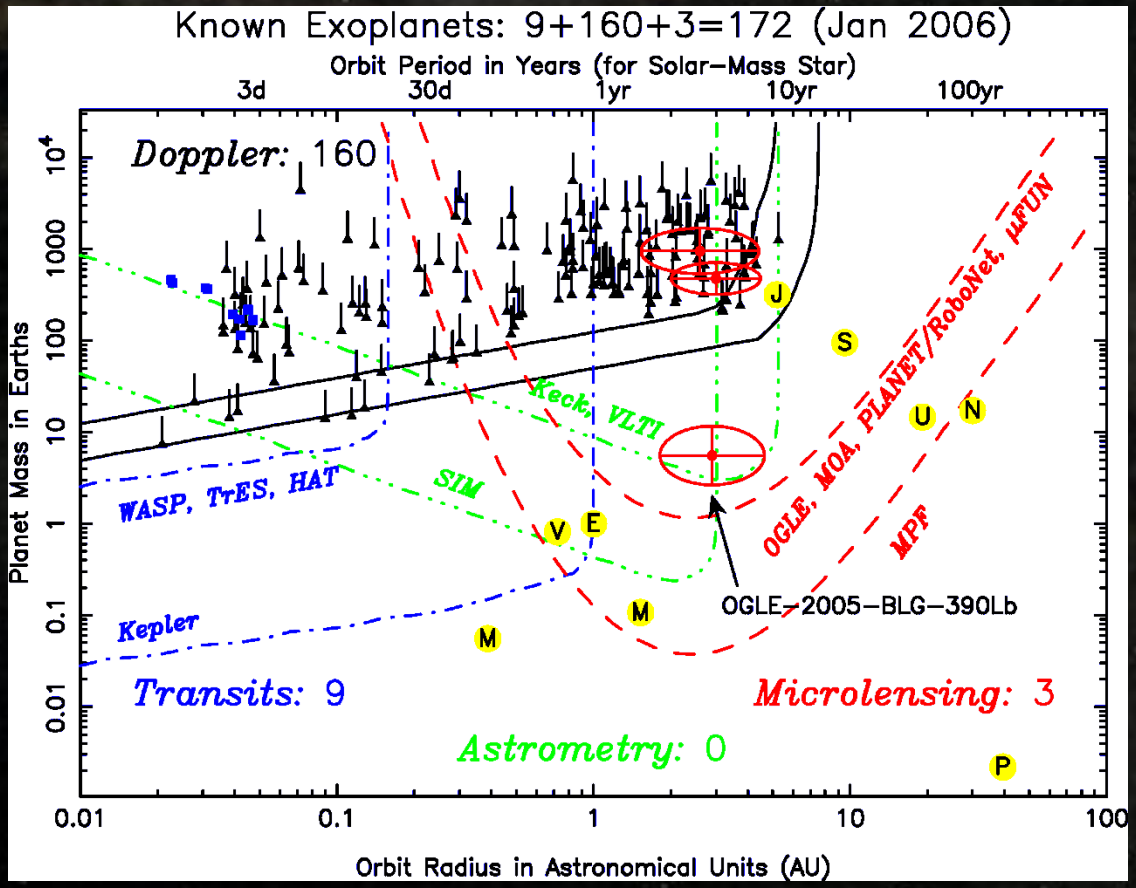

Discovery of Earth-like planet
through gravitational
microlensing

Known extrasolar planets



Search limits and planets:

Radial velocity (160)

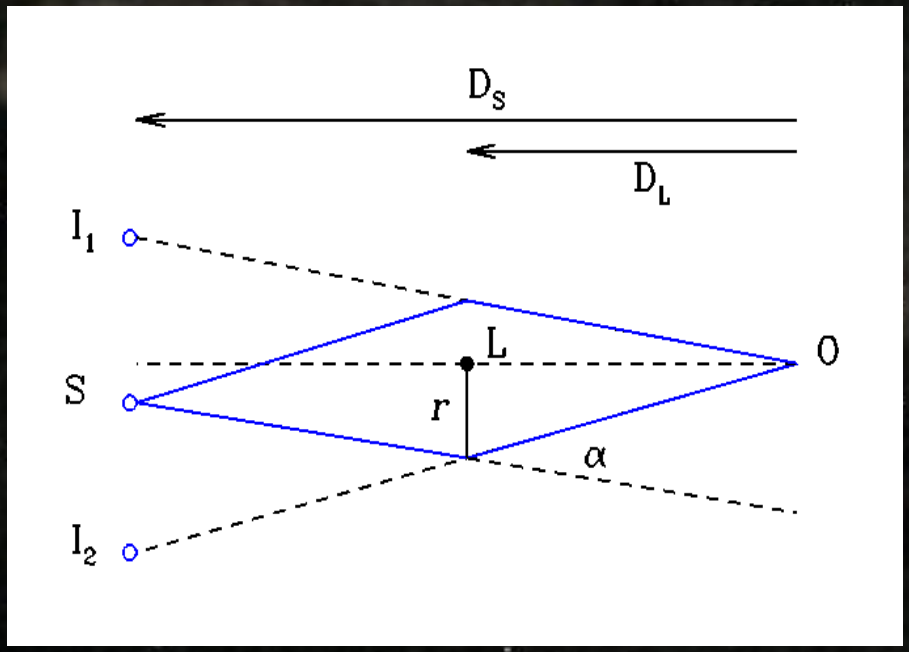
Transit (9)

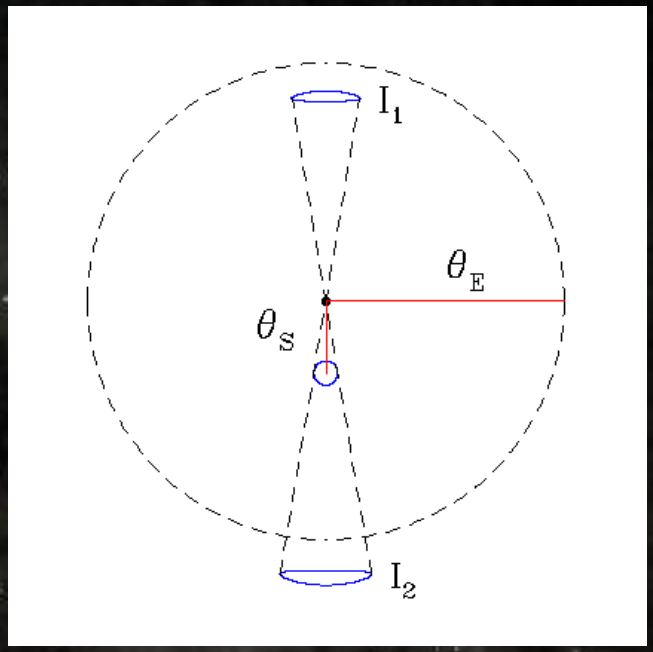
Astrometry (0)

Microlensing (3)

M,V,E,M,J,S,U,N,P - the planets in our Solar System

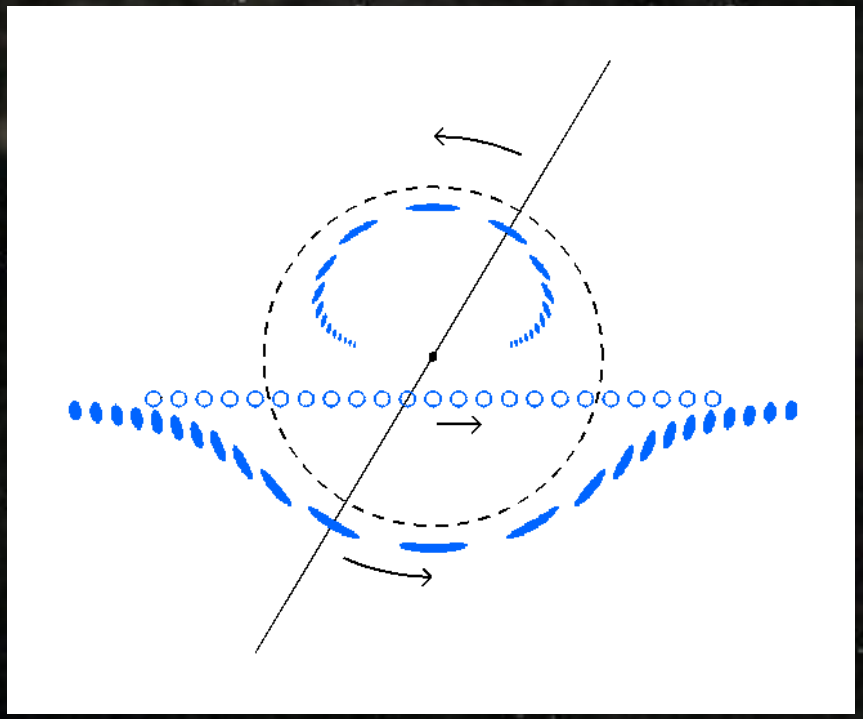
What is microlensing ?

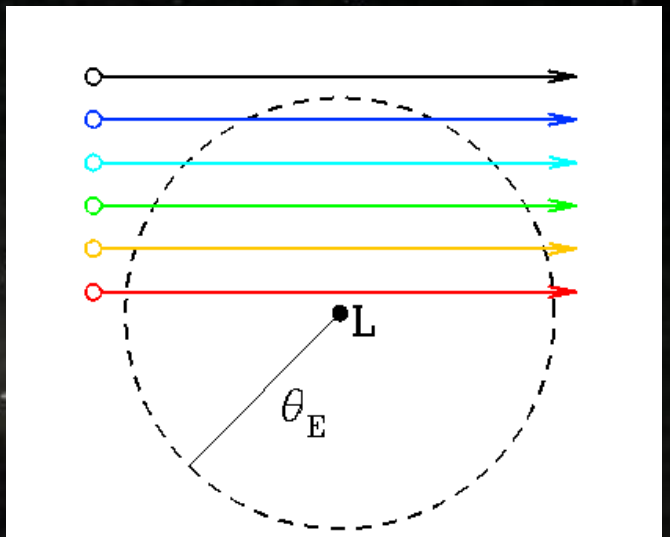


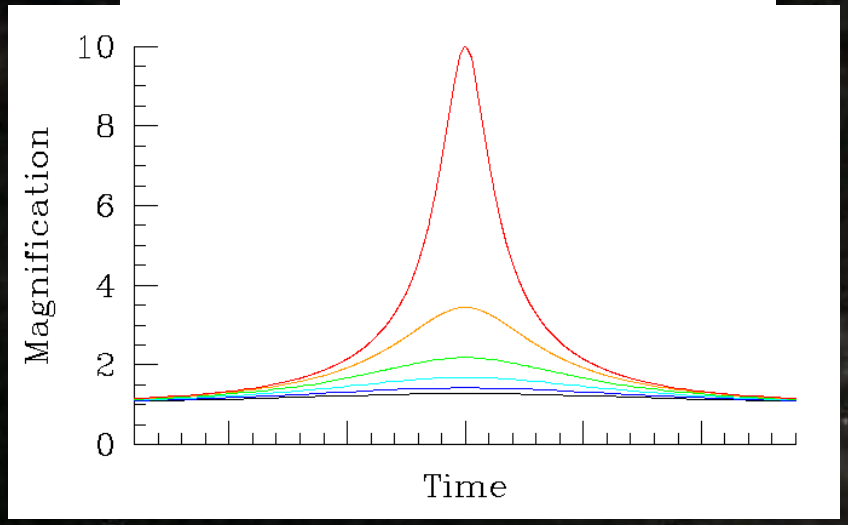


The „perfect” telescope

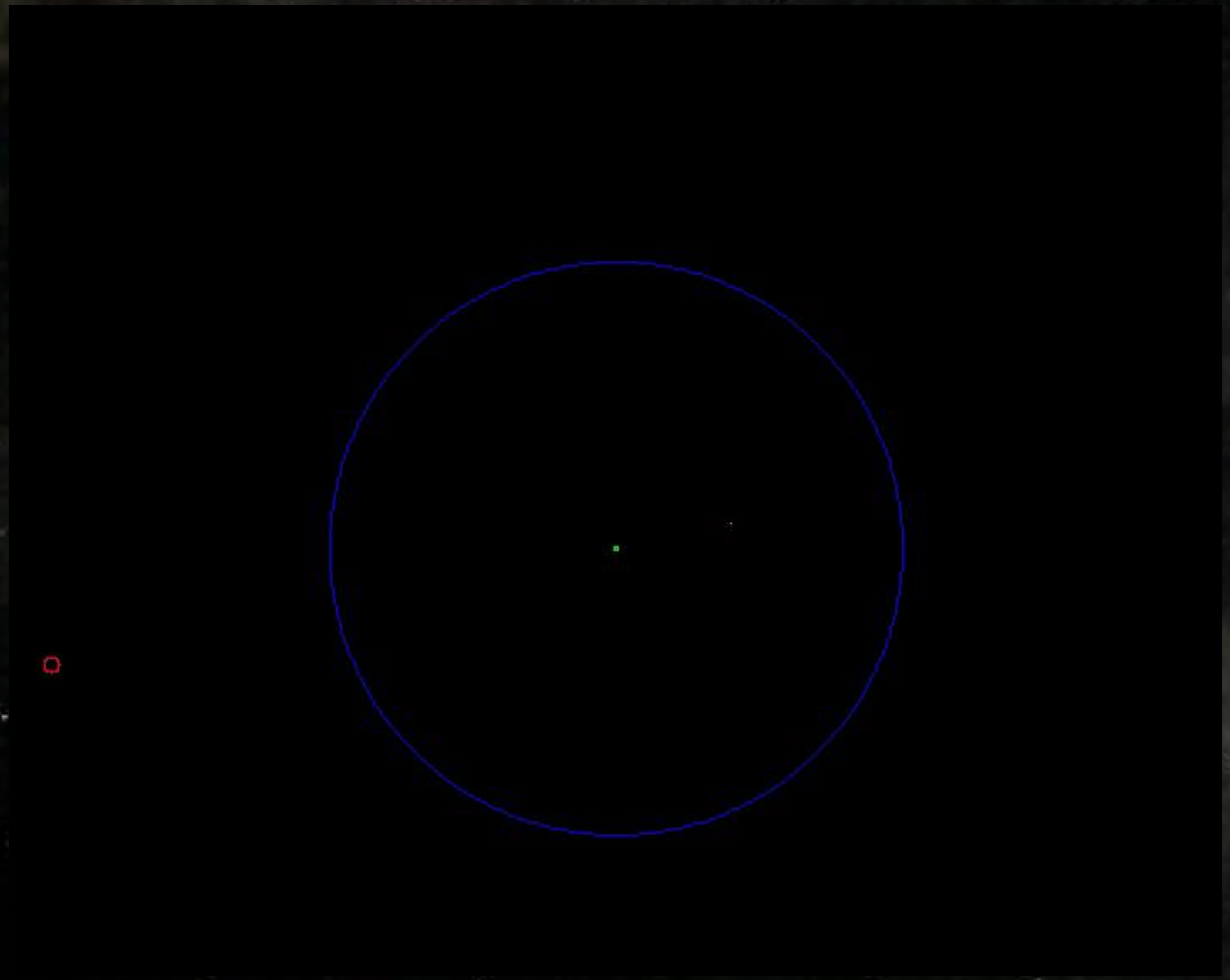
Everything flows...







The movie from the „perfect” telescope ?



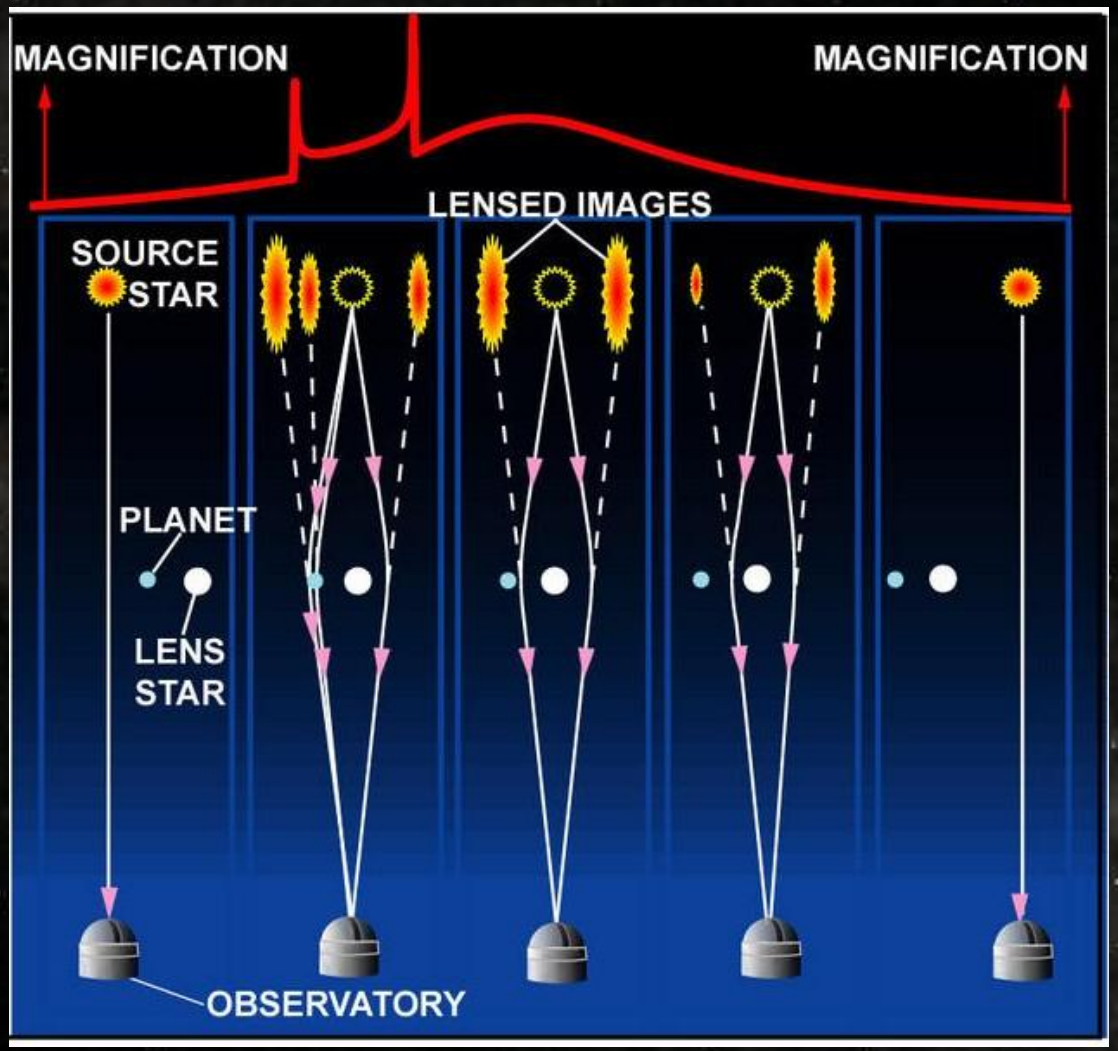
Background star

Real position of the background star

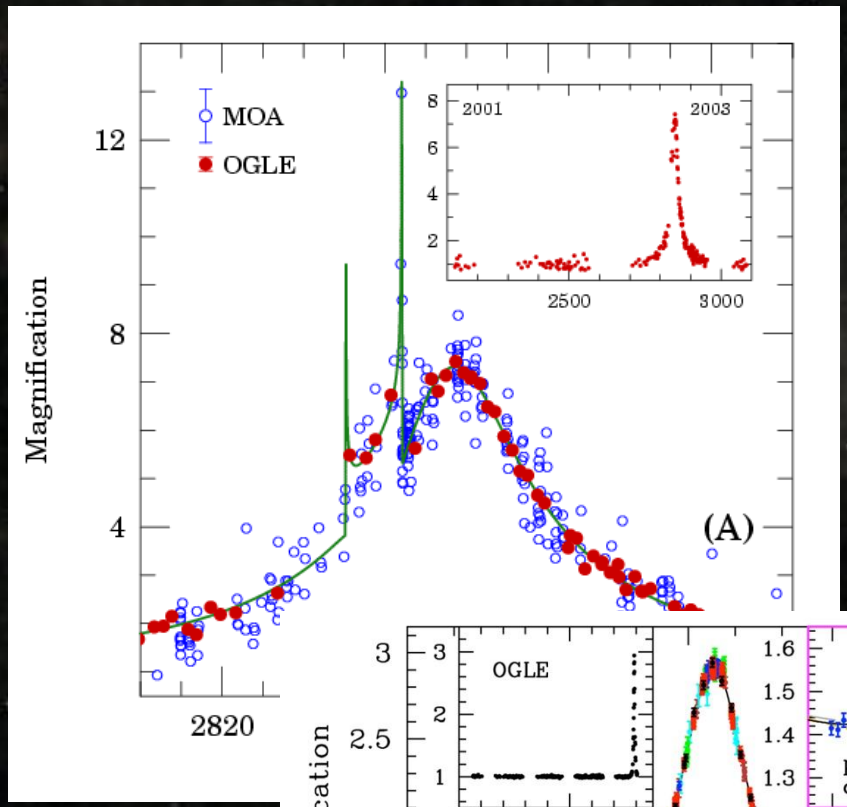
Position of the lens star

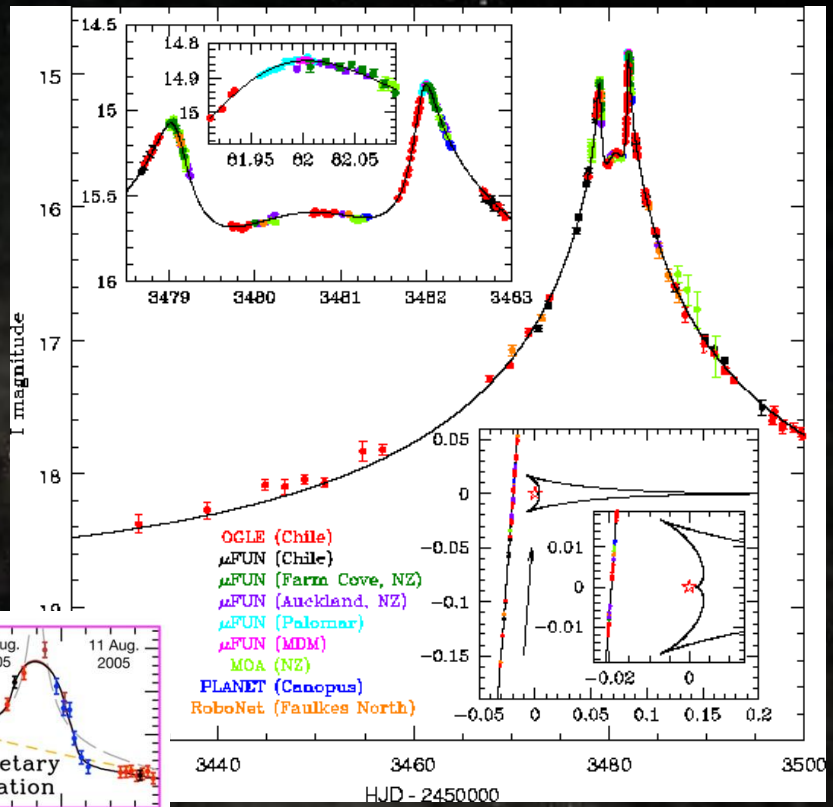
The Einstein radius

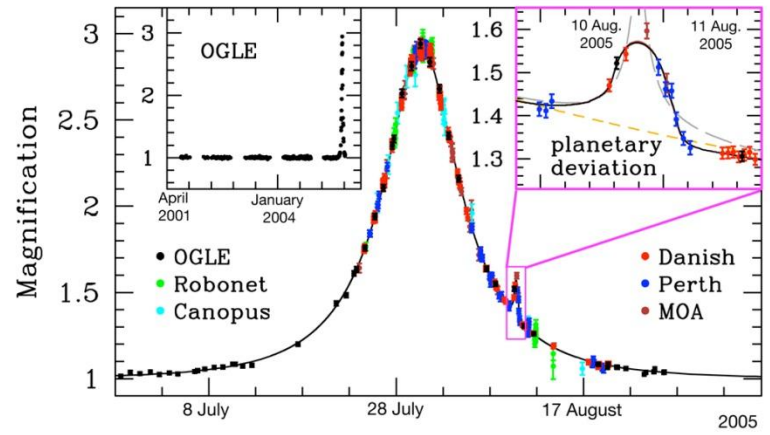
Lens with a companion



Examples (in fact all that we have)







Light Curve of OGLE-2005-BLG-390

ESO PR Photo 03b/06 (January 25, 2006)

Participating observatories/projects

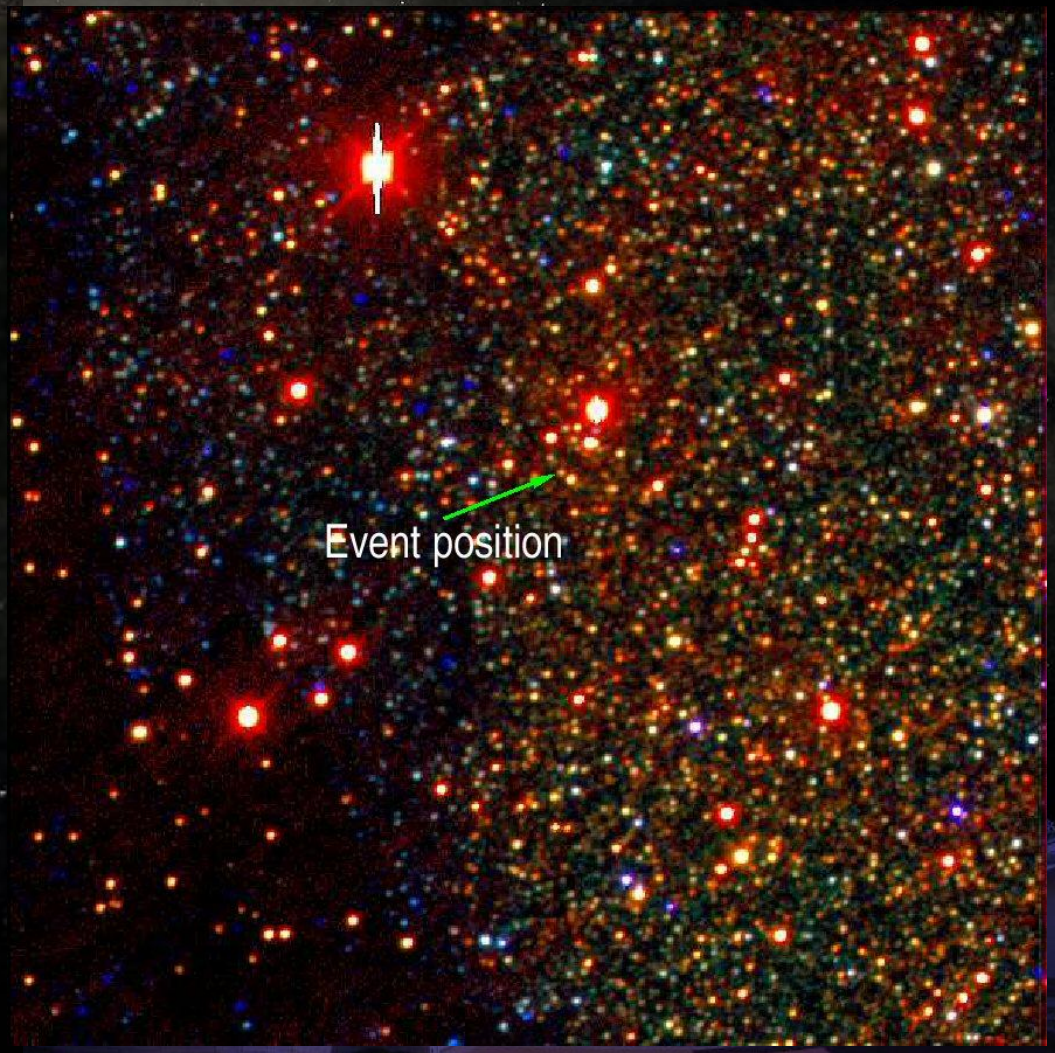
MOA (Microlensing Observations in Astrophysics):
- Mt John Observatory, New Zealand

OGLE (The Optical Gravitational Lensing Experiment):
Las Campanas Observatory, Chile

PLANET (Probing Lensing Anomalies NETwork):
- The Perth Observatory, Australia
- The Danish telescope, Chile
- The Canopus Observatory, Australia

RoboNet-1.0:
- Faulkes Telescope South, Australia

Where ?

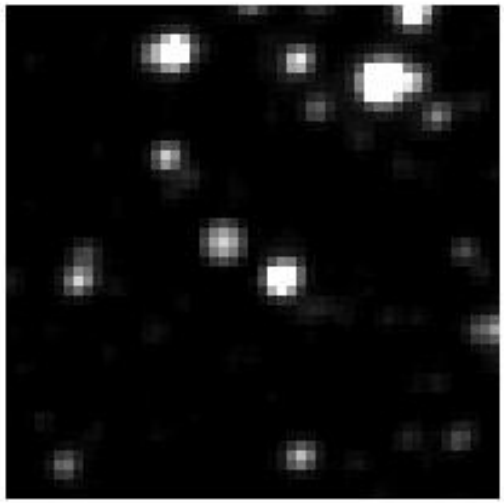


Equatorial coordinates (J2000.0):

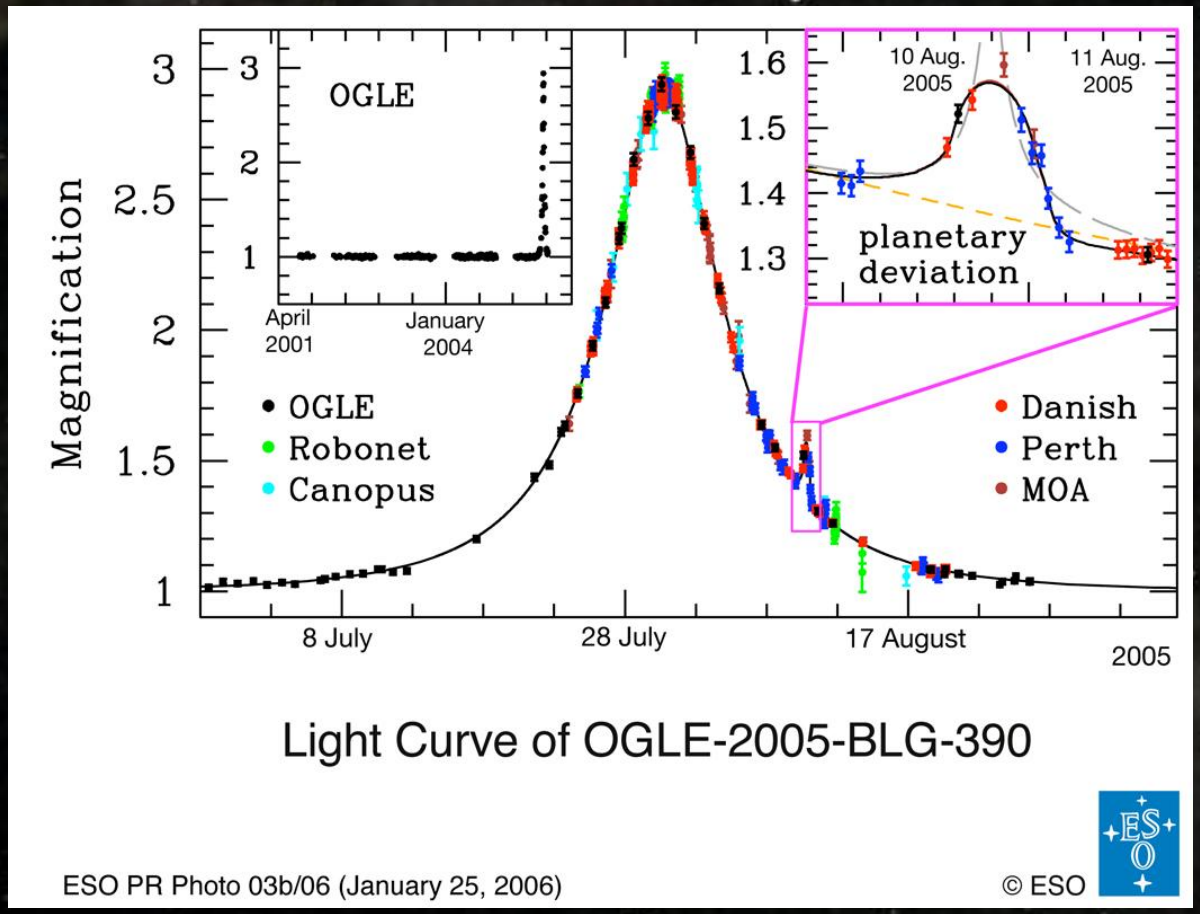
RA=17:54:19.19
DEC=-30:22:38.3

Where ?

Equatorial coordinates



Let's discover something



Lightcurve (several telescopes, almost continuous observations)

↓

Model (theoretical brightening, are there spots on the source star? etc.)

↓

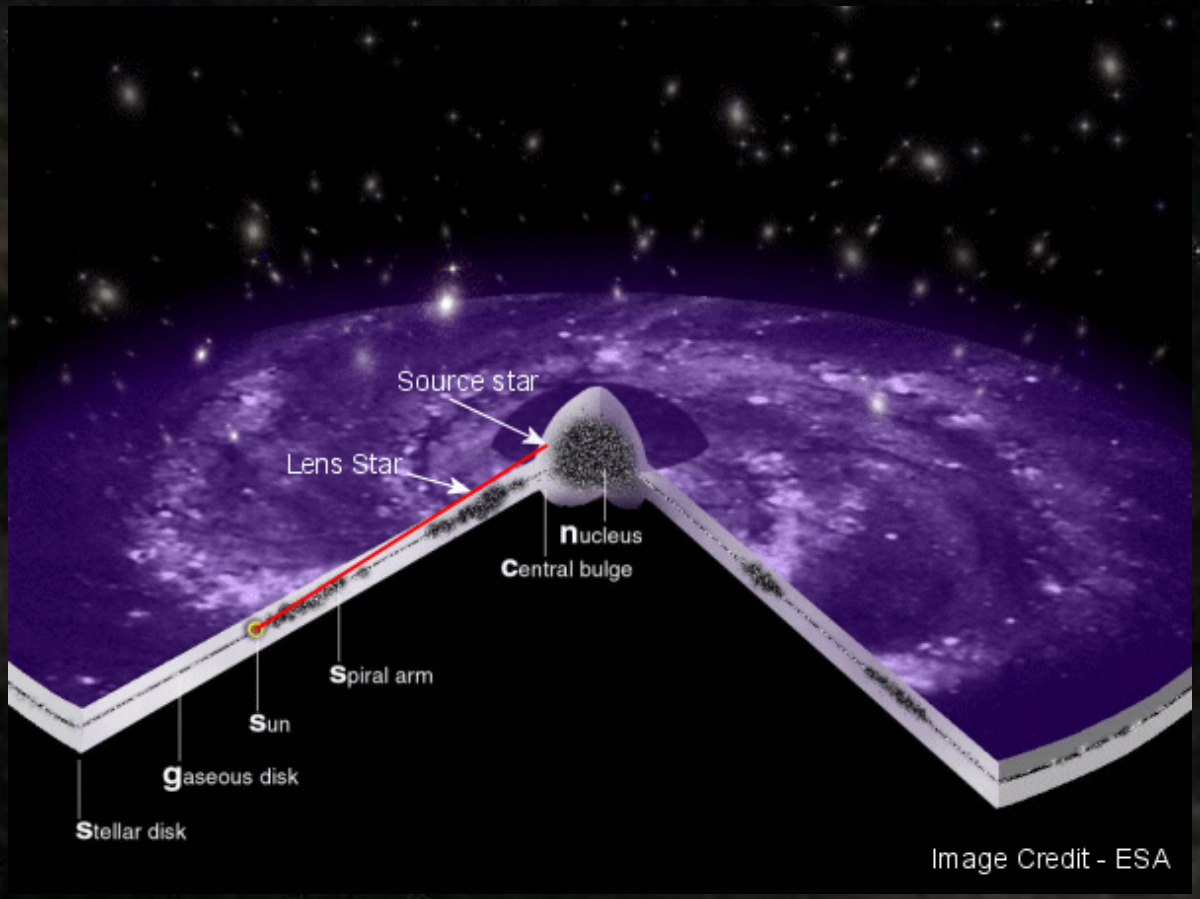
WOW! We discovered a planet!

Who?

Discovery of a cool planet of 5.5 Earth masses through gravitational microlensing*

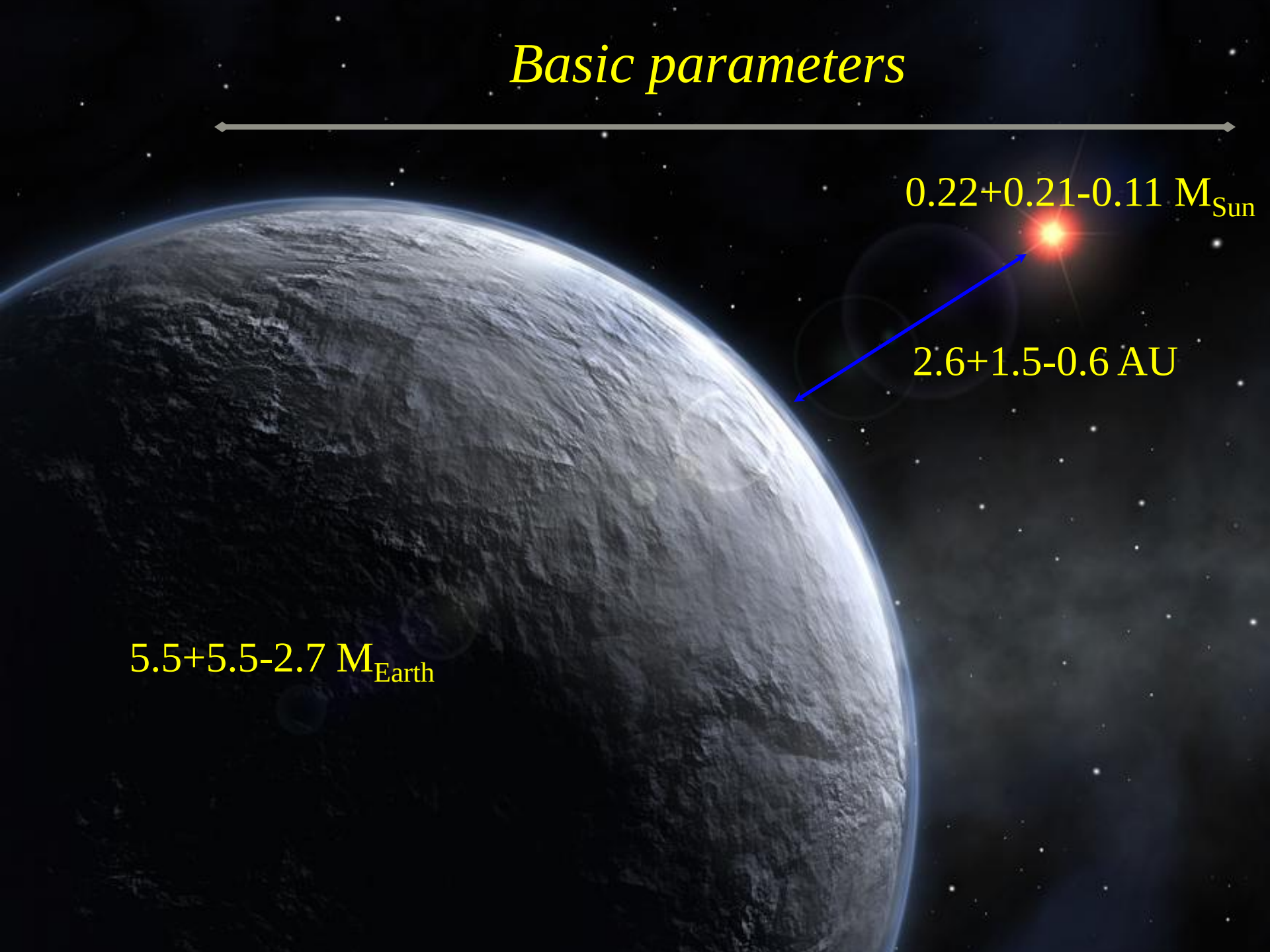
J.-P. Beaulieu[1,4], D. P. Bennett[1,3,5], P. Fouqué[1,6], A. Williams[1,7], M. Dominik[1,8], U. G. Jørgensen[1,9], D. Kubas[1,10], A. Cassan[1,4], C. Coutures[1,11], J. Greenhill[1,12], K. Hill[1,12], J. Menzies[1,13], P.D. Sackett[1,14], M. Albrow[1,15], S. Brillant[1,10], J.A.R. Caldwell[1,16], J. J. Calitz[1,17], K. H. Cook[1,18], E. Corrales[1,4], M. Desort[1,4], S. Dieters[1,12], D. Dominis[1,19], J. Donatowicz[1,20], M. Hoffman[1,19], S. Kane[1,21], J.-B. Marquette[1,4], R. Martin[1,7], P. Meintjes[1,17], K. Pollard[1,15], K. Sahu[1,22], C. Vinter[1,9], J. Wambsganss[1,23], K. Woller[1,9], K. Horne[1,8], I. Steele[1,24], D. M. Bramich[1,8,24], M. Burgdorf[1,24], C. Snodgrass[1,25], M. Bode[1,24], A. Udalski[2,26], M.K. Szymański[2,26], M. Kubiak[2,26], T. Więckowski[2,26], G. Pietrzyński[2,26,27], I. Soszyński[2,26,27], O. Szewczyk[2,26], Ł. Wyrzykowski[2,26,28], B. Paczyński[2,29], F. Abe[3,30], I. A. Bond[3,31], T. R. Britton[3,15,32], A. C. Gilmore[3,15], J. B. Hearnshaw[3,15], Y. Itow[3,30], K. Kamiya[3,30], P. M. Kilmartin[3,15], A. V. Korpela[3,33], K. Masuda[3,30], Y. Matsubara[3,30], M. Motomura[3,30], Y. Muraki[3,30], S. Nakamura[3,30], C. Okada[3,30], K. Ohnishi[3,34], N. J. Rattenbury[3,28], T. Sako[3,30], S. Sato[3,35], M. Sasaki[3,30], T. Sekiguchi[3,30], D. J. Sullivan[3,33], P. J. Tristram[3,32], P. C. M. Yock[3,32], T. Yoshioka[3,30]

Basic parameters



Distance to the lensing system: 6.6±1.0 kpc
(the most distant among all known extrasolar planetary system)

Basic parameters



THE KONIEC