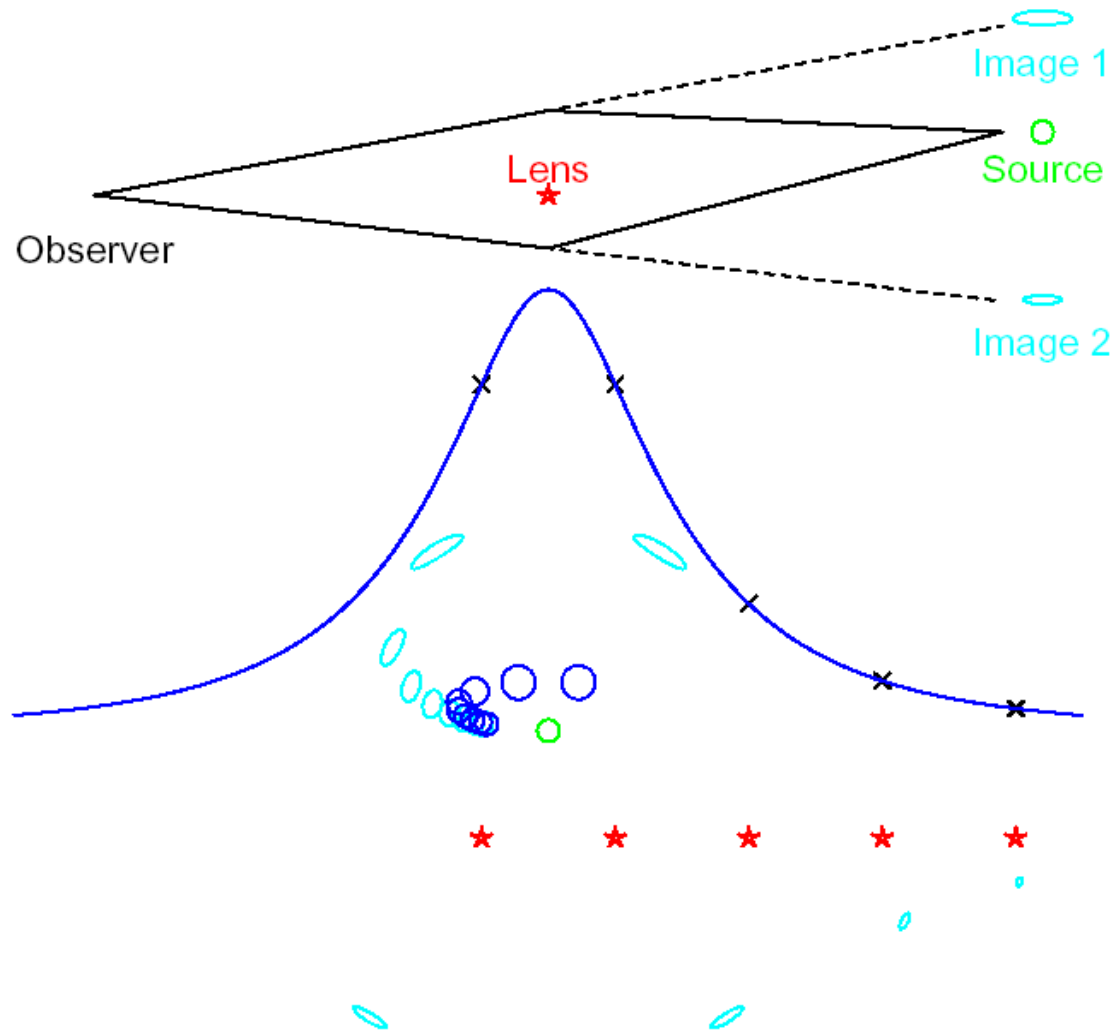
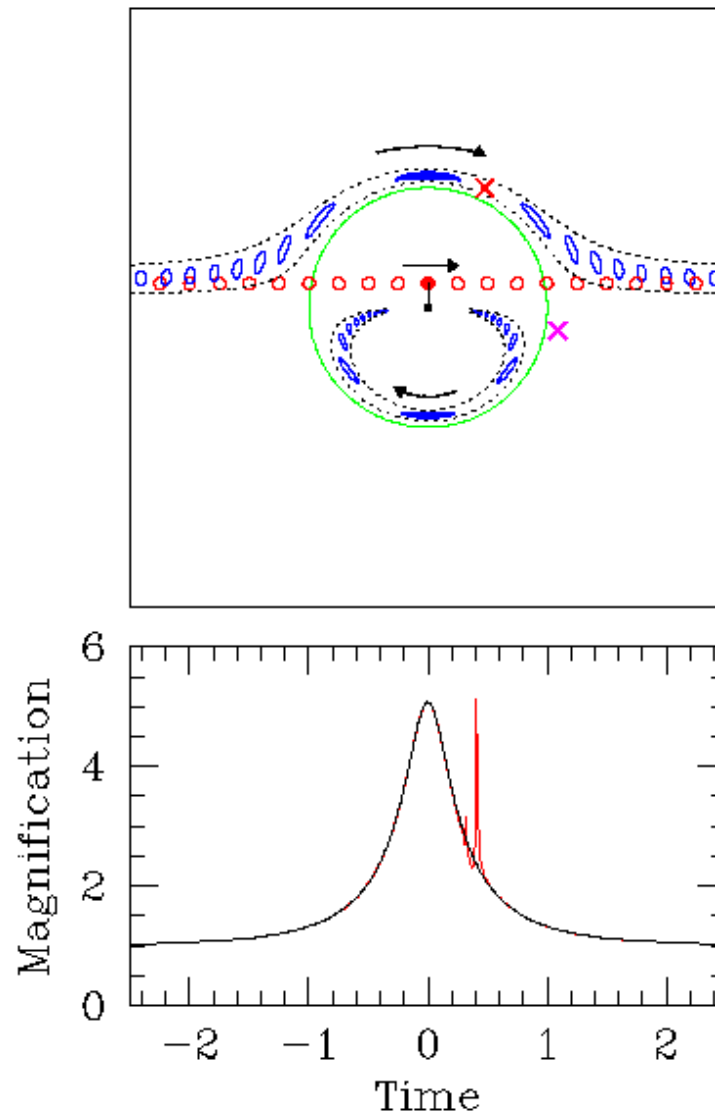


μ FUN Event Selection

Andy Gould (Ohio State)



How Microlensing Finds Planets



Survey + Follow-Up

DISCOVERING PLANETARY SYSTEMS THROUGH GRAVITATIONAL MICROLENSSES

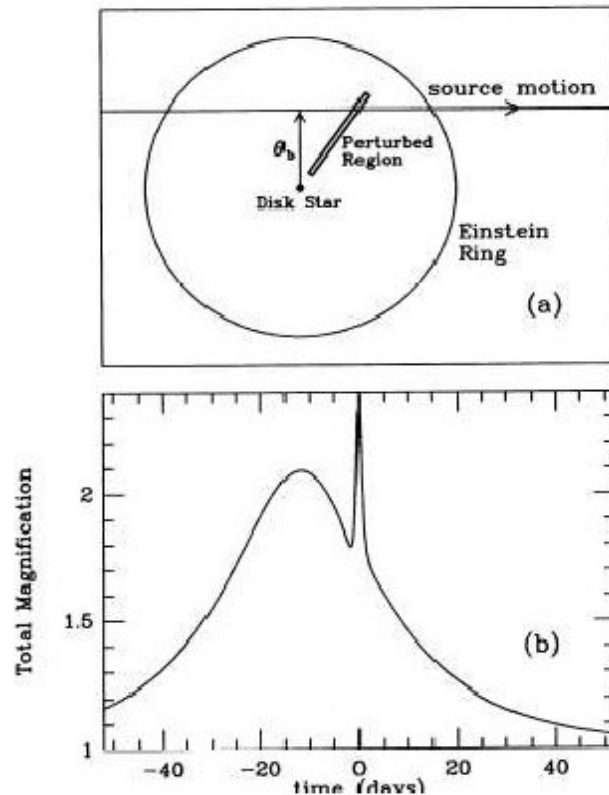
ANDREW GOULD AND ABRAHAM LOEB
Institute for Advanced Study, Princeton, NJ 08540
Received 1991 December 26; accepted 1992 March 9

5. OBSERVATIONAL REQUIREMENTS

Two distinct steps are required to observe a planetary system by microlensing. First, one must single out a disk star which happens to be microlensing a bulge star. Second, one must observe this star often enough to catch the deviation in the light curve due to the planet. The first step involves the observation of millions of bulge stars on the order of once per day. The second step involves the observation of a handful of stars many times per day. In the following we give a rough outline of what is required for each of these steps.

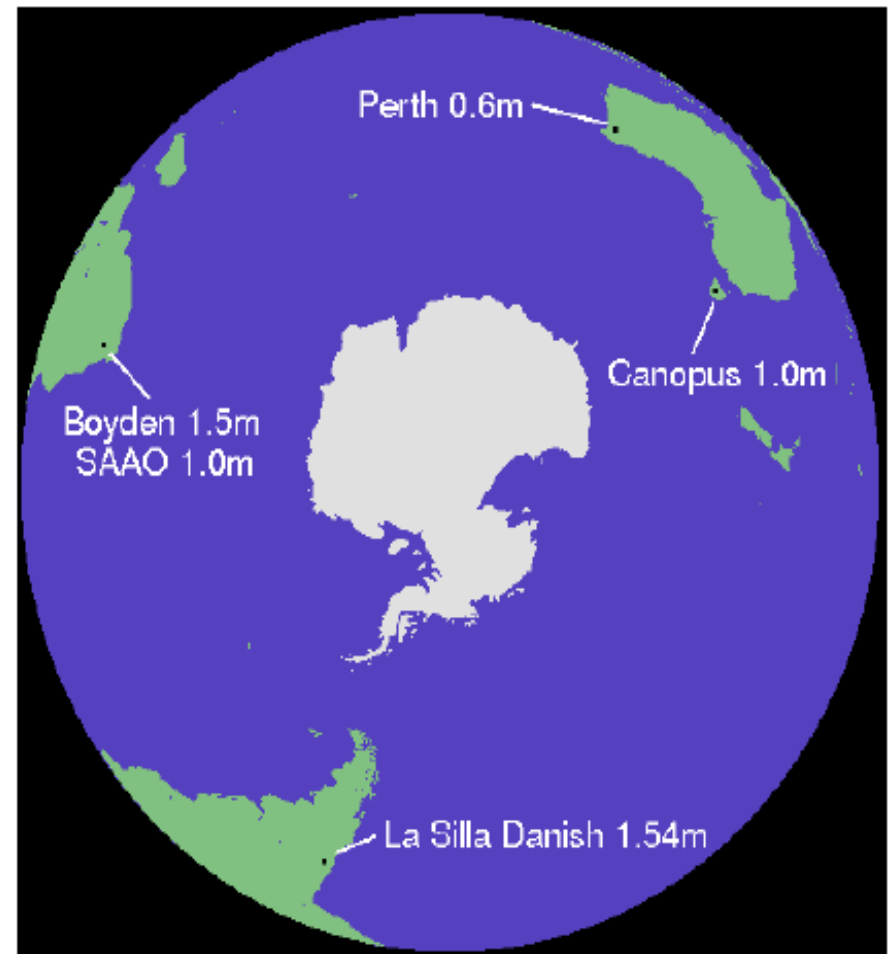
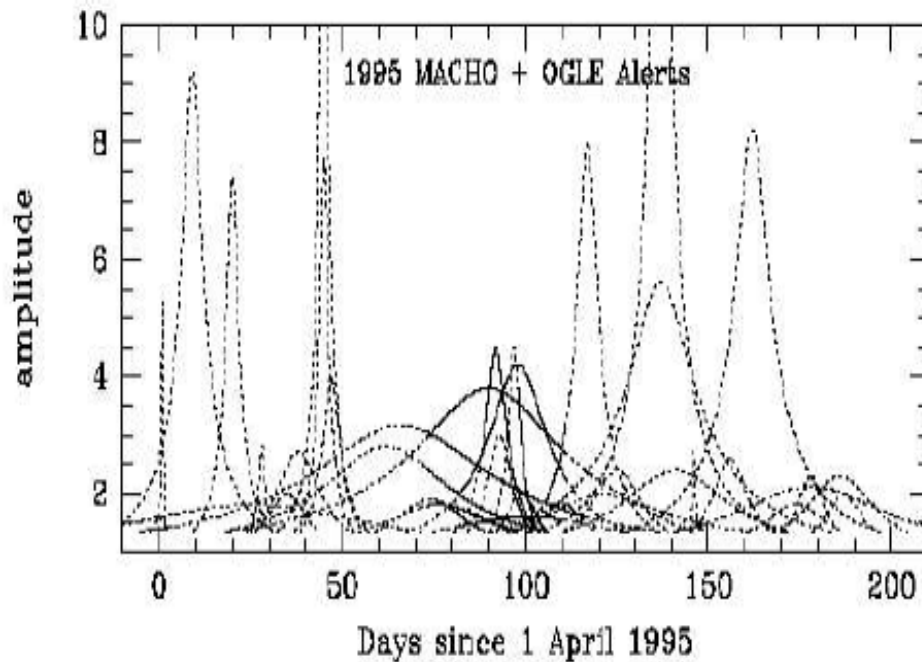
While observations from one site would be useful, there are advantages to be gained by observing from several sites. First,

two telescopes that were totally committed. Third, in view of the fleeting nature of the events, it would seem prudent to build in some redundancy in case of bad weather at a particular site. Thus, the optimal scheme would employ, say, a dozen telescopes. Each of these would be committed to carry out two observations per night. During the near-December season,



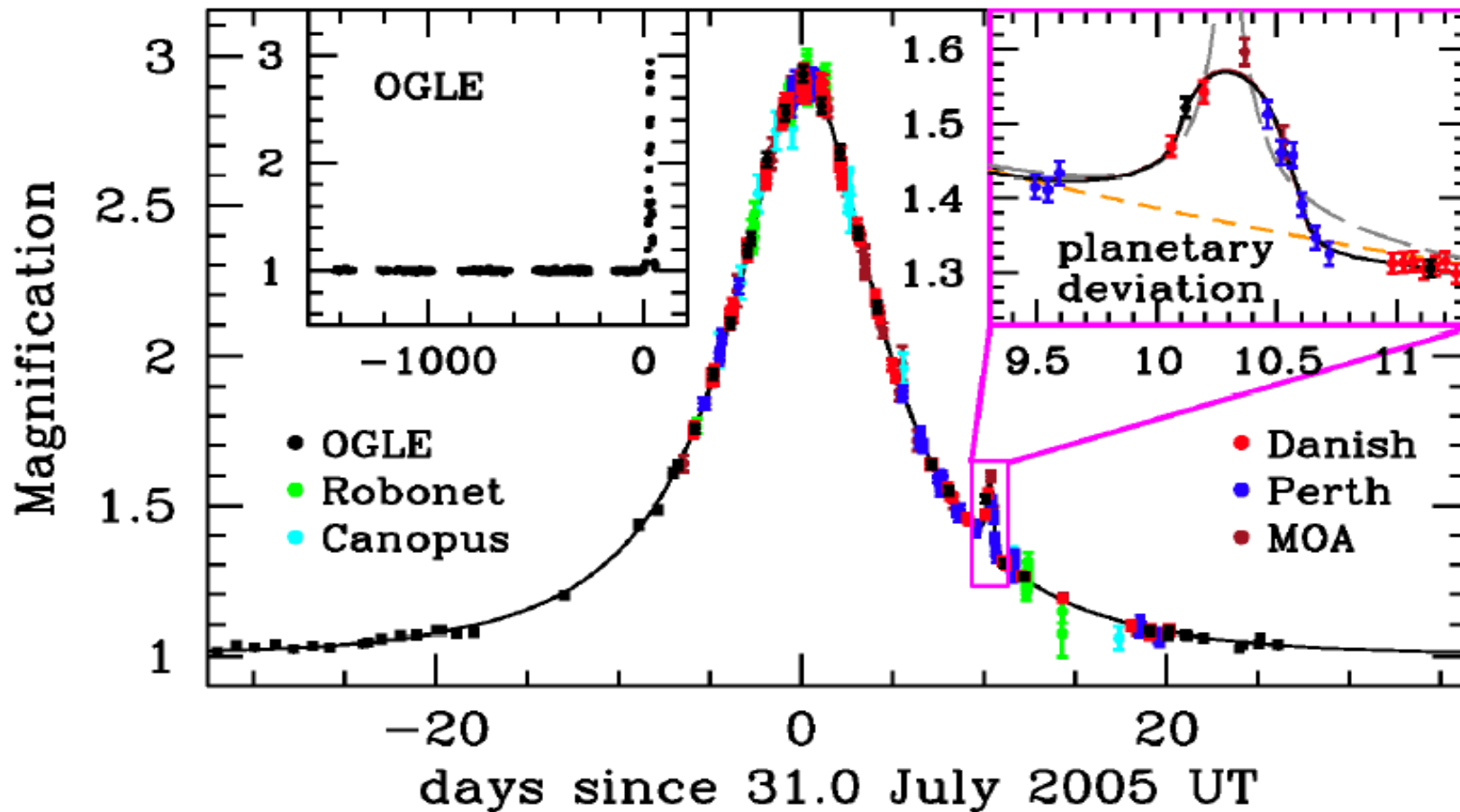
1995 PLANET Pilot Season

- Albrow et al. 1998
ApJ, 509, 687



OGLE-2005-BLG-390

“Classical-Followup” Planetary Caustic

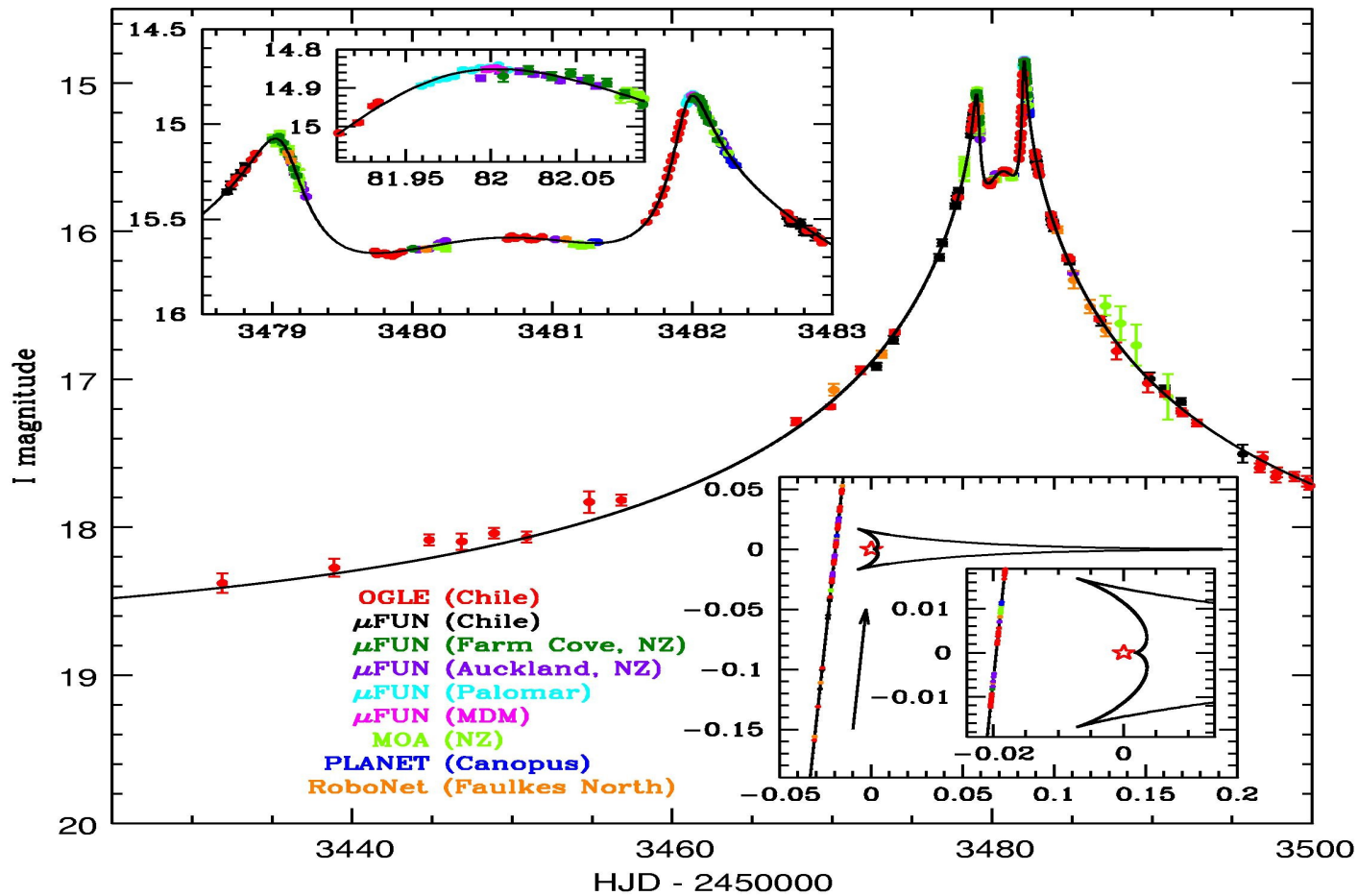


Beaulieu et al. 2006, Nature, 439, 437

OGLE-2005-BLG-071

1st μ FUN Planet:

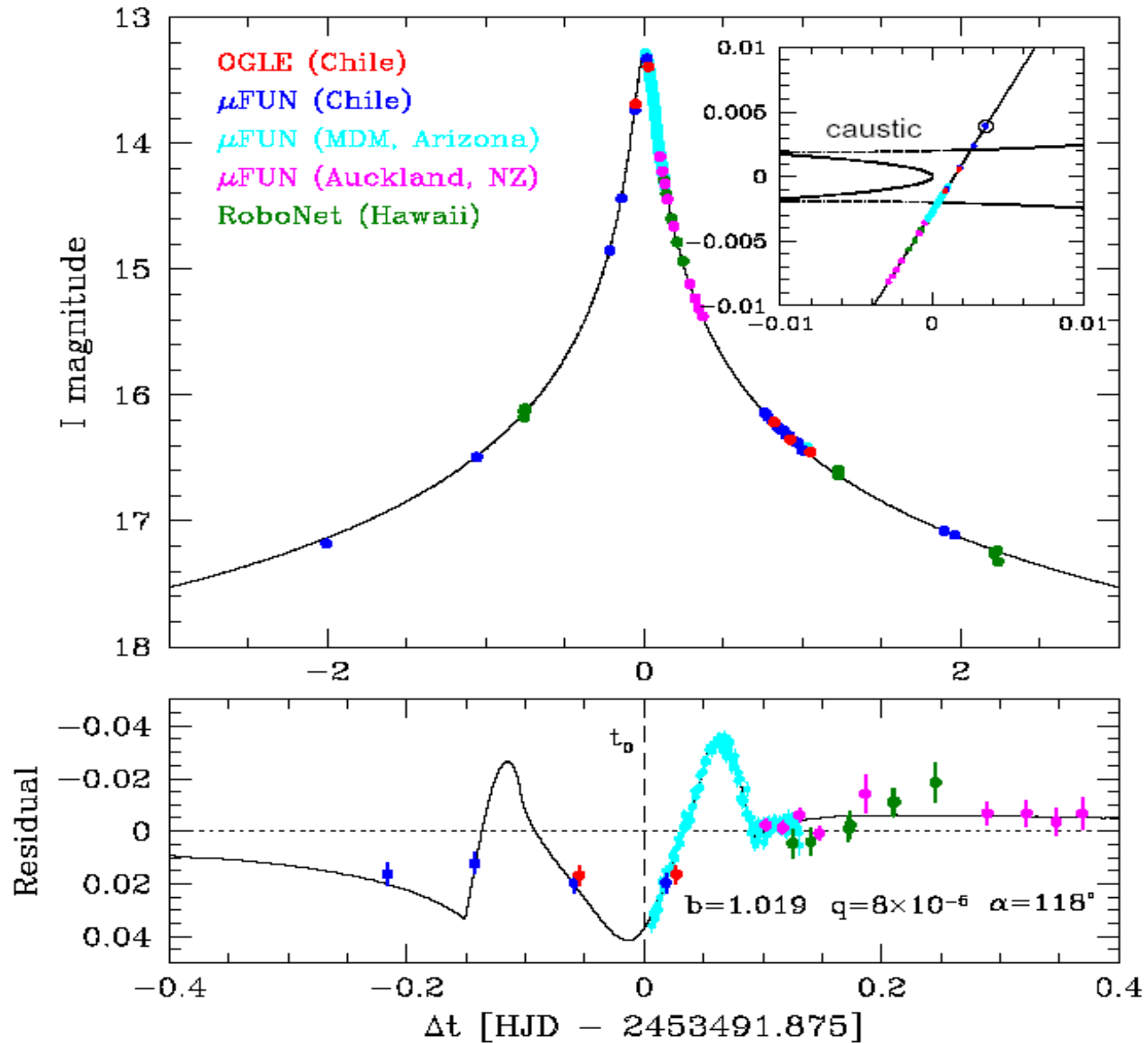
Super-Jupiter around M dwarf



Udalski et al. 2005, ApJ, 628, L109

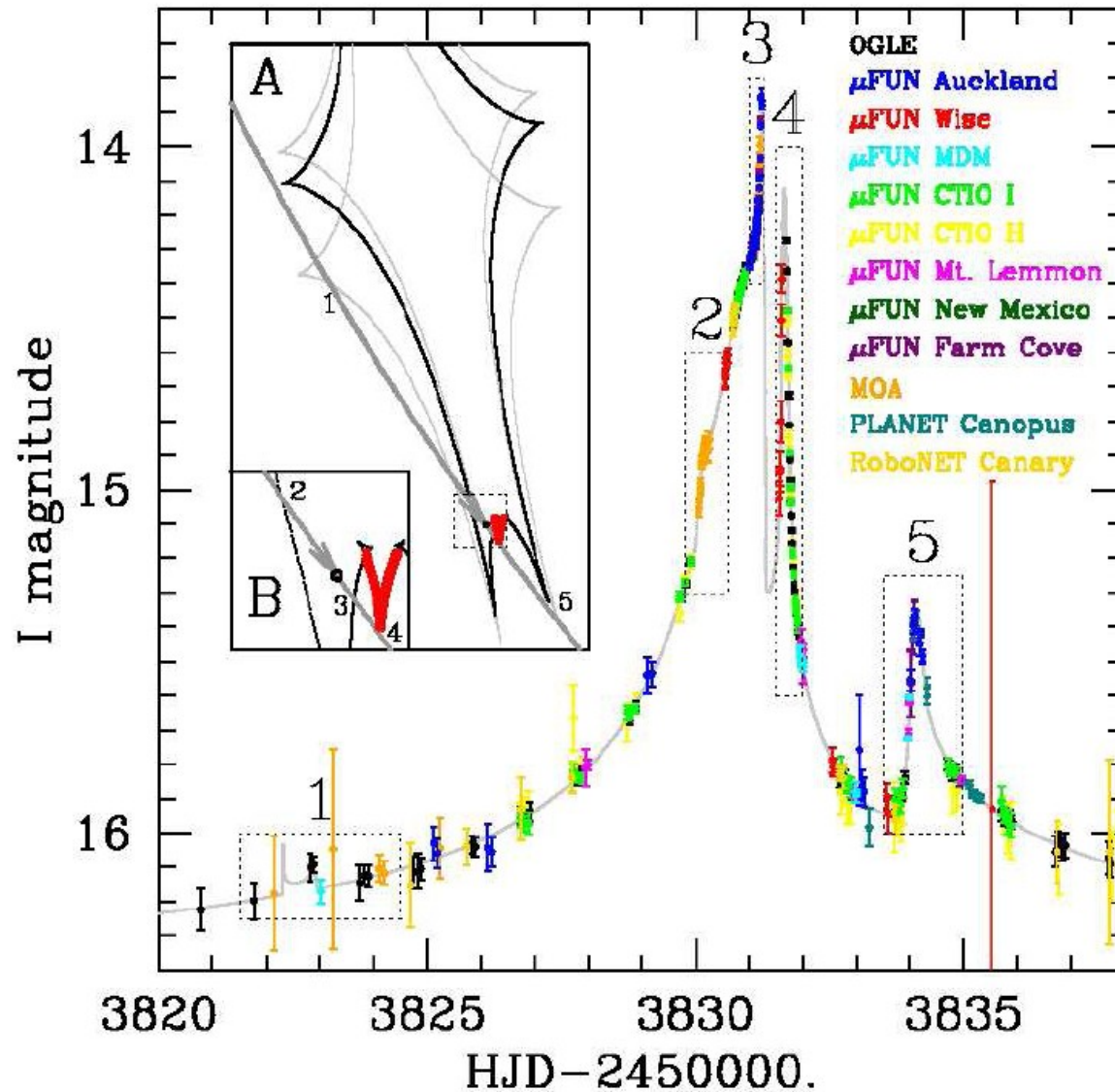
OGLE-2005-BLG-169:

Second μ FUN Planet: Cold Neptune



OGLE-2006-BLG-109

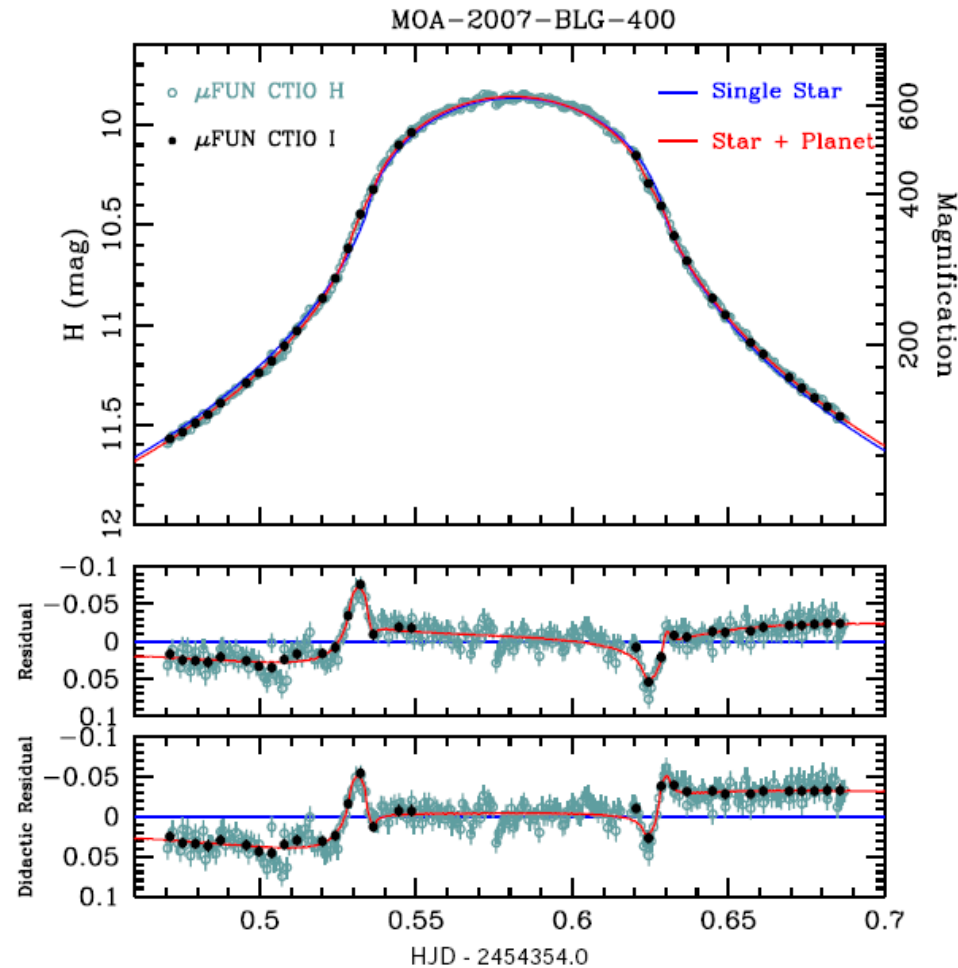
μ FUN Planets 3+4: Jupiter+Saturn System



Gaudi et al. 2008, Science, 319, 927

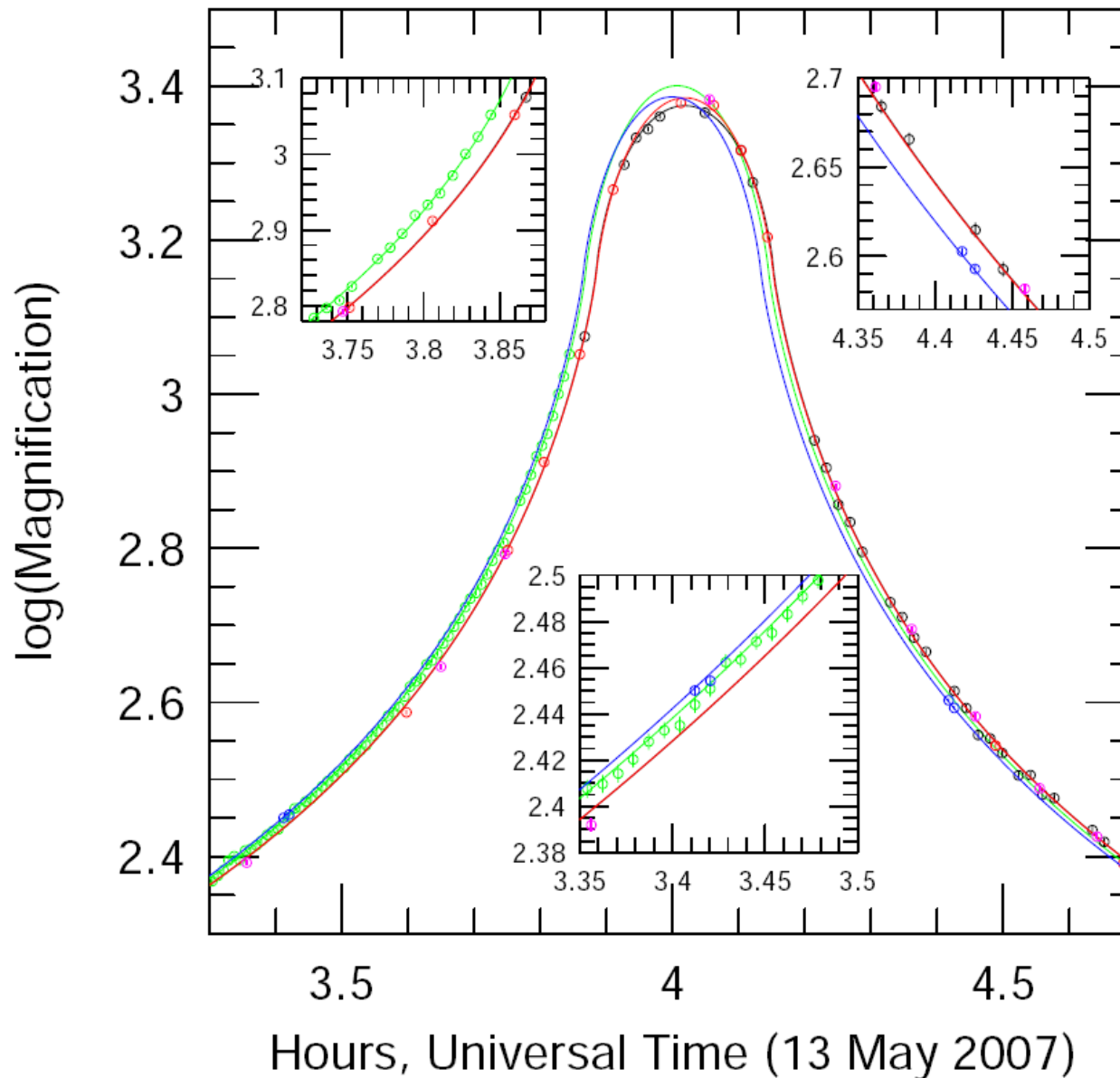
MOA-2007-BLG-400

Fifth μ FUN Planet: “Buried” Jupiter



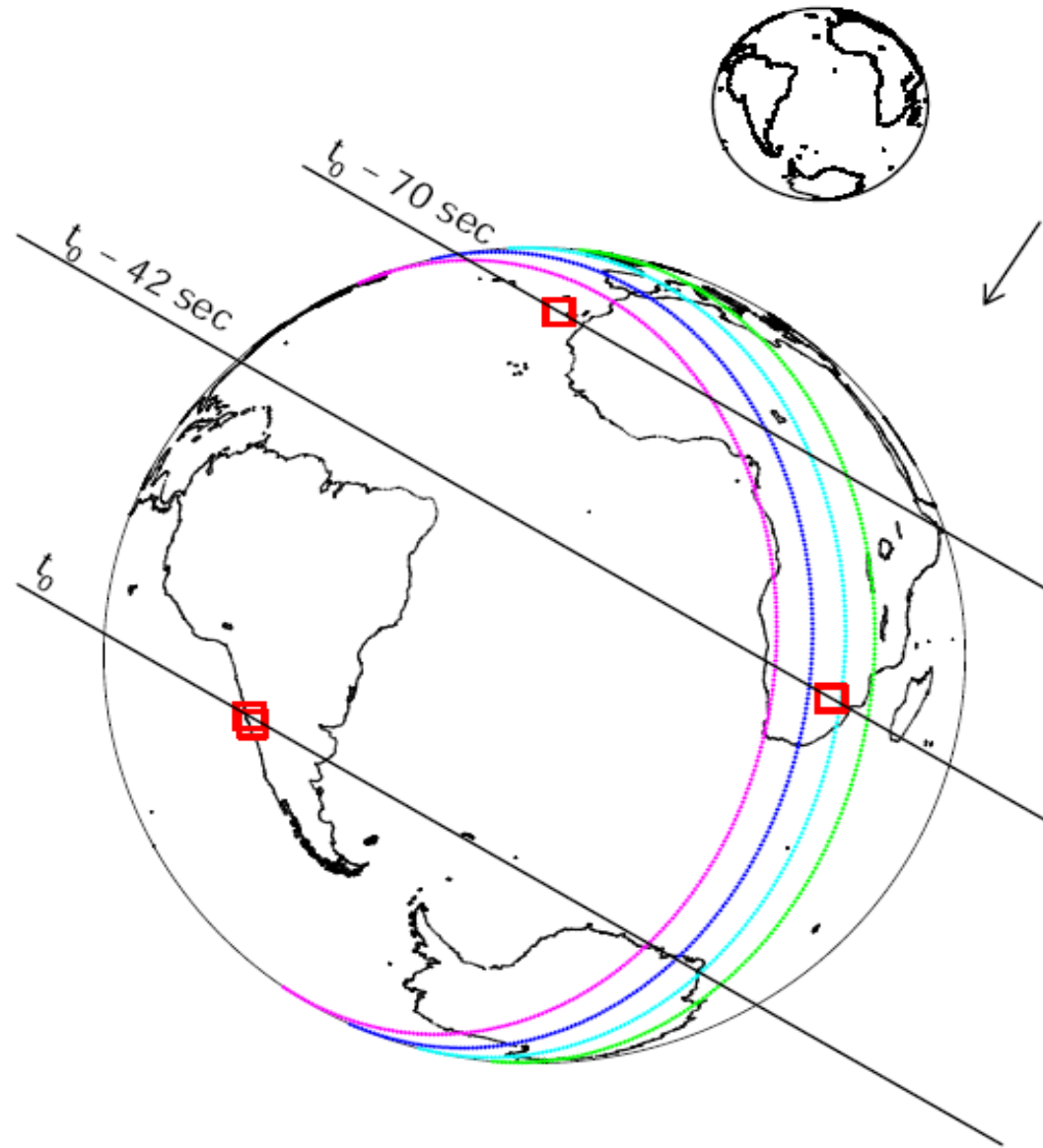
OGLE-2007-BLG-224

Canaries South Africa Chile

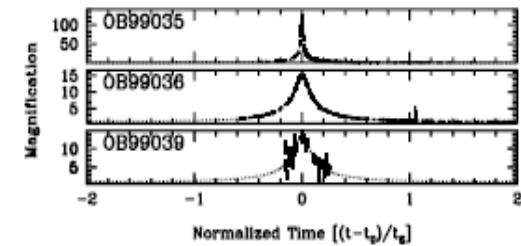
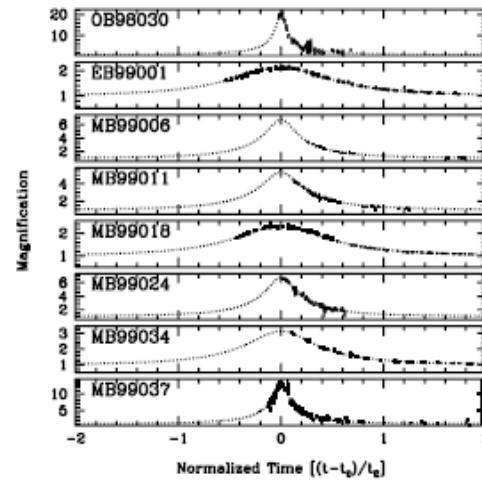
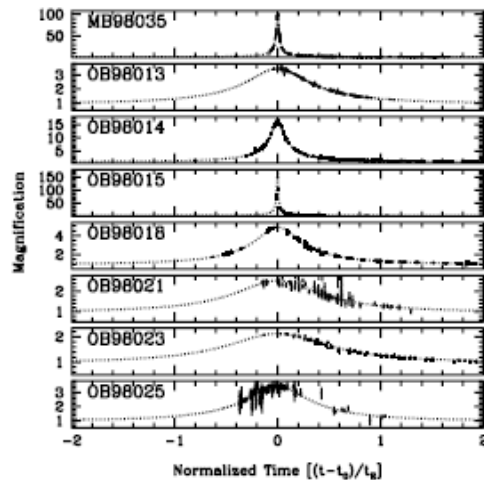
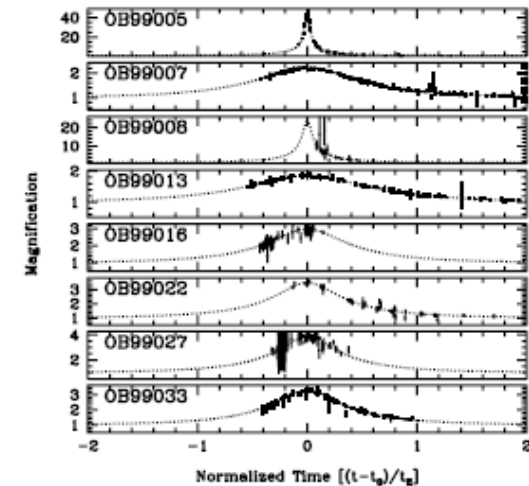
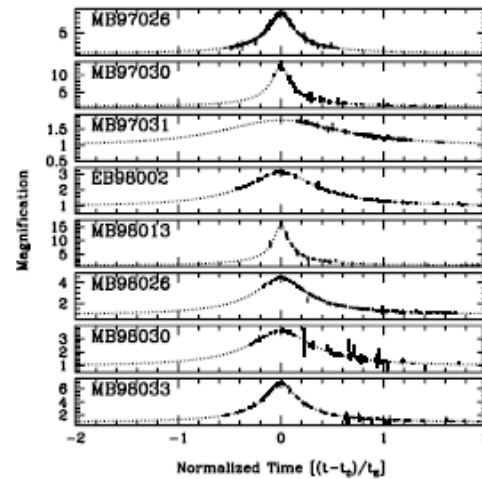
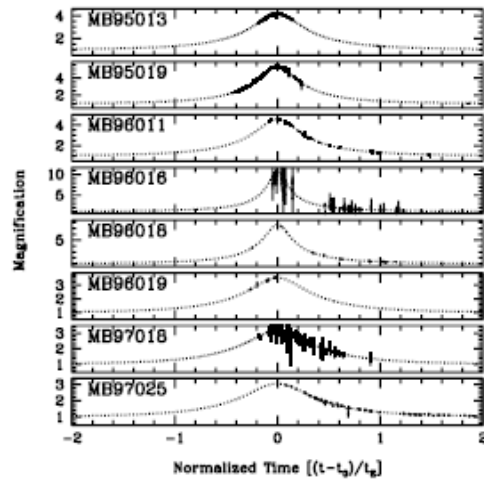


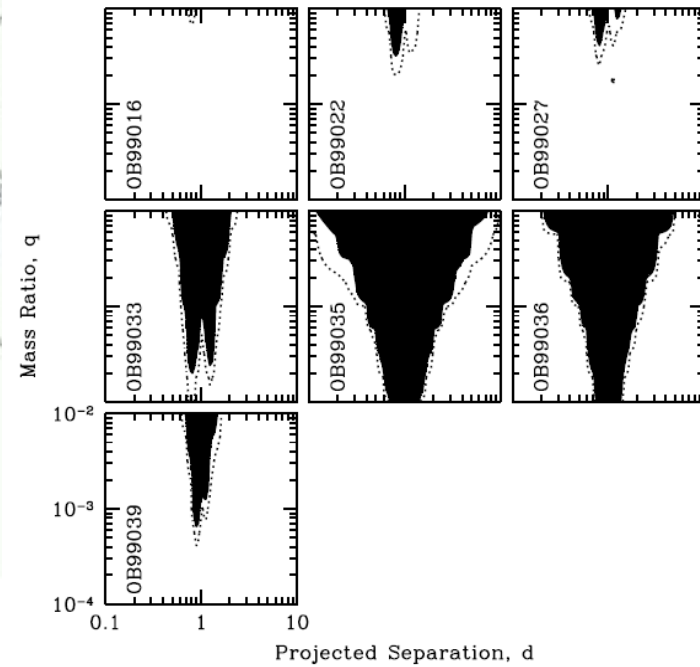
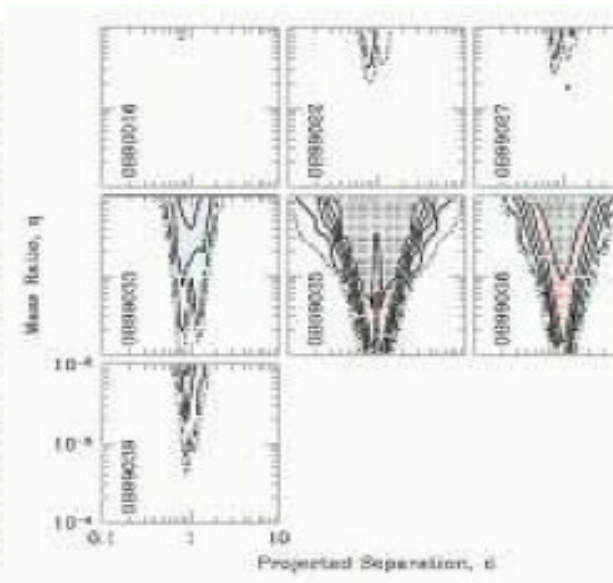
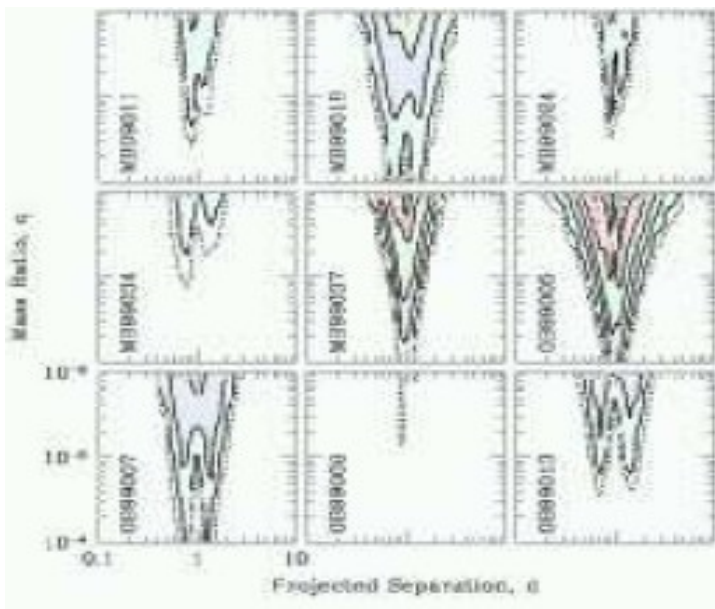
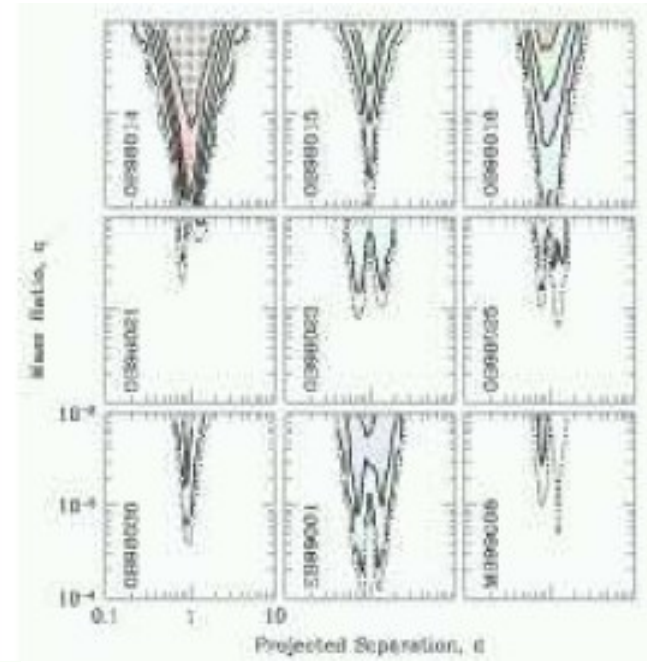
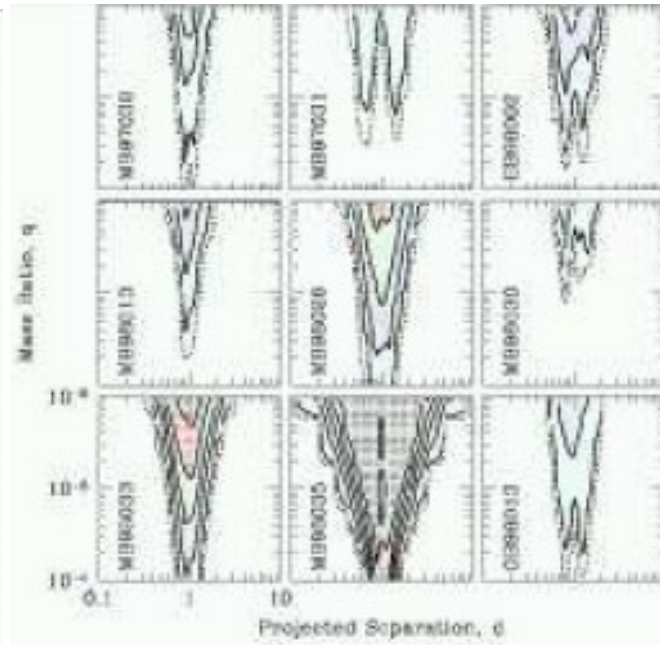
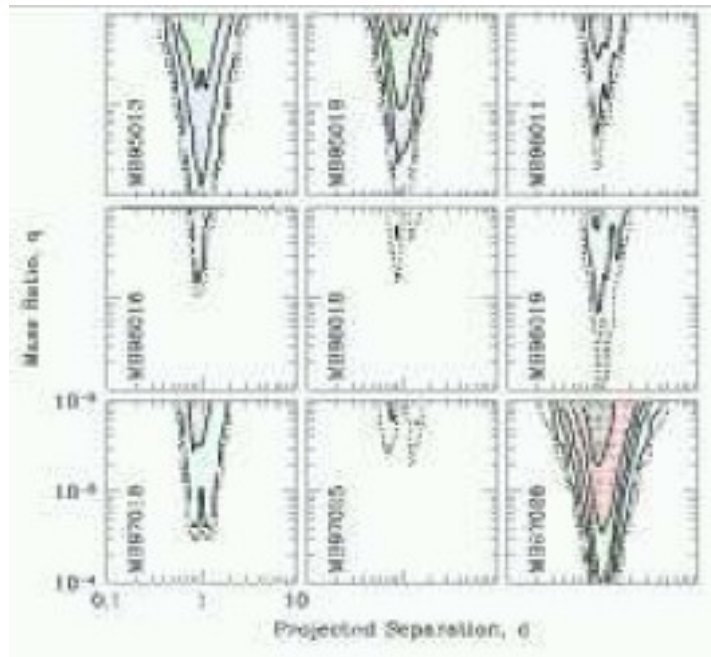
Terrestrial Parallax:

Simultaneous Observations on Earth



Gaudi Thesis (43 events)





Challenge:

Pythagorean Theorem!

