What are LLAGN

Seyferts:
\([\text{O}^\text{III}] / [\text{O}^\text{II}] > 1\]
\([\text{O}^\text{III}] / \text{H}\beta > 3\)

LINERs:
\([\text{O}^\text{III}] / [\text{O}^\text{II}] < 1\]
\([\text{O}^\text{III}] / \text{H}\beta < 3\)
Weakly Ionised lines.
What are LLAGN

- \( L(H\alpha) < 10^{40} \) erg s\(^{-1}\) (Ho et al. 1997).
- More than 30% of nearby galaxies are LLAGN.
- Unresolved cores at mas scales.
- \( T_b > 10^6 \) K.
- Variable radio cores.
- Cores have flat spectral index (\( \sim 0 – 0.6 \)).
- Radio cores synchrotron emission from jet (Nagar et al. 2002, Falcke et al. 1999)
What are LLAGN

[Seyfert]
NGC 1358

[LINER]
NGC 1052

[H II]
NGC 7714

Credit: Ho et al. 2008
Data Sample

- The Palomar spectroscopic survey:
  - Identified 96 LLAGNs at $D < 19$ Mpc among all northern bright ($B_T < 12.5$ mag) galaxies (Ho et al., 1997a).

- VLA observations by Nagar et al. (2002).
  - Half had unresolved radio cores at scales of 150 mas.
  - Follow up of 16 with the VLBA showed all had milli-arcsecond cores.
  - Six showed extended structure.
  - One additional found to be extended by Falcke et al. (2000)

- VLBA used incorrect EOP between 2003 and 2005.
## Data Sample

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Redshift</th>
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<tr>
<td>NGC 6500</td>
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<td>NGC 1052</td>
<td>Seyfert 2</td>
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<td>NGC 4579 (M58)</td>
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NGC 6500

02 February 2008

27 July 2003

25 - 26 September 2003

08 November 2003

24 December 2003

27 February 2004

Date
01/03 03/03 05/03 07/03 09/03 11/03 01/04 03/04

Peak Flux (mJy)
0.032 0.034 0.036 0.038 0.04 0.042 0.044 0.046 0.048 0.05
NGC 1052

Clean LL map. Array: BFKLMNOPS
NGC1052 at 4.987 GHz 2003 Jan 17

Map center: RA: 02 41 04.798, Dec: -08 15 20.752 (2000.0)
Map peak: 0.377 Jy/beam
Contours: 0.0005 Jy/beam x (-1 1 2 4 8 16 32 64)
Contours: 128 256 512)
Beam FWHM: 3.47 x 1.42 (mas) at 0.175°
Future work

- Reduce epochs of remaining sources.
- Model fitting.
- Analyse variability.
- Follow up now with new observations. EVN?
- Unify model of all AGN.