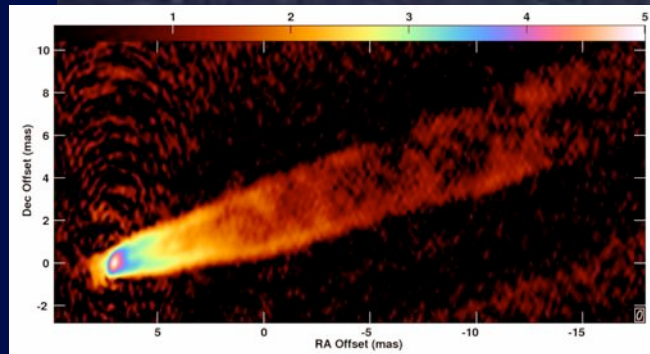


Proper Motion and Core Stability Constraints in the Virgo Cluster: Relative Astrometry of M87 and M84

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Bill Junor, Chun Ly, Phil Hardee

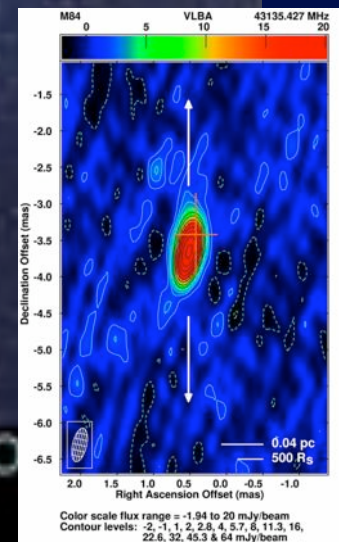


M86

M84

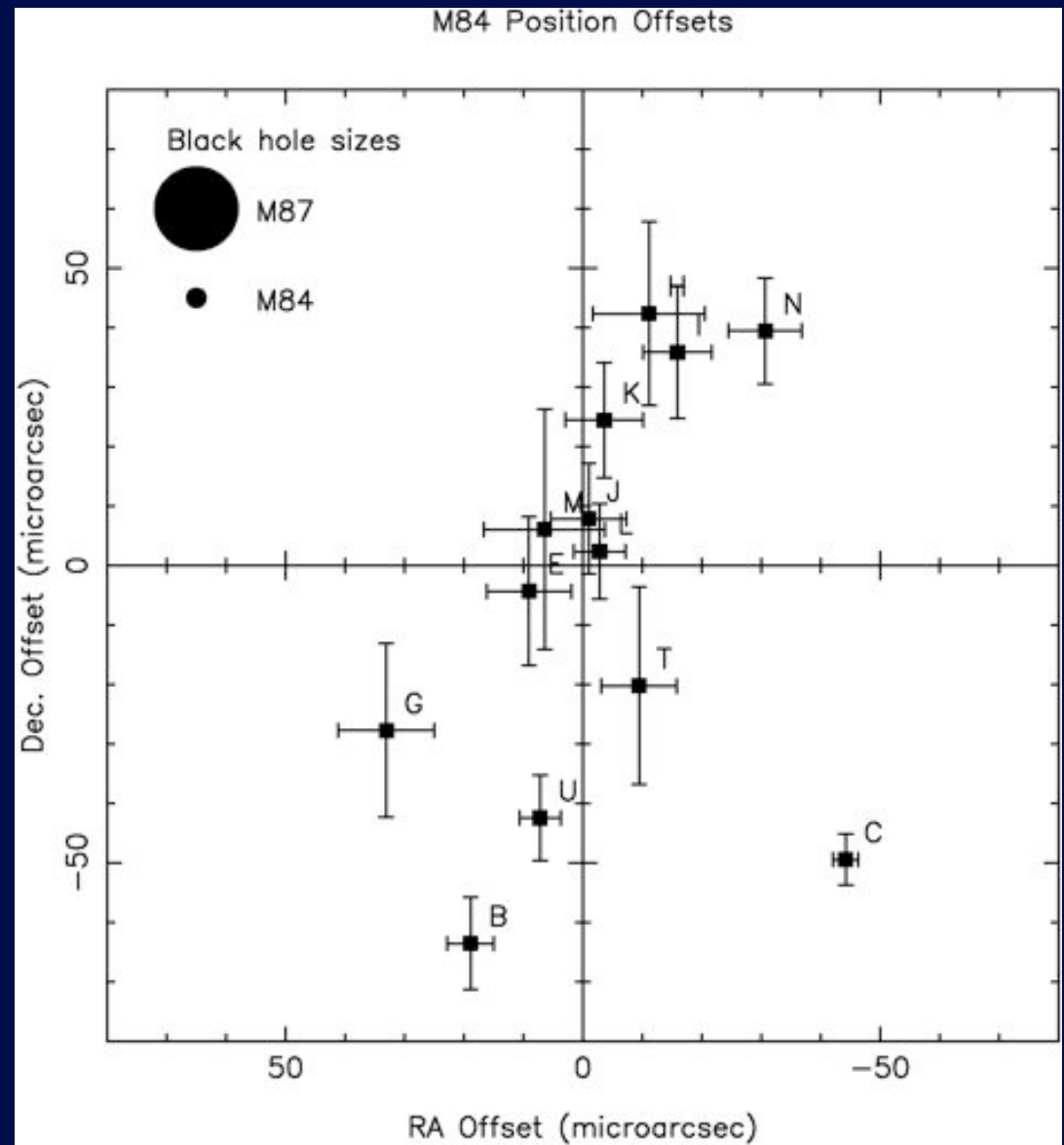
M87

M84, M86, M87 © Royal Observatory Edinburgh/Anglo-Australian C
Photograph from UK Schmidt plates by David Malin



POSITIONS OF M84 RELATIVE TO M87

- Positions shown relative to mean of 2008 results
- “C” is the 2001 position
- Error bars shown are formal JMFIT errors
- Systematic errors still under study



PRELIMINARY ASTROMETRY RESULTS

- Proper motion: about $66 \mu\text{as}$ position change since 2001
 - Needs careful study of long term systematic errors
 - About 5X the scatter in recent data
 - Would correspond to relative velocity of about 800 km/s
 - This is about the mean transverse Virgo cluster velocity deduced from radial velocities
- Core wander: Scatter in recent positions $\sim 11 \times 34 \mu\text{as}$
 - Those are scatters in the beam major and minor axis directions
 - About $1.5 \times 5 R_s$
 - That constraint applied during the flare
 - Intuitively not consistent with a large ($10^5 R_s = 0.7 \text{ arcsec!}$) core offset

