 48.35238 | 248.81758 | 31.35976 | 0.2405577 | 0.22880088 | 2.6474692 | 21 | 1 27.1 | 19.9 |
| 215256 2001 $NR_{2}$ | 16.0 | $X$ | 247.89973 | 222.75530 | 90.58491 | 6.24667 | 0.1563832 | 0.23264543 | 2.6182214 | 21 | 3 6.3 | 20.2 |
| 215257 2001 $NM_{6}$ | 16.3 | $X$ | 173.92063 | 220.99305 | 125.97972 | 15.21383 | 0.3116871 | 0.22370275 | 2.6875414 | 21 | 2 16.0 | 21.2 |
| 215258 2001 $NP_{9}$ | 15.7 | $X$ | 169.97082 | 252.18707 | 116.85195 | 14.50449 | 0.0995188 | 0.22886464 | 2.6469775 | 21 | 2 28.0 | 19.8 |
| 215259 2001 $ON$ | 15.9 | $X$ | 129.71408 | 254.02465 | 129.66502 | 10.37723 | 0.2575820 | 0.22051567 | 2.7133745 | 21 | 2 19.9 | 20.0 |
| 215260 2001 $OH_{2}$ | 16.0 | $X$ | 239.06034 | 134.65357 | 178.95648 | 13.24014 | 0.2173974 | 0.23066740 | 2.6331680 | 21 | 2 19.1 | 20.6 |
| 215261 2001 $OT_{14}$ | 15.9 | $X$ | 231.25388 | 188.50023 | 143.62564 | 14.98087 | 0.2580745 | 0.22996682 | 2.6385132 | 21 | 3 9.5 | 20.6 |
| 215262 2001 $OD_{16}$ | 15.9 | $X$ | 87.27215 | 334.83604 | 54.35283 | 10.41086 | 0.1997955 | 0.21400804 | 2.7681056 | 21 | — | — |
| 215263 2001 $OW_{23}$ | 15.7 | $X$ | 165.86048 | 88.14809 | 293.88511 | 21.34594 | 0.3213226 | 0.27412944 | 2.3469235 | 21 | 3 6.3 | 20.3 |
| 215264 2001 $OT_{33}$ | 15.9 | $X$ | 231.17814 | 229.57914 | 108.01543 | 14.63460 | 0.1779148 | 0.23194891 | 2.6234603 | 21 | 3 23.0 | 20.4 |
| 215265 2001 $OB_{55}$ | 15.8 | $X$ | 124.16984 | 294.95646 | 96.47925 | 13.96529 | 0.2073465 | 0.22333673 | 2.6904769 | 21 | 2 20.3 | 19.9 |
| 215266 2001 $OK_{63}$ | 16.2 | $X$ | 221.42350 | 197.43635 | 147.83991 | 14.51930 | 0.2618256 | 0.23107197 | 2.6300936 | 21 | 3 17.9 | 20.9 |
| 215267 2001 $OA_{67}$ | 16.4 | $X$ | 162.43313 | 284.92274 | 44.25144 | 8.51028 | 0.1866432 | 0.22076185 | 2.7113569 | 21 | 1 9.4 | 20.7 |
| 215268 2001 $ON_{84}$ | 16.4 | $X$ | 198.21079 | 100.96252 | 240.63421 | 3.54439 | 0.1749679 | 0.22811378 | 2.6527828 | 21 | 2 19.9 | 20.8 |
| 215269 2001 $OC_{107}$ | 15.8 | $X$ | 108.12165 | 77.83978 | 304.33611 | 8.07854 | 0.1700543 | 0.21607836 | 2.7503958 | 21 | 1 12.9 | 19.4 |
| 215270 2001 $OV_{110}$ | 15.1 | $X$ | 156.49377 | 245.41807 | 133.04375 | 10.11595 | 0.0860432 | 0.17471072 | 3.1690057 | 21 | 3 1.7 | 19.9 |
| 215271 2001 $OR_{113}$ | 15.7 | $X$ | 273.34514 | 35.46901 | 246.50269 | 14.68883 | 0.1673688 | 0.23134764 | 2.6280039 | 21 | 2 10.5 | 20.1 |
| 215272 2001 $PK_{17}$ | 15.9 | $X$ | 181.27946 | 260.03165 | 102.27177 | 9.13951 | 0.0912131 | 0.22763330 | 2.6565145 | 21 | 3 3.2 | 20.0 |
| 215273 2001 $PO_{34}$ | 16.1 | $X$ | 344.83885 | 108.41720 | 201.63474 | 10.85223 | 0.2797963 | 0.24363970 | 2.5388518 | 21 | 7 2.2 | 18.0 |
| 215274 2001 $PH_{38}$ | 15.4 | $X$ | 243.24525 | 257.35527 | 87.61096 | 13.02405 | 0.2665364 | 0.23314373 | 2.6144894 | 21 | 4 6.7 | 20.1 |
| 215275 2001 $PU_{65}$ | 15.8 | $X$ | 64.14833 | 319.43441 | 46.24753 | 6.19346 | 0.1008224 | 0.21043645 | 2.7993384 | 21 | — | — |
| 215276 2001 $QT_{32}$ | 16.8 | $X$ | 254.08710 | 141.87757 | 200.73172 | 4.13559 | 0.3226186 | 0.23493045 | 2.6012166 | 21 | 4 1.3 | 21.4 |
| 215277 2001 $QL_{57}$ | 16.4 | $X$ | 171.87637 | 303.17358 | 53.19357 | 2.92139 | 0.2136547 | 0.22413014 | 2.6841238 | 21 | 2 20.3 | 20.8 |
| 215278 2001 $QW_{82}$ | 16.5 | $X$ | 345.71805 | 138.54907 | 186.63303 | 19.66063 | 0.3542657 | 0.24421959 | 2.5348312 | 21 | 7 24.4 | 18.3 |
| 215279 2001 $QN_{85}$ | 15.9 | $X$ | 242.23338 | 317.23722 | 36.73292 | 14.77173 | 0.1795484 | 0.23307267 | 2.6150208 | 21 | 4 17.2 | 20.0 |
| 215280 2001 $QC_{86}$ | 16.0 | $X$ | 257.68275 | 168.92035 | 103.03450 | 13.13715 | 0.1291690 | 0.22677494 | 2.6632136 | 21 | 1 25.3 | 20.2 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215281 2001 $QF_{121}$ | 16.3 | $X$ | 254.22501 | 162.43914 | 129.18295 | 14.13825 | 0.1813409 | 0.23044212 | 2.6348839 | 21 | 2 10.4 | 20.5 |
| 215282 2001 $QP_{167}$ | 15.7 | $X$ | 134.24164 | 270.36189 | 131.22246 | 15.47559 | 0.1330847 | 0.22476702 | 2.6790511 | 21 | 3 5.3 | 19.7 |
| 215283 2001 $QJ_{201}$ | 16.0 | $X$ | 150.67522 | 147.16931 | 188.96750 | 9.36178 | 0.1345795 | 0.21793629 | 2.7347419 | 21 | — | — |
| 215284 2001 $QB_{206}$ | 16.9 | $X$ | 273.31666 | 132.25830 | 159.49624 | 4.28615 | 0.2555801 | 0.23239192 | 2.6201251 | 21 | 2 20.4 | 21.2 |
| 215285 2001 $QX_{243}$ | 15.8 | $X$ | 208.43274 | 139.35270 | 184.27616 | 11.46243 | 0.1921934 | 0.22406091 | 2.6846766 | 21 | 2 7.3 | 20.4 |
| 215286 2001 $QV_{262}$ | 16.3 | $X$ | 144.18573 | 194.24212 | 170.27168 | 5.85310 | 0.0706620 | 0.21998405 | 2.7177442 | 21 | 1 18.8 | 20.1 |
| 215287 2001 $QW_{287}$ | 15.7 | $X$ | 123.88655 | 154.64967 | 212.09149 | 4.82114 | 0.0995041 | 0.21779023 | 2.7359644 | 21 | 1 1.9 | 19.5 |
| 215288 2001 $RE_{3}$ | 15.7 | $X$ | 211.58388 | 128.83522 | 199.11963 | 13.04811 | 0.1070523 | 0.22648947 | 2.6654510 | 21 | 2 13.4 | 20.1 |
| 215289 2001 $RF_{85}$ | 16.6 | $X$ | 123.24016 | 178.11785 | 206.96180 | 2.25729 | 0.1799840 | 0.21880563 | 2.7274935 | 21 | 2 3.7 | 20.5 |
| 215290 2001 $RA_{107}$ | 15.8 | $X$ | 123.83412 | 209.42635 | 164.92394 | 15.82387 | 0.1667490 | 0.21777497 | 2.7360923 | 21 | 1 19.8 | 19.8 |
| 215291 2001 $RM_{109}$ | 16.5 | $X$ | 173.85695 | 157.98277 | 170.39201 | 6.08576 | 0.1027995 | 0.22077839 | 2.7112216 | 21 | 1 10.8 | 20.6 |
| 215292 2001 $RD_{120}$ | 16.0 | $X$ | 214.15306 | 161.05346 | 158.25759 | 13.36906 | 0.1874693 | 0.22544174 | 2.6737030 | 21 | 2 7.9 | 20.5 |
| 215293 2001 $RN_{120}$ | 16.6 | $X$ | 134.22201 | 259.32946 | 64.57439 | 2.24938 | 0.1191842 | 0.21449107 | 2.7639482 | 21 | — | — |
| 215294 2001 $RO_{123}$ | 16.9 | $X$ | 37.88804 | 281.22457 | 0.38619 | 6.34822 | 0.1802289 | 0.29645714 | 2.2275533 | 21 | 9 27.6 | 19.0 |
| 215295 2001 $RR_{145}$ | 16.5 | $X$ | 65.08842 | 187.82379 | 208.01522 | 5.39408 | 0.1401419 | 0.21317151 | 2.7753427 | 21 | — | — |
| 215296 2001 $SY_{25}$ | 16.5 | $X$ | 105.02711 | 196.54205 | 167.67861 | 3.90393 | 0.1091731 | 0.21351263 | 2.7723859 | 21 | — | — |
| 215297 2001 $SG_{80}$ | 15.9 | $X$ | 194.65200 | 5.07673 | 322.43013 | 11.19308 | 0.0545061 | 0.22473306 | 2.6793210 | 21 | 1 30.1 | 19.7 |
| 215298 2001 $SC_{83}$ | 15.6 | $X$ | 336.55604 | 173.49831 | 183.82086 | 10.98159 | 0.1400280 | 0.19712560 | 2.9239775 | 21 | 9 3.1 | 18.8 |
| 215299 2001 $SC_{112}$ | 16.0 | $X$ | 98.74886 | 155.37767 | 216.83682 | 4.47311 | 0.1648493 | 0.21060522 | 2.7978427 | 21 | — | — |
| 215300 2001 $SM_{115}$ | 17.0 | $X$ | 336.52199 | 346.89824 | 23.49235 | 4.49958 | 0.2013366 | 0.29376553 | 2.2411392 | 21 | 10 12.9 | 18.3 |
| 215301 2001 $SA_{134}$ | 16.0 | $X$ | 111.45698 | 157.10241 | 208.32939 | 5.28949 | 0.0525794 | 0.21483920 | 2.7609616 | 21 | — | — |
| 215302 2001 $SN_{135}$ | 16.1 | $X$ | 128.46404 | 151.73235 | 184.97250 | 3.77720 | 0.1047056 | 0.21405698 | 2.7676837 | 21 | — | — |
| 215303 2001 $SQ_{141}$ | 16.3 | $X$ | 153.94959 | 42.75399 | 298.74581 | 2.75894 | 0.0947472 | 0.21857521 | 2.7294100 | 21 | 1 5.9 | 20.3 |
| 215304 2001 $SG_{150}$ | 16.0 | $X$ | 135.68060 | 154.12254 | 207.86388 | 7.34122 | 0.2521747 | 0.21737930 | 2.7394114 | 21 | 1 27.2 | 20.3 |
| 215305 2001 $SD_{163}$ | 16.1 | $X$ | 129.76334 | 163.73470 | 192.39746 | 4.79325 | 0.1583989 | 0.21524308 | 2.7575068 | 21 | 1 4.6 | 20.1 |
| 215306 2001 $SW_{176}$ | 15.8 | $X$ | 139.11123 | 147.65796 | 173.05367 | 12.93586 | 0.1583666 | 0.21207241 | 2.7849235 | 21 | — | — |
| 215307 2001 $SS_{178}$ | 16.6 | $X$ | 144.97122 | 296.12111 | 96.31533 | 5.66767 | 0.2355308 | 0.26977611 | 2.3721040 | 21 | 3 10.5 | 20.2 |
| 215308 2001 $ST_{185}$ | 16.2 | $X$ | 209.40236 | 216.56493 | 90.61062 | 4.50338 | 0.0915739 | 0.22337481 | 2.6901712 | 21 | 1 21.6 | 20.3 |
| 215309 2001 $SB_{189}$ | 16.6 | $X$ | 245.13001 | 247.18332 | 55.73074 | 4.55154 | 0.1981727 | 0.22860612 | 2.6489727 | 21 | 2 16.5 | 21.0 |
| 215310 2001 $SW_{207}$ | 16.8 | $X$ | 172.28113 | 314.65924 | 20.60421 | 2.69127 | 0.0809133 | 0.22004303 | 2.7172586 | 21 | 1 17.2 | 20.7 |
| 215311 2001 $SC_{233}$ | 16.1 | $X$ | 153.61037 | 137.77699 | 178.08018 | 6.41292 | 0.0638126 | 0.21278617 | 2.7786923 | 21 | — | — |
| 215312 2001 $SF_{248}$ | 17.3 | $X$ | 245.61157 | 131.20338 | 184.73172 | 7.04141 | 0.1387585 | 0.27632086 | 2.3344985 | 21 | 2 26.8 | 20.7 |
| 215313 2001 $SR_{306}$ | 16.1 | $X$ | 314.35967 | 358.63612 | 351.90417 | 9.97124 | 0.0737802 | 0.19054550 | 2.9909117 | 21 | 7 29.0 | 20.1 |
| 215314 2001 $SA_{319}$ | 16.2 | $X$ | 73.98433 | 296.67984 | 81.96450 | 2.89806 | 0.0992778 | 0.21081669 | 2.7959714 | 21 | — | — |
| 215315 2001 $SC_{319}$ | 16.7 | $X$ | 104.77055 | 253.75156 | 95.94219 | 0.26085 | 0.0815430 | 0.21221284 | 2.7836947 | 21 | — | — |
| 215316 2001 $SQ_{341}$ | 16.4 | $X$ | 210.19706 | 277.82479 | 90.02741 | 6.73462 | 0.1452352 | 0.27977513 | 2.3152433 | 21 | 4 3.9 | 20.0 |
| 215317 2001 $TV_{58}$ | 16.5 | $X$ | 217.59552 | 104.04347 | 220.34915 | 3.56834 | 0.2349533 | 0.22478025 | 2.6789460 | 21 | 2 15.9 | 21.1 |
| 215318 2001 $TQ_{93}$ | 15.5 | $X$ | 328.97309 | 295.57182 | 14.87682 | 22.18405 | 0.0160269 | 0.23562052 | 2.5961353 | 21 | 6 29.8 | 19.4 |
| 215319 2001 $TA_{119}$ | 12.4 | $X$ | 314.68493 | 59.18598 | 240.00054 | 27.76476 | 0.0720290 | 0.08398808 | 5.1640561 | 21 | 5 25.0 | 19.1 |
| 215320 2001 $TS_{136}$ | 15.6 | $X$ | 119.25787 | 259.35363 | 115.42018 | 10.46792 | 0.1705437 | 0.21685091 | 2.7438596 | 21 | 1 17.2 | 19.2 |
| 215321 2001 $TW_{138}$ | 16.5 | $X$ | 288.10186 | 269.82669 | 21.20134 | 16.19731 | 0.3193156 | 0.23460146 | 2.6036478 | 21 | 3 5.1 | 20.9 |
| 215322 2001 $TT_{161}$ | 16.6 | $X$ | 329.46579 | 45.95344 | 219.93477 | 5.08791 | 0.1481642 | 0.28302517 | 2.2974850 | 21 | 4 2.1 | 19.0 |
| 215323 2001 $TW_{172}$ | 16.3 | $X$ | 127.76758 | 179.35635 | 178.89263 | 6.50038 | 0.1206189 | 0.21513274 | 2.7584495 | 21 | — | — |
| 215324 2001 $TP_{198}$ | 16.1 | $X$ | 55.29664 | 293.23018 | 97.76303 | 4.78576 | 0.1004295 | 0.20999281 | 2.8032797 | 21 | — | — |
| 215325 2001 $TG_{204}$ | 15.8 | $X$ | 17.96385 | 354.13089 | 41.04687 | 9.77023 | 0.0811693 | 0.20530677 | 2.8457749 | 21 | 12 29.5 | 19.6 |
| 215326 2001 $UV_{26}$ | 16.1 | $X$ | 101.72426 | 150.32962 | 205.50291 | 9.18390 | 0.1528215 | 0.20900499 | 2.8121055 | 21 | — | — |
| 215327 2001 $UW_{38}$ | 15.9 | $X$ | 167.55381 | 128.92664 | 199.47331 | 13.44033 | 0.1323198 | 0.21685022 | 2.7438654 | 21 | 1 6.4 | 20.3 |
| 215328 2001 $UN_{47}$ | 15.4 | $X$ | 167.97987 | 43.70227 | 52.61770 | 15.07953 | 0.1975238 | 0.17861561 | 3.1226485 | 21 | 6 15.6 | 20.7 |
| 215329 2001 $UT_{48}$ | 16.1 | $X$ | 123.76808 | 302.62393 | 64.20840 | 8.03039 | 0.2683007 | 0.21419119 | 2.7665274 | 21 | 1 27.8 | 20.3 |
| 215330 2001 $UD_{61}$ | 16.3 | $X$ | 327.69330 | 177.49292 | 211.56742 | 5.55500 | 0.0912571 | 0.19600642 | 2.9350974 | 21 | 10 4.3 | 19.8 |
| 215331 2001 $UW_{61}$ | 13.1 | $X$ | 322.69264 | 71.75642 | 226.96059 | 4.05761 | 0.0889667 | 0.08391310 | 5.1671317 | 21 | 6 2.3 | 19.7 |
| 215332 2001 $UA_{116}$ | 15.6 | $X$ | 50.73736 | 268.91269 | 87.06898 | 3.22061 | 0.0795946 | 0.20154826 | 2.8810448 | 21 | 12 22.1 | 19.3 |
| 215333 2001 $UB_{148}$ | 15.9 | $X$ | 241.34990 | 36.13399 | 62.35441 | 7.05945 | 0.0676082 | 0.19082098 | 2.9880324 | 21 | 9 11.5 | 20.3 |
| 215334 2001 $UN_{165}$ | 16.1 | $X$ | 55.71195 | 317.13330 | 71.23751 | 10.21382 | 0.1610976 | 0.20865774 | 2.8152246 | 21 | — | — |
| 215335 2001 $UF_{173}$ | 16.8 | $X$ | 177.43451 | 220.18091 | 71.12127 | 3.46913 | 0.1758343 | 0.26288219 | 2.4133961 | 21 | — | — |
| 215336 2001 $UN_{178}$ | 16.4 | $X$ | 115.97004 | 277.32319 | 81.41059 | 9.34252 | 0.1616949 | 0.21417525 | 2.7666647 | 21 | — | — |
| 215337 2001 $UT_{188}$ | 16.0 | $X$ | 160.65620 | 194.47480 | 83.74293 | 3.15707 | 0.0433806 | 0.20665200 | 2.8334114 | 21 | — | — |
| 215338 2001 $UL_{200}$ | 16.4 | $X$ | 99.41303 | 136.10128 | 221.42742 | 5.51926 | 0.0225254 | 0.21009878 | 2.8023370 | 21 | — | — |
| 215339 2001 $UN_{203}$ | 16.3 | $X$ | 213.31925 | 175.94023 | 223.46087 | 4.78786 | 0.0474769 | 0.23084109 | 2.6318470 | 21 | 5 21.9 | 20.0 |
| 215340 2001 $UX_{210}$ | 13.0 | $X$ | 332.11200 | 84.25164 | 218.09097 | 17.53375 | 0.0631739 | 0.08496167 | 5.1245296 | 21 | 6 19.6 | 19.7 |
| 215341 2001 $UW_{224}$ | 15.6 | $X$ | 153.48281 | 76.69201 | 72.39722 | 17.05087 | 0.1781743 | 0.18106718 | 3.0943983 | 21 | 8 11.9 | 21.0 |
| 215342 2001 $US_{225}$ | 16.3 | $X$ | 126.82419 | 242.86108 | 89.51933 | 5.47612 | 0.0750172 | 0.21195707 | 2.7859337 | 21 | — | — |
| 215343 2001 $VK_{7}$ | 16.1 | $X$ | 52.91072 | 324.28292 | 47.51868 | 2.80134 | 0.0964847 | 0.20400384 | 2.8578789 | 21 | — | — |
| 215344 2001 $VC_{22}$ | 15.6 | $X$ | 130.03669 | 296.36670 | 46.97014 | 13.07862 | 0.2320176 | 0.21193670 | 2.7861122 | 21 | — | — |
| 215345 2001 $VX_{90}$ | 15.2 | $X$ | 334.14395 | 329.06248 | 88.15900 | 14.01181 | 0.1930215 | 0.19729600 | 2.9222937 | 21 | 11 25.2 | 18.2 |
| 215346 2001 $VJ_{111}$ | 16.0 | $X$ | 337.41534 | 328.65586 | 51.44725 | 11.23875 | 0.1095986 | 0.19264861 | 2.9691043 | 21 | 10 12.4 | 19.6 |
| 215347 2001 $VO_{121}$ | 16.3 | $X$ | 112.40901 | 285.67130 | 75.92646 | 9.99128 | 0.2400568 | 0.21186255 | 2.7867623 | 21 | 1 3.6 | 20.1 |
| 215348 2001 $VW_{122}$ | 14.8 | $X$ | 185.55897 | 24.15863 | 56.07011 | 28.13508 | 0.1414661 | 0.17530868 | 3.1617955 | 21 | 6 7.9 | 20.1 |
| 215349 2001 $VA_{128}$ | 13.3 | $X$ | 299.53707 | 186.28242 | 137.78400 | 9.21143 | 0.1186044 | 0.08420592 | 5.1551460 | 21 | 5 30.8 | 20.0 |
| 215350 2001 $WJ_{31}$ | 15.9 | $X$ | 183.98994 | 104.08513 | 204.47687 | 7.33223 | 0.2047630 | 0.21465315 | 2.7625568 | 21 | 1 4.2 | 20.7 |
| 215351 2001 $WQ_{65}$ | 16.3 | $X$ | 218.61782 | 80.56169 | 208.78843 | 8.46456 | 0.1941030 | 0.21892254 | 2.7265224 | 21 | 1 8.3 | 21.0 |
| 215352 2001 $XZ_{87}$ | 16.7 | $X$ | 54.92745 | 2.18542 | 92.45739 | 3.63613 | 0.0895373 | 0.30888802 | 2.1673814 | 21 | — | — |
| 215353 2001 $XD_{94}$ | 15.7 | $X$ | 46.34210 | 281.79575 | 53.45198 | 12.82380 | 0.0798836 | 0.19683460 | 2.9268587 | 21 | 11 19.8 | 19.7 |
| 215354 2001 $XM_{142}$ | 15.6 | $X$ | 112.83709 | 187.23680 | 84.44802 | 10.11726 | 0.0611425 | 0.19499692 | 2.9452187 | 21 | 11 19.6 | 20.0 |
| 215355 2001 $XY_{146}$ | 15.6 | $X$ | 218.09159 | 51.55879 | 80.07334 | 10.90725 | 0.0492832 | 0.18777500 | 3.0202591 | 21 | 9 29.7 | 20.1 |
| 215356 2001 $XJ_{147}$ | 16.1 | $X$ | 220.08230 | 353.12650 | 98.83601 | 3.34797 | 0.0658596 | 0.18237173 | 3.0796241 | 21 | 8 5.7 | 20.5 |
| 215357 2001 $XZ_{158}$ | 15.5 | $X$ | 164.60421 | 30.78135 | 105.26358 | 13.09445 | 0.1309490 | 0.17821968 | 3.1272717 | 21 | 7 31.9 | 20.5 |
| 215358 2001 $XR_{169}$ | 15.4 | $X$ | 312.53238 | 275.63252 | 107.21062 | 11.54447 | 0.1860304 | 0.18744625 | 3.0237895 | 21 | 8 24.7 | 19.0 |
| 215359 2001 $XX_{169}$ | 15.4 | $X$ | 81.52744 | 84.38844 | 97.05952 | 10.52591 | 0.0354551 | 0.17424376 | 3.1746650 | 21 | 6 14.9 | 19.9 |
| 215360 2001 $XJ_{171}$ | 15.8 | $X$ | 155.02423 | 25.95746 | 108.92191 | 9.19407 | 0.1315028 | 0.17736639 | 3.1372936 | 21 | 7 20.6 | 20.8 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215361 2001 $XX_{193}$ | 15.6 | $X$ | 147.92370 | 18.94246 | 110.34181 | 6.41042 | 0.0986363 | 0.17363483 | 3.1820828 | 21 | 7 4.6 | 20.6 |
| 215362 2001 $XL_{195}$ | 15.5 | $X$ | 281.33891 | 121.43808 | 291.30916 | 21.39085 | 0.0358250 | 0.23302656 | 2.6153657 | 21 | 8 27.4 | 19.4 |
| 215363 2001 $XH_{212}$ | 17.0 | $X$ | 172.63581 | 243.77582 | 159.77621 | 3.75755 | 0.1175199 | 0.27195208 | 2.3594338 | 21 | 4 9.7 | 20.3 |
| 215364 2001 $XW_{236}$ | 16.2 | $X$ | 159.90272 | 101.77433 | 23.75936 | 1.18173 | 0.1231905 | 0.17800437 | 3.1297929 | 21 | 7 13.5 | 21.2 |
| 215365 2001 $XY_{249}$ | 15.3 | $X$ | 117.69762 | 70.68525 | 94.66824 | 11.08429 | 0.1237350 | 0.17619487 | 3.1511848 | 21 | 7 20.3 | 20.1 |
| 215366 2001 $XH_{256}$ | 15.9 | $X$ | 218.01130 | 263.91732 | 77.51439 | 17.61024 | 0.2669162 | 0.22643753 | 2.6658586 | 21 | 3 18.1 | 21.0 |
| 215367 2001 $XM_{256}$ | 15.9 | $X$ | 125.68438 | 220.53012 | 126.46130 | 15.13687 | 0.2055187 | 0.21081432 | 2.7959923 | 21 | — | — |
| 215368 2001 $YR_{34}$ | 16.8 | $X$ | 118.95391 | 286.55319 | 67.47454 | 3.29241 | 0.2050666 | 0.26001942 | 2.4310778 | 21 | — | — |
| 215369 2001 $YE_{35}$ | 15.9 | $X$ | 256.30682 | 92.08460 | 346.98102 | 1.66524 | 0.0743899 | 0.18638025 | 3.0353082 | 21 | 8 31.2 | 20.2 |
| 215370 2001 $YU_{64}$ | 15.1 | $X$ | 359.90973 | 306.23353 | 81.84244 | 11.97932 | 0.0529823 | 0.19303651 | 2.9651255 | 21 | 11 21.8 | 19.1 |
| 215371 2001 $YD_{102}$ | 16.3 | $X$ | 267.48093 | 286.07594 | 141.90077 | 1.99820 | 0.1801921 | 0.18586472 | 3.0409182 | 21 | 8 15.6 | 20.5 |
| 215372 2002 $AL_{39}$ | 17.2 | $X$ | 315.25922 | 252.94158 | 262.11930 | 4.81098 | 0.0815888 | 0.30172191 | 2.2015649 | 21 | — | — |
| 215373 2002 $AP_{43}$ | 15.3 | $X$ | 217.14111 | 208.89982 | 116.01758 | 27.83834 | 0.1873345 | 0.21441357 | 2.7646142 | 21 | 2 22.7 | 20.2 |
| 215374 2002 $AV_{64}$ | 16.4 | $X$ | 263.86524 | 100.47355 | 137.74307 | 17.61326 | 0.0940256 | 0.30350129 | 2.1929515 | 21 | — | — |
| 215375 2002 $AV_{73}$ | 15.7 | $X$ | 204.61868 | 310.97781 | 98.86496 | 2.60337 | 0.1668134 | 0.17481750 | 3.1677151 | 21 | 5 23.9 | 20.9 |
| 215376 2002 $AO_{94}$ | 16.1 | $X$ | 146.23355 | 51.44025 | 80.07590 | 2.77014 | 0.0892986 | 0.17426619 | 3.1743925 | 21 | 7 5.1 | 20.8 |
| 215377 2002 $AZ_{106}$ | 14.8 | $X$ | 207.09309 | 13.28079 | 54.23853 | 2.01719 | 0.2302184 | 0.12538926 | 3.9533248 | 21 | 6 14.5 | 21.4 |
| 215378 2002 $AS_{115}$ | 15.4 | $X$ | 208.27397 | 329.70876 | 105.09141 | 9.34980 | 0.0752311 | 0.17465694 | 3.1696562 | 21 | 6 30.5 | 20.2 |
| 215379 2002 $AP_{142}$ | 17.6 | $X$ | 138.77302 | 223.81678 | 182.36169 | 1.12149 | 0.0923558 | 0.31524060 | 2.1381653 | 21 | 2 21.8 | 20.0 |
| 215380 2002 $CZ_{7}$ | 15.4 | $X$ | 157.37989 | 357.59121 | 140.49025 | 16.10167 | 0.1373113 | 0.17439491 | 3.1728303 | 21 | 7 26.1 | 20.5 |
| 215381 2002 $CJ_{22}$ | 16.7 | $X$ | 70.49645 | 56.99715 | 139.07473 | 2.40296 | 0.1454938 | 0.26955392 | 2.3734074 | 21 | 7 5.1 | 19.2 |
| 215382 2002 $CE_{28}$ | 16.7 | $X$ | 48.99662 | 41.27310 | 15.70042 | 5.47191 | 0.1927015 | 0.30410944 | 2.1900269 | 21 | — | — |
| 215383 2002 $CF_{37}$ | 16.8 | $X$ | 227.26813 | 105.00075 | 126.59184 | 6.49503 | 0.1154956 | 0.29663970 | 2.2266393 | 21 | — | — |
| 215384 2002 $CT_{47}$ | 15.4 | $X$ | 176.40102 | 289.08268 | 161.99281 | 12.30444 | 0.0783610 | 0.17200777 | 3.2021181 | 21 | 6 17.3 | 20.5 |
| 215385 2002 $CN_{57}$ | 17.4 | $X$ | 286.13507 | 6.28141 | 158.66346 | 3.47652 | 0.1130643 | 0.29592467 | 2.2302246 | 21 | — | — |
| 215386 2002 $CR_{65}$ | 17.2 | $X$ | 316.30893 | 92.69949 | 65.48825 | 7.61054 | 0.0890170 | 0.30002456 | 2.2098604 | 21 | — | — |
| 215387 2002 $CC_{67}$ | 15.7 | $X$ | 175.61604 | 67.47647 | 126.52766 | 12.45090 | 0.1386092 | 0.18507207 | 3.0495947 | 21 | 10 24.3 | 20.8 |
| 215388 2002 $CG_{81}$ | 15.3 | $X$ | 69.86641 | 118.25410 | 148.74449 | 10.98517 | 0.0349286 | 0.17845700 | 3.1244985 | 21 | 9 19.1 | 19.7 |
| 215389 2002 $CG_{132}$ | 16.1 | $X$ | 79.85365 | 266.71612 | 290.58024 | 3.65549 | 0.0462855 | 0.21985541 | 2.7188043 | 21 | 7 4.4 | 19.8 |
| 215390 2002 $CE_{137}$ | 15.4 | $X$ | 261.35876 | 263.73372 | 152.51972 | 10.23599 | 0.3206575 | 0.18279267 | 3.0748944 | 21 | 7 7.3 | 20.4 |
| 215391 2002 $CA_{144}$ | 16.5 | $X$ | 144.88855 | 110.61048 | 320.39246 | 3.57426 | 0.1838624 | 0.26637718 | 2.3922397 | 21 | 4 19.5 | 20.1 |
| 215392 2002 $CF_{144}$ | 16.8 | $X$ | 72.25789 | 247.90134 | 183.57897 | 3.32490 | 0.0902540 | 0.30535617 | 2.1840617 | 21 | — | — |
| 215393 2002 $CH_{149}$ | 17.7 | $X$ | 343.00556 | 40.56595 | 57.30340 | 1.32260 | 0.1113337 | 0.29753903 | 2.2221502 | 21 | — | — |
| 215394 2002 $CH_{199}$ | 15.3 | $X$ | 73.49391 | 157.19215 | 142.15607 | 11.01137 | 0.1103977 | 0.18414518 | 3.0598195 | 21 | 11 14.9 | 19.9 |
| 215395 2002 $CL_{256}$ | 15.0 | $X$ | 352.85926 | 337.08907 | 347.23411 | 10.16420 | 0.0380848 | 0.17795344 | 3.1303901 | 21 | 8 20.3 | 19.2 |
| 215396 2002 $CT_{258}$ | 17.1 | $X$ | 273.51584 | 31.84718 | 170.73962 | 5.41047 | 0.0884037 | 0.30119479 | 2.2041327 | 21 | — | — |
| 215397 2002 $CT_{292}$ | 15.3 | $X$ | 311.94112 | 220.93479 | 153.25063 | 14.70277 | 0.1702346 | 0.17946922 | 3.1127392 | 21 | 8 9.1 | 19.1 |
| 215398 2002 $DH_{4}$ | 17.5 | $X$ | 281.68434 | 115.10865 | 5.07696 | 25.37219 | 0.1689938 | 0.29020611 | 2.2594272 | 21 | 11 24.6 | 20.3 |
| 215399 2002 $DT_{17}$ | 17.4 | $X$ | 235.92327 | 240.06455 | 0.23421 | 0.60521 | 0.1329078 | 0.29745277 | 2.2225798 | 21 | — | — |
| 215400 2002 $EJ_{17}$ | 16.3 | $X$ | 65.61457 | 192.49863 | 160.57949 | 5.62783 | 0.1237927 | 0.23946680 | 2.5682611 | 21 | — | — |
| 215401 2002 $EW_{22}$ | 16.6 | $X$ | 76.91816 | 315.05913 | 227.22683 | 4.78304 | 0.1553207 | 0.26586400 | 2.3953172 | 21 | 6 26.1 | 19.4 |
| 215402 2002 $EO_{43}$ | 17.4 | $X$ | 168.47833 | 46.81215 | 201.42448 | 3.09970 | 0.2115449 | 0.28643757 | 2.2792015 | 21 | 12 25.9 | 21.0 |
| 215403 2002 $EE_{53}$ | 16.8 | $X$ | 337.44356 | 318.85142 | 173.91783 | 7.54783 | 0.1055027 | 0.29966469 | 2.2116293 | 21 | — | — |
| 215404 2002 $EK_{79}$ | 16.7 | $X$ | 183.66840 | 17.25142 | 258.79183 | 4.36871 | 0.0362126 | 0.29513837 | 2.2341840 | 21 | — | — |
| 215405 2002 $EY_{108}$ | 17.0 | $X$ | 193.72294 | 8.65647 | 249.75984 | 6.07766 | 0.1770306 | 0.29208413 | 2.2497318 | 21 | — | — |
| 215406 2002 $EJ_{111}$ | 16.6 | $X$ | 284.73015 | 103.59138 | 53.60018 | 7.08236 | 0.0970753 | 0.29271949 | 2.2464752 | 21 | — | — |
| 215407 2002 $EK_{115}$ | 12.9 | $X$ | 236.03576 | 95.14280 | 56.63488 | 3.69287 | 0.0574491 | 0.08116870 | 5.2829560 | 21 | 10 25.3 | 19.9 |
| 215408 2002 $ER_{129}$ | 17.3 | $X$ | 346.64270 | 272.34285 | 175.46986 | 5.91315 | 0.1643644 | 0.29435941 | 2.2381238 | 21 | — | — |
| 215409 2002 $EJ_{155}$ | 17.1 | $X$ | 274.95313 | 104.87704 | 41.81406 | 6.78876 | 0.0567424 | 0.29141743 | 2.2531617 | 21 | — | — |
| 215410 2002 $GN_{2}$ | 17.6 | $X$ | 225.94746 | 103.68577 | 25.39921 | 22.39352 | 0.0686882 | 0.38169470 | 1.8821691 | 21 | 10 21.4 | 19.3 |
| 215411 2002 $GB_{23}$ | 15.9 | $X$ | 112.90408 | 324.23342 | 216.82837 | 8.56957 | 0.0654365 | 0.21871397 | 2.7282555 | 21 | 7 25.9 | 19.9 |
| 215412 2002 $GO_{45}$ | 15.2 | $X$ | 143.03205 | 131.16579 | 32.28826 | 12.94799 | 0.2105316 | 0.17000627 | 3.2272015 | 21 | 8 22.3 | 20.8 |
| 215413 2002 $GP_{51}$ | 16.2 | $X$ | 131.07300 | 227.45860 | 32.54547 | 5.41979 | 0.0633041 | 0.23156801 | 2.6263363 | 21 | 11 28.4 | 20.0 |
| 215414 2002 $GL_{86}$ | 16.8 | $X$ | 279.42243 | 61.41357 | 75.34470 | 4.83713 | 0.0923911 | 0.28767475 | 2.2726622 | 21 | — | — |
| 215415 2002 $GX_{94}$ | 17.2 | $X$ | 245.26974 | 344.01768 | 203.05734 | 4.60893 | 0.0920577 | 0.28950915 | 2.2630519 | 21 | — | — |
| 215416 2002 $GN_{100}$ | 16.5 | $X$ | 106.56986 | 92.00330 | 217.72793 | 5.19766 | 0.1110809 | 0.28728938 | 2.2746941 | 21 | — | — |
| 215417 2002 $GU_{103}$ | 17.0 | $X$ | 204.85983 | 72.26005 | 135.28127 | 8.77663 | 0.0802920 | 0.28552223 | 2.2840701 | 21 | 12 25.4 | 20.0 |
| 215418 2002 $GG_{117}$ | 16.8 | $X$ | 234.04103 | 63.45760 | 71.87419 | 6.26396 | 0.1009742 | 0.28114831 | 2.3076985 | 21 | 10 24.7 | 19.6 |
| 215419 2002 $GM_{126}$ | 17.3 | $X$ | 65.74519 | 269.94862 | 5.07148 | 5.69336 | 0.1095443 | 0.27567648 | 2.3381350 | 21 | 10 13.5 | 20.1 |
| 215420 2002 $GN_{149}$ | 17.0 | $X$ | 144.38126 | 304.74801 | 357.52921 | 2.81388 | 0.1514998 | 0.28910328 | 2.2651695 | 21 | — | — |
| 215421 2002 $GO_{155}$ | 16.9 | $X$ | 334.02779 | 48.50028 | 71.99266 | 5.34381 | 0.0666197 | 0.29436049 | 2.2381183 | 21 | — | — |
| 215422 2002 $GN_{175}$ | 16.6 | $X$ | 186.68794 | 251.57924 | 48.22684 | 7.89589 | 0.2393339 | 0.29382452 | 2.2408392 | 21 | — | — |
| 215423 Winnecke | 17.1 | $X$ | 132.60989 | 108.12355 | 207.94594 | 3.49615 | 0.1351932 | 0.28811964 | 2.2703221 | 21 | — | — |
| 215424 2002 $JE_{18}$ | 17.0 | $X$ | 165.69972 | 40.76093 | 233.39162 | 4.90749 | 0.0379520 | 0.28767775 | 2.2726464 | 21 | — | — |
| 215425 2002 $JF_{31}$ | 16.9 | $X$ | 142.68370 | 166.58441 | 65.97501 | 6.95369 | 0.0762279 | 0.27793130 | 2.3254718 | 21 | 11 15.3 | 20.0 |
| 215426 2002 $JF_{45}$ | 16.8 | $X$ | 149.50873 | 45.05645 | 232.35537 | 6.89657 | 0.1145018 | 0.28551805 | 2.2840924 | 21 | — | — |
| 215427 2002 $JF_{46}$ | 16.8 | $X$ | 141.20106 | 243.78745 | 34.75075 | 7.48502 | 0.0998521 | 0.28473514 | 2.2882774 | 21 | — | — |
| 215428 2002 $JB_{61}$ | 17.0 | $X$ | 185.84602 | 257.29129 | 292.02077 | 2.39693 | 0.1459383 | 0.27959020 | 2.3162641 | 21 | 10 31.9 | 20.5 |
| 215429 2002 $JZ_{74}$ | 16.8 | $X$ | 212.68207 | 278.08112 | 237.12114 | 10.39656 | 0.1281918 | 0.27918971 | 2.3184787 | 21 | 10 16.5 | 20.1 |
| 215430 2002 $JJ_{84}$ | 17.4 | $X$ | 201.53864 | 160.32793 | 47.29624 | 3.33237 | 0.1019084 | 0.28440365 | 2.2900551 | 21 | 12 17.9 | 20.4 |
| 215431 2002 $JN_{92}$ | 15.7 | $X$ | 335.23892 | 343.69713 | 244.21049 | 8.90530 | 0.0906804 | 0.20173513 | 2.8792654 | 21 | 3 7.9 | 19.5 |
| 215432 2002 $JL_{129}$ | 17.1 | $X$ | 128.98806 | 90.78739 | 195.35189 | 5.14943 | 0.1725722 | 0.28174573 | 2.3044351 | 21 | — | — |
| 215433 2002 $JA_{140}$ | 16.6 | $X$ | 104.70778 | 46.15159 | 253.18859 | 7.31628 | 0.1378342 | 0.28051532 | 2.3111688 | 21 | 12 31.5 | 20.2 |
| 215434 2002 $KD_{10}$ | 16.6 | $X$ | 248.97605 | 96.56658 | 62.22348 | 8.40969 | 0.0489161 | 0.28418961 | 2.2912049 | 21 | 12 22.9 | 19.2 |
| 215435 2002 $LW_{8}$ | 17.2 | $X$ | 110.49096 | 109.36614 | 200.99806 | 5.24270 | 0.2396976 | 0.27952036 | 2.3166499 | 21 | — | — |
| 215436 2002 $LP_{11}$ | 16.6 | $X$ | 81.34747 | 198.49247 | 126.19468 | 6.50596 | 0.2504158 | 0.27615865 | 2.3354126 | 21 | — | — |
| 215437 2002 $LC_{16}$ | 16.9 | $X$ | 79.29737 | 241.89673 | 63.75443 | 7.26503 | 0.2252818 | 0.27479423 | 2.3431368 | 21 | 12 20.8 | 20.6 |
| 215438 2002 $LL_{25}$ | 16.0 | $X$ | 89.12106 | 51.36481 | 106.21574 | 11.66914 | 0.1680596 | 0.26299174 | 2.4127258 | 21 | 6 11.7 | 19.1 |
| 215439 2002 $LT_{27}$ | 16.9 | $X$ | 138.42925 | 117.40571 | 170.56054 | 4.71032 | 0.1197590 | 0.28278175 | 2.2988032 | 21 | — | — |
| 215440 2002 $LD_{47}$ | 16.7 | $X$ | 140.32262 | 139.53278 | 159.13022 | 8.31762 | 0.2132992 | 0.28326281 | 2.2961998 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215441 2002 $LK_{62}$ | 17.3 | X | 97.35454 | 341.98397 | 297.62199 | 2.43453 | 0.1871825 | 0.27275438 | 2.3548047 | 21 | 12 1.9 | 21.1 |
| 215442 2002 $MQ_{3}$ | 18.5 | X | 77.95730 | 346.90441 | 109.06932 | 36.28548 | 0.2742759 | 1.12852278 | 0.9136836 | 21 | — | — |
| 215443 2002 $NS_{34}$ | 16.1 | X | 338.00564 | 105.87151 | 206.07675 | 5.80257 | 0.1235725 | 0.25789609 | 2.4444034 | 21 | 7 5.4 | 18.5 |
| 215444 2002 $NU_{36}$ | 17.1 | X | 20.49947 | 174.15976 | 175.15852 | 7.74715 | 0.1473233 | 0.26794796 | 2.3828813 | 21 | 11 28.3 | 19.8 |
| 215445 2002 $ND_{40}$ | 17.6 | X | 358.14231 | 231.75768 | 113.97633 | 3.65482 | 0.2158672 | 0.26348787 | 2.4096963 | 21 | 10 21.9 | 19.5 |
| 215446 2002 $NV_{40}$ | 17.4 | X | 78.58592 | 203.17492 | 99.42623 | 2.64620 | 0.1904850 | 0.27100904 | 2.3649041 | 21 | 12 13.2 | 20.8 |
| 215447 2002 $NR_{45}$ | 16.6 | X | 79.82560 | 125.08311 | 117.84852 | 7.70693 | 0.1611461 | 0.26577634 | 2.3958438 | 21 | 9 28.5 | 19.9 |
| 215448 2002 $NL_{62}$ | 17.6 | X | 16.53576 | 94.44500 | 216.57706 | 2.26672 | 0.1803256 | 0.26346316 | 2.4098469 | 21 | 9 28.3 | 19.8 |
| 215449 2002 $OW_{8}$ | 16.4 | X | 334.45807 | 209.80630 | 164.47766 | 5.81460 | 0.1017954 | 0.26471912 | 2.4022185 | 21 | 10 8.3 | 18.7 |
| 215450 2002 $OC_{16}$ | 16.5 | X | 73.96586 | 62.24832 | 234.97113 | 7.39015 | 0.1024083 | 0.27072736 | 2.3665442 | 21 | 11 21.9 | 19.7 |
| 215451 2002 $OH_{19}$ | 15.3 | X | 65.69177 | 81.32475 | 256.85198 | 20.88372 | 0.2773653 | 0.27465168 | 2.3439475 | 21 | — | — |
| 215452 2002 $OQ_{20}$ | 16.8 | X | 4.10253 | 67.90887 | 220.35898 | 3.78928 | 0.1656006 | 0.25806907 | 2.4433110 | 21 | 7 22.5 | 18.9 |
| 215453 2002 $PG_{11}$ | 17.1 | X | 265.74845 | 166.35557 | 218.93048 | 2.60963 | 0.1192280 | 0.25537708 | 2.4604513 | 21 | 6 27.5 | 20.2 |
| 215454 2002 $PQ_{66}$ | 16.7 | X | 314.45091 | 217.59940 | 154.11511 | 4.82999 | 0.1333067 | 0.26136083 | 2.4227525 | 21 | 8 22.2 | 19.1 |
| 215455 2002 $PY_{87}$ | 17.2 | X | 332.96503 | 103.46674 | 225.32326 | 1.32908 | 0.2125488 | 0.25695662 | 2.4503578 | 21 | 7 12.5 | 19.1 |
| 215456 2002 $PZ_{136}$ | 16.9 | X | 258.88264 | 171.99237 | 223.82157 | 2.31553 | 0.0242642 | 0.25646338 | 2.4534985 | 21 | 7 17.4 | 19.9 |
| 215457 2002 $PQ_{139}$ | 16.3 | X | 337.44847 | 229.01770 | 123.37864 | 14.19576 | 0.2496312 | 0.26042541 | 2.4285505 | 21 | 9 8.8 | 17.9 |
| 215458 2002 $PJ_{178}$ | 15.9 | X | 139.41285 | 290.15804 | 161.57413 | 4.23916 | 0.0958760 | 0.24631073 | 2.5204640 | 21 | 5 6.6 | 19.4 |
| 215459 2002 $QL_{5}$ | 16.7 | X | 34.69275 | 80.54200 | 243.87357 | 3.93246 | 0.2492390 | 0.26546997 | 2.3976868 | 21 | 11 29.3 | 19.6 |
| 215460 2002 $QO_{8}$ | 16.8 | X | 60.24325 | 186.63257 | 98.90085 | 3.84702 | 0.2370326 | 0.26515593 | 2.3995795 | 21 | 11 8.5 | 20.1 |
| 215461 2002 $QB_{30}$ | 17.8 | X | 22.43726 | 248.46189 | 86.51117 | 2.85082 | 0.2330939 | 0.26526348 | 2.3989309 | 21 | 11 23.8 | 20.2 |
| 215462 2002 $QF_{63}$ | 17.3 | X | 133.52780 | 241.57382 | 164.11094 | 4.78261 | 0.1604421 | 0.28903246 | 2.2655395 | 21 | 2 28.8 | 20.1 |
| 215463 Jobse | 17.1 | X | 65.87129 | 179.50956 | 80.34254 | 2.37591 | 0.1565492 | 0.26310981 | 2.4120040 | 21 | 9 30.8 | 20.2 |
| 215464 2002 $QQ_{79}$ | 16.4 | X | 76.66096 | 316.31051 | 298.47404 | 9.15263 | 0.1450450 | 0.26566325 | 2.3965237 | 21 | 9 29.3 | 19.9 |
| 215465 2002 $QE_{90}$ | 16.7 | X | 190.46576 | 299.11921 | 108.10876 | 6.74201 | 0.1674279 | 0.24432905 | 2.5340741 | 21 | 5 6.9 | 20.8 |
| 215466 2002 $QD_{98}$ | 17.9 | X | 63.75272 | 172.67476 | 114.03229 | 3.53412 | 0.1769899 | 0.26662106 | 2.3907807 | 21 | 11 6.5 | 21.1 |
| 215467 2002 $QK_{100}$ | 17.7 | X | 62.52740 | 229.98143 | 82.03495 | 5.80373 | 0.2502963 | 0.26912324 | 2.3759388 | 21 | 12 15.0 | 21.1 |
| 215468 2002 $QD_{103}$ | 17.3 | X | 346.14852 | 223.92937 | 122.11513 | 5.89457 | 0.2010474 | 0.26014929 | 2.4302686 | 21 | 9 20.8 | 19.1 |
| 215469 2002 $RM_{10}$ | 15.8 | X | 102.12917 | 304.42103 | 158.66703 | 22.18320 | 0.0499954 | 0.24164010 | 2.5528387 | 21 | 3 31.3 | 19.3 |
| 215470 2002 $RO_{32}$ | 16.9 | X | 28.25729 | 81.60290 | 237.74036 | 1.76145 | 0.1844436 | 0.26283211 | 2.4137027 | 21 | 11 1.6 | 19.6 |
| 215471 2002 $RB_{34}$ | 15.2 | X | 116.17169 | 20.48166 | 4.13833 | 10.53493 | 0.0679320 | 0.17823747 | 3.1270636 | 21 | 1 22.0 | 19.7 |
| 215472 2002 $RX_{40}$ | 16.7 | X | 61.91924 | 279.84269 | 12.40252 | 1.95135 | 0.1969987 | 0.26592890 | 2.3949274 | 21 | 11 12.2 | 19.8 |
| 215473 2002 $RZ_{50}$ | 16.2 | X | 228.41702 | 323.07068 | 22.19653 | 7.15227 | 0.2138043 | 0.29420285 | 2.2389177 | 21 | 3 18.4 | 19.8 |
| 215474 2002 $RD_{66}$ | 16.8 | X | 82.37644 | 287.15078 | 327.16048 | 17.31383 | 0.0664661 | 0.36617121 | 1.9349953 | 21 | 10 2.4 | 19.3 |
| 215475 2002 $RD_{122}$ | 16.7 | X | 211.17402 | 283.09923 | 86.62399 | 8.38375 | 0.1571643 | 0.24211656 | 2.5494885 | 21 | 4 10.9 | 20.9 |
| 215476 2002 $RP_{134}$ | 17.1 | X | 45.24621 | 255.39593 | 61.60450 | 6.90190 | 0.3468080 | 0.26601527 | 2.3944090 | 21 | 12 14.7 | 20.5 |
| 215477 2002 $RK_{163}$ | 17.2 | X | 60.97896 | 106.06901 | 162.57843 | 2.92590 | 0.1782530 | 0.26183381 | 2.4198340 | 21 | 10 9.0 | 20.3 |
| 215478 2002 $RC_{192}$ | 16.7 | X | 317.80379 | 154.63488 | 7.69713 | 6.85396 | 0.0494333 | 0.28126221 | 2.3070754 | 21 | — | — |
| 215479 2002 $RK_{216}$ | 15.1 | X | 88.36874 | 316.61739 | 28.02211 | 18.89002 | 0.1151210 | 0.16892806 | 3.2409190 | 21 | — | — |
| 215480 2002 $RR_{230}$ | 16.9 | X | 229.03681 | 286.14894 | 65.06018 | 2.68516 | 0.1546074 | 0.24311588 | 2.5424973 | 21 | 4 1.4 | 20.9 |
| 215481 2002 $RW_{279}$ | 17.1 | X | 290.94426 | 66.34937 | 210.11753 | 3.31964 | 0.1936629 | 0.24409956 | 2.5356622 | 21 | 2 22.4 | 20.9 |
| 215482 2002 $TU_{16}$ | 16.4 | X | 96.83352 | 231.45400 | 210.59934 | 3.64133 | 0.0378964 | 0.23473098 | 2.6026900 | 21 | 2 18.4 | 19.8 |
| 215483 2002 $TA_{33}$ | 16.8 | X | 233.53347 | 316.68618 | 36.09919 | 2.61660 | 0.0806206 | 0.24272007 | 2.5452606 | 21 | 4 11.4 | 20.4 |
| 215484 2002 $TS_{34}$ | 17.5 | X | 300.45924 | 29.54359 | 14.30610 | 2.30988 | 0.1828812 | 0.25666732 | 2.4521987 | 21 | 9 7.0 | 19.8 |
| 215485 2002 $TB_{37}$ | 16.8 | X | 74.61784 | 348.97789 | 26.12515 | 5.39617 | 0.0818289 | 0.27247303 | 2.3564254 | 21 | — | — |
| 215486 2002 $TH_{43}$ | 16.3 | X | 242.71803 | 136.93174 | 234.18780 | 3.94647 | 0.1040129 | 0.24380198 | 2.5377250 | 21 | 5 13.5 | 20.0 |
| 215487 2002 $TC_{52}$ | 15.6 | X | 12.46541 | 211.42538 | 215.43775 | 13.17815 | 0.2011090 | 0.21434046 | 2.7652429 | 21 | — | — |
| 215488 2002 $TV_{54}$ | 16.2 | X | 176.57978 | 154.18437 | 230.80458 | 13.20226 | 0.1798047 | 0.23438153 | 2.6052764 | 21 | 3 22.4 | 20.7 |
| 215489 2002 $TG_{57}$ | 17.0 | X | 74.49952 | 261.15773 | 19.36742 | 3.84377 | 0.3212534 | 0.26503158 | 2.4003301 | 21 | 11 22.6 | 20.8 |
| 215490 2002 $TY_{67}$ | 16.2 | X | 140.63805 | 74.37817 | 336.61643 | 25.12222 | 0.1759017 | 0.23284231 | 2.6167453 | 21 | 3 16.2 | 20.5 |
| 215491 2002 $TY_{116}$ | 15.0 | X | 90.33436 | 81.18223 | 300.74924 | 9.04726 | 0.0908979 | 0.17163610 | 3.2067391 | 21 | — | — |
| 215492 2002 $TE_{122}$ | 16.0 | X | 10.13714 | 276.63527 | 225.62116 | 13.97250 | 0.1010496 | 0.22981818 | 2.6396507 | 21 | 1 1.9 | 19.4 |
| 215493 2002 $TR_{143}$ | 16.2 | X | 191.08819 | 284.04274 | 108.20578 | 5.93975 | 0.1314185 | 0.24006182 | 2.5640156 | 21 | 4 18.9 | 20.2 |
| 215494 2002 $TH_{157}$ | 15.7 | X | 31.51433 | 89.17858 | 72.52121 | 14.35764 | 0.0813274 | 0.23470654 | 2.6028707 | 21 | 3 15.0 | 19.0 |
| 215495 2002 $TF_{161}$ | 16.0 | X | 199.59021 | 237.41669 | 150.14806 | 15.35265 | 0.1438572 | 0.23975625 | 2.5661936 | 21 | 4 23.4 | 20.3 |
| 215496 2002 $TT_{164}$ | 16.2 | X | 188.40482 | 252.40421 | 126.68207 | 15.02486 | 0.0875842 | 0.23575061 | 2.5951800 | 21 | 4 2.1 | 20.3 |
| 215497 2002 $TN_{214}$ | 16.2 | X | 350.44787 | 232.44896 | 86.16777 | 5.50157 | 0.2132342 | 0.25587410 | 2.4572641 | 21 | 8 13.8 | 18.0 |
| 215498 2002 $TK_{226}$ | 15.7 | X | 72.42569 | 354.99877 | 56.08068 | 18.62577 | 0.2187431 | 0.22200433 | 2.7012312 | 21 | — | — |
| 215499 2002 $TP_{230}$ | 15.7 | X | 112.47006 | 218.16702 | 119.79719 | 15.71925 | 0.1351031 | 0.22457851 | 2.6805500 | 21 | — | — |
| 215500 2002 $TN_{251}$ | 15.4 | X | 127.83075 | 155.20549 | 232.48930 | 12.14108 | 0.1777091 | 0.22638227 | 2.6662924 | 21 | 2 6.4 | 19.5 |
| 215501 2002 $TF_{257}$ | 16.2 | X | 252.94085 | 287.78322 | 36.45986 | 13.40269 | 0.1726793 | 0.24014249 | 2.5634413 | 21 | 3 24.7 | 20.3 |
| 215502 2002 $TJ_{300}$ | 17.0 | X | 173.57440 | 34.00167 | 64.82947 | 6.27767 | 0.1716190 | 0.24474108 | 2.5312292 | 21 | 6 23.7 | 21.2 |
| 215503 2002 $TE_{312}$ | 15.8 | X | 339.11953 | 17.87389 | 176.65020 | 17.29813 | 0.1122032 | 0.23138545 | 2.6277175 | 21 | 1 22.1 | 19.4 |
| 215504 2002 $TZ_{329}$ | 16.8 | X | 314.63197 | 98.68801 | 120.00177 | 2.60074 | 0.0502747 | 0.23461878 | 2.6035197 | 21 | 1 31.4 | 20.2 |
| 215505 2002 $TZ_{363}$ | 16.7 | X | 19.54260 | 25.33003 | 118.78476 | 3.74242 | 0.0420431 | 0.23135576 | 2.6279424 | 21 | 1 25.0 | 20.0 |
| 215506 2002 $TY_{371}$ | 16.1 | X | 28.30898 | 5.47516 | 111.73533 | 12.92121 | 0.1318091 | 0.22367175 | 2.6877897 | 21 | — | — |
| 215507 2002 $TJ_{382}$ | 17.1 | X | 212.45946 | 286.81695 | 94.83153 | 8.51213 | 0.2024293 | 0.24121782 | 2.5558172 | 21 | 4 25.4 | 21.5 |
| 215508 2002 $TK_{382}$ | 15.8 | X | 65.66810 | 6.90090 | 59.45972 | 16.05909 | 0.1029660 | 0.22383736 | 2.6864638 | 21 | — | — |
| 215509 2002 $TL_{382}$ | 16.5 | X | 62.81160 | 225.79791 | 194.33473 | 2.55162 | 0.1414451 | 0.22285113 | 2.6943840 | 21 | — | — |
| 215510 2002 $UN_{2}$ | 14.7 | X | 136.81148 | 59.49903 | 337.88952 | 25.87360 | 0.1581039 | 0.17802527 | 3.1295480 | 21 | 3 5.5 | 19.6 |
| 215511 2002 $UY_{3}$ | 16.1 | X | 57.16949 | 23.78919 | 51.83864 | 13.31354 | 0.2103041 | 0.22344459 | 2.6896111 | 21 | — | — |
| 215512 2002 $UF_{14}$ | 15.8 | X | 116.00229 | 258.34979 | 93.49027 | 11.66050 | 0.2521933 | 0.27623184 | 2.3350000 | 21 | — | — |
| 215513 2002 $UP_{19}$ | 15.8 | X | 336.64134 | 28.81591 | 72.10429 | 13.82110 | 0.1507606 | 0.21333824 | 2.7738965 | 21 | — | — |
| 215514 2002 $UC_{50}$ | 16.0 | X | 208.47231 | 298.64379 | 93.39665 | 15.42983 | 0.1747243 | 0.23977126 | 2.5660866 | 21 | 5 7.7 | 20.4 |
| 215515 2002 $UR_{53}$ | 16.3 | X | 84.09065 | 224.77085 | 89.84439 | 6.59189 | 0.0535877 | 0.21380189 | 2.7698847 | 21 | 12 10.1 | 20.3 |
| 215516 2002 $UQ_{64}$ | 17.0 | X | 290.07642 | 60.94052 | 192.78201 | 12.64937 | 0.2154775 | 0.23916332 | 2.5704333 | 21 | 1 21.4 | 21.2 |
| 215517 2002 $UZ_{74}$ | 13.5 | X | 336.61900 | 93.19560 | 192.40337 | 4.34924 | 0.0159789 | 0.08515902 | 5.1166094 | 21 | 6 10.6 | 20.2 |
| 215518 2002 $UY_{76}$ | 16.5 | X | 351.22693 | 336.53280 | 146.13505 | 3.97496 | 0.0476063 | 0.21997062 | 2.7178549 | 21 | — | — |
| 215519 2002 $VD_{15}$ | 17.1 | X | 192.66923 | 96.38683 | 224.59637 | 20.54352 | 0.1026733 | 0.38577058 | 1.8688882 | 21 | — | — |
| 215520 2002 $VG_{29}$ | 16.2 | X | 139.77591 | 254.04025 | 219.39791 | 24.50721 | 0.2287606 | 0.23726023 | 2.5841601 | 21 | 6 12.8 | 20.8 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215521 2002 $VJ_{35}$ | 16.2 | $X$ | 204.59296 | 305.15515 | 65.89994 | 6.82231 | 0.1445219 | 0.23644803 | 2.5900745 | 21 | 4 5.9 | 20.4 |
| 215522 2002 $VZ_{56}$ | 16.1 | $X$ | 353.60122 | 154.37869 | 226.05798 | 7.52429 | 0.0891685 | 0.25722130 | 2.4486766 | 21 | 11 16.7 | 18.7 |
| 215523 2002 $VB_{59}$ | 16.5 | $X$ | 66.30010 | 39.22636 | 14.91555 | 1.93133 | 0.0541669 | 0.22196693 | 2.7015346 | 21 | — | — |
| 215524 2002 $VZ_{71}$ | 16.5 | $X$ | 209.03768 | 262.13428 | 114.31250 | 5.20500 | 0.1648030 | 0.23909230 | 2.5709422 | 21 | 4 15.7 | 20.7 |
| 215525 2002 $VU_{72}$ | 16.9 | $X$ | 181.28384 | 236.43664 | 143.72790 | 4.91768 | 0.1564611 | 0.23500941 | 2.6006339 | 21 | 3 25.4 | 21.1 |
| 215526 2002 $VV_{83}$ | 15.3 | $X$ | 216.96576 | 145.49328 | 230.06602 | 12.88333 | 0.1959399 | 0.23768169 | 2.5811044 | 21 | 4 16.8 | 19.6 |
| 215527 2002 $VT_{89}$ | 15.8 | $X$ | 8.18599 | 208.87169 | 232.41692 | 8.49297 | 0.1507345 | 0.21757963 | 2.7377296 | 21 | — | — |
| 215528 2002 $VQ_{91}$ | 16.6 | $X$ | 339.69458 | 267.56917 | 77.13982 | 13.09362 | 0.3374140 | 0.25530158 | 2.4609363 | 21 | 8 30.1 | 17.9 |
| 215529 2002 $VK_{101}$ | 15.8 | $X$ | 234.63801 | 288.53862 | 75.23953 | 13.35196 | 0.1437154 | 0.23920179 | 2.5701577 | 21 | 4 27.3 | 19.9 |
| 215530 2002 $VE_{103}$ | 12.5 | $X$ | 222.68894 | 147.62676 | 237.89135 | 19.08529 | 0.0944451 | 0.08303747 | 5.2033933 | 21 | 5 19.2 | 19.7 |
| 215531 2002 $VS_{105}$ | 16.2 | $X$ | 216.55385 | 359.52201 | 28.59710 | 9.15579 | 0.1086945 | 0.23966149 | 2.5668700 | 21 | 5 5.6 | 20.2 |
| 215532 2002 $VW_{105}$ | 15.5 | $X$ | 232.14421 | 69.00537 | 264.74415 | 8.40687 | 0.0988525 | 0.23458524 | 2.6037678 | 21 | 3 11.5 | 19.6 |
| 215533 2002 $VG_{111}$ | 16.6 | $X$ | 251.24004 | 128.71320 | 194.56890 | 2.47827 | 0.2426987 | 0.23920474 | 2.5701365 | 21 | 3 11.6 | 20.9 |
| 215534 2002 $VV_{113}$ | 16.1 | $X$ | 78.89430 | 15.06706 | 60.59844 | 12.57144 | 0.0490286 | 0.22534914 | 2.6744354 | 21 | 1 24.3 | 19.7 |
| 215535 2002 $VF_{128}$ | 16.5 | $X$ | 244.10481 | 291.98570 | 76.48322 | 11.28456 | 0.2651367 | 0.24277326 | 2.5448888 | 21 | 5 1.9 | 20.9 |
| 215536 2002 $WQ_{3}$ | 16.8 | $X$ | 147.11110 | 223.87527 | 164.45396 | 2.19740 | 0.0852588 | 0.22935093 | 2.6432346 | 21 | 2 21.7 | 20.6 |
| 215537 2002 $WQ_{6}$ | 15.2 | $X$ | 306.95493 | 354.19938 | 249.91875 | 22.01034 | 0.0623058 | 0.23177933 | 2.6247397 | 21 | 2 10.8 | 19.3 |
| 215538 2002 $WU_{10}$ | 15.6 | $X$ | 187.14288 | 19.33750 | 205.42864 | 11.53383 | 0.0209780 | 0.20998265 | 2.8033701 | 21 | 12 16.9 | 19.7 |
| 215539 2002 $WN_{12}$ | 15.3 | $X$ | 215.72343 | 273.01510 | 118.92227 | 17.14916 | 0.2433172 | 0.24041343 | 2.5615150 | 21 | 5 12.5 | 20.1 |
| 215540 2002 $WL_{13}$ | 15.9 | $X$ | 5.80680 | 340.87108 | 93.34730 | 14.40841 | 0.1412780 | 0.21518425 | 2.7580093 | 21 | — | — |
| 215541 2002 $WU_{16}$ | 15.4 | $X$ | 241.55450 | 84.32946 | 234.74181 | 14.05950 | 0.1368655 | 0.23300142 | 2.6155539 | 21 | 2 27.4 | 19.8 |
| 215542 2002 $WT_{25}$ | 13.1 | $X$ | 290.42807 | 262.55765 | 70.53156 | 31.67151 | 0.0724640 | 0.08439519 | 5.1474357 | 21 | 6 2.9 | 19.9 |
| 215543 2002 $XD$ | 16.7 | $X$ | 14.23645 | 337.32180 | 78.60092 | 25.56791 | 0.0833683 | 0.37209128 | 1.9144163 | 21 | — | — |
| 215544 2002 $XH_{18}$ | 16.8 | $X$ | 127.02738 | 5.55940 | 84.93773 | 5.58383 | 0.1489065 | 0.23245026 | 2.6196867 | 21 | 4 28.5 | 20.6 |
| 215545 2002 $XB_{25}$ | 16.3 | $X$ | 45.00136 | 176.22286 | 258.80281 | 3.05891 | 0.0872412 | 0.21856713 | 2.7294773 | 21 | — | — |
| 215546 2002 $XF_{51}$ | 16.0 | $X$ | 290.23808 | 257.19541 | 80.59482 | 16.39311 | 0.2933665 | 0.24530646 | 2.5273384 | 21 | 5 5.4 | 19.8 |
| 215547 2002 $XE_{56}$ | 16.0 | $X$ | 216.47683 | 256.59634 | 110.47640 | 14.72036 | 0.2337168 | 0.23734220 | 2.5835651 | 21 | 4 13.9 | 20.7 |
| 215548 2002 $XA_{64}$ | 16.4 | $X$ | 231.13027 | 138.68312 | 218.84640 | 6.56601 | 0.2739456 | 0.23909525 | 2.5709211 | 21 | 4 3.8 | 21.0 |
| 215549 2002 $XQ_{85}$ | 15.8 | $X$ | 191.13968 | 66.45970 | 29.06183 | 6.01358 | 0.1836975 | 0.24174597 | 2.5520934 | 21 | 7 6.2 | 20.0 |
| 215550 2002 $XD_{104}$ | 16.3 | $X$ | 118.88447 | 307.64809 | 90.50524 | 6.14334 | 0.1495909 | 0.22608469 | 2.6686315 | 21 | 2 12.1 | 20.0 |
| 215551 2002 $YR_{36}$ | 13.3 | $X$ | 240.63027 | 123.98047 | 233.84466 | 6.94254 | 0.0936665 | 0.08091282 | 5.2940880 | 21 | 5 5.6 | 20.6 |
| 215552 2003 $AJ_{18}$ | 15.8 | $X$ | 43.43966 | 356.21739 | 62.59056 | 10.63249 | 0.3010442 | 0.21449256 | 2.7639355 | 21 | — | — |
| 215553 2003 $AB_{42}$ | 16.0 | $X$ | 55.64285 | 328.11787 | 141.97852 | 12.92118 | 0.1045064 | 0.22018257 | 2.7161104 | 21 | 2 7.2 | 19.0 |
| 215554 2003 $AX_{51}$ | 16.2 | $X$ | 101.95655 | 314.32734 | 95.16528 | 9.89260 | 0.2338301 | 0.22223739 | 2.6993423 | 21 | 2 19.7 | 19.8 |
| 215555 2003 $AK_{63}$ | 15.7 | $X$ | 133.08335 | 59.75840 | 71.32064 | 1.93919 | 0.1238981 | 0.18169653 | 3.0872487 | 21 | 6 23.2 | 20.5 |
| 215556 2003 $AD_{85}$ | 15.3 | $X$ | 130.50880 | 112.72467 | 65.40132 | 12.70482 | 0.1470495 | 0.18426000 | 3.0585482 | 21 | 8 25.6 | 20.4 |
| 215557 2003 $BJ_{10}$ | 15.6 | $X$ | 96.98047 | 122.42882 | 334.28753 | 16.89607 | 0.3297421 | 0.17203640 | 3.2017628 | 21 | 4 20.7 | 20.8 |
| 215558 2003 $BJ_{57}$ | 15.9 | $X$ | 254.09127 | 358.33141 | 127.50564 | 9.97054 | 0.1329311 | 0.19948561 | 2.9008704 | 21 | 10 23.8 | 20.1 |
| 215559 2003 $BL_{76}$ | 15.6 | $X$ | 204.86954 | 70.26352 | 71.34166 | 11.67865 | 0.0578323 | 0.19136368 | 2.9823805 | 21 | 9 26.8 | 20.2 |
| 215560 2003 $BM_{88}$ | 15.6 | $X$ | 119.67425 | 90.53137 | 128.35604 | 11.84790 | 0.0368024 | 0.18993597 | 2.9973070 | 21 | 9 22.9 | 20.0 |
| 215561 2003 $CG_{18}$ | 16.1 | $X$ | 226.07337 | 351.66777 | 99.00233 | 2.36790 | 0.2273499 | 0.18914324 | 3.0056760 | 21 | 7 27.6 | 21.0 |
| 215562 2003 $CN_{20}$ | 15.8 | $X$ | 133.44591 | 25.82952 | 123.14585 | 13.94607 | 0.1127919 | 0.18054783 | 3.1003296 | 21 | 7 14.9 | 20.7 |
| 215563 2003 $DZ_{17}$ | 15.7 | $X$ | 170.06266 | 31.65750 | 126.87536 | 9.37348 | 0.0473042 | 0.18778981 | 3.0201003 | 21 | 9 4.3 | 20.1 |
| 215564 2003 $DG_{24}$ | 14.9 | $X$ | 58.91133 | 213.34251 | 25.22377 | 15.69698 | 0.1194488 | 0.17828684 | 3.1264862 | 21 | 8 17.4 | 19.4 |
| 215565 2003 $EO_{26}$ | 15.4 | $X$ | 43.51081 | 227.98715 | 347.42763 | 6.61425 | 0.1823062 | 0.17240522 | 3.1971949 | 21 | 6 25.9 | 19.3 |
| 215566 2003 $EG_{40}$ | 15.3 | $X$ | 118.18375 | 112.61797 | 104.69397 | 15.53217 | 0.1153871 | 0.18497707 | 3.0506388 | 21 | 9 29.4 | 20.2 |
| 215567 2003 $EF_{62}$ | 15.4 | $X$ | 101.89267 | 237.45743 | 44.90731 | 10.70918 | 0.0620566 | 0.18851566 | 3.0123431 | 21 | 11 16.9 | 19.8 |
| 215568 2003 $FK_{25}$ | 16.5 | $X$ | 25.05778 | 330.32630 | 170.98694 | 8.89890 | 0.1395435 | 0.21557118 | 2.7547081 | 21 | 1 28.1 | 19.5 |
| 215569 2003 $FM_{25}$ | 15.8 | $X$ | 150.36214 | 95.28510 | 144.50349 | 2.00826 | 0.0570338 | 0.19347985 | 2.9605942 | 21 | 11 20.1 | 20.2 |
| 215570 2003 $FK_{48}$ | 15.5 | $X$ | 30.20052 | 265.93274 | 6.74682 | 7.53924 | 0.2653721 | 0.17458809 | 3.1704894 | 21 | 9 3.1 | 19.0 |
| 215571 2003 $FK_{49}$ | 15.1 | $X$ | 73.59120 | 151.97653 | 58.44583 | 17.19970 | 0.1148172 | 0.17509785 | 3.1643329 | 21 | 7 26.7 | 19.8 |
| 215572 2003 $FE_{54}$ | 15.6 | $X$ | 142.12287 | 19.30723 | 117.96359 | 11.59501 | 0.1634761 | 0.17683700 | 3.1435518 | 21 | 7 12.6 | 20.7 |
| 215573 2003 $FN_{61}$ | 15.5 | $X$ | 88.22724 | 78.13001 | 132.22663 | 6.00644 | 0.0796439 | 0.17813115 | 3.1283077 | 21 | 8 5.8 | 19.8 |
| 215574 2003 $FF_{72}$ | 15.3 | $X$ | 37.71912 | 89.60616 | 146.83417 | 14.16161 | 0.2209992 | 0.17224412 | 3.1991881 | 21 | 7 18.9 | 19.1 |
| 215575 2003 $FU_{74}$ | 15.3 | $X$ | 34.56088 | 203.54147 | 46.91382 | 17.27976 | 0.1280658 | 0.17356031 | 3.1829937 | 21 | 7 24.8 | 19.6 |
| 215576 2003 $FK_{75}$ | 15.4 | $X$ | 173.47067 | 171.63404 | 302.35910 | 15.41695 | 0.1282461 | 0.18065868 | 3.0990612 | 21 | 7 13.5 | 20.4 |
| 215577 2003 $FL_{81}$ | 15.5 | $X$ | 70.00519 | 133.46182 | 80.38776 | 8.75126 | 0.1243023 | 0.17514287 | 3.1637906 | 21 | 7 25.7 | 19.9 |
| 215578 2003 $FH_{82}$ | 15.0 | $X$ | 129.63613 | 359.80225 | 157.87751 | 11.32689 | 0.0211782 | 0.17520928 | 3.1629911 | 21 | 7 12.1 | 19.7 |
| 215579 2003 $FY_{88}$ | 15.3 | $X$ | 111.61604 | 22.82178 | 177.19488 | 10.35587 | 0.0249113 | 0.18037942 | 3.1022590 | 21 | 8 12.2 | 19.9 |
| 215580 2003 $FP_{96}$ | 15.2 | $X$ | 120.35889 | 346.76761 | 204.62612 | 12.71939 | 0.0860838 | 0.17985276 | 3.1083122 | 21 | 8 16.5 | 20.0 |
| 215581 2003 $FP_{127}$ | 15.0 | $X$ | 71.21220 | 74.36622 | 179.43034 | 12.21489 | 0.1046078 | 0.18173635 | 3.0867978 | 21 | 9 11.6 | 19.4 |
| 215582 2003 $GS_{10}$ | 15.1 | $X$ | 111.69718 | 17.75914 | 122.82129 | 11.82925 | 0.1247615 | 0.17133247 | 3.2105265 | 21 | 6 13.6 | 20.0 |
| 215583 2003 $GL_{29}$ | 15.0 | $X$ | 25.01919 | 37.48832 | 223.35587 | 14.30120 | 0.2273872 | 0.17295660 | 3.1903962 | 21 | 7 25.0 | 18.8 |
| 215584 2003 $GF_{36}$ | 14.7 | $X$ | 80.88660 | 60.47394 | 132.75991 | 18.68925 | 0.1599892 | 0.17417975 | 3.1754427 | 21 | 7 17.1 | 19.2 |
| 215585 2003 $GO_{39}$ | 15.3 | $X$ | 67.24774 | 124.27579 | 163.91310 | 6.41611 | 0.1378043 | 0.18544685 | 3.0454846 | 21 | 10 27.4 | 19.6 |
| 215586 2003 $GB_{43}$ | 15.1 | $X$ | 82.05571 | 140.64506 | 78.77174 | 18.06093 | 0.2048164 | 0.17790481 | 3.1309606 | 21 | 9 4.3 | 20.1 |
| 215587 2003 $GO_{44}$ | 15.0 | $X$ | 111.80507 | 87.46975 | 106.48804 | 14.79360 | 0.1314835 | 0.17908227 | 3.1172214 | 21 | 8 22.0 | 19.9 |
| 215588 2003 $HF_{2}$ | 19.4 | $X$ | 269.34285 | 231.02883 | 189.88852 | 3.05639 | 0.6753665 | 0.83836432 | 1.1139034 | 21 | 6 12.0 | 20.3 |
| 215589 2003 $JO_{7}$ | 15.3 | $X$ | 44.99405 | 26.62906 | 201.39484 | 24.65722 | 0.1842490 | 0.17086347 | 3.2163989 | 21 | 7 10.5 | 19.8 |
| 215590 2003 $KY_{10}$ | 15.7 | $X$ | 329.56071 | 164.90665 | 91.79486 | 8.78462 | 0.1819359 | 0.21460269 | 2.7629897 | 21 | 3 31.9 | 19.1 |
| 215591 2003 $OH$ | 17.0 | $X$ | 254.42247 | 288.23726 | 357.27646 | 2.74525 | 0.0830605 | 0.31149054 | 2.1552921 | 21 | 1 27.5 | 19.7 |
| 215592 Normarose | 15.7 | $X$ | 329.08066 | 58.23424 | 319.74265 | 8.44009 | 0.0837988 | 0.22270651 | 2.6955503 | 21 | 9 22.7 | 19.1 |
| 215593 2003 $QG_{9}$ | 15.6 | $X$ | 213.48024 | 4.16713 | 315.82201 | 10.22702 | 0.0730995 | 0.19621921 | 2.9329751 | 21 | 2 12.9 | 20.1 |
| 215594 2003 $QQ_{27}$ | 17.1 | $X$ | 144.22106 | 219.30455 | 135.67907 | 4.70817 | 0.1863312 | 0.29908226 | 2.2144997 | 21 | 1 6.6 | 19.7 |
| 215595 2003 $QZ_{35}$ | 16.6 | $X$ | 81.07695 | 215.90663 | 162.71712 | 7.24988 | 0.1210593 | 0.29286234 | 2.2457446 | 21 | — | — |
| 215596 2003 $QT_{41}$ | 16.9 | $X$ | 88.07041 | 164.53635 | 167.35326 | 5.28287 | 0.1877045 | 0.28778744 | 2.2720689 | 21 | — | — |
| 215597 2003 $QZ_{76}$ | 16.7 | $X$ | 144.47705 | 86.27378 | 206.24005 | 5.16645 | 0.1314323 | 0.29141375 | 2.2531807 | 21 | — | — |
| 215598 2003 $QE_{111}$ | 16.7 | $X$ | 78.32947 | 310.89492 | 40.91186 | 6.19404 | 0.1942801 | 0.28935564 | 2.2638522 | 21 | — | — |
| 215599 2003 $RN_{1}$ | 16.3 | $X$ | 95.61697 | 187.11541 | 104.46098 | 9.84663 | 0.2153766 | 0.28633331 | 2.2797548 | 21 | 12 19.4 | 20.0 |
| 215600 2003 $RM_{13}$ | 17.1 | $X$ | 348.56108 | 163.07802 | 229.10772 | 1.25382 | 0.1670947 | 0.27970600 | 2.3156248 | 21 | 12 9.4 | 19.1 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215601 2003 $RE_{14}$ | 16.8 | $X$ | 136.48583 | 148.37225 | 212.36585 | 2.48799 | 0.1653626 | 0.29859188 | 2.2169236 | 21 | 1 1.4 | 19.3 |
| 215602 2003 $RO_{20}$ | 17.5 | $X$ | 145.74459 | 188.62828 | 163.58972 | 4.76318 | 0.2132934 | 0.29882442 | 2.2157733 | 21 | 1 8.2 | 20.3 |
| 215603 2003 $SH_{13}$ | 16.6 | $X$ | 349.33921 | 278.43655 | 166.90050 | 6.64947 | 0.0863798 | 0.28804706 | 2.2707034 | 21 | — | — |
| 215604 2003 $SY_{14}$ | 17.2 | $X$ | 26.03057 | 332.30604 | 27.19423 | 1.97750 | 0.1200754 | 0.28148149 | 2.3058771 | 21 | 12 17.8 | 19.8 |
| 215605 2003 $SU_{29}$ | 17.0 | $X$ | 227.56622 | 217.08838 | 241.50108 | 1.49387 | 0.0984092 | 0.27141180 | 2.3625639 | 21 | 8 22.8 | 20.3 |
| 215606 2003 $SF_{36}$ | 16.6 | $X$ | 131.33873 | 257.70344 | 41.06060 | 6.76973 | 0.1598388 | 0.28881240 | 2.2666902 | 21 | — | — |
| 215607 2003 $SD_{38}$ | 15.6 | $X$ | 89.07849 | 73.04203 | 313.46652 | 16.11207 | 0.2643119 | 0.18243378 | 3.0789257 | 21 | 1 16.2 | 19.5 |
| 215608 2003 $SX_{60}$ | 16.8 | $X$ | 251.99467 | 334.34304 | 342.38299 | 6.31449 | 0.1175049 | 0.25555384 | 2.4593166 | 21 | 3 11.2 | 20.4 |
| 215609 2003 $SL_{67}$ | 17.5 | $X$ | 173.99107 | 254.33750 | 76.74707 | 0.99345 | 0.2004382 | 0.30015331 | 2.2092284 | 21 | 1 9.7 | 20.6 |
| 215610 2003 $SA_{83}$ | 17.1 | $X$ | 14.49752 | 221.62663 | 175.44720 | 3.22497 | 0.0794876 | 0.28389780 | 2.2927746 | 21 | — | — |
| 215611 2003 $SN_{90}$ | 17.0 | $X$ | 55.37478 | 240.55611 | 145.13512 | 6.77928 | 0.2001581 | 0.28756571 | 2.2732367 | 21 | — | — |
| 215612 2003 $SS_{96}$ | 17.4 | $X$ | 196.02555 | 164.05791 | 158.50725 | 2.62251 | 0.1827407 | 0.30262325 | 2.1971912 | 21 | 1 17.5 | 20.6 |
| 215613 2003 $SW_{110}$ | 16.5 | $X$ | 73.70907 | 164.14810 | 205.36025 | 6.36093 | 0.1141339 | 0.28724990 | 2.2749025 | 21 | — | — |
| 215614 2003 $SW_{121}$ | 17.3 | $X$ | 196.82376 | 77.84186 | 200.86587 | 7.53423 | 0.2063551 | 0.29960620 | 2.2119171 | 21 | — | — |
| 215615 2003 $SH_{125}$ | 16.8 | $X$ | 124.21362 | 113.54111 | 217.21895 | 5.32010 | 0.1900369 | 0.29249814 | 2.2476084 | 21 | — | — |
| 215616 2003 $SP_{125}$ | 17.1 | $X$ | 71.61440 | 258.49592 | 102.52280 | 2.44980 | 0.1644495 | 0.28765900 | 2.2727451 | 21 | — | — |
| 215617 2003 $SW_{128}$ | 17.3 | $X$ | 129.94659 | 131.36253 | 213.91980 | 2.11439 | 0.1714989 | 0.29364123 | 2.2417716 | 21 | — | — |
| 215618 2003 $SB_{165}$ | 16.6 | $X$ | 17.08420 | 249.96245 | 145.11182 | 4.78245 | 0.1585347 | 0.28209229 | 2.3025473 | 21 | — | — |
| 215619 2003 $SQ_{168}$ | 17.0 | $X$ | 118.08649 | 259.49134 | 97.37832 | 5.98739 | 0.2078343 | 0.29496930 | 2.2350376 | 21 | — | — |
| 215620 2003 $SN_{213}$ | 17.2 | $X$ | 60.67172 | 318.45879 | 39.71060 | 3.47211 | 0.2238048 | 0.28451354 | 2.2894655 | 21 | — | — |
| 215621 2003 $SA_{214}$ | 16.5 | $X$ | 90.13018 | 287.50030 | 43.03302 | 8.01791 | 0.2046289 | 0.28513357 | 2.2861452 | 21 | — | — |
| 215622 2003 $SJ_{223}$ | 16.8 | $X$ | 144.93452 | 119.52792 | 209.56905 | 7.25809 | 0.1714992 | 0.29245941 | 2.2478068 | 21 | — | — |
| 215623 2003 $SL_{229}$ | 16.1 | $X$ | 340.68322 | 149.39315 | 181.48648 | 6.19358 | 0.0411977 | 0.21109615 | 2.7935032 | 21 | 8 9.5 | 19.7 |
| 215624 2003 $SF_{235}$ | 15.1 | $X$ | 113.50772 | 256.89226 | 168.38125 | 10.85911 | 0.1120804 | 0.19139975 | 2.9820058 | 21 | 3 9.7 | 19.2 |
| 215625 2003 $SX_{250}$ | 17.1 | $X$ | 214.51697 | 258.40805 | 183.12233 | 9.78823 | 0.2348702 | 0.26171866 | 2.4205437 | 21 | 7 5.2 | 21.3 |
| 215626 2003 $SF_{258}$ | 17.1 | $X$ | 142.55808 | 99.97804 | 207.66440 | 4.71551 | 0.1481590 | 0.29113482 | 2.2546196 | 21 | — | — |
| 215627 2003 $SV_{262}$ | 17.4 | $X$ | 31.66014 | 304.05947 | 56.37932 | 3.41026 | 0.2211598 | 0.28179630 | 2.3041594 | 21 | — | — |
| 215628 2003 $SP_{271}$ | 16.6 | $X$ | 68.65074 | 294.01496 | 66.00603 | 6.53688 | 0.2352120 | 0.28634613 | 2.2796867 | 21 | — | — |
| 215629 2003 $SA_{289}$ | 16.6 | $X$ | 231.92244 | 40.17628 | 62.44764 | 5.68743 | 0.1046532 | 0.26975926 | 2.3722028 | 21 | 9 5.9 | 19.8 |
| 215630 2003 $SZ_{289}$ | 15.0 | $X$ | 215.87387 | 273.68012 | 37.84565 | 11.88617 | 0.0969101 | 0.19208014 | 2.9749596 | 21 | 2 11.5 | 19.8 |
| 215631 2003 $SW_{308}$ | 16.8 | $X$ | 228.13476 | 316.64413 | 253.60682 | 5.60058 | 0.0617309 | 0.28996806 | 2.2606636 | 21 | — | — |
| 215632 2003 $SV_{318}$ | 15.9 | $X$ | 207.60955 | 104.41010 | 21.68598 | 12.93527 | 0.0741389 | 0.21537383 | 2.7563906 | 21 | 9 9.7 | 20.0 |
| 215633 2003 $ST_{321}$ | 16.7 | $X$ | 301.97356 | 278.14441 | 147.33642 | 6.09616 | 0.0947680 | 0.27439019 | 2.3454364 | 21 | 10 29.4 | 19.1 |
| 215634 2003 $SO_{339}$ | 17.0 | $X$ | 180.31329 | 119.81194 | 103.16017 | 7.28658 | 0.0789856 | 0.28191645 | 2.3035047 | 21 | 12 15.6 | 20.0 |
| 215635 2003 $TY_{4}$ | 17.1 | $X$ | 182.06779 | 58.39139 | 225.71490 | 6.23209 | 0.1763584 | 0.29412059 | 2.2393351 | 21 | — | — |
| 215636 2003 $TP_{16}$ | 16.4 | $X$ | 359.19635 | 119.63817 | 253.95776 | 4.91228 | 0.0950775 | 0.27656251 | 2.3331384 | 21 | 11 20.6 | 18.9 |
| 215637 2003 $TG_{41}$ | 17.0 | $X$ | 181.17552 | 283.61729 | 276.95135 | 3.63900 | 0.1369701 | 0.27879267 | 2.3206794 | 21 | 11 11.2 | 20.5 |
| 215638 2003 $TW_{49}$ | 14.8 | $X$ | 64.06188 | 230.50940 | 114.70007 | 12.37765 | 0.0907419 | 0.17367845 | 3.1815501 | 21 | 12 21.5 | 19.5 |
| 215639 2003 $TW_{58}$ | 16.6 | $X$ | 287.60938 | 3.71885 | 68.15225 | 8.06890 | 0.0778533 | 0.27282122 | 2.3544201 | 21 | 10 17.4 | 19.2 |
| 215640 2003 $UP_{14}$ | 16.8 | $X$ | 121.19367 | 279.14007 | 37.81155 | 7.41578 | 0.1428867 | 0.28726420 | 2.2748270 | 21 | — | — |
| 215641 2003 $UJ_{24}$ | 17.1 | $X$ | 188.13067 | 82.54201 | 233.44347 | 5.42563 | 0.1890723 | 0.29822572 | 2.2187378 | 21 | 1 2.8 | 20.5 |
| 215642 2003 $UB_{26}$ | 16.5 | $X$ | 202.26830 | 60.17744 | 246.29318 | 7.46726 | 0.2299395 | 0.29892360 | 2.2152832 | 21 | 1 5.5 | 20.2 |
| 215643 2003 $UJ_{27}$ | 16.8 | $X$ | 150.84037 | 229.08864 | 97.08620 | 6.85927 | 0.1987064 | 0.29445820 | 2.2376232 | 21 | — | — |
| 215644 2003 $UR_{27}$ | 17.2 | $X$ | 30.50270 | 333.30454 | 61.30193 | 3.57738 | 0.1711962 | 0.28448617 | 2.2896123 | 21 | — | — |
| 215645 2003 $UN_{42}$ | 17.8 | $X$ | 216.42092 | 286.72073 | 166.00390 | 1.56266 | 0.1211159 | 0.26531118 | 2.3986434 | 21 | 7 30.4 | 21.2 |
| 215646 2003 $US_{63}$ | 17.4 | $X$ | 193.09080 | 211.25597 | 116.06418 | 5.40803 | 0.2233952 | 0.30227863 | 2.1988609 | 21 | 1 23.7 | 20.9 |
| 215647 2003 $UN_{71}$ | 17.1 | $X$ | 233.95749 | 303.29784 | 187.31943 | 6.51867 | 0.0545487 | 0.27524001 | 2.3406062 | 21 | 10 22.9 | 20.1 |
| 215648 2003 $UF_{78}$ | 16.7 | $X$ | 342.98720 | 115.77071 | 264.34389 | 4.65934 | 0.1602934 | 0.27424751 | 2.3462498 | 21 | 11 4.9 | 18.6 |
| 215649 2003 $UT_{103}$ | 16.6 | $X$ | 240.89066 | 341.65835 | 90.11257 | 3.33428 | 0.2028490 | 0.26309479 | 2.4120958 | 21 | 7 21.4 | 20.2 |
| 215650 2003 $UU_{107}$ | 15.0 | $X$ | 10.88174 | 172.03536 | 342.50686 | 13.44883 | 0.0807028 | 0.18643852 | 3.0346756 | 21 | 2 6.2 | 18.9 |
| 215651 2003 $UT_{110}$ | 16.9 | $X$ | 286.55697 | 242.54972 | 168.95549 | 2.04826 | 0.1596928 | 0.26831645 | 2.3806992 | 21 | 8 28.8 | 19.4 |
| 215652 2003 $UE_{116}$ | 17.6 | $X$ | 109.25244 | 251.77785 | 104.51154 | 3.37174 | 0.1866297 | 0.29156887 | 2.2523815 | 21 | — | — |
| 215653 2003 $UM_{121}$ | 17.1 | $X$ | 94.57146 | 276.61298 | 15.79308 | 5.62427 | 0.1652252 | 0.28115417 | 2.3076664 | 21 | 12 14.8 | 20.6 |
| 215654 2003 $UK_{141}$ | 16.5 | $X$ | 57.77596 | 235.92601 | 130.49729 | 8.21850 | 0.1022321 | 0.28634306 | 2.2797030 | 21 | — | — |
| 215655 2003 $UJ_{156}$ | 16.4 | $X$ | 330.53057 | 188.25651 | 165.26154 | 4.50114 | 0.0875315 | 0.21410734 | 2.7672497 | 21 | 8 24.0 | 19.5 |
| 215656 2003 $UD_{159}$ | 16.8 | $X$ | 337.17638 | 306.32450 | 53.25276 | 2.18192 | 0.2015940 | 0.27021631 | 2.3695271 | 21 | 9 20.6 | 18.3 |
| 215657 2003 $UT_{162}$ | 16.8 | $X$ | 20.65224 | 324.64445 | 59.28149 | 7.59463 | 0.1189522 | 0.28042920 | 2.3116419 | 21 | — | — |
| 215658 2003 $UK_{164}$ | 17.2 | $X$ | 345.44934 | 263.50975 | 133.38839 | 2.80232 | 0.1640095 | 0.27645062 | 2.3337680 | 21 | 12 9.2 | 19.2 |
| 215659 2003 $UY_{164}$ | 15.8 | $X$ | 150.21768 | 77.20410 | 300.84728 | 1.91430 | 0.1484202 | 0.18919070 | 3.0051734 | 21 | 2 24.2 | 20.6 |
| 215660 2003 $UO_{178}$ | 15.2 | $X$ | 83.56502 | 217.68845 | 218.66067 | 9.45969 | 0.0698919 | 0.18719553 | 3.0264887 | 21 | 2 4.8 | 19.5 |
| 215661 2003 $UZ_{179}$ | 17.2 | $X$ | 29.89262 | 292.52296 | 66.15950 | 7.98859 | 0.1226801 | 0.27866235 | 2.3214029 | 21 | 12 21.7 | 20.0 |
| 215662 2003 $UG_{188}$ | 15.8 | $X$ | 98.12888 | 354.37575 | 29.80384 | 11.49396 | 0.1594986 | 0.23586570 | 2.5943358 | 21 | — | — |
| 215663 2003 $UX_{210}$ | 16.5 | $X$ | 104.23397 | 309.39469 | 241.20365 | 5.49428 | 0.0284382 | 0.26088118 | 2.4257212 | 21 | 7 24.8 | 19.7 |
| 215664 2003 $UL_{214}$ | 16.8 | $X$ | 291.19679 | 40.95090 | 237.50754 | 4.57126 | 0.2546887 | 0.31028350 | 2.1608781 | 21 | 2 8.6 | 20.1 |
| 215665 2003 $UJ_{228}$ | 16.7 | $X$ | 104.44812 | 296.88214 | 54.89249 | 7.72373 | 0.1583614 | 0.28967245 | 2.2622013 | 21 | — | — |
| 215666 2003 $UO_{242}$ | 17.6 | $X$ | 148.66325 | 258.65856 | 66.81304 | 3.02756 | 0.2480015 | 0.29397846 | 2.2400569 | 21 | — | — |
| 215667 2003 $UX_{261}$ | 15.8 | $X$ | 222.13880 | 345.96635 | 97.03517 | 24.21572 | 0.1124151 | 0.26347844 | 2.4097537 | 21 | 7 25.2 | 19.4 |
| 215668 2003 $UG_{266}$ | 17.0 | $X$ | 113.95232 | 112.32959 | 218.06307 | 4.62961 | 0.2098057 | 0.28903869 | 2.2655069 | 21 | — | — |
| 215669 2003 $UV_{274}$ | 16.5 | $X$ | 61.17783 | 272.27486 | 90.96593 | 8.95082 | 0.1904743 | 0.28308673 | 2.2971519 | 21 | — | — |
| 215670 2003 $UO_{277}$ | 17.0 | $X$ | 273.62556 | 306.29522 | 104.40811 | 3.48232 | 0.1663363 | 0.26793401 | 2.3829640 | 21 | 8 7.1 | 19.8 |
| 215671 2003 $UB_{279}$ | 16.3 | $X$ | 97.42756 | 33.33924 | 52.89788 | 13.27787 | 0.2232226 | 0.24160495 | 2.5530863 | 21 | 4 1.2 | 19.7 |
| 215672 2003 $UU_{284}$ | 16.0 | $X$ | 123.90760 | 176.95518 | 197.00060 | 3.29427 | 0.1668020 | 0.18397538 | 3.0617020 | 21 | 1 26.2 | 20.4 |
| 215673 2003 $UO_{379}$ | 17.6 | $X$ | 188.87871 | 152.11464 | 44.61351 | 4.74114 | 0.1513764 | 0.28045037 | 2.3115256 | 21 | 11 13.9 | 20.8 |
| 215674 2003 $UJ_{381}$ | 16.7 | $X$ | 111.94766 | 120.52329 | 45.13631 | 7.27133 | 0.0454848 | 0.26252556 | 2.4155813 | 21 | 7 4.7 | 19.9 |
| 215675 2003 $UF_{405}$ | 17.4 | $X$ | 133.87015 | 74.67601 | 57.25807 | 4.98613 | 0.1427062 | 0.25843424 | 2.4410088 | 21 | 6 26.0 | 20.9 |
| 215676 2003 $VJ_{11}$ | 16.8 | $X$ | 326.73929 | 345.56285 | 60.54578 | 5.22461 | 0.1355790 | 0.27272037 | 2.3550005 | 21 | 11 11.8 | 18.9 |
| 215677 2003 $WN$ | 15.2 | $X$ | 140.76859 | 276.05521 | 68.42854 | 10.00245 | 0.1723533 | 0.18111439 | 3.0938606 | 21 | 1 11.8 | 20.0 |
| 215678 2003 $WR$ | 17.0 | $X$ | 79.81616 | 280.63804 | 63.75738 | 6.49909 | 0.1939217 | 0.28409138 | 2.2917330 | 21 | — | — |
| 215679 2003 $WL_{59}$ | 17.0 | $X$ | 105.12426 | 271.62532 | 64.64467 | 7.23422 | 0.1790470 | 0.28651298 | 2.2788016 | 21 | — | — |
| 215680 2003 $WS_{85}$ | 17.4 | $X$ | 337.54143 | 229.11174 | 172.66570 | 6.59185 | 0.1339246 | 0.27313826 | 2.3525978 | 21 | 11 27.9 | 19.6 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215681 2003 $WH_{147}$ | 15.8 | X | 114.48692 | 19.75270 | 233.63953 | 23.20794 | 0.1747324 | 0.27128304 | 2.3633114 | 21 | 11 14.5 | 19.4 |
| 215682 2003 $WD_{155}$ | 16.3 | X | 264.17830 | 256.49936 | 147.24770 | 6.31805 | 0.1011123 | 0.26243537 | 2.4161347 | 21 | 7 23.9 | 19.5 |
| 215683 2003 $WB_{156}$ | 16.8 | X | 181.46158 | 26.13423 | 45.19323 | 6.50155 | 0.1128249 | 0.25357482 | 2.4720958 | 21 | 5 24.9 | 20.6 |
| 215684 2003 $WR_{158}$ | 17.2 | X | 326.15006 | 243.25166 | 124.20880 | 1.97329 | 0.1961739 | 0.26921582 | 2.3753941 | 21 | 9 4.7 | 18.7 |
| 215685 2003 $WK_{185}$ | 16.0 | X | 304.29398 | 52.01335 | 78.80472 | 12.24206 | 0.1061611 | 0.22172888 | 2.7034679 | 21 | — | — |
| 215686 2003 $XG_{43}$ | 16.4 | X | 2.59497 | 276.70821 | 236.07563 | 12.13692 | 0.2096123 | 0.23321829 | 2.6139322 | 21 | — | — |
| 215687 2003 $YP_{12}$ | 15.7 | X | 357.40155 | 112.86446 | 67.84629 | 8.31951 | 0.1089856 | 0.23424661 | 2.6062766 | 21 | 2 5.7 | 18.8 |
| 215688 2003 $YC_{45}$ | 15.1 | X | 18.89245 | 0.65959 | 142.07976 | 13.63693 | 0.2143832 | 0.17463689 | 3.1698987 | 21 | 1 28.8 | 18.3 |
| 215689 2003 $YT_{51}$ | 16.5 | X | 351.05380 | 275.64797 | 90.63799 | 7.05228 | 0.1523607 | 0.26772652 | 2.3841951 | 21 | 11 2.5 | 18.7 |
| 215690 2003 $YM_{54}$ | 16.5 | X | 329.39705 | 289.91699 | 88.56467 | 8.14588 | 0.1270136 | 0.26950276 | 2.3737077 | 21 | 10 9.2 | 18.8 |
| 215691 2003 $YT_{56}$ | 17.5 | X | 67.57039 | 239.49370 | 238.11566 | 3.50123 | 0.1387950 | 0.29529491 | 2.2333943 | 21 | 2 22.2 | 19.5 |
| 215692 2003 $YK_{68}$ | 16.4 | X | 114.56472 | 217.03168 | 240.93093 | 3.52484 | 0.1144478 | 0.24161147 | 2.5530404 | 21 | 4 15.1 | 19.9 |
| 215693 2003 $YC_{69}$ | 16.7 | X | 259.26050 | 316.09399 | 111.38020 | 6.97674 | 0.1163484 | 0.26447978 | 2.4036675 | 21 | 8 19.9 | 19.7 |
| 215694 2003 $YD_{78}$ | 17.0 | X | 59.68815 | 326.23324 | 88.03450 | 7.40275 | 0.0924248 | 0.28459443 | 2.2890316 | 21 | — | — |
| 215695 2003 $YU_{84}$ | 16.6 | X | 23.70979 | 112.44350 | 56.22373 | 5.10511 | 0.2067636 | 0.23910028 | 2.5708850 | 21 | 3 1.7 | 18.7 |
| 215696 2003 $YX_{85}$ | 16.5 | X | 81.16233 | 297.68254 | 170.26066 | 3.50274 | 0.2508216 | 0.23928649 | 2.5695511 | 21 | 4 6.4 | 19.3 |
| 215697 2003 $YM_{102}$ | 17.0 | X | 256.28436 | 270.44851 | 148.05668 | 2.56010 | 0.1813605 | 0.25969467 | 2.4331041 | 21 | 7 22.6 | 20.4 |
| 215698 2003 $YE_{117}$ | 16.9 | X | 176.54730 | 283.56404 | 89.75648 | 3.65217 | 0.0605020 | 0.29466080 | 2.2365974 | 21 | 2 26.2 | 19.7 |
| 215699 2003 $YH_{117}$ | 17.1 | X | 6.26346 | 40.27950 | 109.29616 | 8.62047 | 0.1388377 | 0.23035035 | 2.6355836 | 21 | 1 3.5 | 20.1 |
| 215700 2003 $YE_{120}$ | 16.1 | X | 320.56516 | 243.37495 | 342.41419 | 4.71993 | 0.1206783 | 0.23436115 | 2.6054274 | 21 | 2 7.6 | 19.3 |
| 215701 2003 $YD_{121}$ | 14.7 | X | 81.87532 | 68.04112 | 318.74106 | 15.44844 | 0.1106367 | 0.17002442 | 3.2269719 | 21 | — | — |
| 215702 2003 $YJ_{122}$ | 17.7 | X | 307.46551 | 139.02619 | 31.60247 | 2.45674 | 0.1582648 | 0.28133491 | 2.3066780 | 21 | — | — |
| 215703 2003 $YK_{129}$ | 15.5 | X | 21.13602 | 80.74845 | 88.70915 | 13.44593 | 0.1291428 | 0.23429804 | 2.6058952 | 21 | 3 5.4 | 18.5 |
| 215704 2004 $AJ_{1}$ | 15.9 | X | 104.83400 | 313.61898 | 124.72850 | 5.79163 | 0.1263032 | 0.18041854 | 3.1018105 | 21 | 3 21.1 | 20.3 |
| 215705 2004 $AR_{7}$ | 16.7 | X | 308.23695 | 337.66958 | 157.86988 | 5.93869 | 0.1728928 | 0.27574605 | 2.3377416 | 21 | — | — |
| 215706 2004 $AP_{10}$ | 15.5 | X | 251.09211 | 258.36525 | 138.68287 | 14.99909 | 0.2854625 | 0.25621105 | 2.4551092 | 21 | 6 9.7 | 19.8 |
| 215707 2004 $AN_{24}$ | 15.9 | X | 355.42171 | 314.31528 | 93.51837 | 6.22780 | 0.0427386 | 0.21490277 | 2.7604171 | 21 | 12 12.6 | 19.3 |
| 215708 2004 $AQ_{26}$ | 15.5 | X | 321.93214 | 287.48952 | 230.26897 | 11.88353 | 0.2046679 | 0.22338600 | 2.6900813 | 21 | — | — |
| 215709 2004 $BV_{21}$ | 16.3 | X | 84.83373 | 67.66638 | 87.03006 | 5.00892 | 0.0321063 | 0.24514371 | 2.5284568 | 21 | 5 11.4 | 19.5 |
| 215710 2004 $BK_{22}$ | 16.9 | X | 54.36341 | 341.27639 | 116.27751 | 3.49512 | 0.1652942 | 0.23150221 | 2.6268340 | 21 | 1 20.2 | 19.3 |
| 215711 2004 $BD_{50}$ | 15.7 | X | 212.33650 | 97.93654 | 300.98610 | 10.05712 | 0.0865690 | 0.19103840 | 2.9857649 | 21 | 5 17.7 | 20.4 |
| 215712 2004 $BO_{50}$ | 16.3 | X | 257.56132 | 351.53676 | 133.52674 | 2.74205 | 0.1732859 | 0.20991495 | 2.8039728 | 21 | 10 19.6 | 20.1 |
| 215713 2004 $BZ_{71}$ | 15.9 | X | 359.08709 | 351.45253 | 147.45589 | 12.41859 | 0.1168884 | 0.22745737 | 2.6578841 | 21 | — | — |
| 215714 2004 $BW_{74}$ | 15.6 | X | 15.28512 | 315.61508 | 169.90403 | 4.81231 | 0.1455810 | 0.17132445 | 3.2106267 | 21 | 1 4.2 | 19.5 |
| 215715 2004 $BK_{75}$ | 16.4 | X | 54.43918 | 4.43071 | 96.27705 | 5.02036 | 0.2038004 | 0.23114088 | 2.6295708 | 21 | 1 28.9 | 18.6 |
| 215716 2004 $BH_{76}$ | 17.0 | X | 316.25776 | 38.41675 | 139.11319 | 3.07898 | 0.1613454 | 0.28159082 | 2.3052802 | 21 | — | — |
| 215717 2004 $BE_{87}$ | 15.8 | X | 313.65789 | 315.19426 | 229.27067 | 8.69889 | 0.0330478 | 0.22557287 | 2.6726667 | 21 | — | — |
| 215718 2004 $BY_{91}$ | 16.5 | X | 356.14273 | 310.82835 | 205.39742 | 4.08610 | 0.1418373 | 0.22869332 | 2.6482993 | 21 | — | — |
| 215719 2004 $BR_{94}$ | 15.8 | X | 325.19716 | 261.64075 | 253.30973 | 10.26118 | 0.1405488 | 0.22243552 | 2.6977392 | 21 | — | — |
| 215720 2004 $BU_{94}$ | 15.7 | X | 314.74220 | 300.68911 | 247.72135 | 10.35809 | 0.1577668 | 0.22448711 | 2.6812776 | 21 | — | — |
| 215721 2004 $BU_{96}$ | 16.1 | X | 271.54368 | 49.07081 | 140.27111 | 8.49278 | 0.1167923 | 0.21933928 | 2.7230677 | 21 | — | — |
| 215722 2004 $BZ_{96}$ | 15.3 | X | 49.43109 | 240.55975 | 319.15245 | 10.53829 | 0.1157469 | 0.18435883 | 3.0574551 | 21 | 6 3.2 | 19.4 |
| 215723 2004 $BT_{101}$ | 16.7 | X | 316.34230 | 299.09754 | 183.48511 | 9.62444 | 0.2462347 | 0.21795905 | 2.7345516 | 21 | — | — |
| 215724 2004 $BT_{111}$ | 16.4 | X | 39.20332 | 10.86527 | 82.65902 | 6.02626 | 0.1590842 | 0.22747352 | 2.6577583 | 21 | — | — |
| 215725 2004 $BN_{116}$ | 15.8 | X | 276.21905 | 151.10749 | 61.10658 | 12.27021 | 0.1397309 | 0.22428454 | 2.6828918 | 21 | — | — |
| 215726 2004 $BX_{116}$ | 15.5 | X | 90.72690 | 7.08565 | 100.41487 | 13.54624 | 0.1121673 | 0.18064925 | 3.0991691 | 21 | 4 11.4 | 20.0 |
| 215727 2004 $BK_{150}$ | 17.2 | X | 5.04775 | 163.50676 | 347.02272 | 1.69694 | 0.1425800 | 0.22924293 | 2.6440647 | 21 | 1 2.9 | 20.1 |
| 215728 2004 $CP$ | 15.8 | X | 82.98464 | 83.76858 | 47.27642 | 27.06662 | 0.1861811 | 0.23756537 | 2.5819468 | 21 | 5 2.4 | 19.0 |
| 215729 2004 $CN_{20}$ | 16.7 | X | 128.64208 | 164.88823 | 115.88918 | 7.39288 | 0.1058061 | 0.26852388 | 2.3794730 | 21 | 12 29.6 | 20.3 |
| 215730 2004 $CB_{31}$ | 17.0 | X | 102.59635 | 322.43690 | 137.62444 | 5.44850 | 0.0808395 | 0.23859721 | 2.5744975 | 21 | 3 31.6 | 20.3 |
| 215731 2004 $CZ_{58}$ | 15.9 | X | 357.90676 | 99.07816 | 121.60877 | 15.51962 | 0.0626038 | 0.23821800 | 2.5772289 | 21 | 4 10.9 | 19.3 |
| 215732 2004 $CL_{73}$ | 15.7 | X | 62.69186 | 258.08268 | 210.81838 | 9.88397 | 0.1445521 | 0.23161454 | 2.6259846 | 21 | 2 14.9 | 18.8 |
| 215733 2004 $CU_{102}$ | 16.6 | X | 273.49117 | 205.63768 | 266.21940 | 5.87040 | 0.0710320 | 0.26463521 | 2.4027263 | 21 | 11 15.9 | 19.4 |
| 215734 2004 $DV_{19}$ | 15.8 | X | 235.46904 | 82.59997 | 334.00206 | 8.92349 | 0.0548741 | 0.19337572 | 2.9616570 | 21 | 7 12.1 | 20.2 |
| 215735 2004 $DV_{23}$ | 16.2 | X | 264.21796 | 112.18047 | 154.03369 | 14.31238 | 0.1878654 | 0.22668883 | 2.6638880 | 21 | 1 18.5 | 20.6 |
| 215736 2004 $DX_{39}$ | 16.5 | X | 280.57372 | 72.84401 | 159.43997 | 4.64304 | 0.0619851 | 0.22520995 | 2.6755373 | 21 | 1 6.6 | 20.2 |
| 215737 2004 $DG_{44}$ | 16.0 | X | 13.64679 | 350.53794 | 117.54937 | 10.40985 | 0.1560639 | 0.22355284 | 2.6887428 | 21 | — | — |
| 215738 2004 $DN_{49}$ | 15.6 | X | 267.40831 | 222.70365 | 340.99986 | 6.28856 | 0.0748688 | 0.21853899 | 2.7297116 | 21 | — | — |
| 215739 2004 $DL_{53}$ | 16.8 | X | 23.85366 | 40.04481 | 82.63990 | 2.03023 | 0.0220643 | 0.22610441 | 2.6684763 | 21 | 1 5.5 | 20.4 |
| 215740 2004 $ED$ | 15.8 | X | 261.65181 | 120.22392 | 71.48483 | 13.76239 | 0.1250502 | 0.21569161 | 2.7536826 | 21 | — | — |
| 215741 2004 $EL_{11}$ | 15.8 | X | 330.02813 | 27.88438 | 98.39558 | 4.96257 | 0.1171962 | 0.21794214 | 2.7346930 | 21 | — | — |
| 215742 2004 $EY_{16}$ | 15.8 | X | 243.44768 | 151.76206 | 40.18966 | 9.19093 | 0.1344590 | 0.21070130 | 2.7969921 | 21 | 12 29.2 | 19.7 |
| 215743 2004 $EV_{29}$ | 16.8 | X | 199.15377 | 137.92761 | 139.01921 | 1.42695 | 0.1177529 | 0.21649177 | 2.7468933 | 21 | — | — |
| 215744 2004 $EB_{48}$ | 16.3 | X | 33.16871 | 83.54995 | 24.76434 | 5.10471 | 0.0551434 | 0.22384110 | 2.6864339 | 21 | — | — |
| 215745 2004 $EK_{50}$ | 15.4 | X | 201.72087 | 31.27133 | 41.01643 | 10.70032 | 0.0854957 | 0.18806672 | 3.0171350 | 21 | 6 18.8 | 20.1 |
| 215746 2004 $EH_{74}$ | 16.6 | X | 222.50118 | 6.95719 | 258.10047 | 3.16926 | 0.1380712 | 0.27409953 | 2.3470942 | 21 | — | — |
| 215747 2004 $EU_{82}$ | 15.8 | X | 356.41071 | 110.08487 | 182.67105 | 13.51110 | 0.0579010 | 0.18624969 | 3.0367265 | 21 | 7 10.9 | 20.0 |
| 215748 2004 $EC_{83}$ | 16.4 | X | 58.73499 | 48.27770 | 58.52920 | 4.10404 | 0.1379318 | 0.23092743 | 2.6311909 | 21 | 2 10.3 | 19.2 |
| 215749 2004 $EN_{83}$ | 15.9 | X | 124.02590 | 148.17034 | 54.22868 | 8.13994 | 0.0699695 | 0.19239309 | 2.9717327 | 21 | 9 10.9 | 20.4 |
| 215750 2004 $EK_{85}$ | 16.8 | X | 234.08696 | 29.98080 | 121.38073 | 4.67230 | 0.0909820 | 0.26159059 | 2.4213337 | 21 | 11 13.2 | 19.9 |
| 215751 2004 $EH_{105}$ | 16.3 | X | 182.26844 | 201.43366 | 155.21878 | 5.80587 | 0.1428304 | 0.22825258 | 2.6517073 | 21 | 2 24.3 | 20.6 |
| 215752 2004 $FZ_{2}$ | 16.6 | X | 168.16302 | 254.50561 | 349.33341 | 5.59722 | 0.0824712 | 0.26497954 | 2.4006443 | 21 | 12 25.1 | 20.0 |
| 215753 2004 $FB_{9}$ | 16.3 | X | 319.16552 | 39.45472 | 84.96059 | 5.12956 | 0.1622690 | 0.21376194 | 2.7702297 | 21 | — | — |
| 215754 2004 $FF_{14}$ | 16.0 | X | 320.89380 | 286.83942 | 330.15497 | 11.98727 | 0.2852695 | 0.22915700 | 2.6447257 | 21 | 2 22.8 | 19.5 |
| 215755 2004 $FF_{51}$ | 16.2 | X | 308.28152 | 128.58931 | 49.28184 | 4.37429 | 0.0296285 | 0.22231438 | 2.6987191 | 21 | — | — |
| 215756 2004 $FQ_{62}$ | 16.6 | X | 268.91549 | 58.88022 | 157.79297 | 5.65230 | 0.1262521 | 0.21769904 | 2.7367285 | 21 | — | — |
| 215757 2004 $FU_{64}$ | 17.8 | X | 270.01303 | 286.45744 | 20.87836 | 24.88047 | 0.3671396 | 0.39564902 | 1.8376494 | 21 | 2 27.1 | 21.4 |
| 215758 2004 $FM_{68}$ | 16.4 | X | 308.96567 | 18.37043 | 164.02348 | 7.54397 | 0.0452527 | 0.22125817 | 2.7073007 | 21 | — | — |
| 215759 2004 $FW_{85}$ | 16.0 | X | 257.51100 | 162.88607 | 103.79355 | 7.52944 | 0.0886354 | 0.22624787 | 2.6673482 | 21 | 1 21.4 | 19.9 |
| 215760 2004 $FZ_{89}$ | 15.5 | X | 330.24569 | 291.78665 | 168.44313 | 16.05712 | 0.1649024 | 0.21198457 | 2.7856927 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215761 2004 $FF_{90}$ | 16.2 | $X$ | 62.42345 | 324.47478 | 116.55423 | 6.50041 | 0.0818613 | 0.22363961 | 2.6880472 | 21 | 1 7.9 | 19.2 |
| 215762 2004 $FK_{91}$ | 15.9 | $X$ | 292.47290 | 271.76445 | 102.69171 | 3.29438 | 0.0286071 | 0.18931674 | 3.0038393 | 21 | 8 2.0 | 20.0 |
| 215763 2004 $FB_{95}$ | 16.4 | $X$ | 19.44634 | 358.35384 | 110.26536 | 12.83287 | 0.1111581 | 0.22182193 | 2.7027117 | 21 | — | — |
| 215764 2004 $FQ_{112}$ | 16.2 | $X$ | 171.89560 | 77.20608 | 192.92962 | 6.30597 | 0.0304011 | 0.21134355 | 2.7913227 | 21 | — | — |
| 215765 2004 $FJ_{115}$ | 16.2 | $X$ | 5.88491 | 241.88355 | 23.93972 | 6.55350 | 0.1756144 | 0.24071395 | 2.5593826 | 21 | 6 20.5 | 18.5 |
| 215766 2004 $FX_{124}$ | 15.9 | $X$ | 79.12449 | 226.51734 | 201.44308 | 5.32188 | 0.0269020 | 0.22181222 | 2.7027906 | 21 | 1 9.6 | 19.5 |
| 215767 2004 $FZ_{124}$ | 15.9 | $X$ | 184.84148 | 278.26933 | 0.94695 | 7.13073 | 0.1981814 | 0.21097619 | 2.7945621 | 21 | — | — |
| 215768 2004 $FZ_{131}$ | 16.9 | $X$ | 202.70886 | 95.01474 | 162.59302 | 4.78298 | 0.0671368 | 0.21517929 | 2.7580517 | 21 | — | — |
| 215769 2004 $GA_{12}$ | 15.7 | $X$ | 296.97169 | 55.22002 | 66.53252 | 33.00452 | 0.2919333 | 0.21116346 | 2.7929096 | 21 | 11 27.5 | 18.2 |
| 215770 2004 $GP_{16}$ | 15.7 | $X$ | 249.06010 | 93.77886 | 108.32577 | 10.42396 | 0.0465683 | 0.21091338 | 2.7951168 | 21 | — | — |
| 215771 2004 $GR_{18}$ | 15.8 | $X$ | 45.95006 | 15.30052 | 164.44751 | 11.00325 | 0.1604540 | 0.17581615 | 3.1557085 | 21 | 5 12.3 | 19.7 |
| 215772 2004 $GU_{29}$ | 15.5 | $X$ | 162.43448 | 328.44801 | 208.99772 | 9.69839 | 0.0379269 | 0.19254903 | 2.9701280 | 21 | 9 14.9 | 19.9 |
| 215773 2004 $GX_{31}$ | 15.9 | $X$ | 182.43980 | 229.97604 | 64.06776 | 8.82839 | 0.2124732 | 0.21155263 | 2.7894832 | 21 | — | — |
| 215774 2004 $GH_{32}$ | 15.5 | $X$ | 225.57138 | 350.59432 | 247.65576 | 12.00144 | 0.1289649 | 0.21399026 | 2.7682590 | 21 | — | — |
| 215775 2004 $HF_{6}$ | 15.8 | $X$ | 76.71072 | 93.93490 | 206.65314 | 8.17581 | 0.3930877 | 0.18978608 | 2.9988850 | 21 | 12 15.5 | 21.1 |
| 215776 2004 $HU_{34}$ | 16.5 | $X$ | 194.46480 | 130.70642 | 207.98445 | 6.32173 | 0.0415075 | 0.22569111 | 2.6717332 | 21 | 2 8.6 | 20.4 |
| 215777 2004 $HR_{37}$ | 15.4 | $X$ | 228.41466 | 87.37504 | 73.83660 | 15.82588 | 0.0943050 | 0.20366539 | 2.8610441 | 21 | 11 11.4 | 19.7 |
| 215778 2004 $HP_{53}$ | 15.6 | $X$ | 179.78441 | 113.66916 | 121.77122 | 15.73267 | 0.1084882 | 0.20503737 | 2.8482670 | 21 | 12 16.3 | 20.1 |
| 215779 2004 $HY_{65}$ | 15.9 | $X$ | 150.34755 | 122.85250 | 139.22916 | 9.53358 | 0.1353953 | 0.19987225 | 2.8971282 | 21 | 12 17.4 | 20.7 |
| 215780 2004 $HR_{69}$ | 15.8 | $X$ | 283.94236 | 256.94595 | 225.01437 | 14.07027 | 0.1057160 | 0.20340804 | 2.8634568 | 21 | 11 28.8 | 19.4 |
| 215781 2004 $HL_{73}$ | 16.2 | $X$ | 93.96436 | 246.19797 | 26.51873 | 1.90308 | 0.0997169 | 0.19342394 | 2.9611647 | 21 | 11 1.8 | 20.7 |
| 215782 2004 $JO_{28}$ | 17.0 | $X$ | 75.97248 | 273.39855 | 101.96873 | 23.25973 | 0.0824853 | 0.37805545 | 1.8942286 | 21 | — | — |
| 215783 2004 $JS_{34}$ | 15.8 | $X$ | 102.32747 | 216.17946 | 84.45461 | 9.16307 | 0.2227502 | 0.19555043 | 2.9396584 | 21 | 12 22.9 | 20.6 |
| 215784 2004 $JE_{42}$ | 17.0 | $X$ | 44.68895 | 75.07220 | 144.34162 | 10.23772 | 0.1010060 | 0.29311401 | 2.2444589 | 21 | 6 19.8 | 19.4 |
| 215785 2004 $KQ_{13}$ | 15.8 | $X$ | 232.48530 | 220.48742 | 103.90555 | 12.80767 | 0.2125021 | 0.22026570 | 2.7154270 | 21 | 3 6.4 | 20.6 |
| 215786 2004 $KM_{14}$ | 14.9 | $X$ | 343.66208 | 209.50514 | 92.19531 | 25.17734 | 0.1891620 | 0.17807000 | 3.1290239 | 21 | 6 26.9 | 18.1 |
| 215787 2004 $LT$ | 15.8 | $X$ | 7.04617 | 82.51134 | 192.67147 | 19.91487 | 0.2015870 | 0.17821060 | 3.1273779 | 21 | 7 6.6 | 19.6 |
| 215788 2004 $LW_{4}$ | 15.8 | $X$ | 11.41562 | 109.89577 | 109.00742 | 12.27020 | 0.1262231 | 0.22921385 | 2.6442883 | 21 | 4 28.4 | 18.9 |
| 215789 2004 $LQ_{9}$ | 15.5 | $X$ | 47.81009 | 221.18236 | 75.85318 | 10.85336 | 0.0638580 | 0.18721574 | 3.0262710 | 21 | 10 7.3 | 19.8 |
| 215790 2004 $LK_{14}$ | 17.0 | $X$ | 306.56326 | 146.41037 | 126.25208 | 3.52176 | 0.1469290 | 0.28198895 | 2.3031099 | 21 | 3 11.5 | 19.8 |
| 215791 2004 $LP_{24}$ | 15.3 | $X$ | 22.94987 | 166.43915 | 139.40361 | 19.70812 | 0.2380800 | 0.17720716 | 3.1391726 | 21 | 10 4.7 | 19.2 |
| 215792 2004 $MS_{3}$ | 15.0 | $X$ | 25.24124 | 48.98247 | 230.71387 | 11.11693 | 0.1845453 | 0.17594617 | 3.1541536 | 21 | 8 15.3 | 18.9 |
| 215793 2004 $MD_{7}$ | 15.1 | $X$ | 12.26184 | 171.92466 | 116.37218 | 16.54863 | 0.2104476 | 0.17518456 | 3.1632887 | 21 | 8 11.1 | 18.4 |
| 215794 2004 $NV_{12}$ | 15.8 | $X$ | 100.87879 | 106.08446 | 120.19264 | 7.21106 | 0.2643688 | 0.18489147 | 3.0515802 | 21 | 10 2.4 | 20.9 |
| 215795 2004 $NF_{18}$ | 16.0 | $X$ | 74.72116 | 9.16763 | 245.40910 | 6.02161 | 0.3200985 | 0.18440838 | 3.0569074 | 21 | 10 13.5 | 20.8 |
| 215796 2004 $NY_{28}$ | 15.5 | $X$ | 52.38053 | 133.14822 | 138.73134 | 16.15997 | 0.1794847 | 0.17914904 | 3.1164468 | 21 | 9 26.1 | 19.8 |
| 215797 2004 $OV$ | 15.2 | $X$ | 25.05772 | 166.19194 | 106.05657 | 17.42242 | 0.1619296 | 0.17597226 | 3.1538419 | 21 | 8 9.2 | 19.0 |
| 215798 2004 $OZ_{9}$ | 15.3 | $X$ | 51.37885 | 186.47511 | 106.82432 | 10.39477 | 0.2335707 | 0.18288050 | 3.0739097 | 21 | 10 30.3 | 19.7 |
| 215799 2004 $OK_{10}$ | 16.8 | $X$ | 276.38684 | 341.35896 | 10.47550 | 5.53408 | 0.1564934 | 0.28280830 | 2.2986594 | 21 | 5 17.2 | 19.7 |
| 215800 2004 $PS_{27}$ | 15.2 | $X$ | 60.57757 | 203.25654 | 87.07337 | 8.81559 | 0.1407103 | 0.18121177 | 3.0927522 | 21 | 10 23.8 | 19.6 |
| 215801 2004 $PK_{64}$ | 15.4 | $X$ | 0.72327 | 37.78821 | 244.29579 | 6.69031 | 0.1452196 | 0.17074243 | 3.2179188 | 21 | 7 4.4 | 19.2 |
| 215802 2004 $PB_{73}$ | 16.4 | $X$ | 283.58673 | 308.13554 | 340.11998 | 6.62756 | 0.1283863 | 0.27500767 | 2.3419243 | 21 | 3 5.9 | 19.7 |
| 215803 2004 $PQ_{83}$ | 16.7 | $X$ | 192.09706 | 50.94534 | 155.13746 | 23.37994 | 0.0533242 | 0.36013407 | 1.9565603 | 21 | 12 29.0 | 19.4 |
| 215804 2004 $QG_{8}$ | 14.9 | $X$ | 357.93085 | 269.40298 | 38.60943 | 15.63646 | 0.2242703 | 0.17332612 | 3.1858602 | 21 | 8 14.6 | 18.5 |
| 215805 2004 $RT_{25}$ | 17.6 | $X$ | 187.90502 | 341.94206 | 61.10397 | 2.48254 | 0.1870332 | 0.27039034 | 2.3685102 | 21 | 4 26.1 | 21.2 |
| 215806 2004 $RW_{138}$ | 16.2 | $X$ | 196.78907 | 161.07570 | 322.01520 | 24.01161 | 0.2206130 | 0.28465337 | 2.2887156 | 21 | 8 14.8 | 19.7 |
| 215807 2004 $RE_{168}$ | 15.9 | $X$ | 48.32280 | 111.43648 | 170.59921 | 14.68058 | 0.2368620 | 0.17914929 | 3.1164440 | 21 | 10 9.9 | 20.0 |
| 215808 2004 $RS_{236}$ | 16.8 | $X$ | 341.38418 | 63.31997 | 193.89433 | 6.17068 | 0.1011669 | 0.27647431 | 2.3336346 | 21 | 4 20.2 | 19.1 |
| 215809 Hugoschwarz | 17.6 | $X$ | 133.53699 | 42.49928 | 323.71019 | 1.52719 | 0.1941001 | 0.25700139 | 2.4500732 | 21 | 1 18.7 | 20.8 |
| 215810 2004 $RZ_{290}$ | 16.5 | $X$ | 272.81758 | 126.98026 | 287.21245 | 3.26604 | 0.1633572 | 0.22485882 | 2.6783218 | 21 | 8 7.9 | 20.0 |
| 215811 2004 $RE_{308}$ | 15.2 | $X$ | 48.44946 | 300.41083 | 354.66937 | 9.87522 | 0.2074127 | 0.17448521 | 3.1717356 | 21 | 10 16.2 | 19.5 |
| 215812 2004 $TC_{139}$ | 15.2 | $X$ | 72.23497 | 30.79890 | 267.03864 | 3.79605 | 0.1400315 | 0.17861270 | 3.1226825 | 21 | 11 10.4 | 19.8 |
| 215813 2004 $TL_{197}$ | 17.6 | $X$ | 311.19279 | 235.50546 | 199.54134 | 6.16693 | 0.2170915 | 0.29193934 | 2.2504755 | 21 | 11 28.3 | 18.8 |
| 215814 2004 $TO_{220}$ | 14.9 | $X$ | 22.89134 | 216.17005 | 156.71304 | 17.72882 | 0.2563099 | 0.17887756 | 3.1195992 | 21 | 12 27.6 | 19.1 |
| 215815 2004 $TV_{242}$ | 15.7 | $X$ | 334.92477 | 250.19224 | 59.98337 | 14.39531 | 0.1711018 | 0.22481806 | 2.6786456 | 21 | 6 21.4 | 18.6 |
| 215816 2004 $TH_{277}$ | 16.3 | $X$ | 55.84163 | 273.92692 | 50.84189 | 5.19612 | 0.0621931 | 0.23359712 | 2.6111053 | 21 | 11 22.8 | 19.6 |
| 215817 2004 $VB_{27}$ | 16.0 | $X$ | 308.09766 | 190.77067 | 249.97573 | 11.48214 | 0.1200482 | 0.23139537 | 2.6276425 | 21 | 11 16.2 | 18.9 |
| 215818 2004 $XP_{31}$ | 16.4 | $X$ | 9.68026 | 110.15382 | 295.47714 | 2.30890 | 0.0982112 | 0.23236919 | 2.6202960 | 21 | — | — |
| 215819 2004 $XW_{34}$ | 17.3 | $X$ | 324.83129 | 85.69829 | 79.89226 | 4.64466 | 0.0881942 | 0.30188016 | 2.2007954 | 21 | — | — |
| 215820 2004 $XX_{35}$ | 16.3 | $X$ | 350.81431 | 210.39154 | 184.47748 | 11.91703 | 0.1883077 | 0.23226465 | 2.6210822 | 21 | 12 6.9 | 19.1 |
| 215821 2004 $XO_{157}$ | 17.0 | $X$ | 326.43784 | 22.80087 | 90.71196 | 6.99090 | 0.1025152 | 0.29393588 | 2.2402732 | 21 | — | — |
| 215822 2004 $XT_{184}$ | 13.0 | $X$ | 341.25524 | 202.68015 | 82.12977 | 11.19513 | 0.0410702 | 0.08594816 | 5.0852424 | 21 | 6 13.6 | 19.6 |
| 215823 2005 $AX_{18}$ | 16.8 | $X$ | 254.38111 | 76.38403 | 113.90591 | 7.09964 | 0.0482781 | 0.29332139 | 2.2434009 | 21 | — | — |
| 215824 2005 $AY_{25}$ | 17.7 | $X$ | 285.37449 | 267.38409 | 175.70752 | 0.96140 | 0.2059255 | 0.28300332 | 2.2976032 | 21 | 10 8.3 | 19.7 |
| 215825 2005 $AC_{32}$ | 17.2 | $X$ | 228.26322 | 67.42899 | 103.56639 | 2.14086 | 0.1645000 | 0.28423049 | 2.2909852 | 21 | 11 23.9 | 19.9 |
| 215826 2005 $AN_{43}$ | 17.6 | $X$ | 254.19909 | 19.47669 | 128.30428 | 0.94885 | 0.1490014 | 0.28503351 | 2.2866802 | 21 | 11 30.3 | 20.1 |
| 215827 2005 $AW_{53}$ | 17.1 | $X$ | 283.65561 | 204.70722 | 268.72439 | 2.61673 | 0.1724002 | 0.28473414 | 2.2882828 | 21 | 11 26.9 | 19.0 |
| 215828 2005 $AX_{53}$ | 17.4 | $X$ | 274.38977 | 248.01587 | 215.85620 | 1.37295 | 0.1987323 | 0.28211975 | 2.3023980 | 21 | 10 20.8 | 19.7 |
| 215829 2005 $AK_{61}$ | 17.3 | $X$ | 7.15701 | 46.93263 | 57.21966 | 2.99243 | 0.0579943 | 0.29711604 | 2.2242588 | 21 | — | — |
| 215830 2005 $BK_{8}$ | 17.0 | $X$ | 263.15209 | 115.06858 | 89.68240 | 7.32468 | 0.0370051 | 0.29656384 | 2.2270190 | 21 | — | — |
| 215831 2005 $BD_{11}$ | 16.6 | $X$ | 340.62129 | 158.19179 | 320.20656 | 5.14527 | 0.2432341 | 0.23542920 | 2.5975415 | 21 | — | — |
| 215832 2005 $BR_{27}$ | 16.9 | $X$ | 263.21736 | 65.04057 | 127.44052 | 7.25563 | 0.0787323 | 0.29243167 | 2.2479489 | 21 | — | — |
| 215833 2005 $CZ_{5}$ | 16.8 | $X$ | 242.08999 | 11.58173 | 148.22575 | 5.81324 | 0.0981308 | 0.28215823 | 2.3021886 | 21 | 12 7.6 | 19.6 |
| 215834 2005 $CL_{11}$ | 17.1 | $X$ | 271.21219 | 340.28393 | 109.58009 | 3.04848 | 0.1622119 | 0.27874797 | 2.3209275 | 21 | 10 2.6 | 19.7 |
| 215835 2005 $CZ_{15}$ | 15.9 | $X$ | 336.99638 | 41.04200 | 308.89213 | 5.41654 | 0.0540371 | 0.21282203 | 2.7783802 | 21 | 8 29.8 | 19.4 |
| 215836 2005 $CW_{18}$ | 17.3 | $X$ | 191.81584 | 50.56117 | 135.80448 | 5.28069 | 0.1830079 | 0.27832936 | 2.3232540 | 21 | 11 3.4 | 20.8 |
| 215837 2005 $CX_{20}$ | 17.1 | $X$ | 176.08678 | 114.93825 | 71.05704 | 3.23024 | 0.1435352 | 0.27523370 | 2.3406419 | 21 | 10 19.8 | 20.6 |
| 215838 2005 $CT_{22}$ | 16.6 | $X$ | 288.42258 | 41.21161 | 100.93757 | 6.50667 | 0.1187386 | 0.28891729 | 2.2661415 | 21 | — | — |
| 215839 2005 $CP_{26}$ | 17.2 | $X$ | 189.08427 | 197.37354 | 108.35915 | 6.13118 | 0.1947064 | 0.29665413 | 2.2265671 | 21 | — | — |
| 215840 2005 $CP_{35}$ | 17.2 | $X$ | 109.88552 | 111.86638 | 95.18629 | 2.31304 | 0.1382396 | 0.26720989 | 2.3872672 | 21 | 9 9.7 | 20.6 |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215841 Čimelice | 17.1 | $X$ | 218.12678 | 20.81804 | 128.80172 | 2.60417 | 0.1403740 | 0.27777762 | 2.3263294 | 21 | 10 17.5 | 20.2 |
| 215842 2005 $CB_{46}$ | 16.8 | $X$ | 122.01138 | 317.87437 | 355.42553 | 1.65823 | 0.0752946 | 0.22783240 | 2.6549666 | 21 | — | — |
| 215843 2005 $CU_{57}$ | 17.3 | $X$ | 43.92421 | 294.91892 | 131.44180 | 5.05982 | 0.0994087 | 0.29783781 | 2.2206639 | 21 | — | — |
| 215844 2005 $CA_{63}$ | 15.7 | $X$ | 315.49844 | 205.03125 | 79.38569 | 3.10301 | 0.0510372 | 0.19460812 | 2.9491402 | 21 | 5 3.9 | 19.7 |
| 215845 2005 $CS_{65}$ | 17.2 | $X$ | 304.87791 | 12.10541 | 86.49000 | 3.92329 | 0.0770668 | 0.28350823 | 2.2948745 | 21 | 12 22.6 | 19.2 |
| 215846 2005 $EJ_{5}$ | 16.6 | $X$ | 115.98807 | 142.73156 | 132.69348 | 4.64784 | 0.1088499 | 0.27610150 | 2.3357349 | 21 | 12 11.8 | 20.1 |
| 215847 2005 $EL_{5}$ | 17.1 | $X$ | 101.08367 | 61.88271 | 138.86135 | 5.49674 | 0.1975569 | 0.26145721 | 2.4221571 | 21 | 8 28.1 | 20.6 |
| 215848 2005 $EA_{6}$ | 16.8 | $X$ | 128.88628 | 185.47607 | 30.86799 | 3.30431 | 0.1223003 | 0.26905142 | 2.3763616 | 21 | 10 10.3 | 20.3 |
| 215849 2005 $EZ_{12}$ | 17.0 | $X$ | 121.53863 | 199.68208 | 44.77197 | 3.01197 | 0.1624354 | 0.27303176 | 2.3532096 | 21 | 11 9.5 | 20.7 |
| 215850 2005 $ED_{15}$ | 17.2 | $X$ | 138.12482 | 54.19661 | 143.88694 | 2.77310 | 0.1480234 | 0.26870770 | 2.3783877 | 21 | 9 27.6 | 20.8 |
| 215851 2005 $EB_{18}$ | 17.5 | $X$ | 168.08024 | 22.67259 | 150.78046 | 1.65655 | 0.1170328 | 0.26972407 | 2.3724091 | 21 | 9 25.1 | 20.8 |
| 215852 2005 $ES_{20}$ | 17.0 | $X$ | 161.23619 | 97.36433 | 97.63009 | 2.08029 | 0.1197310 | 0.27282417 | 2.3544031 | 21 | 10 16.8 | 20.4 |
| 215853 2005 $EB_{29}$ | 16.6 | $X$ | 141.68157 | 153.01856 | 46.04123 | 2.83963 | 0.1439630 | 0.26813366 | 2.3817810 | 21 | 10 2.2 | 20.3 |
| 215854 2005 $EQ_{29}$ | 17.0 | $X$ | 219.11979 | 297.86528 | 208.53278 | 2.79965 | 0.1847365 | 0.27817586 | 2.3241086 | 21 | 10 7.6 | 20.3 |
| 215855 2005 $EG_{36}$ | 16.9 | $X$ | 112.87034 | 4.40132 | 227.59622 | 5.91706 | 0.1927423 | 0.26830612 | 2.3807603 | 21 | 10 17.1 | 20.6 |
| 215856 2005 $ER_{47}$ | 17.1 | $X$ | 173.56344 | 172.52661 | 15.28715 | 2.26093 | 0.1085705 | 0.27422854 | 2.3463580 | 21 | 10 19.6 | 20.5 |
| 215857 2005 $EF_{52}$ | 17.1 | $X$ | 65.77905 | 76.83649 | 147.04676 | 2.11018 | 0.1385013 | 0.26287355 | 2.4134490 | 21 | 8 6.4 | 19.8 |
| 215858 2005 $ES_{58}$ | 17.1 | $X$ | 160.42419 | 325.01678 | 213.00060 | 0.91985 | 0.1156443 | 0.26892373 | 2.3771137 | 21 | 9 22.3 | 20.7 |
| 215859 2005 $EJ_{63}$ | 16.9 | $X$ | 236.32236 | 250.24121 | 244.33637 | 1.94165 | 0.1665570 | 0.21741982 | 2.7390710 | 21 | 10 6.5 | 20.9 |
| 215860 2005 $EQ_{71}$ | 16.9 | $X$ | 227.92336 | 63.07644 | 72.71422 | 5.47642 | 0.1187342 | 0.27712332 | 2.3299897 | 21 | 10 14.6 | 19.9 |
| 215861 2005 $EM_{101}$ | 16.5 | $X$ | 66.58583 | 141.69333 | 84.50104 | 10.39578 | 0.1575959 | 0.25796244 | 2.4439842 | 21 | 8 17.9 | 19.7 |
| 215862 2005 $ED_{112}$ | 16.6 | $X$ | 249.33862 | 326.37200 | 152.11847 | 6.70054 | 0.0612750 | 0.27456833 | 2.3444218 | 21 | 10 27.8 | 19.5 |
| 215863 2005 $EX_{132}$ | 17.5 | $X$ | 139.85162 | 279.19096 | 208.58552 | 2.33981 | 0.1281339 | 0.25942584 | 2.4347847 | 21 | 6 25.6 | 20.9 |
| 215864 2005 $EC_{142}$ | 16.7 | $X$ | 133.11372 | 325.47903 | 247.34896 | 4.41936 | 0.0242487 | 0.27140303 | 2.3626148 | 21 | 10 3.3 | 19.7 |
| 215865 2005 $ET_{144}$ | 16.0 | $X$ | 170.35683 | 265.32148 | 164.53651 | 6.21933 | 0.0717902 | 0.19312408 | 2.9642291 | 21 | 5 15.2 | 20.5 |
| 215866 2005 $EG_{145}$ | 16.7 | $X$ | 163.01020 | 47.46201 | 165.14520 | 6.85737 | 0.0418154 | 0.27443352 | 2.3451895 | 21 | 11 14.4 | 19.8 |
| 215867 2005 $EK_{148}$ | 16.8 | $X$ | 36.76899 | 161.49940 | 122.78964 | 3.53558 | 0.2198838 | 0.26007524 | 2.4307299 | 21 | 10 3.9 | 19.4 |
| 215868 Rohrer | 17.1 | $X$ | 283.29694 | 209.63550 | 231.40212 | 0.47884 | 0.0416256 | 0.27474362 | 2.3434245 | 21 | 10 24.9 | 19.6 |
| 215869 2005 $ET_{156}$ | 16.5 | $X$ | 325.70568 | 230.27584 | 347.35316 | 2.78098 | 0.1447432 | 0.24118221 | 2.5560688 | 21 | 1 29.6 | 19.6 |
| 215870 2005 $EM_{161}$ | 17.3 | $X$ | 79.08502 | 179.49980 | 58.78530 | 2.12373 | 0.1426063 | 0.26128294 | 2.4232340 | 21 | 9 15.8 | 20.4 |
| 215871 2005 $EO_{165}$ | 17.4 | $X$ | 210.53266 | 98.80532 | 22.33674 | 1.95590 | 0.1277528 | 0.26910649 | 2.3760374 | 21 | 8 31.9 | 20.8 |
| 215872 2005 $EH_{176}$ | 17.8 | $X$ | 25.96375 | 61.84273 | 233.25257 | 0.52618 | 0.1910992 | 0.26301364 | 2.4125919 | 21 | 9 24.2 | 19.9 |
| 215873 2005 $EO_{183}$ | 17.6 | $X$ | 181.84808 | 323.69564 | 187.88349 | 0.90056 | 0.1143073 | 0.26826268 | 2.3810173 | 21 | 9 10.2 | 21.1 |
| 215874 2005 $EB_{193}$ | 17.3 | $X$ | 62.63780 | 42.97453 | 258.78941 | 1.25931 | 0.2149311 | 0.27019559 | 2.3696482 | 21 | 11 28.5 | 20.7 |
| 215875 2005 $EY_{193}$ | 17.2 | $X$ | 0.61892 | 116.48326 | 195.07433 | 3.79877 | 0.1316669 | 0.26278659 | 2.4139814 | 21 | 8 20.6 | 19.5 |
| 215876 2005 $EO_{207}$ | 16.8 | $X$ | 171.10870 | 139.02311 | 87.47637 | 4.88401 | 0.0207631 | 0.27939129 | 2.3173634 | 21 | 12 13.5 | 19.5 |
| 215877 2005 $EU_{219}$ | 16.7 | $X$ | 303.93352 | 78.28956 | 198.43609 | 11.51337 | 0.2780481 | 0.24119806 | 2.5559568 | 21 | 2 24.8 | 20.7 |
| 215878 2005 $EM_{230}$ | 17.0 | $X$ | 152.38122 | 165.85070 | 138.67126 | 3.97200 | 0.1603268 | 0.28904775 | 2.2654596 | 21 | — | — |
| 215879 2005 $EA_{231}$ | 16.9 | $X$ | 131.41145 | 111.06804 | 68.68828 | 8.22035 | 0.1467238 | 0.26332799 | 2.4106715 | 21 | 8 30.9 | 20.7 |
| 215880 2005 $EA_{245}$ | 16.6 | $X$ | 65.63800 | 75.81790 | 177.52310 | 6.84795 | 0.0698641 | 0.25980410 | 2.4324209 | 21 | 9 5.2 | 19.5 |
| 215881 2005 $EE_{245}$ | 17.2 | $X$ | 110.82047 | 63.81658 | 119.27309 | 2.16855 | 0.1299230 | 0.25875208 | 2.4390094 | 21 | 8 7.1 | 20.5 |
| 215882 2005 $EO_{253}$ | 17.4 | $X$ | 124.04064 | 81.11815 | 103.16637 | 2.21171 | 0.1226940 | 0.26334885 | 2.4105442 | 21 | 8 23.8 | 20.9 |
| 215883 2005 $EJ_{295}$ | 16.8 | $X$ | 112.81732 | 72.50360 | 196.93301 | 5.69378 | 0.1333974 | 0.27350610 | 2.3504880 | 21 | 12 1.9 | 20.4 |
| 215884 2005 $EX_{296}$ | 17.3 | $X$ | 180.83500 | 256.79124 | 92.68351 | 1.86672 | 0.2050719 | 0.29653652 | 2.2271558 | 21 | 2 9.6 | 20.7 |
| 215885 2005 $EW_{323}$ | 16.9 | $X$ | 129.55693 | 346.93066 | 177.77142 | 5.26053 | 0.1386301 | 0.26119060 | 2.4238051 | 21 | 8 2.8 | 20.6 |
| 215886 Barryarnold | 17.4 | $X$ | 140.84280 | 359.20274 | 180.39350 | 3.00300 | 0.0927479 | 0.26492785 | 2.4009566 | 21 | 9 2.1 | 20.9 |
| 215887 2005 $GZ_{2}$ | 17.6 | $X$ | 118.84674 | 116.99600 | 56.79535 | 2.95186 | 0.1425051 | 0.25923832 | 2.4359586 | 21 | 8 5.9 | 21.1 |
| 215888 2005 $GU_{4}$ | 16.5 | $X$ | 6.34227 | 262.52826 | 62.85129 | 7.27440 | 0.1608501 | 0.26108837 | 2.4244377 | 21 | 10 2.0 | 18.8 |
| 215889 2005 $GY_{5}$ | 16.8 | $X$ | 284.35358 | 345.96656 | 61.21634 | 6.81422 | 0.0889960 | 0.26442586 | 2.4039943 | 21 | 9 3.8 | 19.7 |
| 215890 2005 $GM_{17}$ | 17.6 | $X$ | 142.33401 | 326.35326 | 188.06703 | 0.97583 | 0.1231496 | 0.26318609 | 2.4115379 | 21 | 8 2.7 | 21.2 |
| 215891 2005 $GF_{19}$ | 17.7 | $X$ | 109.25847 | 137.37954 | 30.77006 | 2.53470 | 0.1124019 | 0.25681558 | 2.4512549 | 21 | 7 13.9 | 21.1 |
| 215892 2005 $GG_{30}$ | 17.2 | $X$ | 63.24920 | 193.11893 | 73.36682 | 4.94412 | 0.1453244 | 0.26299008 | 2.4127360 | 21 | 10 6.0 | 20.3 |
| 215893 2005 $GS_{42}$ | 17.1 | $X$ | 218.82240 | 318.26257 | 172.60597 | 6.66231 | 0.0574898 | 0.27447768 | 2.3449380 | 21 | 10 2.5 | 20.2 |
| 215894 2005 $GN_{53}$ | 17.7 | $X$ | 2.64783 | 71.31123 | 221.33266 | 1.22716 | 0.1682471 | 0.25287196 | 2.4766745 | 21 | 7 27.2 | 19.6 |
| 215895 2005 $GG_{54}$ | 17.1 | $X$ | 349.11876 | 327.41130 | 207.35696 | 1.74462 | 0.1214848 | 0.23898851 | 2.5716866 | 21 | 1 9.7 | 20.1 |
| 215896 2005 $GV_{58}$ | 16.8 | $X$ | 109.68620 | 76.58226 | 119.47679 | 5.48308 | 0.1406124 | 0.26011261 | 2.4304971 | 21 | 8 25.7 | 20.2 |
| 215897 2005 $GJ_{66}$ | 17.6 | $X$ | 44.45666 | 107.63655 | 51.70914 | 0.77942 | 0.1235634 | 0.24472395 | 2.5313473 | 21 | 3 25.5 | 20.2 |
| 215898 2005 $GR_{69}$ | 16.7 | $X$ | 99.18897 | 122.34441 | 99.97372 | 10.38679 | 0.0868354 | 0.26186068 | 2.4196684 | 21 | 9 15.7 | 20.2 |
| 215899 2005 $GQ_{104}$ | 17.4 | $X$ | 57.94752 | 77.73170 | 174.01652 | 4.24084 | 0.0893056 | 0.25952929 | 2.4341376 | 21 | 8 25.9 | 20.2 |
| 215900 2005 $GR_{124}$ | 16.2 | $X$ | 21.79919 | 207.47215 | 77.30223 | 16.80546 | 0.0840564 | 0.25969082 | 2.4331281 | 21 | 8 23.9 | 19.3 |
| 215901 2005 $GA_{130}$ | 16.6 | $X$ | 81.04808 | 115.30500 | 67.10197 | 6.95499 | 0.0754165 | 0.25275878 | 2.4774138 | 21 | 6 19.2 | 19.6 |
| 215902 2005 $GL_{169}$ | 16.1 | $X$ | 205.71890 | 243.57014 | 29.07697 | 3.81180 | 0.0607529 | 0.22634868 | 2.6665562 | 21 | — | — |
| 215903 2005 $GO_{181}$ | 17.0 | $X$ | 141.72045 | 357.17536 | 134.96607 | 3.14915 | 0.1419388 | 0.25729570 | 2.4482045 | 21 | 7 4.5 | 20.8 |
| 215904 2005 $GX_{181}$ | 16.9 | $X$ | 52.70620 | 193.77347 | 78.15043 | 2.56569 | 0.1696930 | 0.26075013 | 2.4265339 | 21 | 10 1.5 | 19.9 |
| 215905 2005 $GF_{223}$ | 17.1 | $X$ | 264.25790 | 358.77771 | 163.13539 | 2.97417 | 0.0954586 | 0.28109106 | 2.3080118 | 21 | — | — |
| 215906 2005 $GV_{226}$ | 16.7 | $X$ | 41.83461 | 299.51866 | 240.96445 | 2.69738 | 0.1018097 | 0.24557992 | 2.5254619 | 21 | 4 17.7 | 19.3 |
| 215907 2005 $HT_{3}$ | 16.4 | $X$ | 356.21745 | 189.13925 | 161.66691 | 6.11326 | 0.1380056 | 0.26611743 | 2.3937962 | 21 | 10 17.2 | 18.6 |
| 215908 2005 $HH_{6}$ | 16.8 | $X$ | 352.87998 | 110.01422 | 151.00605 | 5.85821 | 0.0395895 | 0.24632774 | 2.5203479 | 21 | 5 24.7 | 19.9 |
| 215909 2005 $JH_{13}$ | 16.5 | $X$ | 320.92343 | 287.95160 | 39.15049 | 8.01436 | 0.1167031 | 0.25408425 | 2.4687904 | 21 | 6 28.5 | 19.2 |
| 215910 2005 $JL_{20}$ | 15.7 | $X$ | 77.97224 | 3.60165 | 139.28703 | 13.59850 | 0.0781796 | 0.24383557 | 2.5374920 | 21 | 4 26.6 | 19.1 |
| 215911 2005 $JX_{21}$ | 16.8 | $X$ | 91.30770 | 121.30233 | 140.84893 | 7.58249 | 0.0954062 | 0.26441972 | 2.4040315 | 21 | 10 28.7 | 20.2 |
| 215912 2005 $JK_{30}$ | 16.3 | $X$ | 256.53502 | 192.77027 | 110.49022 | 4.91755 | 0.1388259 | 0.23677937 | 2.5876576 | 21 | 3 1.9 | 20.2 |
| 215913 2005 $JE_{34}$ | 16.3 | $X$ | 9.16582 | 315.18082 | 255.06008 | 4.75769 | 0.1569941 | 0.24352978 | 2.5396156 | 21 | 3 28.9 | 18.7 |
| 215914 2005 $JK_{36}$ | 17.0 | $X$ | 278.17710 | 72.50391 | 238.57733 | 4.03380 | 0.2638878 | 0.23890996 | 2.5722502 | 21 | 3 16.9 | 21.3 |
| 215915 2005 $JG_{39}$ | 16.0 | $X$ | 281.99854 | 97.15295 | 233.43789 | 10.81762 | 0.2913031 | 0.24234454 | 2.5478893 | 21 | 4 10.0 | 20.0 |
| 215916 2005 $JT_{48}$ | 16.7 | $X$ | 31.64046 | 319.61431 | 94.38459 | 6.88458 | 0.0643406 | 0.28003350 | 2.3138190 | 21 | — | — |
| 215917 2005 $JB_{56}$ | 17.7 | $X$ | 75.88007 | 79.87255 | 161.63251 | 1.63089 | 0.1323702 | 0.26108382 | 2.4244659 | 21 | 9 13.6 | 20.6 |
| 215918 2005 $JG_{56}$ | 16.0 | $X$ | 172.00787 | 210.39926 | 129.93241 | 14.29310 | 0.1592062 | 0.22622622 | 2.6675184 | 21 | 1 27.4 | 20.0 |
| 215919 2005 $JZ_{70}$ | 16.3 | $X$ | 28.64166 | 350.51006 | 196.85454 | 13.23366 | 0.0994322 | 0.24339249 | 2.5405706 | 21 | 4 5.1 | 19.1 |
| 215920 2005 $JB_{86}$ | 16.4 | $X$ | 10.65559 | 285.40398 | 194.45657 | 3.30828 | 0.2099974 | 0.23133953 | 2.6280653 | 21 | — | — |

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

| Planet | $H$ | $G$ | $M$ | $\omega$ | $\Omega$ | $i$ | $e$ | $\mu$ | $a$ | TE | Oppos. | $V$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m | | ° | ° | ° | ° | | ° | | | | |
| 215921 2005 $JV_{98}$ | 15.6 | X | 286.52321 | 351.89642 | 195.02292 | 15.63246 | 0.1885953 | 0.22594422 | 2.6697375 | 21 | — | — |
| 215922 2005 $JG_{103}$ | 15.6 | X | 188.63531 | 238.01936 | 129.11581 | 14.76860 | 0.2289541 | 0.23181229 | 2.6244909 | 21 | 3 21.4 | 20.3 |
| 215923 2005 $JP_{103}$ | 16.4 | X | 161.26528 | 342.84606 | 17.83625 | 8.69783 | 0.1238805 | 0.23691290 | 2.5866852 | 21 | 2 9.5 | 20.3 |
| 215924 2005 $JX_{104}$ | 17.7 | X | 25.19788 | 80.08847 | 53.45863 | 5.58806 | 0.2519832 | 0.23689255 | 2.5868333 | 21 | 1 3.8 | 19.7 |
| 215925 2005 $JP_{107}$ | 16.4 | X | 334.06299 | 69.86270 | 196.33022 | 4.69149 | 0.1186690 | 0.24454546 | 2.5325789 | 21 | 4 22.4 | 19.2 |
| 215926 2005 $JX_{126}$ | 16.1 | X | 313.71206 | 148.11522 | 106.54185 | 11.01516 | 0.1777153 | 0.23860946 | 2.5744094 | 21 | 3 1.7 | 19.6 |
| 215927 2005 $JZ_{127}$ | 16.1 | X | 18.70738 | 355.61886 | 209.69405 | 9.59485 | 0.1443423 | 0.24319960 | 2.5419137 | 21 | 4 12.9 | 18.5 |
| 215928 2005 $JX_{151}$ | 17.3 | X | 81.42529 | 144.36205 | 109.08929 | 2.67251 | 0.1277396 | 0.26438151 | 2.4042631 | 21 | 10 7.7 | 20.5 |
| 215929 2005 $JP_{153}$ | 16.5 | X | 140.84370 | 56.22537 | 97.38163 | 7.03515 | 0.0571607 | 0.25794959 | 2.4440654 | 21 | 7 27.3 | 19.7 |
| 215930 2005 $JB_{161}$ | 16.6 | X | 345.28148 | 324.80088 | 207.78684 | 13.16464 | 0.1073281 | 0.23323064 | 2.6138399 | 21 | 1 2.9 | 20.2 |
| 215931 2005 $KF_{4}$ | 17.1 | X | 156.38028 | 336.45309 | 169.42955 | 2.42087 | 0.0639741 | 0.25844502 | 2.4409410 | 21 | 8 3.9 | 20.6 |
| 215932 2005 $KY_{4}$ | 16.6 | X | 273.85902 | 76.31405 | 207.13404 | 3.30704 | 0.2145405 | 0.23493748 | 2.6011647 | 21 | 2 13.2 | 20.8 |
| 215933 2005 $KU_{5}$ | 16.9 | X | 264.24984 | 172.73235 | 122.24095 | 15.19352 | 0.2370707 | 0.23343679 | 2.6123008 | 21 | 2 20.3 | 21.3 |
| 215934 2005 $KV_{6}$ | 16.9 | X | 318.00851 | 39.01533 | 230.49074 | 8.27678 | 0.1369843 | 0.24110936 | 2.5565836 | 21 | 3 26.7 | 20.3 |
| 215935 2005 $KW_{6}$ | 16.7 | X | 287.80168 | 112.58590 | 211.34537 | 2.88103 | 0.2216752 | 0.24195992 | 2.5505887 | 21 | 4 18.5 | 20.1 |
| 215936 2005 $KQ_{10}$ | 16.1 | X | 259.70217 | 118.76736 | 235.24332 | 3.73252 | 0.2870116 | 0.24147294 | 2.5540167 | 21 | 4 21.3 | 20.3 |
| 215937 2005 $KW_{10}$ | 16.0 | X | 272.15008 | 222.54841 | 39.38842 | 14.95548 | 0.0873532 | 0.23306368 | 2.6150881 | 21 | 2 4.9 | 20.1 |
| 215938 2005 $LS_{4}$ | 15.7 | X | 153.94241 | 142.47929 | 210.86272 | 13.81494 | 0.1946816 | 0.22587197 | 2.6703068 | 21 | 1 25.2 | 20.2 |
| 215939 2005 $LQ_{5}$ | 15.9 | X | 225.51995 | 86.92367 | 224.96908 | 11.68620 | 0.1157130 | 0.23018754 | 2.6368262 | 21 | 2 6.1 | 20.2 |
| 215940 2005 $LS_{5}$ | 15.8 | X | 306.42921 | 108.66967 | 97.93711 | 12.60261 | 0.1234377 | 0.22984949 | 2.6394110 | 21 | — | — |
| 215941 2005 $LO_{20}$ | 16.7 | X | 35.57732 | 351.91848 | 186.39237 | 5.83998 | 0.1511140 | 0.24202580 | 2.5501258 | 21 | 4 8.2 | 18.9 |
| 215942 2005 $LG_{22}$ | 16.6 | X | 125.21534 | 302.37483 | 169.17381 | 4.53129 | 0.1125548 | 0.24697800 | 2.5159222 | 21 | 5 17.9 | 20.1 |
| 215943 2005 $MN_{3}$ | 16.2 | X | 296.51732 | 114.53605 | 168.25671 | 11.14419 | 0.1666200 | 0.23804527 | 2.5784755 | 21 | 3 14.9 | 19.8 |
| 215944 2005 $MU_{11}$ | 16.6 | X | 204.04819 | 99.76692 | 198.63148 | 7.47642 | 0.1349597 | 0.22437501 | 2.6821705 | 21 | 1 5.2 | 21.0 |
| 215945 2005 $ML_{15}$ | 15.9 | X | 80.32595 | 217.73914 | 134.49747 | 6.92857 | 0.0842067 | 0.20502445 | 2.8483867 | 21 | — | — |
| 215946 2005 $MA_{23}$ | 15.5 | X | 214.91284 | 10.83976 | 286.56830 | 11.21709 | 0.2964772 | 0.22047992 | 2.7136678 | 21 | 1 15.6 | 20.6 |
| 215947 2005 $MZ_{38}$ | 15.3 | X | 219.03329 | 319.51590 | 133.01712 | 12.76895 | 0.1552427 | 0.18200102 | 3.0838044 | 21 | 7 28.1 | 20.1 |
| 215948 2005 $MC_{43}$ | 16.5 | X | 203.55016 | 123.74308 | 146.26907 | 2.49446 | 0.1833312 | 0.21547803 | 2.7555019 | 21 | — | — |
| 215949 2005 $MH_{43}$ | 16.0 | X | 240.51637 | 14.52701 | 265.52433 | 11.27222 | 0.1626822 | 0.22351961 | 2.6890093 | 21 | 1 15.1 | 20.5 |
| 215950 2005 $NO_{6}$ | 16.4 | X | 69.89260 | 243.91008 | 135.36423 | 7.34091 | 0.0636840 | 0.20935198 | 2.8089974 | 21 | — | — |
| 215951 2005 $NC_{23}$ | 16.6 | X | 322.54920 | 32.91249 | 240.96785 | 5.64249 | 0.1907928 | 0.24185777 | 2.5513068 | 21 | 3 31.4 | 19.7 |
| 215952 2005 $NX_{27}$ | 16.2 | X | 183.27357 | 101.30648 | 154.00778 | 4.85717 | 0.0665950 | 0.20920971 | 2.8102707 | 21 | — | — |
| 215953 2005 $NR_{31}$ | 16.5 | X | 237.57147 | 129.93964 | 109.39340 | 4.49907 | 0.1427490 | 0.21717884 | 2.7410968 | 21 | — | — |
| 215954 2005 $NS_{31}$ | 15.8 | X | 208.60565 | 166.52861 | 177.56204 | 14.34801 | 0.2647129 | 0.22975886 | 2.6401050 | 21 | 3 4.0 | 20.6 |
| 215955 2005 $NF_{39}$ | 16.0 | X | 197.53801 | 239.73951 | 95.92912 | 12.12039 | 0.1548023 | 0.22375552 | 2.6871189 | 21 | 2 17.4 | 20.5 |
| 215956 2005 $NW_{40}$ | 16.4 | X | 204.14313 | 199.00432 | 127.68084 | 5.43478 | 0.0560683 | 0.22482973 | 2.6785528 | 21 | 2 7.8 | 20.2 |
| 215957 2005 $NT_{55}$ | 16.0 | X | 232.20842 | 63.06710 | 224.10028 | 12.18786 | 0.2469005 | 0.22235066 | 2.6984255 | 21 | 1 13.7 | 21.0 |
| 215958 2005 $NN_{56}$ | 16.3 | X | 90.01897 | 196.04575 | 119.52938 | 3.18745 | 0.0565893 | 0.20275309 | 2.8696200 | 21 | 12 16.3 | 20.4 |
| 215959 2005 $NL_{72}$ | 16.1 | X | 164.19925 | 273.44248 | 82.52845 | 9.91031 | 0.2186782 | 0.21974452 | 2.7197189 | 21 | 2 16.4 | 20.7 |
| 215960 2005 $NX_{74}$ | 15.7 | X | 132.02108 | 74.71869 | 125.42679 | 10.91668 | 0.0413968 | 0.19059028 | 2.9904431 | 21 | 9 13.8 | 20.1 |
| 215961 2005 $NC_{122}$ | 16.6 | X | 174.49226 | 218.52526 | 75.01252 | 7.99942 | 0.1226112 | 0.27542778 | 2.3395422 | 21 | — | — |
| 215962 2005 $PA$ | 16.3 | X | 169.24430 | 75.03424 | 232.91422 | 3.99349 | 0.1450635 | 0.21184217 | 2.7869410 | 21 | — | — |
| 215963 2005 $PK_{18}$ | 15.6 | X | 95.20409 | 247.48806 | 99.90375 | 16.04988 | 0.1631057 | 0.20567085 | 2.8424154 | 21 | — | — |
| 215964 2005 $QZ_{2}$ | 16.0 | X | 335.50227 | 183.57748 | 172.42618 | 5.15486 | 0.1280743 | 0.18528179 | 3.0472931 | 21 | 8 30.9 | 19.6 |
| 215965 2005 $QL_{32}$ | 17.0 | X | 193.17960 | 315.33107 | 339.60992 | 1.80315 | 0.2149925 | 0.27646982 | 2.3336599 | 21 | — | — |
| 215966 2005 $QD_{38}$ | 15.5 | X | 331.24676 | 145.95066 | 202.30500 | 7.32098 | 0.0772683 | 0.17986768 | 3.1081403 | 21 | 8 14.1 | 19.5 |
| 215967 2005 $QQ_{43}$ | 15.7 | X | 203.07397 | 319.25673 | 157.50554 | 11.07051 | 0.0376506 | 0.18171869 | 3.0869978 | 21 | 8 18.1 | 20.2 |
| 215968 2005 $QO_{53}$ | 15.8 | X | 281.41101 | 328.08911 | 25.88357 | 1.47862 | 0.1761654 | 0.17506444 | 3.1647356 | 21 | 5 30.4 | 20.3 |
| 215969 2005 $QJ_{55}$ | 15.9 | X | 70.20038 | 181.74092 | 120.60340 | 3.86885 | 0.1070584 | 0.19243636 | 2.9712872 | 21 | 11 13.3 | 20.1 |
| 215970 2005 $QV_{66}$ | 15.6 | X | 147.23947 | 213.38715 | 118.32223 | 10.41193 | 0.1517058 | 0.21145367 | 2.7903535 | 21 | — | — |
| 215971 2005 $QN_{68}$ | 15.7 | X | 322.28224 | 239.88259 | 62.12007 | 6.20727 | 0.1322461 | 0.17660893 | 3.1462576 | 21 | 5 26.6 | 19.4 |
| 215972 2005 $QM_{90}$ | 15.5 | X | 214.33860 | 274.39855 | 162.37724 | 12.91499 | 0.0561728 | 0.17668996 | 3.1452956 | 21 | 7 10.1 | 20.3 |
| 215973 2005 $QW_{96}$ | 15.8 | X | 192.55418 | 209.90605 | 142.38725 | 12.37369 | 0.1098353 | 0.22185088 | 2.7024766 | 21 | 3 1.8 | 19.9 |
| 215974 2005 $QQ_{106}$ | 15.9 | X | 262.90605 | 325.46649 | 48.87993 | 5.86161 | 0.2087658 | 0.17358473 | 3.1826951 | 21 | 5 30.7 | 20.8 |
| 215975 2005 $QK_{111}$ | 15.7 | X | 357.25777 | 148.94350 | 180.08808 | 11.13735 | 0.0794049 | 0.18234306 | 3.0799469 | 21 | 8 29.9 | 19.7 |
| 215976 2005 $QU_{120}$ | 16.4 | X | 220.44105 | 278.07338 | 353.99040 | 2.14582 | 0.0399966 | 0.21394878 | 2.7686167 | 21 | — | — |
| 215977 2005 $QR_{149}$ | 15.2 | X | 298.82132 | 324.70888 | 55.75538 | 10.63779 | 0.1139385 | 0.18186365 | 3.0853572 | 21 | 8 10.2 | 19.4 |
| 215978 2005 $QV_{179}$ | 15.6 | X | 78.24735 | 242.56572 | 88.79784 | 7.15840 | 0.0996852 | 0.19713350 | 2.9238994 | 21 | 12 25.8 | 19.8 |
| 215979 2005 $RD_{11}$ | 14.9 | X | 328.75066 | 112.67935 | 215.08264 | 12.09149 | 0.0794316 | 0.17636451 | 3.1491638 | 21 | 7 13.4 | 19.2 |
| 215980 2005 $RP_{22}$ | 15.5 | X | 330.31694 | 129.07112 | 222.63971 | 6.46739 | 0.1727166 | 0.17991111 | 3.1076402 | 21 | 8 9.4 | 19.1 |
| 215981 2005 $RR_{26}$ | 16.4 | X | 38.12119 | 187.52500 | 162.53184 | 2.87785 | 0.2012235 | 0.19251985 | 2.9704281 | 21 | 12 14.8 | 20.3 |
| 215982 2005 $SN_{27}$ | 15.2 | X | 299.39708 | 145.80105 | 208.87956 | 14.93486 | 0.0739961 | 0.17410820 | 3.1763126 | 21 | 7 6.8 | 19.8 |
| 215983 2005 $SC_{33}$ | 15.7 | X | 334.36656 | 166.90489 | 177.76680 | 9.71353 | 0.0762423 | 0.17704061 | 3.1411412 | 21 | 8 14.6 | 19.7 |
| 215984 2005 $SO_{37}$ | 15.1 | X | 24.84518 | 247.48976 | 14.67694 | 9.17174 | 0.0483587 | 0.17388358 | 3.1790474 | 21 | 7 15.7 | 19.5 |
| 215985 2005 $SH_{46}$ | 15.3 | X | 295.62762 | 160.65175 | 208.01363 | 10.56895 | 0.0940190 | 0.17483095 | 3.1675526 | 21 | 7 17.1 | 19.7 |
| 215986 2005 $SR_{48}$ | 15.9 | X | 261.99948 | 98.54233 | 232.63940 | 2.40160 | 0.1109785 | 0.22593799 | 2.6697866 | 21 | 4 13.5 | 19.8 |
| 215987 2005 $SW_{60}$ | 15.6 | X | 67.70594 | 131.56811 | 167.67922 | 1.74653 | 0.1400467 | 0.18849182 | 3.0125970 | 21 | 11 9.7 | 19.9 |
| 215988 2005 $ST_{70}$ | 15.2 | X | 259.57529 | 157.13969 | 225.54442 | 9.80853 | 0.0719725 | 0.17214124 | 3.2004627 | 21 | 6 23.4 | 19.9 |
| 215989 2005 $SK_{85}$ | 15.5 | X | 21.68481 | 92.97411 | 190.10037 | 12.01169 | 0.0793964 | 0.17684850 | 3.1434156 | 21 | 8 4.9 | 19.7 |
| 215990 2005 $SN_{119}$ | 15.1 | X | 347.49585 | 185.45762 | 169.07530 | 18.49248 | 0.2093559 | 0.18177778 | 3.0863288 | 21 | 9 20.9 | 18.2 |
| 215991 2005 $SZ_{125}$ | 15.3 | X | 314.99877 | 310.69367 | 46.59092 | 9.22800 | 0.1046178 | 0.17703440 | 3.1412146 | 21 | 8 4.2 | 19.4 |
| 215992 2005 $SS_{126}$ | 16.1 | X | 54.17887 | 222.14549 | 25.63438 | 1.15659 | 0.1181259 | 0.17718094 | 3.1394824 | 21 | 8 15.2 | 20.1 |
| 215993 2005 $SN_{163}$ | 15.4 | X | 335.83652 | 286.50873 | 97.23396 | 11.96898 | 0.1698595 | 0.18415266 | 3.0597367 | 21 | 10 14.4 | 19.0 |
| 215994 2005 $SJ_{166}$ | 15.4 | X | 284.41499 | 283.47985 | 86.56356 | 9.42281 | 0.1777464 | 0.17414241 | 3.1758966 | 21 | 6 23.5 | 19.9 |
| 215995 2005 $SR_{178}$ | 15.8 | X | 314.25361 | 149.11335 | 206.47696 | 9.96057 | 0.1042982 | 0.17726398 | 3.1385019 | 21 | 7 25.5 | 20.0 |
| 215996 2005 $SP_{185}$ | 16.2 | X | 1.26473 | 150.22042 | 124.60923 | 0.92182 | 0.1583699 | 0.17491265 | 3.1665662 | 21 | 6 26.1 | 19.5 |
| 215997 2005 $SH_{199}$ | 16.0 | X | 301.74937 | 3.23236 | 358.04440 | 1.44015 | 0.0999404 | 0.17808918 | 3.1287992 | 21 | 7 18.2 | 20.0 |
| 215998 2005 $SH_{201}$ | 15.9 | X | 51.14080 | 73.32147 | 181.13972 | 5.64915 | 0.1334488 | 0.17806513 | 3.1290809 | 21 | 8 20.1 | 20.0 |
| 215999 2005 $SV_{242}$ | 15.2 | X | 197.84077 | 204.98809 | 174.20529 | 8.82973 | 0.1049253 | 0.16046698 | 3.3538651 | 21 | 4 14.5 | 20.5 |
| 216000 2005 $SF_{258}$ | 15.6 | X | 38.03326 | 199.68594 | 95.25963 | 2.93692 | 0.1432985 | 0.18219680 | 3.0815950 | 21 | 9 27.4 | 19.5 |