

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|
| <b>136146 2003 SA<sub>294</sub></b> |                 |                 |          |       |         |      |        |            |             | <b>129322 2005 TN<sub>45</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 6.54          | +18 10.2        | 1.926    | 2.681 | 16.0    | 21.4 | 131 W  | 63         | 46          | 12 17                               | 10 3.13         | +26 48.1        | 2.213    | 2.846 | 17.3    | 21.4 | 121 W  | 72         | 37          |
| 12 27                               | 9 1.70          | +18 48.2        | 1.840    | 2.691 | 12.7    | 21.2 | 143 W  | 64         | 45          | 12 27                               | 10 1.99         | +27 32.9        | 2.092    | 2.835 | 15.2    | 21.2 | 131 W  | 73         | 36          |
| 1 6                                 | 8 54.09         | +19 36.7        | 1.776    | 2.700 | 8.8     | 21.0 | 155 W  | 65         | 44          | 1 6                                 | 9 57.83         | +28 27.8        | 1.987    | 2.823 | 12.6    | 21.0 | 141 W  | 73         | 36          |
| 1 16                                | 8 44.25         | +20 31.3        | 1.739    | 2.708 | 4.5     | 20.8 | 168 W  | 66         | 43          | 1 16                                | 9 50.65         | +29 27.9        | 1.904    | 2.809 | 9.5     | 20.8 | 152 W  | 74         | 35          |
| 1 26                                | 8 33.14         | +21 25.9        | 1.731    | 2.715 | 1.0     | 20.5 | 177 E  | 66         | 43          | 1 26                                | 9 40.81         | +30 25.7        | 1.847    | 2.795 | 6.7     | 20.6 | 161 W  | 75         | 34          |
| <b>276703 2004 BL<sub>11</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>434632 2005 WE</b>               |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 31.96         | +5 42.5         | 0.953    | 1.690 | 29.8    | 21.4 | 121 W  | 51         | 58          | 12 17                               | 10 17.06        | +9 23.1         | 0.705    | 1.412 | 40.1    | 21.4 | 112 W  | 54         | 55          |
| 12 27                               | 9 13.68         | +7 11.3         | 0.917    | 1.763 | 22.7    | 21.2 | 136 W  | 52         | 57          | 12 27                               | 10 16.32        | +6 42.0         | 0.636    | 1.425 | 35.9    | 21.1 | 122 W  | 52         | 57          |
| 1 6                                 | 8 50.18         | +9 11.1         | 0.901    | 1.829 | 14.6    | 21.0 | 152 W  | 54         | 55          | 1 6                                 | 10 9.06         | +4 4.8          | 0.573    | 1.434 | 30.4    | 20.7 | 132 W  | 49         | 60          |
| 1 16                                | 8 23.71         | +11 28.1        | 0.916    | 1.889 | 6.4     | 20.8 | 168 W  | 56         | 53          | 1 16                                | 9 54.23         | +1 38.0         | 0.521    | 1.439 | 23.5    | 20.3 | 144 W  | 47         | 62          |
| 1 26                                | 7 57.79         | +13 43.2        | 0.966    | 1.943 | 5.0     | 20.9 | 170 E  | 59         | 50          | 1 26                                | 9 32.04         | -0 26.7         | 0.484    | 1.441 | 16.2    | 19.9 | 156 W  | 45         | 64          |
| <b>183020 2002 PF<sub>97</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>40310 1999 KU<sub>4</sub></b>    |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 32.11         | +13 27.2        | 2.175    | 2.847 | 16.6    | 21.3 | 124 W  | 58         | 51          | 12 17                               | 10 17.55        | +19 47.7        | 2.473    | 3.034 | 17.0    | 21.4 | 116 W  | 65         | 44          |
| 12 27                               | 9 29.23         | +14 1.2         | 2.071    | 2.855 | 14.0    | 21.2 | 135 W  | 59         | 50          | 12 27                               | 10 17.15        | +20 30.1        | 2.336    | 3.022 | 15.2    | 21.2 | 126 W  | 66         | 43          |
| 1 6                                 | 9 23.74         | +14 49.7        | 1.986    | 2.861 | 10.8    | 21.0 | 147 W  | 60         | 49          | 1 6                                 | 10 14.14        | +21 26.5        | 2.215    | 3.009 | 12.9    | 21.0 | 137 W  | 66         | 43          |
| 1 16                                | 9 15.90         | +15 50.4        | 1.926    | 2.867 | 7.0     | 20.7 | 159 W  | 61         | 48          | 1 16                                | 10 8.45         | +22 34.4        | 2.114    | 2.995 | 10.0    | 20.8 | 148 W  | 68         | 41          |
| 1 26                                | 9 6.34          | +16 58.3        | 1.893    | 2.871 | 2.8     | 20.5 | 172 W  | 62         | 47          | 1 26                                | 10 0.24         | +23 48.8        | 2.038    | 2.979 | 6.8     | 20.5 | 159 W  | 69         | 40          |
| <b>101158 1998 RA<sub>77</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>306605 2000 LV<sub>25</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 37.29         | +20 44.6        | 2.269    | 2.948 | 15.8    | 21.4 | 125 W  | 66         | 43          | 12 17                               | 10 27.35        | -25 24.5        | 3.622    | 3.834 | 14.8    | 21.4 | 95 W   | 20         | 88*         |
| 12 27                               | 9 34.26         | +21 18.8        | 2.160    | 2.948 | 13.4    | 21.2 | 136 W  | 66         | 43          | 12 27                               | 10 26.60        | -26 45.9        | 3.509    | 3.848 | 14.4    | 21.4 | 103 W  | 18         | 89          |
| 1 6                                 | 9 28.54         | +22 2.7         | 2.070    | 2.947 | 10.3    | 21.0 | 147 W  | 67         | 42          | 1 6                                 | 10 23.96        | -27 55.6        | 3.402    | 3.862 | 13.8    | 21.3 | 111 W  | 17         | 88          |
| 1 16                                | 9 20.35         | +22 52.5        | 2.005    | 2.946 | 6.8     | 20.8 | 159 W  | 68         | 41          | 1 16                                | 10 19.44        | -28 49.9        | 3.305    | 3.875 | 12.9    | 21.2 | 119 W  | 16         | 87          |
| 1 26                                | 9 10.31         | +23 42.7        | 1.968    | 2.943 | 3.3     | 20.5 | 170 W  | 69         | 40          | 1 26                                | 10 13.21        | -29 24.7        | 3.224    | 3.886 | 11.8    | 21.1 | 126 W  | 16         | 87          |
| <b>330260 2006 SB<sub>7</sub></b>   |                 |                 |          |       |         |      |        |            |             | <b>307263 2002 NT<sub>26</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 37.82         | +44 25.3        | 1.897    | 2.616 | 17.4    | 21.3 | 127 W  | 89         | 20          | 12 17                               | 10 46.67        | +6 53.1         | 2.584    | 2.990 | 18.6    | 21.5 | 105 W  | 52         | 56*         |
| 12 22                               | 9 36.18         | +45 10.4        | 1.839    | 2.599 | 16.4    | 21.2 | 132 W  | 90         | 19          | 12 27                               | 10 50.50        | +6 59.4         | 2.406    | 2.948 | 17.7    | 21.3 | 114 W  | 52         | 57          |
| 12 27                               | 9 33.41         | +45 56.7        | 1.786    | 2.583 | 15.4    | 21.1 | 136 W  | 89         | 18          | 1 6                                 | 10 52.38        | +7 22.3         | 2.238    | 2.905 | 16.3    | 21.0 | 124 W  | 52         | 57          |
| 1 1                                 | 9 29.46         | +46 42.9        | 1.737    | 2.566 | 14.4    | 21.0 | 140 W  | 88         | 17          | 1 16                                | 10 52.05        | +8 3.9          | 2.084    | 2.861 | 14.2    | 20.8 | 135 W  | 53         | 56          |
| 1 6                                 | 9 24.31         | +47 27.4        | 1.694    | 2.549 | 13.4    | 20.9 | 143 W  | 88         | 17          | 1 26                                | 10 49.36        | +9 5.3          | 1.948    | 2.816 | 11.4    | 20.5 | 146 W  | 54         | 55          |
| 1 11                                | 9 17.98         | +48 8.5         | 1.656    | 2.532 | 12.6    | 20.8 | 146 W  | 87         | 16          | <b>225586 2000 WS<sub>67</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 9 10.56         | +48 44.1        | 1.625    | 2.514 | 12.0    | 20.7 | 148 W  | 86         | 15          | 12 17                               | 10 51.92        | +33 6.2         | 1.093    | 1.723 | 32.0    | 21.1 | 112 W  | 78         | 30*         |
| <b>291252 2006 BP<sub>54</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>145888 1999 TT<sub>103</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 38.20         | +18 48.6        | 1.998    | 2.680 | 17.6    | 21.4 | 124 W  | 64         | 45          | 12 17                               | 10 54.08        | +1 17.5         | 2.425    | 2.784 | 20.3    | 21.5 | 101 W  | 46         | 62*         |
| 12 27                               | 9 36.67         | +18 56.2        | 1.857    | 2.645 | 15.3    | 21.1 | 135 W  | 64         | 45          | 12 27                               | 10 56.82        | +0 42.2         | 2.291    | 2.786 | 19.4    | 21.3 | 110 W  | 46         | 63          |
| 1 6                                 | 9 32.13         | +19 14.7        | 1.733    | 2.608 | 12.1    | 20.8 | 146 W  | 64         | 45          | 1 6                                 | 10 57.27        | +0 20.6         | 2.163    | 2.788 | 17.8    | 21.1 | 120 W  | 45         | 64          |
| 1 16                                | 9 24.60         | +19 42.0        | 1.632    | 2.571 | 8.2     | 20.5 | 158 W  | 65         | 44          | 1 16                                | 10 55.22        | +0 15.2         | 2.047    | 2.789 | 15.6    | 20.9 | 131 W  | 45         | 64          |
| 1 26                                | 9 14.48         | +20 13.8        | 1.558    | 2.533 | 3.8     | 20.1 | 170 W  | 65         | 44          | 1 26                                | 10 50.63        | +0 27.5         | 1.948    | 2.788 | 12.7    | 20.7 | 142 W  | 45         | 64          |
| <b>272499 2005 UJ<sub>157</sub></b> |                 |                 |          |       |         |      |        |            |             | <b>351545 2005 TE<sub>15</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 39.91         | +15 35.4        | 2.273    | 2.929 | 16.3    | 21.5 | 123 W  | 61         | 48          | 12 17                               | 10 55.85        | +34 13.5        | 0.760    | 1.446 | 39.3    | 21.5 | 111 W  | 79         | 29*         |
| 12 27                               | 9 37.08         | +15 40.0        | 2.154    | 2.924 | 14.0    | 21.3 | 134 W  | 61         | 48          | 12 27                               | 11 15.28        | +35 20.0        | 0.659    | 1.408 | 38.6    | 21.1 | 117 W  | 80         | 29*         |
| 1 6                                 | 9 31.61         | +15 55.3        | 2.053    | 2.917 | 11.0    | 21.1 | 145 W  | 61         | 48          | 1 6                                 | 11 33.44        | +36 56.9        | 0.564    | 1.366 | 37.8    | 20.7 | 122 W  | 82         | 27          |
| 1 16                                | 9 23.69         | +16 19.6        | 1.976    | 2.910 | 7.4     | 20.8 | 158 W  | 61         | 48          | 1 16                                | 11 49.85        | +39 12.4        | 0.474    | 1.321 | 36.9    | 20.2 | 126 W  | 84         | 25          |
| 1 26                                | 9 13.88         | +16 49.4        | 1.927    | 2.901 | 3.3     | 20.6 | 170 W  | 62         | 47          | 1 26                                | 12 3.89         | +42 14.5        | 0.392    | 1.272 | 36.4    | 19.7 | 130 W  | 87         | 22          |
| <b>474538 2003 WT<sub>21</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>414429 2009 DC<sub>43</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 39.98         | -33 56.8        | 2.313    | 2.652 | 21.5    | 21.5 | 99 W   | 11         | 82          | 12 17                               | 11 20.54        | +26 37.2        | 1.426    | 1.920 | 29.8    | 21.3 | 104 W  | 72         | 35*         |
| 12 22                               | 9 38.97         | -35 18.3        | 2.276    | 2.659 | 21.2    | 21.4 | 102 W  | 10         | 81          | 12 27                               | 11 37.59        | +28 11.6        | 1.273    | 1.860 | 29.7    | 21.0 | 110 W  | 73         | 35*         |
| 12 27                               | 9 37.21         | -36 35.4        | 2.240    | 2.665 | 20.9    | 21.4 | 105 W  | 8          | 79          | 1 6                                 | 11 54.37        | +30 22.4        | 1.131    | 1.799 | 29.3    | 20.6 | 116 W  | 75         | 34*         |
| 1 1                                 | 9 34.68         | -37 47.0        | 2.207    | 2.671 | 20.6    | 21.4 | 107 W  | 7          | 78          | 1 16                                | 12 10.72        | +33 16.2        | 1.001    | 1.735 | 28.8    | 20.3 | 122 W  | 78         | 31          |
| 1 6                                 | 9 31.38         | -38 52.1        | 2.176    | 2.676 | 20.2    | 21.3 | 110 W  | 6          | 77          | 1 26                                | 12 26.42        | +36 57.4        | 0.885    | 1.669 | 28.4    | 19.9 | 126 W  | 82         | 27          |
| 1 11                                | 9 27.35         | -39 49.8        | 2.147    | 2.682 | 19.8    | 21.3 | 112 W  | 5          | 76          | <b>484284 2007 PW<sub>15</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 9 22.63         | -40 38.7        | 2.122    | 2.687 | 19.4    | 21.3 | 115 W  | 4          | 75          | 12 17                               | 11 24.02        | +14 48.9        | 2.227    | 2.575 | 22.2    | 21.5 | 99 W   | 60         | 46*         |
| <b>243618 1999 JU<sub>61</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>486527 2013 HO<sub>7</sub></b>   |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 45.52         | +3 51.1         | 2.629    | 3.205 | 15.8    | 21.5 | 118 W  | 49         | 60          | 12 17                               | 11 29.58        | +28 55.3        | 2.440    | 2.829 | 19.8    | 21.5 | 103 W  | 74         | 33*         |
| 12 27                               | 9 43.40         | +3 28.5         | 2.491    | 3.190 | 14.1    | 21.3 | 128 W  | 48         | 61          | 12 27                               | 11 33.79        | +29 7.3         | 2.282    | 2.796 | 19.1    | 21.3 | 111 W  | 74         | 34*         |
| 1 6                                 | 9 39.04         | +3 18.8         | 2.369    | 3.174 | 11.8    | 21.1 | 139 W  | 48         | 61          | 1 6                                 | 11 35.42        | +29 32.3        | 2.132    | 2.761 | 17.9    | 21.1 | 120 W  | 75         | 34          |
| 1 16                                | 9 32.54         | +3 23.3         | 2.269    | 3.157 | 9.0     | 20.9 | 150 W  | 48         | 61          | 1 16                                | 11 34.00        | +30 8.9         | 1.993    | 2.726 | 16.2    | 20.8 | 129 W  | 75         | 34          |
| 1 26                                | 9 24.29         | +3 42.3         | 2.194    | 3.139 | 6.0     | 20.7 | 160 W  | 49         | 60          | 1 26                                | 11 29.16        | +30 52.5        | 1.871    | 2.690 | 14.0    | 20.6 | 139 W  | 76         | 33          |
| <b>213812 2003 NE</b>               |                 |                 |          |       |         |      |        |            |             | <b>215664 2003 UL<sub>214</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 9 53.99         | +14 28.2        | 1.960    | 2.591 | 19.3    | 21.4 | 120 W  | 59         | 50          | 12 17                               | 9 59.51         | +6 18.0         | 2.005    | 2.584 | 20.1    | 21.4 | 115 W  | 51         | 58          |
| 12 27                               | 9 52.17         | +15 8.0         | 1.871    | 2.617 | 16.6    | 21.2 | 130 W  | 60         | 49          | 12 27                               | 9 59.57         | +5 50.1         | 1.871    | 2.567 | 18.2    | 21.2 | 125 W  | 51         | 58          |
| 1 6                                 | 9 47.41         | +16 4.1         | 1.798    | 2.643 | 13.3    | 21.1 | 142 W  | 61         | 48          | 1 6                                 | 9 56.84         | +5 37.2         | 1.751    | 2.550 | 15.6    | 20.9 | 136 W  | 51         | 58          |
| 1 16                                | 9 39.88         | +17 13.3        | 1.747    | 2.667 | 9.3     | 20.9 | 154 W  | 62         | 47          | 1 16                                | 9 51.24         | +5 41.3         | 1.649    | 2.532 | 12.2    | 20.6 | 147 W  | 51         | 58          |
| 1 26                                | 9 30.18         | +18 29.7        | 1.723    | 2.690 | 4.9     | 20.6 | 167 W  | 63         | 46          | 1 26                                | 9 43.01         | +6 3.0          | 1.569    | 2.512 | 8.2     | 20.3 | 159 W  | 51         | 58          |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ | 20/21                              | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|
| <b>87024 2000 JS<sub>66</sub></b>   |                 |                 |          |       |         |      |        |            |             | <b>39741 Komm</b>                  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 11 41.15        | -17 23.7        | 1.160    | 1.423 | 43.3    | 21.5 | 83 W   | 28         | 69*         | 12 17                              | 12 35.50        | -9 5.9          | 3.068    | 2.945 | 18.7    | 21.4 | 74 W   | 36         | 54*         |
| 12 27                               | 12 0.28         | -20 56.1        | 1.080    | 1.421 | 43.7    | 21.3 | 87 W   | 24         | 76*         | 12 27                              | 12 43.40        | -10 4.4         | 2.923    | 2.944 | 19.3    | 21.4 | 82 W   | 35         | 62*         |
| 1 6                                 | 12 18.88        | -24 25.9        | 0.999    | 1.415 | 44.0    | 21.1 | 91 W   | 21         | 84*         | 1 6                                | 12 49.93        | -10 54.8        | 2.774    | 2.941 | 19.5    | 21.2 | 90 W   | 34         | 69*         |
| 1 16                                | 12 36.85        | -27 51.7        | 0.917    | 1.407 | 44.1    | 20.9 | 95 W   | 17         | 88          | 1 16                               | 12 54.83        | -11 35.6        | 2.624    | 2.938 | 19.3    | 21.1 | 99 W   | 33         | 75*         |
| 1 26                                | 12 54.04        | -31 11.1        | 0.834    | 1.396 | 44.0    | 20.7 | 100 W  | 14         | 85          | 1 26                               | 12 57.83        | -12 4.9         | 2.476    | 2.933 | 18.6    | 21.0 | 108 W  | 33         | 76          |
| <b>175786 1999 PT<sub>3</sub></b>   |                 |                 |          |       |         |      |        |            |             | <b>175706 1996 FG<sub>3</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 11 43.17        | -2 26.6         | 2.386    | 2.550 | 22.7    | 21.4 | 88 W   | 43         | 59*         | 12 17                              | 12 50.51        | -6 37.4         | 1.383    | 1.413 | 41.2    | 21.5 | 71 W   | 38*        | 49*         |
| 12 27                               | 11 50.53        | -3 52.7         | 2.218    | 2.518 | 22.9    | 21.2 | 96 W   | 41         | 65*         | 12 27                              | 13 13.63        | -9 14.4         | 1.284    | 1.400 | 42.7    | 21.3 | 75 W   | 36         | 55*         |
| 1 6                                 | 11 56.20        | -5 13.4         | 2.052    | 2.485 | 22.5    | 21.0 | 104 W  | 40         | 69*         | 1 6                                | 13 37.53        | -11 50.8        | 1.183    | 1.382 | 44.2    | 21.2 | 79 W   | 33         | 61*         |
| 1 16                                | 11 59.81        | -6 26.6         | 1.891    | 2.450 | 21.7    | 20.8 | 113 W  | 39         | 70          | 1 16                               | 14 2.59         | -14 26.6        | 1.080    | 1.359 | 45.8    | 21.0 | 82 W   | 31         | 67*         |
| 1 26                                | 12 0.94         | -7 30.0         | 1.738    | 2.414 | 20.1    | 20.5 | 122 W  | 37         | 72          | 1 26                               | 14 29.30        | -17 1.2         | 0.977    | 1.331 | 47.5    | 20.8 | 86 W   | 28         | 73*         |
| <b>99321 2001 TT<sub>113</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>370866 2005 EB<sub>37</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 11 48.83        | +2 29.3         | 2.060    | 2.264 | 25.8    | 21.4 | 89 W   | 47         | 54*         | 12 17                              | 13 4.62         | -7 44.4         | 2.201    | 2.037 | 26.5    | 21.4 | 67 W   | 37*        | 47*         |
| 12 27                               | 11 56.98        | +1 33.5         | 1.951    | 2.285 | 25.3    | 21.3 | 97 W   | 47         | 60*         | 12 27                              | 13 25.73        | -8 49.2         | 2.050    | 1.986 | 28.1    | 21.2 | 72 W   | 36         | 52*         |
| 1 6                                 | 12 2.91         | +0 51.5         | 1.843    | 2.306 | 24.3    | 21.2 | 105 W  | 46         | 63*         | 1 6                                | 13 47.41        | -9 42.4         | 1.901    | 1.937 | 29.7    | 21.0 | 77 W   | 35         | 58*         |
| 1 16                                | 12 6.27         | +0 25.4         | 1.739    | 2.326 | 22.6    | 21.0 | 115 W  | 45         | 64          | 1 16                               | 14 9.65         | -10 20.6        | 1.755    | 1.889 | 31.0    | 20.8 | 82 W   | 35         | 63*         |
| 1 26                                | 12 6.73         | +0 17.2         | 1.643    | 2.346 | 20.2    | 20.8 | 125 W  | 45         | 64          | 1 26                               | 14 32.37        | -10 40.3        | 1.614    | 1.843 | 32.2    | 20.6 | 87 W   | 34         | 68*         |
| <b>376817 2001 AT<sub>43</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>181771 1997 GG<sub>3</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 11 50.46        | -19 18.3        | 2.488    | 2.511 | 22.7    | 21.5 | 80 W   | 26         | 68*         | 12 17                              | 13 24.14        | -7 51.8         | 2.786    | 2.495 | 20.5    | 21.4 | 63 W   | 36*        | 43*         |
| 12 27                               | 11 56.75        | -21 38.2        | 2.385    | 2.537 | 22.8    | 21.4 | 87 W   | 23         | 77*         | 12 27                              | 13 37.37        | -9 14.0         | 2.631    | 2.465 | 21.9    | 21.3 | 69 W   | 36*        | 50*         |
| 1 6                                 | 12 0.96         | -23 52.4        | 2.281    | 2.562 | 22.5    | 21.3 | 95 W   | 21         | 87*         | 1 6                                | 13 50.05        | -10 31.3        | 2.471    | 2.433 | 23.1    | 21.2 | 76 W   | 34         | 58*         |
| 1 16                                | 12 2.74         | -25 58.3        | 2.180    | 2.586 | 21.8    | 21.2 | 103 W  | 19         | 90          | 1 16                               | 14 2.00         | -11 42.9        | 2.306    | 2.400 | 24.0    | 21.0 | 83 W   | 33         | 66*         |
| 1 26                                | 12 1.77         | -27 51.7        | 2.084    | 2.608 | 20.6    | 21.1 | 111 W  | 17         | 88          | 1 26                               | 14 12.99        | -12 48.0        | 2.141    | 2.365 | 24.6    | 20.9 | 91 W   | 32         | 73*         |
| <b>464797 2004 FZ<sub>1</sub></b>   |                 |                 |          |       |         |      |        |            |             | <b>157995 2000 LF<sub>26</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 17                               | 11 54.00        | -14 54.5        | 1.293    | 1.495 | 40.5    | 21.3 | 81 W   | 30         | 65*         | 12 17                              | 13 53.06        | -8 34.4         | 2.921    | 2.506 | 19.0    | 21.5 | 56 W   | 34*        | 37*         |
| 12 22                               | 12 7.67         | -14 26.8        | 1.201    | 1.456 | 42.1    | 21.2 | 83 W   | 31         | 67*         | 12 27                              | 14 8.47         | -9 26.8         | 2.726    | 2.476 | 20.6    | 21.4 | 62 W   | 35*        | 44*         |
| 12 27                               | 12 22.47        | -13 44.9        | 1.111    | 1.416 | 43.8    | 21.0 | 85 W   | 31         | 68*         | 1 6                                | 14 23.61        | -10 10.4        | 2.625    | 2.445 | 22.0    | 21.3 | 69 W   | 35*        | 51*         |
| 1 1                                 | 12 38.67        | -12 45.1        | 1.023    | 1.376 | 45.5    | 20.8 | 87 W   | 32         | 69*         | 1 16                               | 14 38.34        | -10 44.0        | 2.469    | 2.414 | 23.2    | 21.2 | 75 W   | 34         | 58*         |
| 1 6                                 | 12 56.60        | -11 23.0        | 0.937    | 1.336 | 47.4    | 20.6 | 88 W   | 34         | 69*         | 1 26                               | 14 52.49        | -11 5.9         | 2.311    | 2.382 | 24.2    | 21.0 | 82 W   | 34         | 65*         |
| 1 11                                | 13 16.68        | -9 32.6         | 0.855    | 1.296 | 49.4    | 20.4 | 89 W   | 35         | 68*         | <b>474295 2001 XX<sub>10</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 13 39.38        | -7 7.1          | 0.778    | 1.256 | 51.6    | 20.2 | 90 W   | 38         | 66*         | 12 17                              | 14 34.44        | +19 55.2        | 1.691    | 1.513 | 35.2    | 21.5 | 62 W   | 56*        | 13*         |
| <b>269745 1998 WU<sub>8</sub></b>   |                 |                 |          |       |         |      |        |            |             | 12 27                              | 15 3.69         | +18 51.6        | 1.651    | 1.514 | 35.9    | 21.5 | 64 W   | 57*        | 17*         |
| 12 17                               | 11 55.06        | +7 8.6          | 2.700    | 2.861 | 20.1    | 21.4 | 89 W   | 52         | 50*         | 1 6                                | 15 31.71        | +17 54.5        | 1.610    | 1.515 | 36.5    | 21.4 | 66 W   | 58*        | 21*         |
| 12 27                               | 12 1.20         | +7 4.4          | 2.570    | 2.875 | 19.8    | 21.3 | 98 W   | 52         | 54*         | 1 16                               | 15 58.37        | +17 5.6         | 1.568    | 1.517 | 37.1    | 21.4 | 69 W   | 58*        | 25*         |
| 1 6                                 | 12 5.47         | +7 15.3         | 2.442    | 2.888 | 19.0    | 21.2 | 107 W  | 52         | 57*         | 1 26                               | 16 23.54        | +16 25.7        | 1.524    | 1.518 | 37.8    | 21.3 | 71 W   | 58*        | 30*         |
| 1 16                                | 12 7.59         | +7 42.3         | 2.320    | 2.901 | 17.6    | 21.1 | 117 W  | 53         | 56          | <b>157185 2004 PX<sub>89</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 1 26                                | 12 7.36         | +8 25.9         | 2.209    | 2.912 | 15.6    | 20.9 | 127 W  | 53         | 56          | 12 17                              | 14 58.64        | -18 9.7         | 2.752    | 2.064 | 17.0    | 21.5 | 38 W   | 20*        | 26*         |
| <b>289022 2004 TN<sub>115</sub></b> |                 |                 |          |       |         |      |        |            |             | 12 27                              | 15 20.90        | -19 48.6        | 2.637    | 2.023 | 19.1    | 21.4 | 42 W   | 20*        | 31*         |
| 12 17                               | 11 56.74        | +25 47.2        | 2.931    | 3.192 | 17.8    | 21.5 | 96 W   | 71         | 33*         | 1 6                                | 15 44.00        | -21 19.7        | 2.517    | 1.982 | 21.3    | 21.3 | 47 W   | 20*        | 37*         |
| 12 27                               | 12 2.26         | +26 30.3        | 2.793    | 3.187 | 17.4    | 21.4 | 105 W  | 72         | 36*         | 1 16                               | 16 7.96         | -22 41.6        | 2.394    | 1.941 | 23.4    | 21.2 | 51 W   | 20*        | 42*         |
| 1 6                                 | 12 5.81         | +27 29.1        | 2.662    | 3.182 | 16.5    | 21.2 | 113 W  | 72         | 36*         | 1 26                               | 16 32.75        | -23 52.7        | 2.270    | 1.901 | 25.4    | 21.1 | 56 W   | 19*        | 48*         |
| 1 16                                | 12 7.08         | +28 42.6        | 2.542    | 3.175 | 15.2    | 21.1 | 122 W  | 74         | 35          | <b>434313 2004 GP</b>              |                 |                 |          |       |         |      |        |            |             |
| 1 26                                | 12 5.79         | +30 7.8         | 2.436    | 3.168 | 13.6    | 20.9 | 131 W  | 75         | 34          | 12 17                              | 15 7.61         | -13 18.9        | 0.771    | 0.595 | 91.2    | 20.9 | 37 W   | 23*        | 22*         |
| <b>153243 2001 AU<sub>47</sub></b>  |                 |                 |          |       |         |      |        |            |             | 12 19                              | 15 10.29        | -12 43.0        | 0.790    | 0.618 | 87.8    | 20.9 | 39 W   | 24*        | 23*         |
| 12 17                               | 12 10.72        | -20 45.4        | 1.826    | 1.837 | 31.2    | 21.4 | 75 W   | 24         | 64*         | 12 21                              | 15 13.46        | -12 12.3        | 0.809    | 0.639 | 84.7    | 20.9 | 40 W   | 25*        | 24*         |
| 12 27                               | 12 22.46        | -25 9.5         | 1.677    | 1.799 | 32.6    | 21.2 | 81 W   | 20         | 72*         | 12 23                              | 15 17.02        | -11 46.0        | 0.827    | 0.661 | 82.0    | 21.0 | 42 W   | 26*        | 25*         |
| 1 6                                 | 12 33.55        | -30 0.6         | 1.530    | 1.757 | 33.9    | 21.0 | 86 W   | 15         | 80*         | 12 25                              | 15 20.91        | -11 23.4        | 0.843    | 0.682 | 79.5    | 21.0 | 43 W   | 27*        | 26*         |
| 1 16                                | 12 43.77        | -35 24.1        | 1.387    | 1.711 | 35.1    | 20.7 | 91 W   | 10         | 81*         | 12 27                              | 15 25.07        | -11 4.1         | 0.859    | 0.702 | 77.4    | 21.0 | 44 W   | 28*        | 27*         |
| 1 26                                | 12 52.79        | -41 25.7        | 1.252    | 1.660 | 36.2    | 20.5 | 95 W   | 4          | 75          | 1 1                                | 15 36.33        | -10 26.5        | 0.893    | 0.750 | 72.9    | 21.1 | 47 W   | 29*        | 29*         |
| <b>223042 2002 TN<sub>56</sub></b>  |                 |                 |          |       |         |      |        |            |             | 1 6                                | 15 48.47        | -9 59.6         | 0.920    | 0.794 | 69.5    | 21.2 | 49 W   | 30*        | 32*         |
| 12 17                               | 12 16.48        | -9 1.2          | 2.437    | 2.430 | 23.3    | 21.5 | 78 W   | 36         | 58*         | 1 11                               | 16 1.16         | -9 39.4         | 0.941    | 0.835 | 66.9    | 21.2 | 51 W   | 31*        | 34*         |
| 12 27                               | 12 25.53        | -10 10.4        | 2.334    | 2.461 | 23.5    | 21.4 | 86 W   | 35         | 65*         | 1 16                               | 16 14.23        | -9 22.9         | 0.956    | 0.871 | 64.9    | 21.3 | 53 W   | 32*        | 36*         |
| 1 6                                 | 12 32.76        | -11 8.2         | 2.227    | 2.491 | 23.2    | 21.3 | 94 W   | 34         | 72*         | <b>234341 2001 FZ<sub>57</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 12 37.86        | -11 52.6        | 2.121    | 2.521 | 22.4    | 21.2 | 102 W  | 33         | 76          | 12 17                              | 16 5.10         | +9 11.3         | 0.488    | 0.685 | 113.0   | 20.9 | 40 W   | 34*        | —           |
| 1 26                                | 12 40.56        | -12 21.3        | 2.017    | 2.550 | 21.0    | 21.1 | 112 W  | 33         | 76          | 12 19                              | 16 0.37         | +10 50.8        | 0.489    | 0.711 | 108.7   | 20.7 | 43 W   | 37*        | 2*          |
| <b>85158 Phyllistrapp</b>           |                 |                 |          |       |         |      |        |            |             | 12 21                              | 15 56.01        | +12 21.7        | 0.491    | 0.737 | 104.7   | 20.6 | 46 W   | 40*        | 4*          |
| 12 17                               | 12 22.97        | -7 32.4         | 3.072    | 3.008 | 18.6    | 21.5 | 77 W   | 37         | 55*         | 12 23                              | 15 52.01        | +13 45.1        | 0.493    | 0.762 | 101.0   | 20.5 | 50 W   | 44*        | 6*          |
| 12 27                               | 12 30.00        | -8 39.4         | 2.920    | 3.001 | 19.1    | 21.4 | 85 W   | 36         | 63*         | 12 25                              | 15 48.34        | +15 2.0         | 0.495    | 0.787 | 97.6    | 20.4 | 53 W   | 46*        | 8*          |
| 1 6                                 | 12 35.60        | -9 39.1         | 2.766    | 2.993 | 19.1    | 21.3 | 94 W   | 35         | 71*         | 12 27                              | 15 44.96        | +16 13.5        | 0.497    | 0.812 | 94.4    | 20.3 | 55 W   | 49*        | 10*         |
| 1 16                                | 12 39.48        | -10 30.3        | 2.612    | 2.984 | 18.8    | 21.1 | 103 W  | 34         | 75*         | 12 29                              | 15 41.83        | +17 20.4        | 0.498    | 0.836 | 91.4    | 20.2 | 58 W   | 52*        | 12*         |
| 1 26                                | 12 41.37        | -11 10.9        | 2.463    | 2.974 | 17.9    | 21.0 | 112 W  | 34         | 75          | 12 31                              | 15 38.91        | +18 23.7        | 0.500    | 0.859 | 88.6    | 20.2 | 61 W   | 54*        | 14*         |
| <b>363071 2000 GD<sub>147</sub></b> |                 |                 |          |       |         |      |        |            |             | 1 2                                | 15 36.17        | +19 24.2        | 0.501    | 0.882 | 86.0    | 20.1 | 63 W   | 56*        | 15*         |
| 12 17                               | 12 24.51        | +11 3.8         | 0.542    | 1.075 | 65.7    | 21.4 | 84 W   | 56         | 42*         | 1 4                                | 15 33.57        | +20 22.4        | 0.501    | 0.905 | 83.5    | 20.1 | 66 W   | 59*        | 17*         |
| 12 22                               | 12 54.85        | +7 0.7          | 0.527    | 1.038 | 69.2    | 21.4 | 81 W   | 52         | 44*         | 1 6                                | 15 31.06        | +21 19.1        | 0.501    | 0.927 | 81.2    | 20.1 | 69 W   | 61*        | 19*         |
| 12 27                               | 13 25.42        | +2 43.4         | 0.521    | 1.004 | 72.7    | 21.4 | 77 W   | 48         | 45*         | 1 8                                | 15 28.60        | +22 14.9        | 0.500    | 0.948 | 78.9    | 20.0 | 71 W   | 63*        | 20*         |
| 1 1                                 | 13 55.87        | +1 37.9         | 0.523    | 0.971 | 75.7    | 21.5 | 73 W   | 43*        | 47*         | 1 10                               | 15 26.16        | +23 10.2        | 0.499    | 0.969 | 76.8    | 20.0 | 74 W   | 65*        | 22*         |
| 1 6                                 | 14 25.89        | -5 52.5         | 0.533    | 0.942 | 78.3    | 21.5 | 70 W   | 39*        | 48*         | 1 12                               | 15 23.70        | +24 5.4         | 0.498    |       |         |      |        |            |             |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° | 20/21                              | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|
| <b>430804 2005 AD<sub>13</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>211042 2002 CL<sub>25</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 16 39.58        | -16 59.1        | 2.429    | 1.503 | 10.0    | 21.4 | 15 W   | 8*  | 3*   | 12 17                              | 18 25.37        | -41 5.4         | 3.674    | 2.772 | 7.0     | 21.5 | 20 E   | -   | 11*  |
| 12 27                               | 17 9.26         | -18 19.7        | 2.286    | 1.385 | 12.7    | 21.2 | 18 W   | 9*  | 7*   | 12 27                              | 18 46.86        | -40 38.5        | 3.667    | 2.749 | 6.3     | 21.4 | 18 E   | -   | 7*   |
| 1 6                                 | 17 42.82        | -19 27.3        | 2.139    | 1.261 | 15.5    | 20.9 | 20 W   | 9*  | 10*  | 1 6                                | 19 8.40         | -40 4.4         | 3.646    | 2.725 | 6.2     | 21.4 | 18 E   | -   | 3*   |
| 1 16                                | 18 21.17        | -20 14.4        | 1.992    | 1.131 | 18.2    | 20.6 | 21 W   | 8*  | 12*  | 1 16                               | 19 29.90        | -39 23.1        | 3.611    | 2.700 | 6.8     | 21.4 | 19 W   | -   | 7*   |
| 1 26                                | 19 5.31         | -20 29.4        | 1.852    | 0.995 | 20.6    | 20.2 | 21 W   | 6*  | 13*  | 1 26                               | 19 51.22        | -38 34.7        | 3.563    | 2.674 | 7.9     | 21.4 | 22 W   | -   | 11*  |
| <b>416678 2004 XT<sub>5</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>152603 1995 VF<sub>2</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 17 33.89        | -15 50.6        | 3.517    | 2.545 | 2.9     | 21.5 | 8 W    | -   | -    | 12 17                              | 18 28.66        | -25 6.0         | 2.541    | 1.588 | 7.0     | 21.5 | 11 E   | -   | 5*   |
| 12 27                               | 17 51.98        | -15 18.8        | 3.476    | 2.518 | 4.2     | 21.5 | 11 W   | 5*  | -    | 12 27                              | 19 0.75         | -24 39.9        | 2.535    | 1.570 | 5.4     | 21.3 | 9 E    | -   | 2*   |
| 1 6                                 | 18 10.21        | -14 36.4        | 3.421    | 2.489 | 6.1     | 21.5 | 16 W   | 9*  | 2*   | 1 6                                | 19 33.01        | -23 48.5        | 2.529    | 1.554 | 3.8     | 21.2 | 6 E    | -   | -    |
| 1 16                                | 18 28.53        | -13 42.8        | 3.353    | 2.460 | 8.2     | 21.6 | 21 W   | 12* | 8*   | 1 16                               | 20 5.14         | -22 32.3        | 2.523    | 1.542 | 2.3     | 21.1 | 4 E    | -   | -    |
| 1 26                                | 18 46.83        | -12 37.4        | 3.273    | 2.430 | 10.3    | 21.6 | 26 W   | 15* | 14*  | 1 26                               | 20 36.87        | -20 52.9        | 2.517    | 1.534 | 1.5     | 21.0 | 2 E    | -   | -    |
| <b>393359 1998 ME<sub>3</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>455157 1997 YM<sub>3</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 17 39.09        | -21 3.4         | 2.159    | 1.176 | 1.9     | 21.5 | 2 W    | -   | -    | 12 17                              | 18 35.40        | -23 51.9        | 2.886    | 1.939 | 6.5     | 21.3 | 13 E   | 2*  | 6*   |
| 12 22                               | 17 59.90        | -21 21.3        | 2.143    | 1.161 | 1.8     | 21.4 | 2 W    | -   | -    | 12 27                              | 19 0.40         | -23 12.8        | 2.824    | 1.856 | 4.5     | 21.1 | 8 E    | -   | 1*   |
| 12 27                               | 18 21.05        | -21 29.3        | 2.131    | 1.148 | 1.6     | 21.4 | 2 W    | -   | -    | 1 6                                | 19 26.65        | -22 15.7        | 2.753    | 1.774 | 2.4     | 20.8 | 4 E    | -   | -    |
| 1 1                                 | 18 42.42        | -21 27.2        | 2.121    | 1.138 | 1.5     | 21.3 | 2 W    | -   | -    | 1 16                               | 19 54.10        | -20 58.3        | 2.675    | 1.692 | 0.4     | 20.5 | 1 E    | -   | -    |
| 1 6                                 | 19 3.93         | -21 14.6        | 2.114    | 1.131 | 1.3     | 21.3 | 2 W    | -   | -    | 1 26                               | 20 22.70        | -19 18.4        | 2.593    | 1.611 | 1.6     | 20.4 | 3 W    | -   | -    |
| 1 11                                | 19 25.48        | -20 51.6        | 2.109    | 1.126 | 1.2     | 21.3 | 1 W    | -   | -    | <b>369452 2010 LG<sub>14</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 1 16                                | 19 46.94        | -20 18.4        | 2.108    | 1.125 | 1.0     | 21.2 | 1 W    | -   | -    | 12 17                              | 18 44.38        | -14 57.1        | 2.448    | 1.539 | 11.1    | 21.5 | 18 E   | 10* | 4*   |
| <b>488901 2005 TQ<sub>78</sub></b>  |                 |                 |          |       |         |      |        |     |      | 12 27                              | 19 5.87         | -13 44.2        | 2.404    | 1.469 | 9.2     | 21.3 | 14 E   | 8*  | -    |
| 12 17                               | 17 39.62        | -20 44.8        | 2.645    | 1.663 | 1.5     | 21.4 | 3 E    | -   | -    | 1 6                                | 19 28.45        | -12 15.1        | 2.339    | 1.389 | 8.0     | 21.0 | 11 E   | 5*  | -    |
| 12 27                               | 18 9.62         | -20 40.4        | 2.626    | 1.647 | 2.5     | 21.5 | 4 W    | -   | -    | 1 16                               | 19 52.42        | -10 27.1        | 2.254    | 1.300 | 8.0     | 20.8 | 11 E   | 2*  | -    |
| 1 6                                 | 18 39.85        | -20 14.6        | 2.605    | 1.633 | 4.1     | 21.5 | 7 W    | -   | -    | 1 26                               | 20 18.19        | -8 17.1         | 2.150    | 1.199 | 9.1     | 20.6 | 11 W   | 4*  | -    |
| 1 16                                | 19 10.10        | -19 27.5        | 2.583    | 1.622 | 5.9     | 21.6 | 10 W   | 2*  | 2*   | <b>508808 2000 UK<sub>19</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 1 26                                | 19 40.13        | -18 19.7        | 2.561    | 1.614 | 7.7     | 21.6 | 13 W   | 3*  | 5*   | 12 17                              | 18 58.71        | -29 57.9        | 2.725    | 1.822 | 10.1    | 21.4 | 19 E   | -   | 13*  |
| <b>242211 2003 QB<sub>90</sub></b>  |                 |                 |          |       |         |      |        |     |      | 12 27                              | 19 28.02        | -29 25.9        | 2.718    | 1.791 | 8.5     | 21.3 | 16 E   | -   | 10*  |
| 12 17                               | 17 42.68        | -21 21.3        | 2.546    | 1.563 | 1.4     | 21.3 | 2 E    | -   | -    | 1 6                                | 19 57.74        | -28 32.1        | 2.707    | 1.762 | 7.1     | 21.2 | 13 E   | -   | 7*   |
| 12 27                               | 18 14.50        | -21 37.2        | 2.488    | 1.506 | 1.8     | 21.2 | 3 W    | -   | -    | 1 16                               | 20 27.61        | -27 16.3        | 2.694    | 1.735 | 5.9     | 21.1 | 10 E   | -   | 4*   |
| 1 6                                 | 18 47.80        | -21 28.6        | 2.429    | 1.452 | 3.2     | 21.2 | 5 W    | -   | -    | 1 26                               | 20 57.39        | -25 39.1        | 2.678    | 1.712 | 5.1     | 21.0 | 9 E    | -   | 2*   |
| 1 16                                | 19 22.38        | -20 52.7        | 2.373    | 1.400 | 4.7     | 21.1 | 7 W    | -   | -    | <b>450293 2004 LV<sub>3</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 1 26                                | 19 57.95        | -19 47.6        | 2.320    | 1.354 | 6.1     | 21.1 | 8 W    | -   | 2*   | 12 17                              | 19 5.15         | -10 34.5        | 1.920    | 1.099 | 21.5    | 21.5 | 24 E   | 17* | 6*   |
| <b>203269 2001 QP<sub>280</sub></b> |                 |                 |          |       |         |      |        |     |      | 12 27                              | 19 38.08        | -7 23.0         | 1.876    | 1.055 | 22.2    | 21.4 | 24 E   | 18* | 2*   |
| 12 17                               | 17 42.69        | -22 25.0        | 3.155    | 2.171 | 0.6     | 21.4 | 1 E    | -   | -    | 1 6                                | 20 12.43        | + 3 48.7        | 1.824    | 1.014 | 23.6    | 21.2 | 24 E   | 18* | -    |
| 12 27                               | 18 5.57         | -22 41.3        | 3.120    | 2.141 | 1.9     | 21.5 | 4 W    | -   | -    | 1 16                               | 20 48.65        | + 0 5.5         | 1.770    | 0.976 | 25.6    | 21.2 | 25 E   | 19* | -    |
| 1 6                                 | 18 28.93        | -22 45.0        | 3.076    | 2.111 | 4.1     | 21.5 | 9 W    | -   | 2*   | 1 26                               | 21 27.18        | + 4 13.9        | 1.715    | 0.944 | 27.8    | 21.1 | 27 E   | 20* | -    |
| 1 16                                | 18 52.68        | -22 35.6        | 3.023    | 2.080 | 6.4     | 21.6 | 14 W   | 2*  | 7*   | <b>163679 2002 XG<sub>84</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 1 26                                | 19 16.71        | -22 12.9        | 2.962    | 2.050 | 8.7     | 21.6 | 18 W   | 3*  | 12*  | 12 17                              | 19 16.85        | -25 0.2         | 1.842    | 1.004 | 21.9    | 21.5 | 22 E   | 7*  | 15*  |
| <b>163000 2001 SW<sub>169</sub></b> |                 |                 |          |       |         |      |        |     |      | 12 22                              | 19 38.02        | -24 11.0        | 1.807    | 0.969 | 22.5    | 21.4 | 22 E   | 7*  | 14*  |
| 12 17                               | 17 43.19        | -25 17.4        | 2.173    | 1.190 | 1.8     | 21.5 | 2 E    | -   | -    | 12 27                              | 19 59.69        | -23 8.5         | 1.771    | 0.936 | 23.3    | 21.3 | 22 E   | 8*  | 14*  |
| 12 27                               | 18 22.46        | -25 16.7        | 2.169    | 1.187 | 1.6     | 21.5 | 2 W    | -   | -    | 1 1                                | 20 21.81        | -21 51.8        | 1.735    | 0.905 | 24.3    | 21.2 | 22 E   | 9*  | 13*  |
| 1 6                                 | 19 1.62         | -24 37.9        | 2.167    | 1.185 | 2.1     | 21.5 | 3 W    | -   | -    | 1 6                                | 20 44.31        | -20 20.6        | 1.698    | 0.876 | 25.5    | 21.1 | 23 E   | 10* | 13*  |
| 1 16                                | 19 40.26        | -23 22.1        | 2.165    | 1.184 | 2.9     | 21.5 | 3 W    | -   | -    | 1 11                               | 21 7.14         | -18 34.7        | 1.662    | 0.851 | 27.0    | 21.1 | 23 E   | 11* | 13*  |
| 1 26                                | 20 17.99        | -21 32.3        | 2.163    | 1.184 | 3.8     | 21.6 | 5 W    | -   | -    | 1 16                               | 21 30.21        | -16 34.2        | 1.627    | 0.829 | 28.7    | 21.0 | 24 E   | 12* | 13*  |
| <b>189008 1996 FR<sub>3</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>136897 1998 HJ<sub>41</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 18 7.27         | -28 47.0        | 3.516    | 2.546 | 3.2     | 21.4 | 8 E    | -   | 2*   | 12 17                              | 19 21.46        | + 1 5.9         | 1.865    | 1.198 | 28.0    | 21.5 | 35 E   | 29* | 5*   |
| 12 27                               | 18 24.85        | -28 40.2        | 3.445    | 2.468 | 2.1     | 21.2 | 5 E    | -   | -    | 12 27                              | 19 59.66        | + 1 34.9        | 1.873    | 1.194 | 27.5    | 21.5 | 34 E   | 28* | 3*   |
| 1 6                                 | 18 43.22        | -28 26.7        | 3.355    | 2.386 | 3.3     | 21.1 | 8 W    | -   | 2*   | 1 6                                | 20 37.99        | + 2 11.2        | 1.889    | 1.193 | 26.8    | 21.5 | 33 E   | 27* | 2*   |
| 1 16                                | 19 2.38         | -28 5.5         | 3.248    | 2.301 | 5.6     | 21.1 | 13 W   | -   | 7*   | 1 16                               | 21 16.11        | + 2 53.1        | 1.914    | 1.195 | 25.6    | 21.5 | 32 E   | 26* | 2*   |
| 1 26                                | 19 22.35        | -27 35.4        | 3.123    | 2.212 | 8.1     | 21.1 | 19 W   | -   | 12*  | 1 26                               | 21 53.68        | + 3 38.7        | 1.947    | 1.199 | 24.2    | 21.5 | 30 E   | 24* | 1*   |
| <b>470951 2009 LS</b>               |                 |                 |          |       |         |      |        |     |      | <b>141526 2002 FA<sub>6</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 18 14.17        | -8 33.5         | 2.404    | 1.491 | 11.1    | 21.5 | 17 E   | 11* | -    | 12 17                              | 19 25.44        | -15 9.1         | 1.428    | 0.699 | 38.6    | 21.4 | 26 E   | 16* | 13*  |
| 12 27                               | 18 39.64        | -6 37.7         | 2.371    | 1.460 | 11.5    | 21.4 | 17 E   | 9*  | -    | 12 22                              | 19 53.61        | -16 10.5        | 1.397    | 0.691 | 40.8    | 21.4 | 27 E   | 16* | 14*  |
| 1 6                                 | 19 5.87         | -4 23.9         | 2.327    | 1.426 | 12.4    | 21.3 | 18 W   | 8*  | -    | 12 27                              | 20 22.25        | -17 6.0         | 1.367    | 0.687 | 43.1    | 21.4 | 28 E   | 16* | 16*  |
| 1 16                                | 19 33.01        | -1 51.4         | 2.276    | 1.389 | 13.8    | 21.3 | 20 W   | 11* | -    | 1 1                                | 20 51.20        | -17 53.7        | 1.338    | 0.688 | 45.2    | 21.4 | 30 E   | 16* | 18*  |
| 1 26                                | 20 1.26         | + 1 0.2         | 2.219    | 1.350 | 15.4    | 21.2 | 21 W   | 14* | -    | 1 6                                | 21 20.29        | -18 32.0        | 1.312    | 0.695 | 47.2    | 21.5 | 31 E   | 16* | 20*  |
| <b>412512 2014 LY<sub>26</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>153315 2001 NH<sub>6</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 18 14.90        | -24 7.8         | 2.880    | 1.911 | 4.2     | 21.5 | 8 E    | -   | 1*   | 12 17                              | 19 28.53        | -30 12.8        | 1.707    | 0.919 | 27.2    | 21.4 | 25 E   | 4*  | 19*  |
| 12 27                               | 18 41.39        | -24 2.0         | 2.862    | 1.882 | 2.2     | 21.3 | 4 E    | -   | -    | 12 22                              | 19 49.82        | -30 53.1        | 1.666    | 0.881 | 28.4    | 21.3 | 25 E   | 3*  | 19*  |
| 1 6                                 | 19 8.35         | -23 39.0        | 2.838    | 1.855 | 0.6     | 21.1 | 1 E    | -   | -    | 1 27                               | 20 12.31        | -31 21.0        | 1.620    | 0.844 | 29.9    | 21.2 | 25 E   | 2*  | 19*  |
| 1 16                                | 19 35.61        | -22 58.3        | 2.808    | 1.828 | 2.2     | 21.2 | 4 W    | -   | -    | 1 1                                | 20 36.00        | -31 33.6        | 1.571    | 0.809 | 32.0    | 21.1 | 26 E   | 2*  | 20*  |
| 1 26                                | 20 3.03         | -21 59.9        | 2.773    | 1.803 | 4.2     | 21.3 | 8 W    | -   | 2*   | 1 6                                | 21 0.86         | -31 28.1        | 1.518    | 0.777 | 34.6    | 21.0 | 27 E   | 2*  | 21*  |
| <b>496970 2002 QV<sub>5</sub></b>   |                 |                 |          |       |         |      |        |     |      | 1 11                               | 21 26.80        | -31 0.7         | 1.462    | 0.748 | 37.7    | 20.9 | 28 E   | 3*  | 22*  |
| 12 17                               | 18 18.54        | -26 56.0        | 2.696    | 1.734 | 5.4     | 21.5 | 10 E   | -   | 4*   | 1 16                               | 21 53.64        | -30 7.8         | 1.403    | 0.723 | 41.3    | 20.8 | 29 E   | 4*  | 23*  |
| 12 27                               | 18 48.69        | -26 26.5        | 2.677    | 1.704 | 3.7     | 21.3 | 7 E    | -   | -    | <b>356520 2011 SV<sub>87</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 1 6                                 | 19 19.17        | -25 34.0        | 2.656    | 1.676 | 2.4     | 21.2 | 4 E    | -   | -    | 12 17                              | 19 31.93        | -20 36.4        | 2.468    | 1.644 | 15.3    | 21.5 | 26 E   | 12* | 16*  |
| 1 16                                | 19 49.75        | -24 18.4        | 2.633    | 1.651 | 2.0     | 21.1 | 3 W    | -   | -    | 12 27                              | 20 1.21         | -19 14.6        | 2.506    | 1.647 | 13.5    | 21.5 | 23 E   | 11* | 12*  |
| 1 26                                | 20 20.16        | -22 40.2        | 2.608    | 1.630 | 3.0     | 21.1 | 5 W    | -   | -    | 1 6                                | 20 29.98        | -17 35.1        | 2.542    | 1.652 | 11.7    | 21.4 | 20 E   | 10* | 9*   |
|                                     |                 |                 |          |       |         |      |        |     |      | 1 16                               | 20 58.14        | -15 40.0        | 2.577    | 1.660 | 9.8     | 21.4 | 17 E   | 8*  | 6*   |
|                                     |                 |                 |          |       |         |      |        |     |      | 1 26                               | 21 25.61        | -13 31.6        | 2.611    | 1.670 | 8.0     | 21.4 | 14 E   | 6*  | 3*   |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° | 20/21   | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|---|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|
| <b>429463 2010 WY<sub>39</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>360502 2003 EO<sub>16</sub></b> (continuation) |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 19 33.98        | -22 12.5        | 2.657    | 1.829 | 13.9    | 21.4 | 26 E   | 11* | 17*  | 12 27   | 3 7.95          | -78 24.6        | 0.226    | 0.949 | 92.2    | 20.4 | 75 E   | —   | 38   |
| 12 27                               | 20 0.32         | -21 25.7        | 2.668    | 1.799 | 12.0    | 21.3 | 22 E   | 9*  | 13*  | 12 28   | 3 22.37         | -77 25.5        | 0.225    | 0.953 | 91.1    | 20.4 | 76 E   | —   | 39   |
| 1 6                                 | 20 27.06        | -20 21.6        | 2.674    | 1.770 | 10.2    | 21.2 | 19 E   | 7*  | 9*   | 12 29   | 3 34.67         | -76 24.0        | 0.224    | 0.957 | 90.1    | 20.3 | 77 E   | —   | 40   |
| 1 16                                | 20 54.04        | -19 0.4         | 2.674    | 1.742 | 8.4     | 21.1 | 15 E   | 5*  | 6*   | 12 30   | 3 45.23         | -75 20.5        | 0.224    | 0.961 | 89.0    | 20.3 | 78 E   | —   | 41   |
| 1 26                                | 21 21.14        | -17 22.9        | 2.671    | 1.717 | 6.5     | 21.0 | 11 E   | 3*  | 3*   | 12 31   | 3 54.37         | -74 15.5        | 0.223    | 0.966 | 87.9    | 20.3 | 79 E   | —   | 42   |
| <b>308004 2004 RT<sub>110</sub></b> |                 |                 |          |       |         |      |        |     |      | <b>250706 2005 RR<sub>6</sub></b>                 |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 19 34.13        | -26 3.4         | 3.476    | 2.629 | 9.5     | 21.4 | 26 E   | 8*  | 19*  | 12 17   | 22 3.76         | -13 53.3        | 1.415    | 1.304 | 42.2    | 21.5 | 63 E   | 31* | 48*  |
| 12 27                               | 19 51.16        | -24 43.9        | 3.505    | 2.603 | 7.4     | 21.3 | 20 E   | 6*  | 12*  | 12 27   | 22 25.11        | -10 57.3        | 1.384    | 1.210 | 43.9    | 21.3 | 59 E   | 33* | 41*  |
| 1 6                                 | 20 8.32         | -23 18.1        | 3.519    | 2.575 | 5.3     | 21.2 | 14 E   | 3*  | 7*   | 1 6   | 22 49.11        | -7 34.2         | 1.340    | 1.122 | 46.0    | 21.1 | 55 E   | 34* | 36*  |
| 1 16                                | 20 25.54        | -21 45.6        | 3.517    | 2.547 | 3.1     | 21.1 | 8 E    | —   | 1*   | 1 16  | 23 15.91        | -3 41.4         | 1.284    | 1.041 | 48.7    | 21.0 | 53 E   | 36* | 31*  |
| 1 26                                | 20 42.74        | -20 6.2         | 3.501    | 2.518 | 1.0     | 20.9 | 3 E    | —   | —    | 1 26  | 23 45.81        | +0 42.5         | 1.218    | 0.973 | 52.0    | 20.8 | 51 E   | 38* | 28*  |
| <b>279776 1999 TA<sub>122</sub></b> |                 |                 |          |       |         |      |        |     |      | <b>488490 2000 AF<sub>205</sub></b>               |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 19 37.02        | -20 52.8        | 2.348    | 1.542 | 17.1    | 21.5 | 27 E   | 13* | 17*  | 12 17   | 23 24.94        | -23 14.2        | 0.086    | 0.970 | 97.1    | 19.9 | 78 E   | 22  | 69*  |
| 12 27                               | 20 7.97         | -19 25.4        | 2.373    | 1.534 | 15.5    | 21.5 | 25 E   | 12* | 14*  | 12 18   | 23 42.61        | -21 58.5        | 0.086    | 0.975 | 93.8    | 19.8 | 81 E   | 23  | 71*  |
| 1 6                                 | 20 38.60        | -17 37.4        | 2.398    | 1.530 | 13.9    | 21.4 | 22 E   | 11* | 11*  | 12 19   | 23 59.96        | -20 35.8        | 0.086    | 0.979 | 90.4    | 19.6 | 85 E   | 24  | 74*  |
| 1 16                                | 21 8.74         | -15 30.9        | 2.423    | 1.529 | 12.2    | 21.4 | 19 E   | 10* | 8*   | 12 20   | 0 16.85         | -19 7.5         | 0.087    | 0.984 | 87.1    | 19.5 | 88 E   | 26  | 76*  |
| 1 26                                | 21 38.29        | -13 8.8         | 2.449    | 1.532 | 10.6    | 21.3 | 17 E   | 9*  | 5*   | 12 21   | 0 33.13         | -17 35.3        | 0.088    | 0.989 | 83.9    | 19.4 | 91 E   | 27  | 77*  |
| <b>326386 2001 OA<sub>14</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>410778 2009 FG<sub>19</sub></b>                |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 19 58.04        | -14 47.9        | 1.869    | 1.186 | 27.5    | 21.5 | 34 E   | 20* | 20*  | 12 27   | 7 22.02         | -43 6.4         | 3.850    | 4.319 | 12.2    | 24.9 | 112 W  | 2   | 73   |
| 12 27                               | 20 24.48        | -11 37.4        | 1.842    | 1.121 | 26.9    | 21.3 | 31 E   | 21* | 14*  | 1 1   | 7 16.92         | -43 9.8         | 3.852    | 4.337 | 12.0    | 24.9 | 113 W  | 2   | 73   |
| 1 6                                 | 20 51.90        | -8 5.7          | 1.799    | 1.051 | 26.9    | 21.1 | 29 E   | 21* | 10*  | 1 6   | 7 11.76         | -43 6.2         | 3.856    | 4.355 | 11.9    | 24.9 | 114 W  | 2   | 73   |
| 1 16                                | 21 20.73        | -4 11.3         | 1.738    | 0.978 | 27.7    | 20.9 | 28 E   | 21* | 6*   | 1 11  | 7 6.62          | -42 55.7        | 3.865    | 4.372 | 11.8    | 25.0 | 115 E  | 2   | 73   |
| 1 26                                | 21 51.60        | +0 6.3          | 1.661    | 0.902 | 29.7    | 20.7 | 27 E   | 21* | 2*   | 1 16  | 7 1.60          | -42 38.3        | 3.877    | 4.390 | 11.7    | 25.0 | 115 E  | 2   | 73   |
| <b>11054 1991 FA</b>                |                 |                 |          |       |         |      |        |     |      | <b>459119 2012 BJ<sub>134</sub></b>               |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 20 11.55        | -20 50.8        | 2.652    | 1.934 | 17.1    | 21.5 | 35 E   | 16* | 25*  | 12 27   | 7 22.86         | +4 52.2         | 3.189    | 4.110 | 5.4     | 24.2 | 157 W  | 50  | 59   |
| 12 27                               | 20 32.92        | -19 30.1        | 2.660    | 1.878 | 15.3    | 21.3 | 30 E   | 15* | 19*  | 1 6   | 7 12.92         | +5 14.3         | 3.151    | 4.101 | 4.1     | 24.1 | 163 W  | 50  | 59   |
| 1 6                                 | 20 55.03        | -17 56.1        | 2.657    | 1.820 | 13.5    | 21.2 | 26 E   | 13* | 14*  | 1 16  | 7 2.77          | +5 45.8         | 3.148    | 4.090 | 4.5     | 24.1 | 161 E  | 51  | 58   |
| 1 16                                | 21 17.85        | -16 7.9         | 2.643    | 1.761 | 11.6    | 21.0 | 21 E   | 11* | 10*  | 1 26  | 6 53.12         | +6 25.1         | 3.177    | 4.077 | 6.4     | 24.3 | 153 E  | 51  | 58   |
| 1 26                                | 21 41.34        | -14 5.4         | 2.618    | 1.701 | 9.7     | 20.9 | 17 E   | 8*  | 6*   | 2 5   | 6 44.57         | +7 9.8          | 3.238    | 4.063 | 8.5     | 24.4 | 142 E  | 52  | 57   |
| <b>310842 2003 AK<sub>18</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>435608 2008 SL<sub>66</sub></b>                |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 20 33.29        | +2 42.8         | 0.227    | 0.855 | 118.6   | 20.9 | 50 E   | 40* | 20*  | 12 27   | 7 26.10         | +20 23.5        | 2.255    | 3.215 | 4.5     | 22.4 | 165 W  | 65  | 44   |
| 12 22                               | 21 18.52        | +7 30.6         | 0.202    | 0.891 | 111.8   | 20.3 | 57 E   | 47* | 22*  | 1 1   | 7 20.97         | +20 32.4        | 2.243    | 3.219 | 2.6     | 22.3 | 171 W  | 66  | 43   |
| 12 27                               | 22 12.25        | +12 33.0        | 0.188    | 0.924 | 102.8   | 19.7 | 66 E   | 54* | 26*  | 1 6   | 7 15.68         | +20 41.4        | 2.239    | 3.222 | 0.8     | 22.1 | 177 W  | 66  | 43   |
| 1 1                                 | 23 11.82        | +17 3.7         | 0.185    | 0.957 | 92.8    | 19.2 | 76 E   | 61* | 30*  | 1 11  | 7 10.34         | +20 50.1        | 2.244    | 3.225 | 1.4     | 22.2 | 175 E  | 66  | 43   |
| 1 6                                 | 0 11.54         | +20 17.3        | 0.193    | 0.987 | 83.2    | 19.0 | 86 E   | 65  | 34*  | 1 16  | 7 5.10          | +20 58.4        | 2.256    | 3.228 | 3.3     | 22.3 | 169 E  | 66  | 43   |
| 1 8                                 | 0 34.08         | +21 9.4         | 0.199    | 0.999 | 79.8    | 19.0 | 89 E   | 66  | 35*  |   |                 |                 |          |       |         |      |        |     |      |
| 1 10                                | 0 55.44         | +21 48.2        | 0.206    | 1.010 | 76.6    | 19.0 | 92 E   | 67  | 36*  |   |                 |                 |          |       |         |      |        |     |      |
| 1 12                                | 1 15.46         | +22 15.5        | 0.215    | 1.021 | 73.8    | 19.0 | 94 E   | 67  | 37*  |   |                 |                 |          |       |         |      |        |     |      |
| 1 14                                | 1 34.07         | +22 33.1        | 0.224    | 1.032 | 71.3    | 19.0 | 96 E   | 68  | 38*  |   |                 |                 |          |       |         |      |        |     |      |
| 1 16                                | 1 51.29         | +22 43.0        | 0.235    | 1.043 | 69.1    | 19.1 | 98 E   | 68  | 38*  |   |                 |                 |          |       |         |      |        |     |      |
| <b>155341 2006 SA<sub>218</sub></b> |                 |                 |          |       |         |      |        |     |      | <b>410778 2009 FG<sub>19</sub></b>                |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 20 56.59        | -21 44.8        | 1.823    | 1.331 | 31.8    | 21.5 | 45 E   | 19* | 35*  | 12 27   | 7 22.02         | -43 6.4         | 3.850    | 4.319 | 12.2    | 24.9 | 112 W  | 2   | 73   |
| 12 27                               | 21 27.98        | -20 47.7        | 1.837    | 1.297 | 30.9    | 21.4 | 43 E   | 19* | 32*  | 1 1   | 7 16.92         | -43 9.8         | 3.852    | 4.337 | 12.0    | 24.9 | 113 W  | 2   | 73   |
| 1 6                                 | 22 0.04         | -19 25.0        | 1.844    | 1.264 | 30.2    | 21.3 | 40 E   | 19* | 29*  | 1 6   | 7 11.76         | -43 6.2         | 3.856    | 4.355 | 11.9    | 24.9 | 114 W  | 2   | 73   |
| 1 16                                | 22 32.65        | -17 37.1        | 1.846    | 1.233 | 29.5    | 21.3 | 38 E   | 19* | 27*  | 1 11  | 7 6.62          | -42 55.7        | 3.865    | 4.372 | 11.8    | 25.0 | 115 E  | 2   | 73   |
| 1 26                                | 23 5.74         | -15 25.3        | 1.844    | 1.205 | 29.1    | 21.2 | 37 E   | 19* | 26*  | 1 16  | 7 1.60          | -42 38.3        | 3.877    | 4.390 | 11.7    | 25.0 | 115 E  | 2   | 73   |
| <b>415715 1999 AU<sub>23</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>459119 2012 BJ<sub>134</sub></b>               |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 21 9.07         | -0 53.2         | 1.770    | 1.460 | 33.8    | 21.5 | 56 E   | 40* | 30*  | 12 27   | 7 22.86         | +4 52.2         | 3.189    | 4.110 | 5.4     | 24.2 | 157 W  | 50  | 59   |
| 12 27                               | 21 34.45        | +1 28.7         | 1.781    | 1.419 | 33.4    | 21.4 | 53 E   | 41* | 24*  | 1 6   | 7 12.92         | +5 14.3         | 3.151    | 4.101 | 4.1     | 24.1 | 163 W  | 50  | 59   |
| 1 6                                 | 22 1.39         | +4 4.0          | 1.788    | 1.381 | 33.1    | 21.4 | 50 E   | 41* | 20*  | 1 16  | 7 2.77          | +5 45.8         | 3.148    | 4.090 | 4.5     | 24.1 | 161 E  | 51  | 58   |
| 1 16                                | 22 29.96        | +6 50.8         | 1.793    | 1.348 | 32.8    | 21.3 | 48 E   | 40* | 16*  | 1 26  | 6 53.12         | +6 25.1         | 3.177    | 4.077 | 6.4     | 24.3 | 153 E  | 51  | 58   |
| 1 26                                | 23 0.20         | +9 46.0         | 1.796    | 1.321 | 32.5    | 21.2 | 46 E   | 39* | 13*  | 2 5   | 6 44.57         | +7 9.8          | 3.238    | 4.063 | 8.5     | 24.4 | 142 E  | 52  | 57   |
| <b>509352 2007 AG</b>               |                 |                 |          |       |         |      |        |     |      | <b>435608 2008 SL<sub>66</sub></b>                |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 21 10.61        | +1 25.0         | 0.384    | 0.839 | 100.4   | 21.3 | 57 E   | 42* | 29*  | 12 27   | 7 26.10         | +20 23.5        | 2.255    | 3.215 | 4.5     | 22.4 | 165 W  | 65  | 44   |
| 12 22                               | 21 46.73        | +3 28.1         | 0.373    | 0.867 | 96.8    | 21.1 | 61 E   | 46* | 31*  | 1 1   | 7 20.97         | +20 32.4        | 2.243    | 3.219 | 2.6     | 22.3 | 171 W  | 66  | 43   |
| 12 27                               | 22 22.79        | +5 17.0         | 0.369    | 0.892 | 93.1    | 21.0 | 65 E   | 48* | 32*  | 1 6   | 7 15.68         | +20 41.4        | 2.239    | 3.222 | 0.8     | 22.1 | 177 W  | 66  | 43   |
| 1 1                                 | 22 57.89        | +6 48.1         | 0.371    | 0.914 | 89.4    | 20.9 | 68 E   | 50* | 34*  | 1 11  | 7 10.34         | +20 50.1        | 2.244    | 3.225 | 1.4     | 22.2 | 175 E  | 66  | 43   |
| 1 6                                 | 23 31.27        | +8 0.4          | 0.379    | 0.934 | 86.1    | 20.9 | 71 E   | 52* | 36*  | 1 16  | 7 5.10          | +20 58.4        | 2.256    | 3.228 | 3.3     | 22.3 | 169 E  | 66  | 43   |
| 1 11                                | 0 2.42          | +8 54.8         | 0.391    | 0.950 | 83.1    | 20.9 | 74 E   | 53* | 37*  |   |                 |                 |          |       |         |      |        |     |      |
| 1 16                                | 0 31.12         | +9 33.9         | 0.407    | 0.964 | 80.7    | 20.9 | 75 E   | 54* | 39*  |   |                 |                 |          |       |         |      |        |     |      |
| <b>360502 2003 EO<sub>16</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>435608 2008 SL<sub>66</sub></b>                |                 |                 |          |       |         |      |        |     |      |
| 12 17                               | 21 58.17        | -81 51.7        | 0.234    | 0.904 | 103.2   | 20.9 | 63 E   | —   | 32*  | 12 27   | 7 26.10         | +20 23.5        | 2.255    | 3.215 | 4.5     | 22.4 | 165 W  | 65  | 44   |
| 12 18                               | 22 32.94        | -82 20.1        | 0.233    | 0.908 | 102.1   | 20.9 | 65 E   | —   | 32*  | 1 1   | 7 20.97         | +20 32.4        | 2.243    | 3.219 | 2.6     | 22.3 | 171 W  | 66  | 43   |
| 12 19                               | 23 11.06        | -82 36.8        | 0.232    | 0.913 | 101.0   | 20.8 | 66 E   | —   | 32*  | 1 6   | 7 15.68         | +20 41.4        | 2.239    | 3.222 | 0.8     | 22.1 | 177 W  | 66  | 43   |
| 12 20                               | 23 50.78        | -82 40.8        | 0.231    | 0.917 | 99.9    | 20.8 | 67 E   | —   | 33*  | 1 11  | 7 10.34         | +20 50.1        | 2.244    | 3.225 | 1.4     | 22.2 | 175 E  | 66  | 43   |
| 12 21                               | 0 29.88         | -82 31.8        | 0.230    | 0.922 | 98.8    | 20.7 | 68 E   | —   | 33*  | 1 16  | 7 5.10          | +20 58.4        | 2.256    | 3.228 | 3.3     | 22.3 | 169 E  | 66  | 43   |
| 12 22                               | 1 6.31          | -82 10.7        | 0.229    | 0.926 | 97.7    | 20.7 | 69 E   | —   | 34*  |   |                 |                 |          |       |         |      |        |     |      |
| 12 23                               | 1 38.80         | -81 39.3        | 0.228    | 0.931 | 96.6    | 20.6 | 70 E   | —   | 34   |   |                 |                 |          |       |         |      |        |     |      |
| 12 24                               | 2 6.89          | -80 59.2        | 0.228    | 0.935 | 95.5    | 20.6 | 71 E   | —   | 35   |   |                 |                 |          |       |         |      |        |     |      |
| 12 25                               | 2 30.77         | -80 12.5        | 0.227    | 0.940 | 94.4    | 20.5 | 72 E   | —   | 36   |   |                 |                 |          |       |         |      |        |     |      |
| 12 26                               | 2 50.94         | -79 20.6        | 0.226    | 0.944 | 93.3    | 20.5 | 73 E   | —   | 37   |   |                 |                 |          |       |         |      |        |     |      |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                              | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ - $26^\circ$ | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ - $26^\circ$ |
|------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-------------------------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-------------------------|
| <b>162168 1999 GT<sub>6</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>481985 2009 KM<sub>7</sub></b>   |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 34.77         | +16 28.0        | 3.491    | 4.436 | 3.9     | 23.5 | 162 W  | 61   48                 | 12 27                               | 8 3.46          | -4 19.3         | 2.465    | 3.305 | 10.3    | 22.8 | 143 W  | 41   68                 |
| 1 6                                | 7 26.67         | +16 42.7        | 3.454    | 4.431 | 1.6     | 23.3 | 173 W  | 62   47                 | 1 6                                 | 7 54.23         | -4 25.7         | 2.420    | 3.313 | 8.3     | 22.7 | 151 W  | 41   68                 |
| 1 16                               | 7 18.28         | +16 59.5        | 3.449    | 4.424 | 1.9     | 23.4 | 171 E  | 62   47                 | 1 16                                | 7 44.21         | -4 12.7         | 2.403    | 3.319 | 7.3     | 22.6 | 155 E  | 41   68                 |
| 1 26                               | 7 10.21         | +17 17.0        | 3.478    | 4.417 | 4.3     | 23.5 | 160 E  | 62   47                 | 1 26                                | 7 34.26         | -3 41.0         | 2.415    | 3.324 | 7.7     | 22.7 | 153 E  | 41   68                 |
| 2 5                                | 7 3.00          | +17 34.4        | 3.537    | 4.409 | 6.7     | 23.7 | 149 E  | 63   46                 | 2 5                                 | 7 25.22         | -2 54.0         | 2.456    | 3.327 | 9.3     | 22.8 | 147 E  | 42   67                 |
| <b>513165 2004 CK<sub>39</sub></b> |                 |                 |          |       |         |      |        |                         | <b>474204 2000 QE<sub>203</sub></b> |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 35.33         | +38 16.0        | 2.300    | 3.236 | 6.4     | 23.7 | 159 W  | 83   26                 | 12 27                               | 8 6.00          | +15 2.7         | 1.868    | 2.788 | 8.7     | 22.6 | 154 W  | 60   49                 |
| 1 1                                | 7 27.58         | +38 38.7        | 2.257    | 3.206 | 5.4     | 23.6 | 162 W  | 84   25                 | 1 6                                 | 7 55.85         | +15 40.1        | 1.832    | 2.799 | 4.6     | 22.4 | 167 W  | 61   48                 |
| 1 6                                | 7 19.31         | +38 57.0        | 2.222    | 3.176 | 5.1     | 23.6 | 163 W  | 84   25                 | 1 16                                | 7 44.64         | +16 23.3        | 1.827    | 2.808 | 1.7     | 22.2 | 175 E  | 61   48                 |
| 1 11                               | 7 10.69         | +39 10.3        | 2.195    | 3.146 | 5.5     | 23.5 | 162 E  | 84   25                 | 1 26                                | 7 33.58         | +17 8.2         | 1.852    | 2.817 | 5.0     | 22.4 | 166 E  | 62   47                 |
| 1 16                               | 7 1.93          | +39 18.0        | 2.177    | 3.115 | 6.5     | 23.6 | 159 E  | 84   25                 | 2 5                                 | 7 23.81         | +17 51.2        | 1.907    | 2.824 | 8.9     | 22.7 | 154 E  | 63   46                 |
| <b>483680 2005 NM<sub>2</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>367251 2007 PN<sub>49</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 46.84         | +18 27.1        | 2.242    | 3.184 | 6.1     | 22.5 | 160 W  | 63   46                 | 12 27                               | 8 7.23          | +18 3.6         | 1.700    | 2.625 | 9.0     | 22.8 | 155 W  | 63   46                 |
| 1 6                                | 7 37.58         | +19 9.3         | 2.179    | 3.156 | 2.4     | 22.3 | 172 W  | 64   45                 | 1 6                                 | 7 56.42         | +18 28.3        | 1.664    | 2.634 | 4.5     | 22.5 | 168 W  | 63   46                 |
| 1 16                               | 7 27.40         | +19 54.3        | 2.147    | 3.128 | 1.8     | 22.2 | 174 E  | 65   44                 | 1 16                                | 7 44.45         | +18 55.8        | 1.659    | 2.642 | 1.0     | 22.3 | 177 E  | 64   45                 |
| 1 26                               | 7 17.30         | +20 38.8        | 2.147    | 3.098 | 5.6     | 22.4 | 162 E  | 66   43                 | 1 26                                | 7 32.67         | +19 22.2        | 1.683    | 2.648 | 5.3     | 22.6 | 166 E  | 64   45                 |
| 2 5                                | 7 8.27          | +21 20.1        | 2.176    | 3.068 | 9.3     | 22.5 | 150 E  | 66   43                 | 2 5                                 | 7 22.38         | +19 45.1        | 1.737    | 2.654 | 9.7     | 22.9 | 153 E  | 65   44                 |
| <b>391449 2007 FL<sub>1</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>495278 2013 RD<sub>32</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 47.59         | +46 17.7        | 1.876    | 2.780 | 9.7     | 22.7 | 151 W  | 89   18                 | 12 27                               | 8 8.34          | +6 48.4         | 2.454    | 3.341 | 8.5     | 23.6 | 150 W  | 52   57                 |
| 1 1                                | 7 40.32         | +47 20.9        | 1.844    | 2.758 | 9.2     | 22.6 | 153 W  | 88   17                 | 1 6                                 | 8 0.06          | +7 5.3          | 2.360    | 3.301 | 5.8     | 23.3 | 160 W  | 52   57                 |
| 1 6                                | 7 32.23         | +48 18.8        | 1.818    | 2.735 | 9.1     | 22.6 | 154 W  | 87   16                 | 1 16                                | 7 50.56         | +7 34.6         | 2.295    | 3.260 | 4.0     | 23.1 | 167 E  | 53   56                 |
| 1 11                               | 7 23.50         | +49 9.8         | 1.800    | 2.712 | 9.6     | 22.6 | 153 E  | 86   15                 | 1 26                                | 7 40.62         | +8 14.9         | 2.262    | 3.218 | 5.0     | 23.1 | 163 E  | 53   56                 |
| 1 16                               | 7 14.38         | +49 52.6        | 1.790    | 2.688 | 10.5    | 22.6 | 150 E  | 85   14                 | 2 5                                 | 7 31.15         | +9 3.4          | 2.259    | 3.174 | 7.8     | 23.2 | 154 E  | 54   55                 |
| <b>446791 1998 SJ<sub>70</sub></b> |                 |                 |          |       |         |      |        |                         | <b>312942 1995 EK<sub>1</sub></b>   |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 51.08         | +31 20.2        | 2.399    | 3.336 | 6.1     | 23.3 | 159 W  | 76   33                 | 12 27                               | 8 12.79         | +30 20.6        | 3.111    | 4.022 | 6.0     | 23.3 | 155 W  | 75   34                 |
| 1 1                                | 7 45.02         | +31 41.8        | 2.359    | 3.316 | 4.6     | 23.2 | 164 W  | 77   32                 | 1 1                                 | 8 7.66          | +30 39.2        | 3.083    | 4.022 | 4.7     | 23.2 | 160 W  | 76   33                 |
| 1 6                                | 7 38.52         | +32 1.4         | 2.327    | 3.296 | 3.5     | 23.1 | 168 W  | 77   32                 | 1 6                                 | 8 2.21          | +30 56.4        | 3.062    | 4.021 | 3.6     | 23.1 | 165 W  | 76   33                 |
| 1 11                               | 7 31.71         | +32 18.4        | 2.303    | 3.275 | 3.1     | 23.0 | 170 W  | 77   32                 | 1 11                                | 7 56.52         | +31 11.9        | 3.050    | 4.020 | 2.7     | 23.0 | 169 W  | 76   33                 |
| 1 16                               | 7 24.72         | +32 32.2        | 2.288    | 3.254 | 3.9     | 23.0 | 167 E  | 78   31                 | 1 16                                | 7 50.69         | +31 25.0        | 3.047    | 4.018 | 2.5     | 23.0 | 170 E  | 76   33                 |
| <b>468741 2010 VM<sub>1</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>503911 2002 FD<sub>6</sub></b>   |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 54.80         | +13 39.2        | 2.097    | 3.023 | 7.5     | 24.7 | 156 W  | 59   50                 | 12 27                               | 8 21.18         | +43 44.3        | 0.715    | 1.636 | 18.4    | 23.6 | 148 W  | 89   20                 |
| 1 6                                | 7 44.21         | +14 6.8         | 2.060    | 3.029 | 3.9     | 24.4 | 168 W  | 59   50                 | 1 1                                 | 8 9.70          | +44 56.0        | 0.694    | 1.630 | 16.4    | 23.4 | 152 W  | 90   19                 |
| 1 16                               | 7 32.85         | +14 40.5        | 2.055    | 3.033 | 2.5     | 24.3 | 172 E  | 60   49                 | 1 6                                 | 7 56.17         | +45 56.5        | 0.678    | 1.622 | 15.1    | 23.3 | 155 W  | 89   18                 |
| 1 26                               | 7 21.80         | +15 17.2        | 2.082    | 3.036 | 5.6     | 24.6 | 163 E  | 60   49                 | 1 11                                | 7 41.07         | +46 40.8        | 0.668    | 1.614 | 14.9    | 23.3 | 155 W  | 88   17                 |
| 2 5                                | 7 12.07         | +15 54.2        | 2.139    | 3.037 | 9.2     | 24.8 | 151 E  | 61   48                 | 1 16                                | 7 25.16         | +47 5.2         | 0.664    | 1.605 | 15.9    | 23.3 | 153 E  | 88   17                 |
| <b>488580 2002 GK<sub>8</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>237881 2002 LN<sub>3</sub></b>   |                 |                 |          |       |         |      |        |                         |
| 12 27                              | 7 55.03         | +73 3.4         | 1.644    | 2.386 | 18.8    | 23.6 | 129 W  | 62   -                  | 12 27                               | 8 29.37         | -0 30.9         | 2.638    | 3.460 | 10.3    | 21.4 | 141 W  | 44   65                 |
| 12 29                              | 7 47.55         | +73 28.8        | 1.649    | 2.391 | 18.7    | 23.6 | 129 W  | 62   -                  | 1 6                                 | 8 22.08         | -0 23.8         | 2.575    | 3.467 | 8.0     | 21.2 | 151 W  | 45   64                 |
| 12 31                              | 7 39.60         | +73 51.2        | 1.656    | 2.396 | 18.7    | 23.7 | 129 W  | 61   -                  | 1 16                                | 8 13.70         | -0 0.7          | 2.540    | 3.473 | 6.0     | 21.1 | 158 W  | 45   64                 |
| 1 2                                | 7 31.25         | +74 10.6        | 1.663    | 2.401 | 18.7    | 23.7 | 128 W  | 61   -                  | 1 26                                | 8 4.95          | +0 37.4         | 2.534    | 3.478 | 5.4     | 21.1 | 161 E  | 46   63                 |
| 1 4                                | 7 22.57         | +74 26.7        | 1.671    | 2.406 | 18.7    | 23.7 | 128 W  | 61   -                  | 2 5                                 | 7 56.57         | +1 27.5         | 2.559    | 3.482 | 6.6     | 21.2 | 156 E  | 46   63                 |
| 1 6                                | 7 13.65         | +74 39.6        | 1.680    | 2.411 | 18.8    | 23.7 | 128 W  | 60   -                  | <b>374855 2006 VQ<sub>13</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 1 7                                | 7 9.13          | +74 44.7        | 1.684    | 2.414 | 18.8    | 23.7 | 128 E  | 60   -                  | 12 27                               | 8 32.12         | -14 16.1        | 0.704    | 1.540 | 28.8    | 21.4 | 131 W  | 31   78                 |
| 1 8                                | 7 4.60          | +74 49.1        | 1.689    | 2.416 | 18.9    | 23.7 | 127 E  | 60   -                  | 1 1                                 | 8 21.35         | -15 19.9        | 0.691    | 1.551 | 26.6    | 21.4 | 135 W  | 30   79                 |
| 1 9                                | 7 0.05          | +74 52.6        | 1.694    | 2.419 | 18.9    | 23.7 | 127 E  | 60   -                  | 1 6                                 | 8 9.37          | -16 6.5         | 0.681    | 1.560 | 24.7    | 21.3 | 139 W  | 29   80                 |
| 1 10                               | 6 55.52         | +74 55.3        | 1.699    | 2.421 | 18.9    | 23.7 | 127 E  | 60   -                  | 1 11                                | 7 56.56         | -16 33.4        | 0.677    | 1.569 | 23.2    | 21.2 | 141 W  | 28   81                 |
| 1 11                               | 6 51.01         | +74 57.2        | 1.704    | 2.424 | 19.0    | 23.7 | 127 E  | 60   -                  | 1 16                                | 7 43.41         | -16 39.3        | 0.678    | 1.575 | 22.4    | 21.2 | 142 E  | 28   81                 |
| 1 12                               | 6 46.53         | +74 58.4        | 1.710    | 2.426 | 19.1    | 23.8 | 126 E  | 60   -                  | <b>327140 2005 EE<sub>224</sub></b> |                 |                 |          |       |         |      |        |                         |
| 1 13                               | 6 42.11         | +74 58.7        | 1.716    | 2.428 | 19.1    | 23.8 | 126 E  | 60   -                  | 12 27                               | 8 33.97         | +61 28.6        | 1.070    | 1.903 | 21.1    | 22.5 | 136 W  | 74   3                  |
| 1 14                               | 6 37.75         | +74 58.2        | 1.722    | 2.431 | 19.2    | 23.8 | 126 E  | 60   -                  | 1 1                                 | 8 24.98         | +62 53.4        | 1.040    | 1.881 | 21.0    | 22.4 | 137 W  | 72   1                  |
| 1 15                               | 6 33.46         | +74 57.1        | 1.728    | 2.433 | 19.3    | 23.8 | 125 E  | 60   -                  | 1 6                                 | 8 13.29         | +64 7.4         | 1.014    | 1.859 | 21.1    | 22.3 | 137 W  | 71   -                  |
| 1 16                               | 6 29.27         | +74 55.2        | 1.734    | 2.435 | 19.3    | 23.8 | 125 E  | 60   -                  | 1 11                                | 7 59.10         | +65 6.2         | 0.993    | 1.836 | 21.7    | 22.3 | 136 W  | 70   -                  |
| <b>508918 2004 BG<sub>86</sub></b> |                 |                 |          |       |         |      |        |                         | 1 16                                | 7 42.97         | +65 45.9        | 0.977    | 1.813 | 22.5    | 22.2 | 135 E  | 69   -                  |
| 12 27                              | 7 56.34         | -19 27.8        | 1.284    | 2.072 | 20.8    | 22.3 | 132 W  | 26   83                 | <b>271519 2004 GL<sub>39</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 1 1                                | 7 47.87         | -19 16.9        | 1.239    | 2.056 | 19.7    | 22.2 | 135 W  | 26   83                 | 12 27                               | 8 36.70         | +30 3.5         | 2.203    | 3.091 | 9.3     | 21.5 | 150 W  | 75   34                 |
| 1 6                                | 7 38.51         | -18 50.7        | 1.201    | 2.040 | 18.8    | 22.1 | 138 W  | 26   83                 | 1 1                                 | 8 32.37         | +30 30.4        | 2.172    | 3.092 | 7.7     | 21.4 | 155 W  | 76   33                 |
| 1 11                               | 7 28.45         | -18 7.9         | 1.168    | 2.023 | 18.2    | 22.0 | 140 E  | 27   82                 | 1 6                                 | 8 27.51         | +30 56.5        | 2.148    | 3.092 | 6.1     | 21.3 | 160 W  | 76   33                 |
| 1 16                               | 7 17.98         | -17 7.5         | 1.141    | 2.004 | 18.0    | 21.9 | 141 E  | 28   81                 | 1 11                                | 8 22.21         | +31 20.9        | 2.131    | 3.091 | 4.8     | 21.2 | 165 W  | 76   33                 |
| <b>369983 1998 QB<sub>28</sub></b> |                 |                 |          |       |         |      |        |                         | 1 16                                | 8 16.60         | +31 42.9        | 2.122    | 3.091 | 3.8     | 21.1 | 168 W  | 77   32                 |
| 12 27                              | 7 56.97         | +22 0.8         | 1.897    | 2.835 | 7.3     | 24.3 | 158 W  | 67   42                 | <b>373463 2000 PK<sub>17</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 1 1                                | 7 51.52         | +22 15.6        | 1.870    | 2.830 | 5.2     | 24.2 | 165 W  | 67   42                 | 12 27                               | 8 38.11         | +21 40.9        | 1.471    | 2.368 | 12.4    | 21.4 | 149 W  | 67   42                 |
| 1 6                                | 7 45.65         | +22 30.4        | 1.850    | 2.826 | 3.0     | 24.0 | 171 W  | 68   41                 | 1 1                                 | 8 33.20         | +21 52.1        | 1.453    | 2.381 | 10.0    | 21.3 | 155 W  | 67   42                 |
| 1 11                               | 7 39.50         | +22 44.7        | 1.838    | 2.821 | 0.9     | 23.8 | 178 W  | 68   41                 | 1 6                                 | 8 27.68         | +22 3.9         | 1.441    | 2.394 | 7.5     | 21.2 | 161 W  | 67   42                 |
| 1 16                               | 7 33.24         | +22 58.0        | 1.833    | 2.815 | 1.6     | 23.9 | 175 E  | 68   41                 | 1 11                                | 8 21.68         | +22 15.6        | 1.436    | 2.406 | 4.9     | 21.1 | 168 W  | 67   42                 |
| <b>162183 1999 NB<sub>5</sub></b>  |                 |                 |          |       |         |      |        |                         | 1 16                                | 8 15.39         | +22 26.5        | 1.438    | 2.419 | 2.4     | 21.0 | 174 W  | 67   42                 |
| 12 27                              | 7 58.99         | +18 11.5        | 0.809    | 1.758 | 12.6    | 22.5 | 157 W  | 63   46                 | <b>184449 2005 NL<sub>55</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 1 1                                | 7 49.91         | +18 32.9        | 0.827    | 1.794 | 8.5     | 22.5 | 164 W  | 64   45                 | 12 27                               | 8 40.06         | +25 58.7        | 2.009    | 2.896 | 10.1    | 21.5 | 149 W  | 71   38                 |
| 1 6                                | 7 40.76         | +18 53.9        | 0.851    | 1.829 | 4.6     | 22.5 | 171 W  | 64   45                 | 1 1                                 | 8 35.73         | +26 21.5        | 1.981    | 2.901 | 8.3     | 21.4 | 155 W  | 71   38                 |
| 1 11                               | 7 31.89         | +19 13.8        | 0.881    | 1.864 | 1.4     | 22.4 | 177 W  | 64   45                 | 1 6                                 | 8 30.86         | +26 44.1        | 1.959    | 2.905 | 6.4     | 21.3 | 161 W  | 72   37                 |
| 1 16                               | 7 23.63         | +19 31.9        | 0.918    | 1.899 | 3.4     | 22.6 | 173 E  | 65   44                 | 1 11                                | 8 25.54         | +27 5.9         | 1.945    | 2.910 | 4.6     | 21.2 | 166 W  | 72   37                 |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ - $26^\circ$ | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ - $26^\circ$ |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-------------------------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-------------------------|
| <b>434113 2002 PV<sub>68</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>396436 2014 EO<sub>45</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 8 49.10         | +10 37.4        | 1.594    | 2.453 | 13.9    | 21.4 | 143 W  | 56   53                 | 12 27                               | 9 43.30         | +24 23.0        | 1.630    | 2.423 | 16.8    | 21.5 | 135 W  | 69   40                 |
| 1 6                                 | 8 41.31         | +10 17.7        | 1.496    | 2.421 | 10.1    | 21.0 | 154 W  | 55   54                 | 1 6                                 | 9 40.05         | +25 9.3         | 1.513    | 2.387 | 13.6    | 21.2 | 145 W  | 70   39                 |
| 1 16                                | 8 30.85         | +10 10.2        | 1.422    | 2.387 | 5.9     | 20.7 | 166 W  | 55   54                 | 1 16                                | 9 33.34         | +26 4.6         | 1.416    | 2.349 | 9.8     | 20.8 | 156 W  | 71   38                 |
| 1 26                                | 8 18.71         | +10 14.0        | 1.376    | 2.353 | 3.9     | 20.5 | 171 E  | 55   54                 | 1 26                                | 9 23.49         | +27 1.3         | 1.344    | 2.312 | 6.0     | 20.5 | 166 W  | 72   37                 |
| 2 5                                 | 8 6.30          | +10 26.8        | 1.359    | 2.319 | 7.3     | 20.6 | 163 E  | 55   54                 | 2 5                                 | 9 11.44         | +27 49.9        | 1.299    | 2.273 | 5.1     | 20.4 | 168 E  | 73   36                 |
| <b>461918 2006 RJ<sub>108</sub></b> |                 |                 |          |       |         |      |        |                         | <b>191600 2004 FW<sub>146</sub></b> |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 0.20          | +7 26.2         | 1.086    | 1.940 | 19.3    | 21.5 | 139 W  | 52   57                 | 12 27                               | 9 45.71         | +4 4.3          | 2.277    | 2.981 | 15.2    | 21.4 | 128 W  | 49   60                 |
| 1 6                                 | 8 55.05         | +7 18.7         | 0.996    | 1.912 | 14.9    | 21.1 | 150 W  | 52   57                 | 1 6                                 | 9 41.78         | +4 9.6          | 2.160    | 2.968 | 12.7    | 21.2 | 138 W  | 49   60                 |
| 1 16                                | 8 46.23         | +7 36.4         | 0.926    | 1.883 | 9.7     | 20.7 | 161 W  | 53   56                 | 1 16                                | 9 35.53         | +4 31.6         | 2.063    | 2.955 | 9.7     | 21.0 | 150 W  | 50   59                 |
| 1 26                                | 8 34.66         | +8 19.8         | 0.878    | 1.854 | 5.5     | 20.4 | 170 W  | 53   56                 | 1 26                                | 9 27.36         | +5 9.9          | 1.991    | 2.940 | 6.2     | 20.7 | 161 W  | 50   59                 |
| 2 5                                 | 8 22.03         | +9 24.1         | 0.853    | 1.825 | 7.7     | 20.4 | 166 E  | 54   55                 | 2 5                                 | 9 17.92         | +6 2.3          | 1.949    | 2.925 | 3.4     | 20.5 | 170 W  | 51   58                 |
| <b>333578 2006 KM<sub>103</sub></b> |                 |                 |          |       |         |      |        |                         | <b>313809 2004 BH<sub>41</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 3.23          | -7 2.0          | 0.662    | 1.501 | 29.9    | 21.5 | 131 W  | 38   71                 | 12 27                               | 9 51.25         | +7 55.7         | 0.837    | 1.637 | 28.3    | 21.2 | 128 W  | 53   56                 |
| 1 6                                 | 8 50.08         | -5 39.4         | 0.654    | 1.554 | 22.8    | 21.3 | 142 W  | 39   70                 | 1 6                                 | 9 38.49         | +12 28.0        | 0.781    | 1.673 | 20.8    | 20.9 | 143 W  | 57   52                 |
| 1 16                                | 8 33.87         | -3 20.9         | 0.663    | 1.605 | 15.9    | 21.2 | 154 W  | 42   67                 | 1 16                                | 9 19.21         | +17 52.5        | 0.749    | 1.705 | 11.9    | 20.6 | 159 W  | 63   46                 |
| 1 26                                | 8 17.32         | -0 21.2         | 0.694    | 1.655 | 11.5    | 21.2 | 160 E  | 45   64                 | 1 26                                | 8 54.92         | +23 30.0        | 0.750    | 1.731 | 3.9     | 20.2 | 173 W  | 69   40                 |
| 2 5                                 | 8 3.13          | +2 54.5         | 0.747    | 1.702 | 12.5    | 21.5 | 158 E  | 48   61                 | 2 5                                 | 8 29.08         | +28 28.9        | 0.784    | 1.753 | 9.1     | 20.6 | 164 E  | 73   36                 |
| <b>435138 2007 GD<sub>49</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>155785 2000 SS<sub>351</sub></b> |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 4.68          | +59 37.1        | 2.087    | 2.860 | 14.3    | 21.5 | 134 W  | 75   4                  | 12 27                               | 10 6.20         | +19 27.9        | 2.430    | 3.136 | 14.2    | 21.4 | 128 W  | 64   45                 |
| 1 1                                 | 8 57.30         | +60 34.5        | 2.092    | 2.882 | 13.7    | 21.5 | 136 W  | 74   3                  | 1 6                                 | 10 2.55         | +20 30.0        | 2.340    | 3.152 | 11.7    | 21.3 | 139 W  | 66   43                 |
| 1 6                                 | 8 48.73         | +61 23.9        | 2.104    | 2.905 | 13.2    | 21.5 | 137 W  | 74   3                  | 1 16                                | 9 56.52         | +21 41.6        | 2.272    | 3.167 | 8.7     | 21.1 | 151 W  | 67   42                 |
| 1 11                                | 8 39.20         | +62 3.9         | 2.121    | 2.927 | 13.0    | 21.5 | 138 W  | 73   2                  | 1 26                                | 9 48.48         | +22 57.2        | 2.230    | 3.181 | 5.5     | 20.9 | 162 W  | 68   41                 |
| 1 16                                | 8 29.00         | +62 33.3        | 2.145    | 2.949 | 12.9    | 21.6 | 138 W  | 72   1                  | 2 5                                 | 9 39.08         | +24 10.4        | 2.218    | 3.194 | 3.1     | 20.8 | 170 W  | 69   40                 |
| <b>511684 2015 BN<sub>509</sub></b> |                 |                 |          |       |         |      |        |                         | <b>180309 2003 XR</b>               |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 8.55          | +13 59.6        | 0.498    | 1.402 | 26.8    | 21.1 | 140 W  | 59   50                 | 12 27                               | 10 8.40         | +9 15.8         | 1.942    | 2.628 | 17.9    | 21.5 | 125 W  | 54   55                 |
| 1 1                                 | 9 2.60          | +14 40.0        | 0.444    | 1.376 | 23.1    | 20.7 | 147 W  | 60   49                 | 1 6                                 | 10 4.64         | +9 8.6          | 1.850    | 2.643 | 15.1    | 21.3 | 136 W  | 54   55                 |
| 1 6                                 | 8 53.48         | +15 38.0        | 0.393    | 1.348 | 18.6    | 20.3 | 154 W  | 61   48                 | 1 16                                | 9 58.09         | +9 15.8         | 1.777    | 2.658 | 11.5    | 21.1 | 147 W  | 54   55                 |
| 1 11                                | 8 40.28         | +16 56.9        | 0.346    | 1.318 | 12.9    | 19.8 | 163 W  | 62   47                 | 1 26                                | 9 49.14         | +9 35.9         | 1.727    | 2.671 | 7.4     | 20.9 | 159 W  | 55   54                 |
| 1 16                                | 8 21.87         | +18 39.1        | 0.304    | 1.285 | 5.8     | 19.1 | 172 W  | 64   45                 | 2 5                                 | 9 38.58         | +10 5.5         | 1.704    | 2.684 | 3.1     | 20.6 | 172 W  | 55   54                 |
| <b>382438 1999 TK<sub>271</sub></b> |                 |                 |          |       |         |      |        |                         | <b>306857 2001 SR<sub>169</sub></b> |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 9.94          | +21 42.1        | 1.851    | 2.692 | 13.1    | 21.4 | 142 W  | 67   42                 | 12 27                               | 10 9.21         | +46 15.5        | 2.781    | 3.491 | 12.5    | 21.5 | 130 W  | 89   18                 |
| 1 6                                 | 9 1.69          | +22 18.5        | 1.799    | 2.716 | 9.2     | 21.2 | 154 W  | 67   42                 | 1 1                                 | 10 6.64         | +46 55.5        | 2.730    | 3.480 | 11.8    | 21.4 | 133 W  | 88   17                 |
| 1 16                                | 8 51.19         | +22 56.9        | 1.773    | 2.738 | 5.0     | 21.0 | 166 W  | 68   41                 | 1 6                                 | 10 3.25         | +47 35.1        | 2.685    | 3.470 | 11.1    | 21.3 | 137 W  | 87   16                 |
| 1 26                                | 8 39.47         | +23 31.7        | 1.777    | 2.759 | 1.8     | 20.8 | 175 W  | 69   40                 | 1 11                                | 9 59.03         | +48 13.2        | 2.645    | 3.459 | 10.5    | 21.3 | 140 W  | 87   16                 |
| 2 5                                 | 8 27.82         | +23 57.9        | 1.812    | 2.780 | 4.7     | 21.0 | 167 E  | 69   40                 | 1 16                                | 9 54.02         | +48 48.8        | 2.612    | 3.448 | 9.9     | 21.2 | 143 W  | 86   15                 |
| <b>216653 2003 UJ<sub>20</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>329923 2005 NK<sub>20</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 11.35         | +10 34.0        | 1.894    | 2.706 | 14.1    | 21.4 | 138 W  | 56   53                 | 12 27                               | 10 11.05        | -9 7.6          | 2.314    | 2.879 | 17.9    | 21.5 | 116 W  | 36   73                 |
| 1 6                                 | 9 4.38          | +10 38.6        | 1.816    | 2.711 | 10.5    | 21.2 | 150 W  | 56   53                 | 1 6                                 | 10 6.98         | -10 25.3        | 2.216    | 2.896 | 16.1    | 21.3 | 125 W  | 35   74                 |
| 1 16                                | 8 55.13         | +10 55.7        | 1.763    | 2.714 | 6.6     | 21.0 | 162 W  | 56   53                 | 1 16                                | 10 0.43         | -11 25.7        | 2.135    | 2.911 | 13.9    | 21.2 | 135 W  | 34   75                 |
| 1 26                                | 8 44.44         | +11 22.7        | 1.738    | 2.717 | 2.8     | 20.8 | 172 W  | 56   53                 | 1 26                                | 9 51.74         | -12 4.8         | 2.074    | 2.926 | 11.5    | 21.0 | 144 W  | 33   76                 |
| 2 5                                 | 8 33.42         | +11 55.8        | 1.744    | 2.719 | 3.9     | 20.8 | 169 E  | 57   52                 | 2 5                                 | 9 41.54         | -12 19.8        | 2.038    | 2.939 | 9.4     | 20.9 | 151 W  | 33   76                 |
| <b>142561 2002 TX<sub>68</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>174287 2002 SX<sub>37</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 13.05         | +1 34.8         | 1.269    | 2.073 | 20.1    | 21.2 | 134 W  | 47   62                 | 12 27                               | 10 13.90        | +21 47.0        | 2.751    | 3.436 | 13.2    | 21.3 | 127 W  | 67   42                 |
| 1 1                                 | 9 10.42         | +1 52.9         | 1.218    | 2.064 | 18.2    | 21.0 | 139 W  | 47   62                 | 1 6                                 | 10 10.97        | +22 40.5        | 2.632    | 3.425 | 11.1    | 21.2 | 138 W  | 68   41                 |
| 1 6                                 | 9 6.85          | +2 19.9         | 1.171    | 2.054 | 16.0    | 20.9 | 145 W  | 47   62                 | 1 16                                | 10 5.78         | +23 42.4        | 2.534    | 3.414 | 8.6     | 21.0 | 149 W  | 69   40                 |
| 1 11                                | 9 2.34          | +2 56.2         | 1.129    | 2.044 | 13.7    | 20.7 | 151 W  | 48   61                 | 1 26                                | 9 58.56         | +24 48.3        | 2.463    | 3.402 | 5.9     | 20.8 | 159 W  | 70   39                 |
| 1 16                                | 8 56.98         | +3 42.1         | 1.093    | 2.033 | 11.2    | 20.5 | 156 W  | 49   60                 | 2 5                                 | 9 49.80         | +25 52.4        | 2.420    | 3.389 | 3.7     | 20.6 | 167 W  | 71   38                 |
| <b>457768 2009 KN<sub>4</sub></b>   |                 |                 |          |       |         |      |        |                         | <b>467609 2008 AV<sub>28</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 14.11         | +18 46.6        | 1.311    | 2.159 | 17.0    | 21.5 | 140 W  | 64   45                 | 12 27                               | 10 14.45        | +13 42.4        | 0.792    | 1.576 | 30.8    | 21.2 | 125 W  | 59   50                 |
| 1 1                                 | 9 7.87          | +18 57.1        | 1.298    | 2.187 | 14.3    | 21.4 | 147 W  | 64   45                 | 1 6                                 | 10 4.68         | +12 23.5        | 0.718    | 1.584 | 25.2    | 20.8 | 137 W  | 57   52                 |
| 1 6                                 | 9 0.83          | +19 9.2         | 1.291    | 2.215 | 11.5    | 21.3 | 153 W  | 64   45                 | 1 16                                | 9 47.67         | +11 13.9        | 0.658    | 1.589 | 17.8    | 20.4 | 150 W  | 56   53                 |
| 1 11                                | 8 53.15         | +19 22.1        | 1.291    | 2.242 | 8.5     | 21.2 | 160 W  | 64   45                 | 1 26                                | 9 24.07         | +10 12.5        | 0.618    | 1.590 | 9.2     | 20.0 | 165 W  | 55   54                 |
| 1 16                                | 8 45.06         | +19 34.8        | 1.299    | 2.268 | 5.5     | 21.1 | 167 W  | 65   44                 | 2 5                                 | 8 56.70         | +9 18.1         | 0.605    | 1.587 | 4.9     | 19.7 | 172 E  | 54   55                 |
| <b>368188 2000 SZ<sub>72</sub></b>  |                 |                 |          |       |         |      |        |                         | <b>136149 2003 SR<sub>313</sub></b> |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 25.48         | +22 55.3        | 1.620    | 2.444 | 15.5    | 21.4 | 138 W  | 68   41                 | 12 27                               | 10 17.02        | +20 47.7        | 2.082    | 2.779 | 16.6    | 21.4 | 126 W  | 66   43                 |
| 1 6                                 | 9 18.24         | +23 48.2        | 1.568    | 2.469 | 11.5    | 21.2 | 150 W  | 69   40                 | 1 6                                 | 10 14.01        | +21 45.6        | 1.986    | 2.787 | 13.9    | 21.2 | 137 W  | 67   42                 |
| 1 16                                | 9 8.15          | +24 44.4        | 1.539    | 2.493 | 7.1     | 21.0 | 162 W  | 70   39                 | 1 16                                | 10 8.12         | +22 54.6        | 1.910    | 2.794 | 10.7    | 21.0 | 148 W  | 68   41                 |
| 1 26                                | 8 56.27         | +25 35.8        | 1.538    | 2.516 | 3.4     | 20.9 | 171 W  | 71   38                 | 1 26                                | 9 59.64         | +24 8.7         | 1.858    | 2.800 | 7.2     | 20.8 | 159 W  | 69   40                 |
| 2 5                                 | 8 44.01         | +26 15.3        | 1.567    | 2.538 | 4.8     | 21.0 | 168 E  | 71   38                 | 2 5                                 | 9 49.25         | +25 20.0        | 1.834    | 2.805 | 4.3     | 20.6 | 168 W  | 70   39                 |
| <b>486220 2013 AB<sub>103</sub></b> |                 |                 |          |       |         |      |        |                         | <b>415025 2011 QJ<sub>80</sub></b>  |                 |                 |          |       |         |      |        |                         |
| 12 27                               | 9 32.35         | +17 34.5        | 1.749    | 2.546 | 15.7    | 21.4 | 136 W  | 63   46                 | 12 27                               | 10 24.95        | -6 5.9          | 1.178    | 1.817 | 29.6    | 21.3 | 114 W  | 39   70                 |
| 1 6                                 | 9 25.06         | +17 41.6        | 1.700    | 2.583 | 11.8    | 21.2 | 147 W  | 63   46                 | 1 1                                 | 10 26.44        | -6 48.9         | 1.142    | 1.827 | 28.3    | 21.2 | 118 W  | 38   71                 |
| 1 16                                | 9 15.25         | +17 55.6        | 1.674    | 2.620 | 7.4     | 21.0 | 160 W  | 63   46                 | 1 6                                 | 10 27.02        | -7 25.6         | 1.109    | 1.837 | 26.7    | 21.2 | 123 W  | 38   71                 |
| 1 26                                | 9 3.88          | +18 11.9        | 1.676    | 2.655 | 2.7     | 20.8 | 173 W  | 63   46                 | 1 11                                | 10 26.64        | -7 55.1         | 1.078    | 1.848 | 25.0    | 21.0 | 127 W  | 37   72                 |
| 2 5                                 | 8 52.19         | +18 26.0        | 1.707    | 2.690 | 2.1     | 20.9 | 174 E  | 63   46                 | 1 16                                | 10 25.31        | -8 16.5         | 1.049    | 1.858 | 23.1    | 20.9 | 132 W  | 37   72</               |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45°-26° | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45°-26° |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|---------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|---------|
| <b>3102 Krok</b>                    |                 |                 |          |       |         |      |        |         | <b>500638 2012 VS<sub>1</sub></b>   |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 31.27        | + 3 38.4        | 2.532    | 3.107 | 16.4    | 21.5 | 117 W  | 49 60   | 12 27                               | 11 55.44        | +15 30.0        | 1.530    | 1.988 | 28.9    | 21.4 | 102 W  | 60 47*  |
| 1 6                                 | 10 28.90        | + 3 48.8        | 2.410    | 3.112 | 14.4    | 21.3 | 128 W  | 49 60   | 1 6                                 | 12 0.11         | +15 14.5        | 1.442    | 2.017 | 27.1    | 21.2 | 111 W  | 60 49*  |
| 1 16                                | 10 24.18        | + 4 15.4        | 2.303    | 3.115 | 11.9    | 21.1 | 139 W  | 49 60   | 1 16                                | 12 1.18         | +15 17.3        | 1.360    | 2.045 | 24.4    | 21.1 | 121 W  | 60 49   |
| 1 26                                | 10 17.28        | + 4 57.9        | 2.219    | 3.117 | 8.8     | 20.9 | 151 W  | 50 59   | 1 26                                | 11 58.23        | +15 37.2        | 1.287    | 2.072 | 21.0    | 20.9 | 131 W  | 61 48   |
| 2 5                                 | 10 8.60         | + 5 54.5        | 2.161    | 3.118 | 5.2     | 20.7 | 163 W  | 51 58   | 2 5                                 | 11 51.07        | +16 10.1        | 1.228    | 2.097 | 16.7    | 20.6 | 142 W  | 61 48   |
| <b>426255 2012 QU<sub>2</sub></b>   |                 |                 |          |       |         |      |        |         | <b>124329 2001 QU<sub>98</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 33.80        | +44 19.5        | 2.215    | 2.898 | 16.1    | 21.4 | 125 W  | 89 20   | 12 27                               | 12 4.05         | - 0 55.3        | 2.721    | 2.958 | 19.4    | 21.4 | 94 W   | 44 61*  |
| 1 1                                 | 10 32.02        | +45 8.4         | 2.184    | 2.909 | 15.1    | 21.4 | 129 W  | 90 19   | 1 6                                 | 12 8.31         | - 1 10.7        | 2.584    | 2.968 | 18.8    | 21.3 | 103 W  | 44 65*  |
| 1 6                                 | 10 29.29        | +45 57.5        | 2.156    | 2.919 | 14.2    | 21.3 | 133 W  | 89 18   | 1 16                                | 12 10.58        | - 1 11.8        | 2.452    | 2.976 | 17.7    | 21.1 | 113 W  | 44 65   |
| 1 11                                | 10 25.59        | +46 45.6        | 2.134    | 2.929 | 13.3    | 21.3 | 137 W  | 88 17   | 1 26                                | 12 10.65        | - 0 57.0        | 2.329    | 2.983 | 16.0    | 21.0 | 123 W  | 44 65   |
| 1 16                                | 10 20.94        | +47 31.2        | 2.117    | 2.939 | 12.5    | 21.2 | 140 W  | 87 16   | 2 5                                 | 12 8.41         | - 0 25.7        | 2.219    | 2.990 | 13.7    | 20.8 | 134 W  | 45 64   |
| <b>83120 2001 QP<sub>246</sub></b>  |                 |                 |          |       |         |      |        |         | <b>247925 2003 WD<sub>87</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 38.45        | +10 57.5        | 2.389    | 2.984 | 16.9    | 21.5 | 118 W  | 56 53   | 12 27                               | 12 5.65         | - 3 19.7        | 2.988    | 3.190 | 17.9    | 21.4 | 93 W   | 42 63*  |
| 1 6                                 | 10 37.15        | +11 5.4         | 2.258    | 2.975 | 14.9    | 21.3 | 129 W  | 56 53   | 1 6                                 | 12 8.23         | - 4 5.9         | 2.858    | 3.211 | 17.4    | 21.3 | 102 W  | 41 68*  |
| 1 16                                | 10 33.34        | +11 26.7        | 2.143    | 2.965 | 12.3    | 21.1 | 140 W  | 56 53   | 1 16                                | 12 8.84         | - 4 41.7        | 2.732    | 3.230 | 16.4    | 21.2 | 112 W  | 40 69   |
| 1 26                                | 10 27.09        | +12 0.3         | 2.050    | 2.954 | 9.1     | 20.8 | 152 W  | 57 52   | 1 26                                | 12 7.30         | - 5 5.4         | 2.615    | 3.248 | 14.9    | 21.1 | 122 W  | 40 69   |
| 2 5                                 | 10 18.75        | +12 42.9        | 1.982    | 2.943 | 5.3     | 20.6 | 164 W  | 58 51   | 2 5                                 | 12 3.57         | - 5 16.3        | 2.512    | 3.266 | 12.8    | 20.9 | 133 W  | 40 69   |
| <b>175519 2006 SR<sub>54</sub></b>  |                 |                 |          |       |         |      |        |         | <b>392022 2009 BA<sub>2</sub></b>   |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 40.19        | +15 40.0        | 1.886    | 2.520 | 19.9    | 21.4 | 119 W  | 61 48   | 12 27                               | 12 12.69        | +10 8.3         | 1.315    | 1.728 | 34.4    | 21.3 | 96 W   | 55 50*  |
| 1 6                                 | 10 40.77        | +16 8.0         | 1.759    | 2.503 | 17.6    | 21.1 | 130 W  | 61 48   | 1 6                                 | 12 32.03        | +11 26.4        | 1.207    | 1.714 | 34.1    | 21.1 | 102 W  | 56 51*  |
| 1 16                                | 10 38.34        | +16 53.0        | 1.647    | 2.485 | 14.6    | 20.9 | 140 W  | 62 47   | 1 16                                | 12 50.47        | +13 21.1        | 1.106    | 1.700 | 33.3    | 20.9 | 109 W  | 58 51*  |
| 1 26                                | 10 32.80        | +17 52.5        | 1.555    | 2.466 | 10.9    | 20.6 | 152 W  | 63 46   | 1 26                                | 13 7.59         | +15 56.7        | 1.015    | 1.685 | 32.0    | 20.6 | 115 W  | 61 48   |
| 2 5                                 | 10 24.41        | +19 0.9         | 1.486    | 2.446 | 6.8     | 20.3 | 163 W  | 64 45   | 2 5                                 | 13 22.92        | +19 14.9        | 0.935    | 1.672 | 30.4    | 20.4 | 121 W  | 64 45   |
| <b>182127 2000 RJ<sub>70</sub></b>  |                 |                 |          |       |         |      |        |         | <b>298680 2004 DJ<sub>25</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 42.96        | + 9 28.1        | 2.515    | 3.085 | 16.5    | 21.4 | 117 W  | 54 55   | 12 27                               | 12 14.57        | - 6 29.7        | 1.428    | 1.726 | 34.7    | 21.5 | 89 W   | 39 64*  |
| 1 6                                 | 10 43.09        | + 9 43.1        | 2.355    | 3.049 | 14.9    | 21.2 | 127 W  | 55 54   | 1 6                                 | 12 27.52        | - 7 37.3        | 1.356    | 1.759 | 33.8    | 21.4 | 96 W   | 37 70*  |
| 1 16                                | 10 40.92        | +10 13.3        | 2.209    | 3.012 | 12.7    | 21.0 | 138 W  | 55 54   | 1 16                                | 12 37.86        | - 8 24.1        | 1.283    | 1.793 | 32.2    | 21.3 | 104 W  | 37 72   |
| 1 26                                | 10 36.38        | +10 58.4        | 2.085    | 2.974 | 9.7     | 20.7 | 149 W  | 56 53   | 1 26                                | 12 45.13        | - 8 46.9        | 1.212    | 1.827 | 30.0    | 21.1 | 112 W  | 36 73   |
| 2 5                                 | 10 29.63        | +11 56.4        | 1.984    | 2.935 | 6.2     | 20.4 | 161 W  | 57 52   | 2 5                                 | 12 48.92        | - 8 42.6        | 1.146    | 1.861 | 26.9    | 21.0 | 121 W  | 36 73   |
| <b>511520 2014 QW<sub>296</sub></b> |                 |                 |          |       |         |      |        |         | <b>267337 2001 VK<sub>5</sub></b>   |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 48.79        | +18 25.9        | 1.132    | 1.818 | 28.4    | 21.4 | 118 W  | 63 46   | 12 27                               | 12 16.02        | +26 40.0        | 1.460    | 1.920 | 30.1    | 21.4 | 102 W  | 72 35*  |
| 1 6                                 | 10 49.84        | +20 0.7         | 1.085    | 1.864 | 24.4    | 21.3 | 128 W  | 65 44   | 1 6                                 | 12 24.67        | +28 18.7        | 1.347    | 1.914 | 29.0    | 21.2 | 109 W  | 73 35*  |
| 1 16                                | 10 46.33        | +21 58.2        | 1.051    | 1.909 | 19.6    | 21.1 | 139 W  | 67 42   | 1 16                                | 12 30.09        | +30 32.2        | 1.239    | 1.904 | 27.3    | 21.0 | 117 W  | 76 33   |
| 1 26                                | 10 38.40        | +24 7.5         | 1.035    | 1.953 | 14.4    | 20.9 | 150 W  | 69 40   | 1 26                                | 12 31.28        | +33 20.6        | 1.141    | 1.890 | 25.1    | 20.7 | 125 W  | 78 31   |
| 2 5                                 | 10 26.93        | +26 12.5        | 1.040    | 1.996 | 9.6     | 20.8 | 160 W  | 71 38   | 2 5                                 | 12 27.04        | +36 38.2        | 1.057    | 1.871 | 22.8    | 20.5 | 133 W  | 82 27   |
| <b>101795 1999 HX<sub>2</sub></b>   |                 |                 |          |       |         |      |        |         | <b>101969 1999 RJ<sub>45</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 10 59.05        | +11 56.7        | 3.420    | 3.923 | 13.2    | 21.4 | 114 W  | 57 52   | 12 27                               | 12 28.66        | + 8 48.3        | 3.795    | 3.958 | 14.4    | 21.5 | 92 W   | 54 50*  |
| 1 6                                 | 10 58.92        | +12 36.1        | 3.244    | 3.885 | 12.1    | 21.2 | 124 W  | 58 51   | 1 6                                 | 12 31.85        | + 9 10.7        | 3.657    | 3.975 | 14.0    | 21.4 | 102 W  | 54 53*  |
| 1 16                                | 10 56.98        | +13 28.7        | 3.085    | 3.845 | 10.4    | 21.0 | 135 W  | 58 51   | 1 16                                | 12 33.49        | + 9 45.2        | 3.524    | 3.990 | 13.3    | 21.3 | 111 W  | 55 54   |
| 1 26                                | 10 53.19        | +14 33.4        | 2.947    | 3.805 | 8.3     | 20.8 | 146 W  | 60 49   | 1 26                                | 12 33.44        | +10 31.5        | 3.400    | 4.005 | 12.1    | 21.2 | 122 W  | 56 53   |
| 2 5                                 | 10 47.67        | +15 47.7        | 2.834    | 3.764 | 5.7     | 20.6 | 158 W  | 61 48   | 2 5                                 | 12 31.65        | +11 28.1        | 3.292    | 4.019 | 10.5    | 21.1 | 132 W  | 56 53   |
| <b>214529 2006 KU<sub>41</sub></b>  |                 |                 |          |       |         |      |        |         | <b>484757 2009 BL<sub>2</sub></b>   |                 |                 |          |       |         |      |        |         |
| 12 27                               | 11 5.28         | +10 0.8         | 2.013    | 2.547 | 21.0    | 21.4 | 112 W  | 55 54*  | 12 27                               | 12 35.59        | - 5 23.6        | 0.911    | 1.282 | 49.8    | 21.5 | 85 W   | 40 60*  |
| 1 6                                 | 11 6.25         | +10 10.0        | 1.904    | 2.562 | 19.0    | 21.2 | 122 W  | 55 54   | 1 6                                 | 12 58.00        | - 7 1.4         | 0.868    | 1.247 | 51.7    | 21.4 | 84 W   | 38 61*  |
| 1 16                                | 11 4.38         | +10 36.3        | 1.808    | 2.577 | 16.3    | 21.0 | 133 W  | 56 53   | 1 6                                 | 13 21.79        | - 8 38.3        | 0.830    | 1.213 | 53.7    | 21.3 | 83 W   | 36 62*  |
| 1 26                                | 10 59.58        | +11 18.8        | 1.728    | 2.590 | 12.9    | 20.8 | 144 W  | 56 53   | 1 11                                | 13 46.89        | -10 11.8        | 0.799    | 1.180 | 55.7    | 21.2 | 82 W   | 35 63*  |
| 2 5                                 | 10 52.10        | +12 14.1        | 1.670    | 2.602 | 8.9     | 20.6 | 156 W  | 57 52   | 1 16                                | 14 13.19        | -11 39.3        | 0.773    | 1.150 | 57.6    | 21.1 | 81 W   | 33 63*  |
| <b>210806 2001 HN<sub>40</sub></b>  |                 |                 |          |       |         |      |        |         | <b>217251 2003 UM<sub>25</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 11 14.47        | +11 13.5        | 2.437    | 2.925 | 18.4    | 21.3 | 110 W  | 56 53*  | 12 27                               | 12 48.68        | -12 18.9        | 2.445    | 2.463 | 23.1    | 21.5 | 79 W   | 33 62*  |
| 1 6                                 | 11 17.17        | +11 36.5        | 2.275    | 2.892 | 17.2    | 21.1 | 120 W  | 57 52   | 1 6                                 | 12 59.29        | -13 41.1        | 2.291    | 2.440 | 23.7    | 21.4 | 87 W   | 31 70*  |
| 1 16                                | 11 17.63        | +12 16.5        | 2.126    | 2.859 | 15.3    | 20.9 | 130 W  | 57 52   | 1 16                                | 13 8.65         | -14 56.1        | 2.136    | 2.416 | 24.0    | 21.2 | 94 W   | 30 77*  |
| 1 26                                | 11 15.63        | +13 13.6        | 1.993    | 2.824 | 12.8    | 20.6 | 141 W  | 58 51   | 1 26                                | 13 16.45        | -16 2.2         | 1.982    | 2.391 | 23.7    | 21.0 | 102 W  | 29 80   |
| 2 5                                 | 11 11.09        | +14 25.8        | 1.881    | 2.789 | 9.6     | 20.3 | 152 W  | 59 50   | 2 5                                 | 13 22.33        | -16 57.4        | 1.832    | 2.365 | 23.0    | 20.8 | 111 W  | 28 81   |
| <b>418900 2009 BE<sub>2</sub></b>   |                 |                 |          |       |         |      |        |         | <b>175921 2000 DM<sub>1</sub></b>   |                 |                 |          |       |         |      |        |         |
| 12 27                               | 11 29.46        | +28 27.9        | 0.830    | 1.508 | 37.2    | 21.2 | 112 W  | 73 35*  | 12 27                               | 13 22.96        | - 8 44.5        | 1.424    | 1.475 | 39.6    | 21.5 | 73 W   | 36 53*  |
| 1 1                                 | 11 44.29        | +30 11.1        | 0.779    | 1.482 | 37.3    | 21.0 | 114 W  | 75 34*  | 1 6                                 | 13 48.81        | -13 14.5        | 1.280    | 1.407 | 42.6    | 21.2 | 76 W   | 32 60*  |
| 1 6                                 | 12 0.00         | +32 6.6         | 0.732    | 1.457 | 37.5    | 20.9 | 116 W  | 77 32*  | 1 16                                | 14 18.46        | -18 17.9        | 1.144    | 1.336 | 45.9    | 21.0 | 77 W   | 27 66*  |
| 1 11                                | 12 16.71        | +34 14.1        | 0.688    | 1.431 | 37.9    | 20.7 | 117 W  | 79 30*  | 1 26                                | 14 53.92        | -23 56.8        | 1.021    | 1.262 | 49.7    | 20.7 | 78 W   | 21 70*  |
| 1 16                                | 12 34.55        | +36 32.3        | 0.649    | 1.405 | 38.5    | 20.5 | 117 W  | 82 27   | 2 5                                 | 15 38.32        | -30 2.8         | 0.915    | 1.184 | 54.2    | 20.5 | 77 W   | 15 71*  |
| <b>250008 2002 AO<sub>31</sub></b>  |                 |                 |          |       |         |      |        |         | <b>390802 2004 GS<sub>19</sub></b>  |                 |                 |          |       |         |      |        |         |
| 12 27                               | 11 38.05        | + 4 11.5        | 1.578    | 2.026 | 28.3    | 21.5 | 102 W  | 49 59*  | 12 27                               | 13 28.95        | +20 9.1         | 2.337    | 2.437 | 23.7    | 21.4 | 84 W   | 65* 32* |
| 1 6                                 | 11 43.61        | + 3 25.8        | 1.492    | 2.057 | 26.6    | 21.3 | 111 W  | 48 61   | 1 6                                 | 13 42.69        | +20 19.6        | 2.198    | 2.409 | 24.1    | 21.2 | 90 W   | 65 36*  |
| 1 16                                | 11 46.00        | + 2 58.7        | 1.412    | 2.087 | 24.0    | 21.2 | 120 W  | 48 61   | 1 16                                | 13 55.24        | +20 47.0        | 2.061    | 2.380 | 24.2    | 21.1 | 96 W   | 66 40*  |
| 1 26                                | 11 44.92        | + 2 51.8        | 1.340    | 2.117 | 20.7    | 21.0 | 131 W  | 48 61   | 1 26                                | 14 6.28         | +21 32.3        | 1.928    | 2.351 | 24.1    | 20.9 | 103 W  | 67 41*  |
| 2 5                                 | 11 40.30        | + 3 5.4         | 1.283    | 2.147 | 16.5    | 20.8 | 142 W  | 48 61   | 2 5                                 | 14 15.42        | +22 35.4        | 1.800    | 2.321 | 23.6    | 20.7 | 109 W  | 68 41*  |
| <b>177266 2003 WK<sub>88</sub></b>  |                 |                 |          |       |         |      |        |         | <b>185851 2000 DP<sub>107</sub></b> |                 |                 |          |       |         |      |        |         |
| 12 27                               | 11 49.72        | - 3 51.7        | 2.238    | 2.540 | 22.6    | 21.5 | 96 W   | 41 65*  | 12 27                               | 13 47.01        | - 9 33.5        | 1.498    | 1.437 | 39.1    | 21.4 | 67 W   | 35* 48* |
| 1 6                                 | 11 55.23        | - 4 56.6        | 2.089    | 2.524 | 22.1    | 21.3 | 105 W  | 40 69*  | 1 6                                 | 14 16.26        | -12 57.9        | 1.379    | 1.384 | 41.7    | 21.2 | 69 W   | 32* 54* |
| 1 16                                | 11 58.60        | - 5 50.5        | 1.945    | 2.507 | 21.1    | 21.1 | 114 W  | 39 70   | 1 16                                | 14 48.59        | -16 28.5        | 1.266    | 1.328 | 44.5    | 21.0 | 71 W   | 29* 58* |
| 1 26                                | 11 59.50        | - 6 30.8        | 1.809    | 2.490 | 19.3    | 20.8 | 123 W  | 38 71   | 1 26                                | 15 24.93        | -20 0.5         | 1.163    | 1.270 | 47.5    | 20.8 | 72 W   | 25* 62* |
| 2 5                                 | 11 57.64        | - 6 54.9        | 1.686    |       |         |      |        |         |                                     |                 |                 |          |       |         |      |        |         |

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | 45° | -26° |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|-----|------|
| <b>101496 1998 XM<sub>3</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>382825 2003 XB<sub>22</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 13 51.65        | -8 43.4         | 3.838    | 3.560 | 14.7    | 21.5 | 66 W   | 36* | 47*  | 12 27                               | 16 34.22        | -5 40.2         | 1.530    | 0.865 | 36.7    | 21.5 | 32 W   | 24* | 9*   |
| 1 6                                 | 13 58.87        | -9 26.8         | 3.689    | 3.557 | 15.5    | 21.4 | 75 W   | 36  | 56*  | 1 1                                 | 16 58.22        | -7 18.4         | 1.549    | 0.857 | 35.3    | 21.5 | 30 W   | 22* | 10*  |
| 1 16                                | 14 4.97         | -10 3.4         | 3.533    | 3.554 | 16.0    | 21.4 | 83 W   | 35  | 64*  | 1 6                                 | 17 21.99        | -8 51.9         | 1.571    | 0.853 | 33.7    | 21.4 | 29 W   | 21* | 10*  |
| 1 26                                | 14 9.74         | -10 32.7        | 3.374    | 3.550 | 16.1    | 21.3 | 92 W   | 34  | 71*  | 1 11                                | 17 45.51        | -10 19.4        | 1.596    | 0.853 | 32.1    | 21.4 | 27 W   | 19* | 11*  |
| 2 5                                 | 14 12.96        | -10 54.0        | 3.216    | 3.545 | 15.8    | 21.1 | 101 W  | 34  | 75   | 1 16                                | 18 8.74         | -11 39.8        | 1.622    | 0.857 | 30.4    | 21.4 | 26 W   | 17* | 12*  |
| <b>189430 1998 HH<sub>145</sub></b> |                 |                 |          |       |         |      |        |     |      | <b>513171 2004 MD<sub>6</sub></b>   |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 14 31.63        | -12 35.7        | 2.364    | 1.986 | 24.2    | 21.5 | 56 W   | 31* | 40*  | 12 27                               | 16 35.51        | -34 46.0        | 1.015    | 0.453 | 73.1    | 21.3 | 26 W   | -   | 20*  |
| 1 6                                 | 14 53.25        | -13 55.3        | 2.242    | 1.957 | 26.0    | 21.4 | 61 W   | 30* | 46*  | 12 29                               | 16 44.60        | -34 45.3        | 1.063    | 0.469 | 67.4    | 21.3 | 26 W   | -   | 20*  |
| 1 16                                | 15 15.17        | -15 4.6         | 2.119    | 1.929 | 27.6    | 21.3 | 65 W   | 29* | 52*  | 12 31                               | 16 53.95        | -34 37.7        | 1.109    | 0.487 | 62.3    | 21.3 | 26 W   | -   | 20*  |
| 1 26                                | 15 37.27        | -16 2.1         | 1.994    | 1.901 | 29.2    | 21.2 | 70 W   | 29* | 58*  | 1 2                                 | 17 3.42         | -34 24.3        | 1.154    | 0.508 | 57.9    | 21.3 | 26 W   | -   | 20*  |
| 2 5                                 | 15 59.48        | -16 46.9        | 1.870    | 1.874 | 30.5    | 21.0 | 75 W   | 28* | 64*  | 1 4                                 | 17 12.88        | -34 6.0         | 1.196    | 0.529 | 54.0    | 21.4 | 26 W   | -   | 20*  |
| <b>156716 2002 RK<sub>27</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>515049 2010 FL</b>               |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 14 35.59        | -12 16.4        | 2.181    | 1.807 | 26.5    | 21.5 | 55 W   | 31* | 39*  | 12 27                               | 16 36.67        | -19 22.8        | 1.608    | 0.831 | 30.2    | 21.2 | 25 W   | 12* | 14*  |
| 1 6                                 | 14 59.08        | -13 50.6        | 2.080    | 1.790 | 28.2    | 21.4 | 59 W   | 30* | 44*  | 1 1                                 | 17 6.08         | -21 1.6         | 1.588    | 0.786 | 29.5    | 21.1 | 23 W   | 10* | 14*  |
| 1 16                                | 15 22.81        | -15 13.7        | 1.977    | 1.773 | 29.8    | 21.3 | 64 W   | 29* | 50*  | 1 6                                 | 17 37.15        | -22 23.2        | 1.576    | 0.745 | 28.1    | 20.9 | 21 W   | 7*  | 13*  |
| 1 26                                | 15 46.69        | -16 24.3        | 1.874    | 1.758 | 31.3    | 21.2 | 68 W   | 28* | 56*  | 1 11                                | 18 9.65         | -23 22.8        | 1.572    | 0.711 | 26.0    | 20.7 | 18 W   | 5*  | 11*  |
| 2 5                                 | 16 10.59        | -17 21.6        | 1.770    | 1.743 | 32.6    | 21.1 | 72 W   | 27* | 62*  | 1 16                                | 18 43.19        | -23 56.4        | 1.575    | 0.685 | 23.2    | 20.6 | 16 W   | 2*  | 9*   |
| <b>376779 2000 LU<sub>25</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>265032 2003 OU</b>               |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 14 52.40        | -29 25.4        | 3.329    | 2.759 | 15.2    | 21.5 | 47 W   | 13* | 40*  | 12 27                               | 16 50.85        | -3 51.2         | 3.068    | 2.267 | 12.4    | 21.5 | 30 W   | 23* | 5*   |
| 1 6                                 | 15 8.38         | -30 1.2         | 3.180    | 2.714 | 16.9    | 21.4 | 54 W   | 14* | 47*  | 1 6                                 | 17 10.05        | -3 21.3         | 2.925    | 2.184 | 14.7    | 21.4 | 34 W   | 27* | 11*  |
| 1 16                                | 15 24.15        | -30 29.8        | 3.021    | 2.669 | 18.6    | 21.3 | 60 W   | 14* | 53*  | 1 16                                | 17 30.25        | -2 35.1         | 2.772    | 2.099 | 17.1    | 21.2 | 39 W   | 30* | 16*  |
| 1 26                                | 15 39.55        | -30 50.2        | 2.852    | 2.623 | 20.2    | 21.2 | 67 W   | 14* | 60*  | 1 26                                | 17 51.54        | -1 30.3         | 2.612    | 2.011 | 19.6    | 21.1 | 43 W   | 32* | 22*  |
| 2 5                                 | 15 54.40        | -31 0.9         | 2.677    | 2.575 | 21.5    | 21.0 | 73 W   | 14* | 67*  | 2 5                                 | 18 14.08        | -0 4.8          | 2.448    | 1.920 | 22.1    | 20.9 | 47 W   | 34* | 27*  |
| <b>338847 2003 XZ<sub>21</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>333707 2008 YT<sub>30</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 15 16.37        | -14 0.7         | 2.633    | 2.060 | 19.8    | 21.5 | 45 W   | 26* | 30*  | 12 27                               | 17 7.38         | -27 3.9         | 1.809    | 0.921 | 18.8    | 21.5 | 18 W   | 2*  | 11*  |
| 1 6                                 | 15 37.96        | -15 13.2        | 2.509    | 2.021 | 21.9    | 21.4 | 50 W   | 26* | 36*  | 1 1                                 | 17 32.53        | -26 38.8        | 1.815    | 0.920 | 18.2    | 21.5 | 17 W   | 2*  | 10*  |
| 1 16                                | 16 0.12         | -16 16.3        | 2.380    | 1.981 | 23.9    | 21.3 | 55 W   | 26* | 42*  | 1 6                                 | 17 57.32        | -25 57.5        | 1.823    | 0.922 | 17.5    | 21.4 | 16 W   | 2*  | 10*  |
| 1 26                                | 16 22.81        | -17 9.0         | 2.249    | 1.941 | 25.9    | 21.2 | 59 W   | 26* | 48*  | 1 11                                | 18 21.60        | -25 1.1         | 1.832    | 0.926 | 16.9    | 21.4 | 16 W   | 2*  | 9*   |
| 2 5                                 | 16 46.03        | -17 50.3        | 2.116    | 1.900 | 27.8    | 21.1 | 64 W   | 26* | 54*  | 1 16                                | 18 45.26        | -23 50.8        | 1.843    | 0.932 | 16.3    | 21.5 | 15 W   | 2*  | 9*   |
| <b>100933 1998 MK<sub>30</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>480808 1994 XL<sub>1</sub></b>   |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 15 27.09        | -17 22.1        | 3.617    | 2.955 | 12.8    | 21.5 | 42 W   | 22* | 29*  | 12 27                               | 17 10.77        | -29 41.4        | 1.144    | 0.360 | 55.1    | 21.0 | 17 W   | -   | 11*  |
| 1 6                                 | 15 41.22        | -18 1.3         | 3.478    | 2.919 | 14.6    | 21.5 | 48 W   | 23* | 36*  | 12 29                               | 17 29.40        | -28 23.9        | 1.176    | 0.342 | 48.4    | 20.7 | 15 W   | -   | 9*   |
| 1 16                                | 15 55.15        | -18 34.3        | 3.327    | 2.882 | 16.3    | 21.4 | 55 W   | 24* | 44*  | 12 31                               | 17 48.06        | -26 55.4        | 1.208    | 0.328 | 40.9    | 20.5 | 13 W   | -   | 6*   |
| 1 26                                | 16 8.73         | -19 0.7         | 3.167    | 2.844 | 17.8    | 21.3 | 62 W   | 25* | 52*  | 1 2                                 | 18 6.69         | -25 17.5        | 1.237    | 0.320 | 32.8    | 20.3 | 10 W   | -   | 4*   |
| 2 5                                 | 16 21.83        | -19 20.2        | 2.998    | 2.804 | 19.2    | 21.2 | 69 W   | 25* | 60*  | 1 4                                 | 18 25.18        | -23 32.2        | 1.263    | 0.318 | 24.8    | 20.1 | 8 W    | -   | 1*   |
| <b>436030 2009 JO<sub>2</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>480922 2002 XP<sub>37</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 15 57.80        | -33 14.7        | 0.751    | 0.546 | 97.3    | 20.9 | 33 W   | 5*  | 27*  | 12 27                               | 17 17.61        | -27 37.3        | 1.504    | 0.615 | 25.3    | 21.4 | 15 W   | -   | 9*   |
| 12 29                               | 15 59.38        | -32 35.4        | 0.778    | 0.563 | 92.9    | 20.8 | 35 W   | 6*  | 29*  | 1 1                                 | 17 49.83        | -26 20.2        | 1.541    | 0.624 | 20.9    | 21.3 | 13 W   | -   | 7*   |
| 12 31                               | 16 1.85         | -31 57.2        | 0.804    | 0.581 | 88.9    | 20.8 | 36 W   | 7*  | 30*  | 1 6                                 | 18 20.57        | -24 39.3        | 1.577    | 0.640 | 17.0    | 21.3 | 11 W   | -   | 4*   |
| 1 2                                 | 16 5.04         | -31 20.3        | 0.830    | 0.600 | 85.3    | 20.8 | 37 W   | 8*  | 31*  | 1 11                                | 18 49.67        | -22 40.0        | 1.613    | 0.661 | 13.8    | 21.3 | 9 W    | -   | 2*   |
| 1 4                                 | 16 8.79         | -30 44.8        | 0.854    | 0.619 | 82.1    | 20.8 | 39 W   | 9*  | 32*  | 1 16                                | 19 17.10        | -20 27.2        | 1.648    | 0.687 | 11.4    | 21.4 | 8 W    | -   | 1*   |
| 1 6                                 | 16 13.00        | -30 10.6        | 0.877    | 0.638 | 79.2    | 20.8 | 40 W   | 10* | 33*  | <b>513529 2010 CR<sub>1</sub></b>   |                 |                 |          |       |         |      |        |     |      |
| 1 8                                 | 16 17.56        | -29 37.4        | 0.899    | 0.658 | 76.6    | 20.8 | 41 W   | 10* | 34*  | 12 27                               | 17 35.54        | -35 43.0        | 2.126    | 1.213 | 13.1    | 21.3 | 16 W   | -   | 9*   |
| 1 10                                | 16 22.39        | -29 5.3         | 0.920    | 0.678 | 74.2    | 20.9 | 42 W   | 11* | 35*  | 1 1                                 | 17 55.77        | -35 11.7        | 2.061    | 1.151 | 13.9    | 21.2 | 16 W   | -   | 9*   |
| 1 12                                | 16 27.42        | -28 34.0        | 0.939    | 0.698 | 72.1    | 20.9 | 42 W   | 12* | 35*  | 1 6                                 | 18 16.91        | -34 25.6        | 1.996    | 1.087 | 14.7    | 21.0 | 16 W   | -   | 9*   |
| 1 14                                | 16 32.62        | -28 3.3         | 0.958    | 0.718 | 70.2    | 20.9 | 43 W   | 12* | 36*  | 1 11                                | 18 38.96        | -33 22.3        | 1.929    | 1.021 | 15.4    | 20.8 | 16 W   | -   | 9*   |
| 1 16                                | 16 37.93        | -27 33.3        | 0.975    | 0.737 | 68.5    | 21.0 | 44 W   | 13* | 37*  | 1 16                                | 19 1.92         | -31 59.1        | 1.862    | 0.952 | 16.1    | 20.6 | 16 W   | -   | 9*   |
| <b>523808 2007 ML<sub>24</sub></b>  |                 |                 |          |       |         |      |        |     |      | <b>264357 2000 AZ<sub>93</sub></b>  |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 16 13.91        | -36 48.1        | 0.832    | 0.505 | 91.4    | 20.7 | 31 W   | -   | 25*  | 12 27                               | 18 1.86         | -24 17.0        | 1.463    | 0.491 | 10.1    | 20.9 | 5 W    | -   | -    |
| 12 29                               | 16 21.95        | -37 49.6        | 0.871    | 0.514 | 86.4    | 20.6 | 31 W   | -   | 25*  | 1 1                                 | 18 40.94        | -23 6.9         | 1.462    | 0.480 | 2.2     | 20.5 | 1 W    | -   | -    |
| 12 31                               | 16 30.64        | -38 39.1        | 0.910    | 0.524 | 81.8    | 20.6 | 32 W   | -   | 26*  | 1 6                                 | 19 19.46        | -21 20.7        | 1.459    | 0.480 | 6.1     | 20.7 | 3 E    | -   | -    |
| 1 2                                 | 16 39.87        | -39 17.7        | 0.949    | 0.534 | 77.5    | 20.5 | 32 W   | -   | 26*  | 1 11                                | 19 56.73        | -19 4.8         | 1.453    | 0.491 | 14.0    | 21.1 | 7 E    | -   | -    |
| 1 4                                 | 16 49.47        | -39 46.3        | 0.986    | 0.546 | 73.6    | 20.5 | 32 W   | -   | 26*  | 1 16                                | 20 32.32        | -16 26.8        | 1.445    | 0.513 | 21.0    | 21.4 | 11 E   | -   | 4*   |
| 1 6                                 | 16 59.34        | -40 5.9         | 1.023    | 0.559 | 70.0    | 20.5 | 32 W   | -   | 26*  | <b>508908 2003 YX<sub>1</sub></b>   |                 |                 |          |       |         |      |        |     |      |
| 1 8                                 | 17 9.37         | -40 17.4        | 1.058    | 0.572 | 66.6    | 20.6 | 32 W   | -   | 26*  | 12 27                               | 18 19.06        | -23 29.9        | 1.661    | 0.678 | 1.5     | 21.4 | 1 W    | -   | -    |
| 1 10                                | 17 19.47        | -40 21.5        | 1.092    | 0.586 | 63.6    | 20.6 | 32 W   | -   | 26*  | 1 1                                 | 18 49.75        | -23 28.4        | 1.647    | 0.664 | 1.6     | 21.3 | 1 E    | -   | -    |
| 1 12                                | 17 29.57        | -40 19.0        | 1.125    | 0.601 | 60.8    | 20.6 | 32 W   | -   | 26*  | 1 6                                 | 19 20.84        | -23 3.6         | 1.633    | 0.653 | 4.7     | 21.4 | 3 E    | -   | -    |
| 1 14                                | 17 39.59        | -40 10.6        | 1.156    | 0.615 | 58.3    | 20.7 | 32 W   | -   | 25*  | 1 11                                | 19 52.01        | -22 15.1        | 1.620    | 0.647 | 8.0     | 21.6 | 5 E    | -   | -    |
| <b>267223 2001 DQ<sub>8</sub></b>   |                 |                 |          |       |         |      |        |     |      | <b>488738 2004 RM<sub>162</sub></b> |                 |                 |          |       |         |      |        |     |      |
| 12 27                               | 16 31.21        | -10 5.7         | 0.486    | 0.612 | 126.8   | 20.9 | 30 W   | 21* | 12*  | 12 27                               | 18 22.54        | -23 14.8        | 2.610    | 1.627 | 0.1     | 21.4 | 0 W    | -   | -    |
| 12 29                               | 16 19.54        | -8 50.4         | 0.467    | 0.657 | 121.1   | 20.5 | 35 W   | 25* | 16*  | 1 6                                 | 18 53.54        | -22 24.6        | 2.592    | 1.611 | 2.0     | 21.5 | 3 W    | -   | -    |
| 12 31                               | 16 7.73         | -7 33.4         | 0.449    | 0.701 | 115.8   | 20.1 | 40 W   | 28* | 20*  | 1 16                                | 19 24.40        | -21 11.4        | 2.573    | 1.599 | 3.8     | 21.6 | 6 W    | -   | -    |
| 1 2                                 | 15 55.71        | -6 14.0         | 0.432    | 0.744 | 110.5   | 19.8 | 45 W   | 32* | 24*  | 1 26                                | 19 54.89        | -19 36.2        | 2.554    | 1.589 | 5.6     | 21.7 | 9 W    | -   | 2*   |
| 1 4                                 | 15 43.41        | -4 51.8         | 0.417    | 0.786 | 105.4   | 19.6 | 50 W   | 35* | 29*  | 2 5                                 | 20 24.82        | -17 40.9        | 2.535    | 1.584 | 7.4     | 21.8 | 12 W   | 1*  | 5*   |
| 1 6                                 | 15 30.75        | -3 26.1         | 0.403    | 0.827 | 100.4   | 19.4 | 56 W   | 38* | 33*  |                                     |                 |                 |          |       |         |      |        |     |      |
| 1 8                                 | 15 17.63        | -1 56.4         | 0.390    | 0.867 | 95.4    | 19.2 | 61 W   | 41* | 37*  |                                     |                 |                 |          |       |         |      |        |     |      |
| 1 10                                | 15 3.97         | -0 22.5         | 0.379    | 0.906 | 90.3    | 19.0 | 67 W   | 44* | 41*  |                                     |                 |                 |          |       |         |      |        |     |      |
| 1 12                                | 14 49.68        | +1 16.0         | 0.368    | 0.943 | 85.2    | 18.8 | 73 W   | 46* | 45*  |                                     |                 |                 |          |       |         |      |        |     |      |
| 1 14                                | 14 34.69        | +2 58.9         | 0.359    | 0.981 | 79.9    | 18.6 | 79 W   | 48  | 48*  |                                     |                 |                 |          |       |         |      |        |     |      |
| 1 16                                | 14 18.95        | +4 45.8         | 0.352    | 1.017 | 74.6    | 18.5 | 85 W   | 50  | 51*  |                                     |                 |                 |          |       |         |      |        |     |      |



EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

| 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ | 20/21                               | $\alpha_{2000}$ | $\delta_{2000}$ | $\Delta$ | $r$   | $\beta$ | $V$  | $\psi$ | $45^\circ$ | $-26^\circ$ |
|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|-------------------------------------|-----------------|-----------------|----------|-------|---------|------|--------|------------|-------------|
| <b>494997 2010 HY<sub>113</sub></b> |                 |                 |          |       |         |      |        |            |             | <b>400513 2008 SP<sub>3</sub></b>   |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 28.29        | -20 38.8        | 2.530    | 1.549 | 1.8     | 21.5 | 3 E    | —          | —           | 12 27                               | 19 59.63        | -19 25.8        | 2.468    | 1.606 | 13.7    | 21.5 | 23 E   | 11*        | 12*         |
| 1 6                                 | 18 59.96        | -19 53.6        | 2.551    | 1.570 | 2.0     | 21.6 | 3 W    | —          | —           | 1 6                                 | 20 29.50        | -18 8.4         | 2.500    | 1.608 | 11.9    | 21.4 | 20 E   | 10*        | 9*          |
| 1 16                                | 19 30.70        | -18 47.5        | 2.572    | 1.595 | 3.2     | 21.7 | 5 W    | —          | —           | 1 16                                | 20 58.87        | -16 33.3        | 2.531    | 1.614 | 10.1    | 21.4 | 17 E   | 8*         | 6*          |
| 1 26                                | 20 0.32         | -17 23.2        | 2.592    | 1.622 | 4.8     | 21.8 | 8 W    | —          | —           | 1 26                                | 21 27.61        | -14 42.7        | 2.562    | 1.622 | 8.2     | 21.4 | 14 E   | 6*         | 4*          |
| 2 5                                 | 20 28.73        | -15 43.7        | 2.610    | 1.653 | 6.5     | 22.0 | 11 W   | 2*         | 4*          | 2 5                                 | 21 55.66        | -12 39.5        | 2.592    | 1.633 | 6.4     | 21.3 | 11 E   | 3*         | 1*          |
| <b>285594 2000 QC<sub>114</sub></b> |                 |                 |          |       |         |      |        |            |             | <b>399630 2004 OH<sub>3</sub></b>   |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 33.87        | -17 20.6        | 3.016    | 2.042 | 3.1     | 21.5 | 6 E    | —          | —           | 12 27                               | 20 0.13         | -19 45.4        | 2.506    | 1.643 | 13.4    | 21.4 | 23 E   | 11*        | 12*         |
| 1 6                                 | 18 57.62        | -17 11.0        | 2.982    | 2.006 | 2.9     | 21.4 | 6 W    | —          | —           | 1 6                                 | 20 28.45        | -17 48.2        | 2.524    | 1.630 | 11.6    | 21.4 | 20 E   | 10*        | 9*          |
| 1 16                                | 19 21.84        | -16 47.4        | 2.940    | 1.971 | 4.0     | 21.4 | 8 W    | 2*         | —           | 1 16                                | 20 56.46        | -15 34.4        | 2.540    | 1.620 | 9.9     | 21.3 | 16 E   | 8*         | 5*          |
| 1 26                                | 19 46.41        | -16 9.7         | 2.891    | 1.936 | 5.8     | 21.4 | 11 W   | 4*         | 3*          | 1 26                                | 21 24.09        | -13 5.9         | 2.554    | 1.613 | 8.2     | 21.2 | 13 E   | 6*         | 2*          |
| 2 5                                 | 20 11.28        | -15 18.1        | 2.835    | 1.901 | 7.8     | 21.4 | 15 W   | 5*         | 7*          | 2 5                                 | 21 51.29        | -10 24.9        | 2.568    | 1.609 | 6.5     | 21.2 | 11 E   | 4*         | —           |
| <b>495858 2003 MJ<sub>4</sub></b>   |                 |                 |          |       |         |      |        |            |             | <b>316922 2000 WB<sub>165</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 35.19        | -24 21.5        | 2.295    | 1.314 | 2.1     | 21.4 | 3 E    | —          | —           | 12 27                               | 20 5.73         | -25 20.6        | 4.660    | 3.777 | 5.9     | 21.5 | 23 E   | 7*         | 16*         |
| 1 1                                 | 18 53.89        | -24 11.5        | 2.260    | 1.278 | 1.7     | 21.3 | 2 E    | —          | —           | 1 6                                 | 20 18.04        | -24 52.7        | 4.728    | 3.794 | 4.2     | 21.4 | 16 E   | 3*         | 9*          |
| 1 6                                 | 19 13.11        | -23 52.5        | 2.226    | 1.244 | 1.5     | 21.2 | 2 E    | —          | —           | 1 16                                | 20 30.39        | -24 22.1        | 4.777    | 3.811 | 2.5     | 21.4 | 10 E   | —          | 4*          |
| 1 11                                | 19 32.81        | -23 23.6        | 2.193    | 1.210 | 1.4     | 21.1 | 2 E    | —          | —           | 1 26                                | 20 42.70        | -23 49.5        | 4.805    | 3.826 | 1.4     | 21.3 | 5 E    | —          | —           |
| 1 16                                | 19 52.94        | -22 44.5        | 2.162    | 1.179 | 1.5     | 21.0 | 2 E    | —          | —           | 2 5                                 | 20 54.87        | -23 15.4        | 4.813    | 3.841 | 2.2     | 21.4 | 9 W    | —          | 1*          |
| <b>247858 2003 UA<sub>38</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>206910 2004 NL<sub>8</sub></b>   |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 42.65        | -23 40.4        | 3.039    | 2.060 | 2.1     | 21.4 | 4 E    | —          | —           | 12 27                               | 20 6.51         | -19 7.9         | 2.710    | 1.859 | 12.6    | 21.4 | 24 E   | 12*        | 13*         |
| 1 6                                 | 19 7.13         | -23 28.7        | 3.009    | 2.026 | 0.5     | 21.2 | 1 W    | —          | —           | 1 6                                 | 20 28.38        | -18 10.2        | 2.657    | 1.760 | 10.7    | 21.1 | 19 E   | 9*         | 9*          |
| 1 16                                | 19 32.06        | -23 2.4         | 2.972    | 1.993 | 2.4     | 21.3 | 5 W    | —          | —           | 1 16                                | 20 51.74        | -16 56.4        | 2.589    | 1.658 | 8.8     | 20.9 | 15 E   | 7*         | 5*          |
| 1 26                                | 19 57.29        | -22 21.6        | 2.927    | 1.961 | 4.6     | 21.4 | 9 W    | —          | 3*          | 1 26                                | 21 16.68        | -15 24.8        | 2.509    | 1.553 | 6.9     | 20.6 | 11 E   | 4*         | 2*          |
| 2 5                                 | 20 22.74        | -21 26.1        | 2.875    | 1.929 | 6.8     | 21.4 | 13 W   | —          | 7*          | 2 5                                 | 21 43.34        | -13 33.1        | 2.418    | 1.447 | 5.1     | 20.2 | 7 E    | 1*         | —           |
| <b>283470 2001 QM<sub>153</sub></b> |                 |                 |          |       |         |      |        |            |             | <b>152964 2000 GP<sub>82</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 47.53        | -33 59.8        | 3.510    | 2.556 | 4.5     | 21.5 | 12 E   | —          | 4*          | 12 27                               | 20 18.88        | -23 8.2         | 2.394    | 1.576 | 16.1    | 21.5 | 26 E   | 10*        | 18*         |
| 1 6                                 | 19 7.94         | -33 4.4         | 3.479    | 2.519 | 4.1     | 21.4 | 11 E   | —          | —           | 1 6                                 | 20 45.54        | -22 5.0         | 2.387    | 1.527 | 14.3    | 21.3 | 23 E   | 9*         | 14*         |
| 1 16                                | 19 28.36        | -32 0.5         | 3.434    | 2.481 | 4.8     | 21.4 | 12 W   | —          | 4*          | 1 16                                | 21 12.94        | -20 43.2        | 2.368    | 1.474 | 12.6    | 21.2 | 19 E   | 7*         | 11*         |
| 1 26                                | 19 48.67        | -30 47.6        | 3.375    | 2.442 | 6.3     | 21.4 | 16 W   | —          | 9*          | 1 26                                | 21 41.06        | -19 2.0         | 2.339    | 1.419 | 11.0    | 21.0 | 16 E   | 4*         | 8*          |
| 2 5                                 | 20 8.81         | -29 25.8        | 3.303    | 2.401 | 8.1     | 21.4 | 20 W   | —          | 13*         | 2 5                                 | 22 9.95         | -17 1.0         | 2.302    | 1.362 | 9.6     | 20.8 | 13 E   | 2*         | 6*          |
| <b>130480 2000 QE<sub>97</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>198856 2005 LR<sub>3</sub></b>   |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 18 55.11        | -24 3.9         | 3.503    | 2.531 | 2.8     | 21.4 | 7 E    | —          | 1*          | 12 27                               | 20 22.51        | -35 6.1         | 2.842    | 2.031 | 13.3    | 21.5 | 28 E   | —          | 22*         |
| 1 6                                 | 19 14.58        | -23 37.4        | 3.486    | 2.504 | 0.8     | 21.2 | 2 E    | —          | —           | 1 6                                 | 20 46.70        | -33 54.7        | 2.856    | 2.004 | 11.8    | 21.4 | 25 E   | —          | 19*         |
| 1 16                                | 19 34.22        | -23 1.8         | 3.455    | 2.476 | 1.7     | 21.3 | 4 W    | —          | —           | 1 16                                | 21 11.04        | -32 30.7        | 2.859    | 1.974 | 10.4    | 21.3 | 21 E   | —          | 15*         |
| 1 26                                | 19 53.96        | -22 17.3        | 3.411    | 2.447 | 3.9     | 21.4 | 10 W   | —          | 4*          | 1 26                                | 21 35.43        | -30 54.4        | 2.850    | 1.942 | 9.3     | 21.2 | 19 E   | —          | 12*         |
| 2 5                                 | 20 13.71        | -21 23.9        | 3.355    | 2.418 | 6.2     | 21.4 | 15 W   | —          | 9*          | 2 5                                 | 21 59.81        | -29 6.2         | 2.832    | 1.909 | 8.6     | 21.2 | 17 E   | —          | 9*          |
| <b>205378 2001 BJ<sub>16</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>190451 2000 AX<sub>146</sub></b> |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 0.91         | -18 19.0        | 2.190    | 1.234 | 8.0     | 21.4 | 10 E   | 4*         | —           | 12 27                               | 20 30.85        | -22 38.9        | 3.165    | 2.356 | 11.8    | 21.5 | 29 E   | 12*        | 20*         |
| 1 6                                 | 19 37.26        | -18 31.1        | 2.183    | 1.217 | 6.5     | 21.3 | 8 E    | 2*         | —           | 1 6                                 | 20 50.13        | -22 10.0        | 3.200    | 2.333 | 9.7     | 21.4 | 24 E   | 9*         | 15*         |
| 1 16                                | 20 14.01        | -18 15.3        | 2.177    | 1.203 | 5.0     | 21.2 | 6 E    | —          | —           | 1 16                                | 21 9.77         | -21 31.8        | 3.223    | 2.310 | 7.7     | 21.3 | 18 E   | 5*         | 11*         |
| 1 26                                | 20 50.92        | -17 31.9        | 2.170    | 1.191 | 3.6     | 21.1 | 4 E    | —          | —           | 1 26                                | 21 29.71        | -20 45.0        | 3.232    | 2.286 | 5.7     | 21.2 | 13 E   | 1*         | 7*          |
| 2 5                                 | 21 27.75        | -16 22.1        | 2.165    | 1.182 | 2.7     | 21.0 | 3 E    | —          | —           | 2 5                                 | 21 49.88        | -19 50.2        | 3.229    | 2.261 | 4.0     | 21.1 | 9 E    | —          | 3*          |
| <b>388189 2006 DS<sub>14</sub></b>  |                 |                 |          |       |         |      |        |            |             | <b>333305 2000 VB<sub>35</sub></b>  |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 2.97         | -15 23.3        | 1.559    | 0.633 | 19.2    | 21.4 | 12 E   | 6*         | —           | 12 27                               | 20 33.66        | -12 50.9        | 3.187    | 2.417 | 12.7    | 21.5 | 33 E   | 21*        | 17*         |
| 1 1                                 | 19 32.99        | -16 7.5         | 1.525    | 0.609 | 21.5    | 21.4 | 13 E   | 7*         | —           | 1 6                                 | 20 51.53        | -11 49.8        | 3.210    | 2.376 | 10.8    | 21.4 | 27 E   | 18*        | 11*         |
| 1 6                                 | 20 3.86         | -16 44.1        | 1.490    | 0.591 | 24.5    | 21.4 | 14 E   | 7*         | 3*          | 1 16                                | 21 9.89         | -10 39.0        | 3.221    | 2.335 | 8.9     | 21.3 | 22 E   | 14*        | 6*          |
| 1 11                                | 20 35.41        | -17 11.7        | 1.453    | 0.578 | 28.3    | 21.4 | 16 E   | 8*         | 6*          | 1 26                                | 21 28.69        | -9 18.5         | 3.221    | 2.293 | 7.0     | 21.2 | 16 E   | 10*        | 1*          |
| 1 16                                | 21 7.39         | -17 28.2        | 1.416    | 0.573 | 32.7    | 21.4 | 18 E   | 8*         | 8*          | 2 5                                 | 21 47.86        | -7 49.0         | 3.209    | 2.252 | 5.0     | 21.0 | 12 E   | 6*         | —           |
| <b>335071 2004 RB<sub>290</sub></b> |                 |                 |          |       |         |      |        |            |             |                                     |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 7.85         | -26 30.0        | 3.460    | 2.500 | 4.1     | 21.4 | 11 E   | —          | 4*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 6                                 | 19 28.03        | -25 51.8        | 3.432    | 2.456 | 2.3     | 21.2 | 6 E    | —          | —           |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 19 48.55        | -25 3.8         | 3.392    | 2.412 | 1.7     | 21.1 | 4 W    | —          | —           |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 26                                | 20 9.32         | -24 5.7         | 3.339    | 2.367 | 3.2     | 21.1 | 8 W    | —          | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 2 5                                 | 20 30.26        | -22 57.4        | 3.275    | 2.322 | 5.3     | 21.1 | 12 W   | —          | 6*          |                                     |                 |                 |          |       |         |      |        |            |             |
| <b>353947 1999 CT<sub>8</sub></b>   |                 |                 |          |       |         |      |        |            |             |                                     |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 10.00        | -40 47.5        | 1.952    | 1.082 | 18.1    | 21.4 | 20 E   | —          | 11*         |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 1                                 | 19 32.50        | -38 38.2        | 1.934    | 1.049 | 17.3    | 21.2 | 19 E   | —          | 10*         |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 6                                 | 19 54.04        | -36 11.3        | 1.915    | 1.016 | 16.4    | 21.1 | 17 E   | —          | 9*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 11                                | 20 14.62        | -33 27.9        | 1.897    | 0.983 | 15.3    | 21.0 | 15 E   | —          | 8*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 20 34.26        | -30 29.0        | 1.879    | 0.951 | 14.1    | 20.9 | 14 E   | —          | 7*          |                                     |                 |                 |          |       |         |      |        |            |             |
| <b>162082 1998 HL<sub>1</sub></b>   |                 |                 |          |       |         |      |        |            |             |                                     |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 33.28        | -10 39.0        | 1.938    | 1.078 | 19.0    | 21.5 | 21 E   | 14*        | 3*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 6                                 | 20 12.72        | -9 14.8         | 1.920    | 1.057 | 19.0    | 21.4 | 20 E   | 14*        | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 20 52.68        | -7 30.2         | 1.906    | 1.039 | 19.0    | 21.4 | 20 E   | 14*        | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 26                                | 21 32.91        | -5 28.7         | 1.897    | 1.025 | 18.9    | 21.3 | 20 E   | 14*        | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 2 5                                 | 22 13.22        | -3 14.8         | 1.893    | 1.017 | 18.7    | 21.3 | 19 E   | 13*        | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |
| <b>367684 2010 OS<sub>22</sub></b>  |                 |                 |          |       |         |      |        |            |             |                                     |                 |                 |          |       |         |      |        |            |             |
| 12 27                               | 19 59.36        | -15 35.7        | 2.152    | 1.314 | 17.6    | 21.4 | 24 E   | 14*        | 11*         |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 6                                 | 20 26.83        | -14 6.1         | 2.070    | 1.200 | 16.7    | 21.1 | 21 E   | 13*        | 7*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 16                                | 20 56.87        | -12 11.2        | 1.973    | 1.081 | 16.4    | 20.7 | 18 E   | 11*        | 4*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 1 26                                | 21 30.01        | -9 47.0         | 1.860    | 0.957 | 16.9    | 20.3 | 16 E   | 10*        | 2*          |                                     |                 |                 |          |       |         |      |        |            |             |
| 2 5                                 | 22 7.03         | -6 49.8         | 1.733    | 0.830 | 18.9    | 20.0 | 16 E   | 10*        | 1*          |                                     |                 |                 |          |       |         |      |        |            |             |