Observe:

Positions

Magnifications

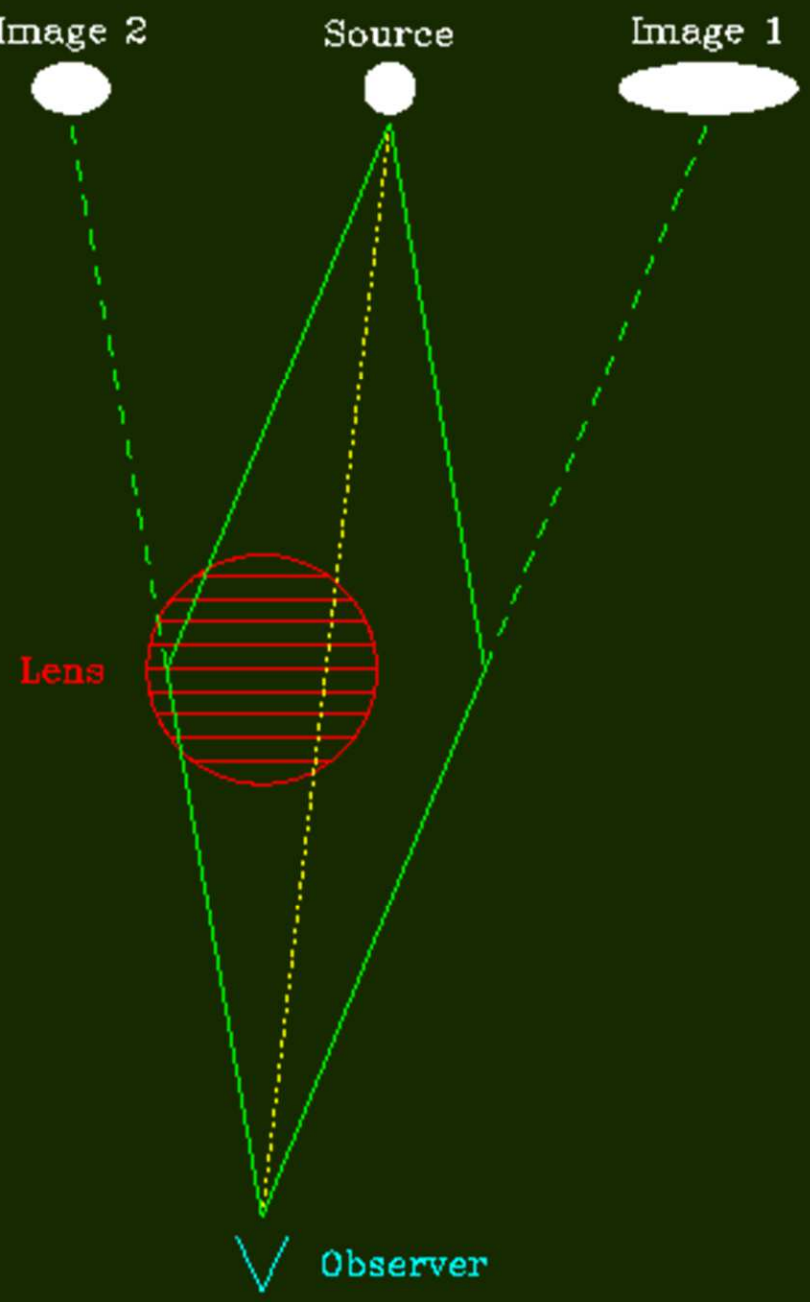
Time delays

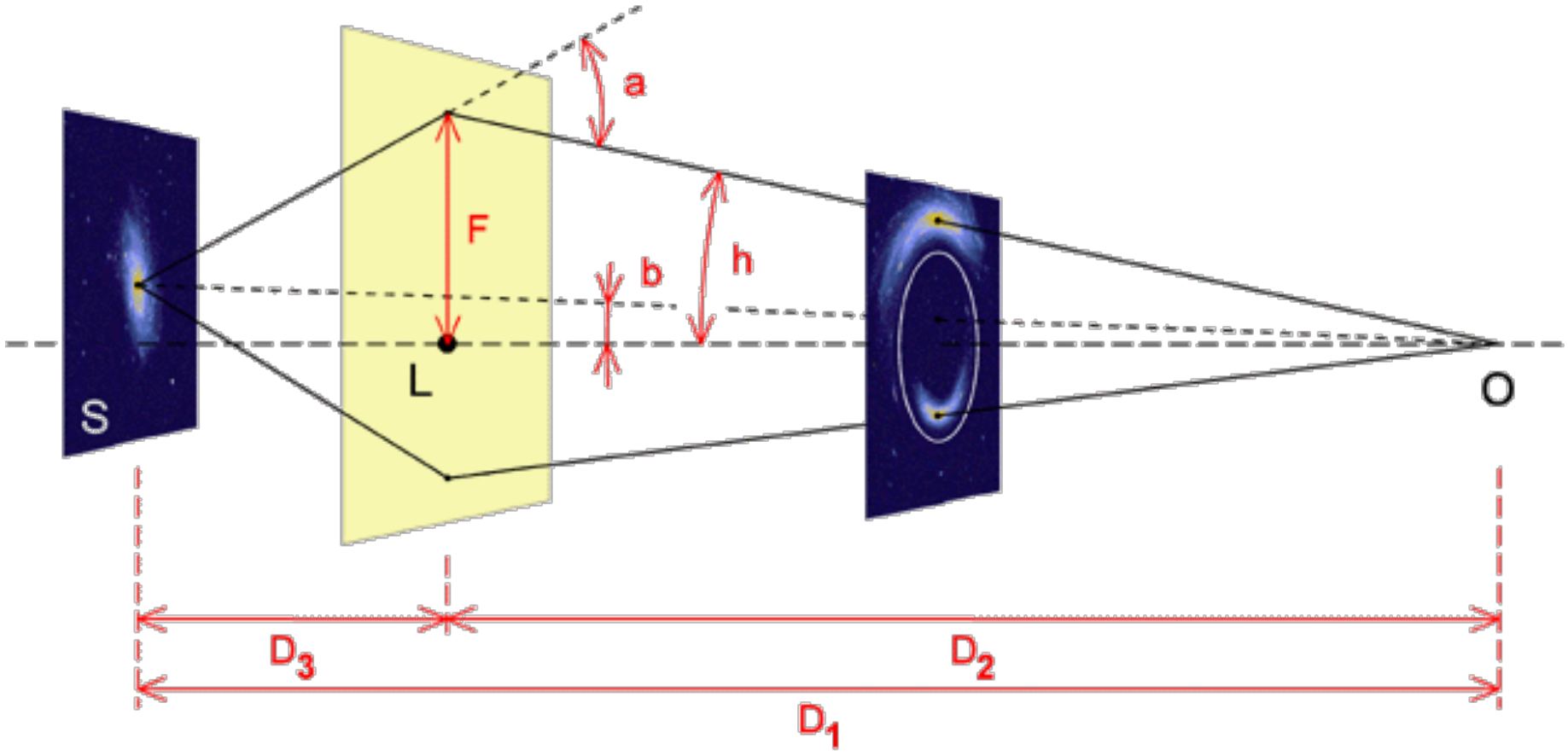
Measure:

Mass

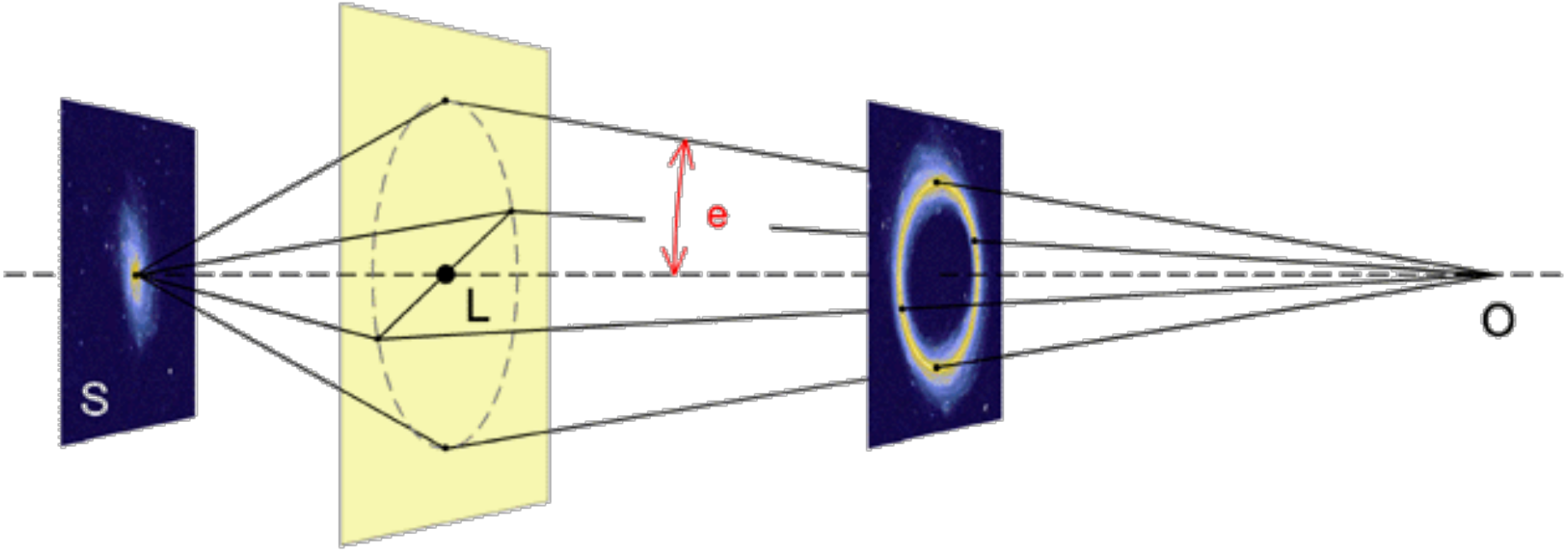
Mass distribution

Hubble constant





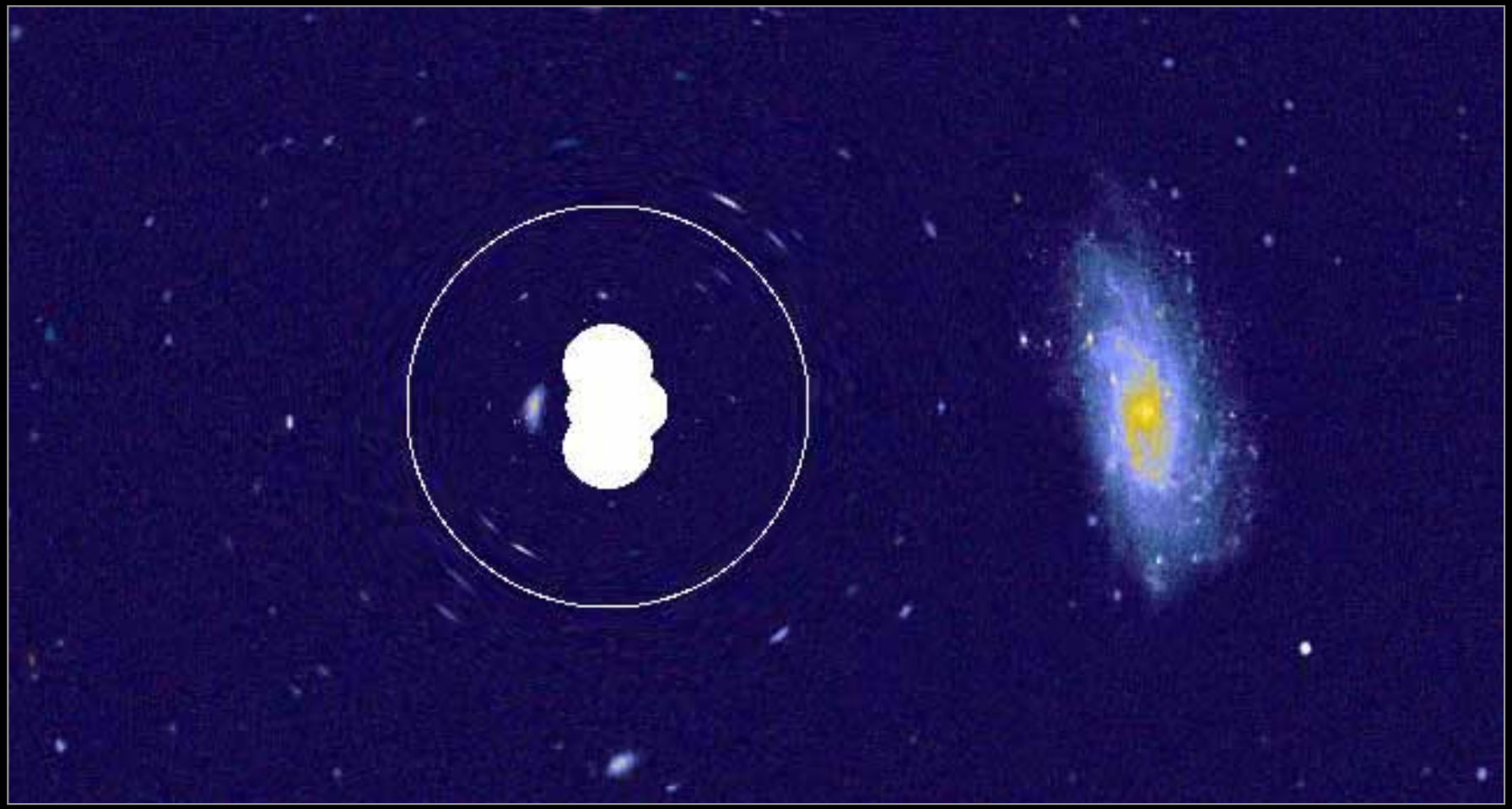
Leos Ondra: http://www.bm.cesnet.cz/~ondra/



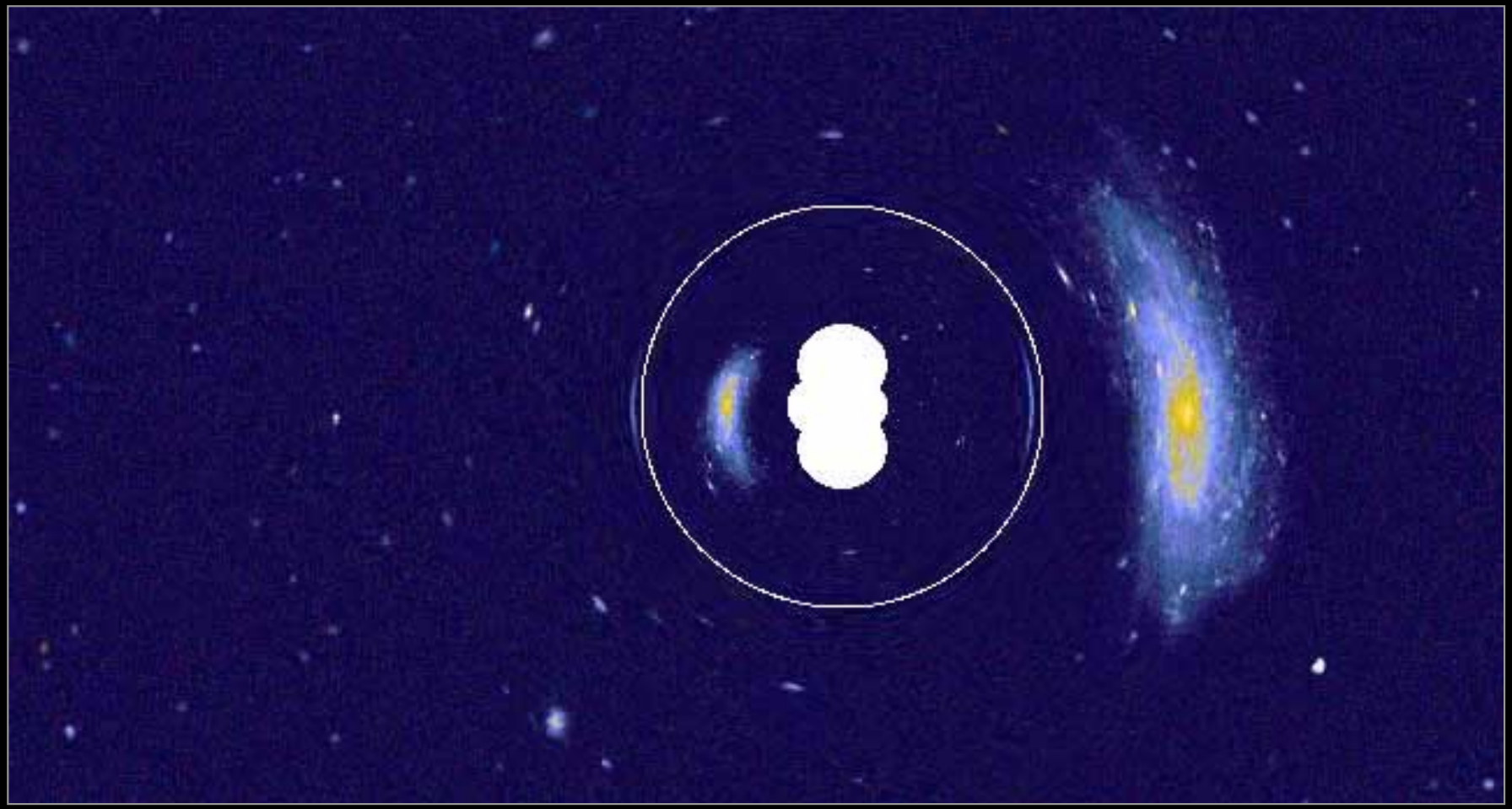
Leos Ondra: http://www.bm.cesnet.cz/~ondra/

M 33

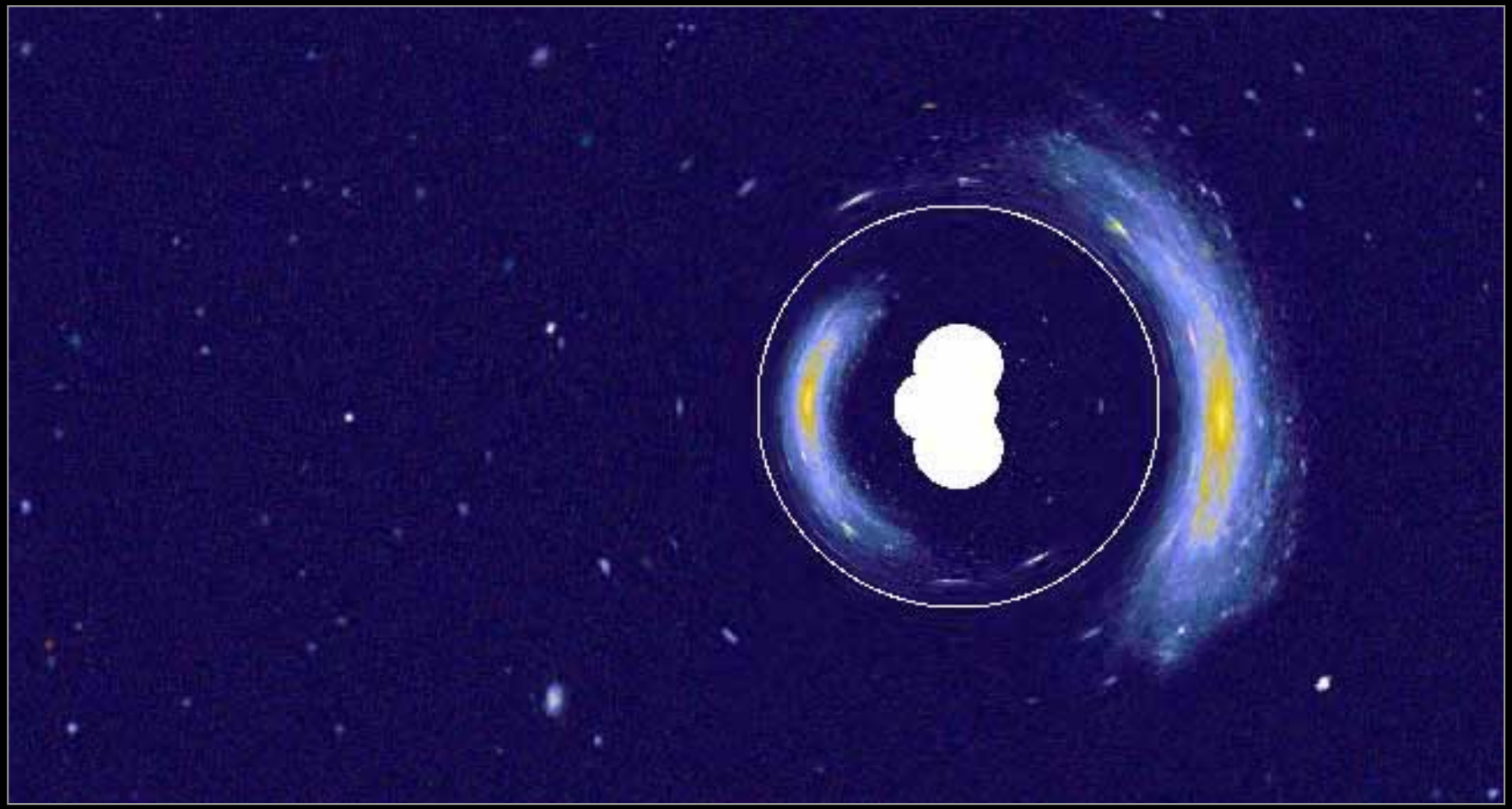
Leos Ondra: http://www.bm.cesnet.cz/~ondra/



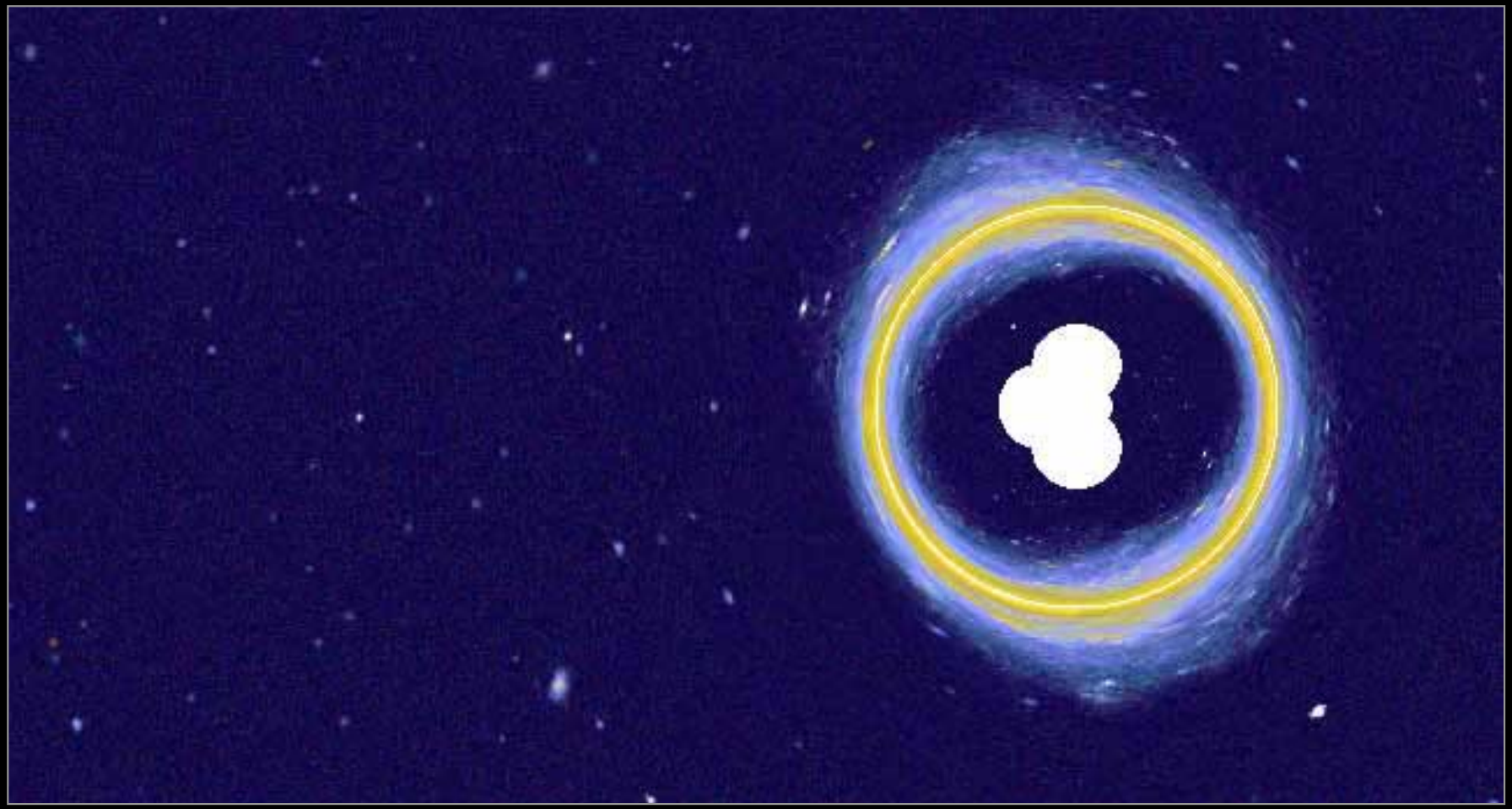
Leos Ondra: http://www.bm.cesnet.cz/~ondra/



Leos Ondra: http://www.bm.cesnet.cz/~ondra/



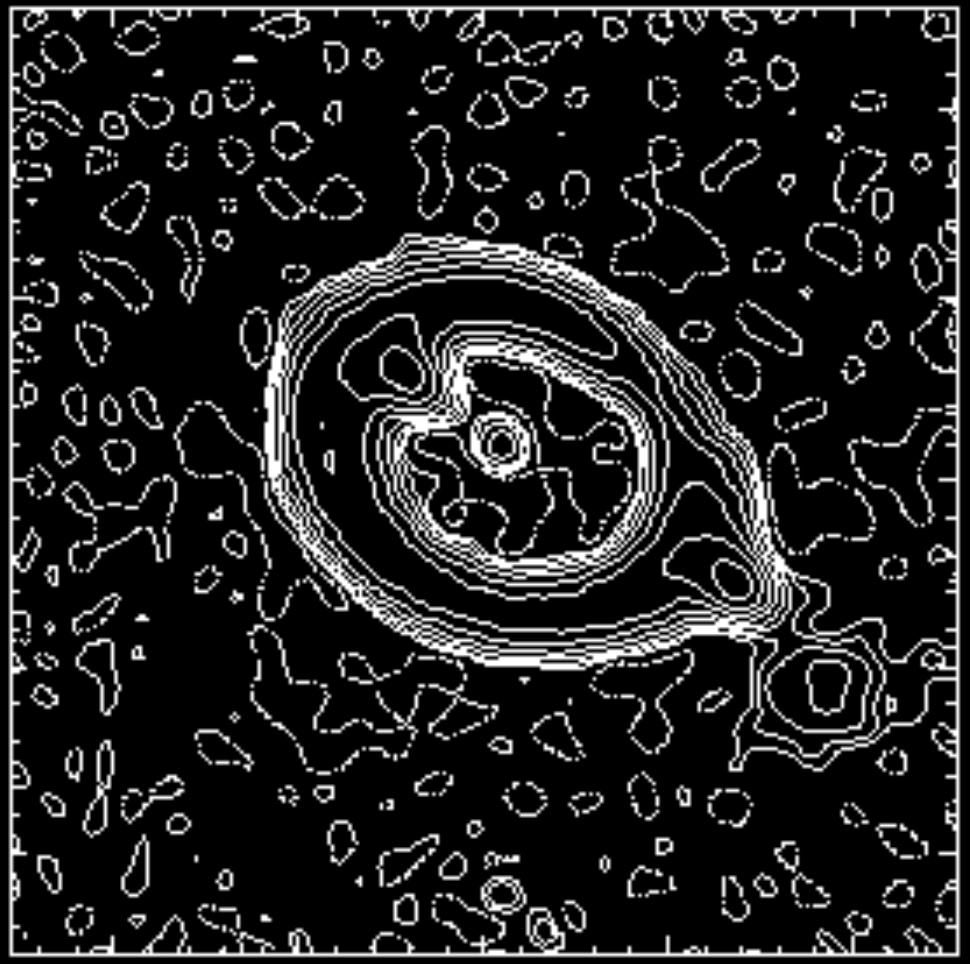
Leos Ondra: http://www.bm.cesnet.cz/~ondra/



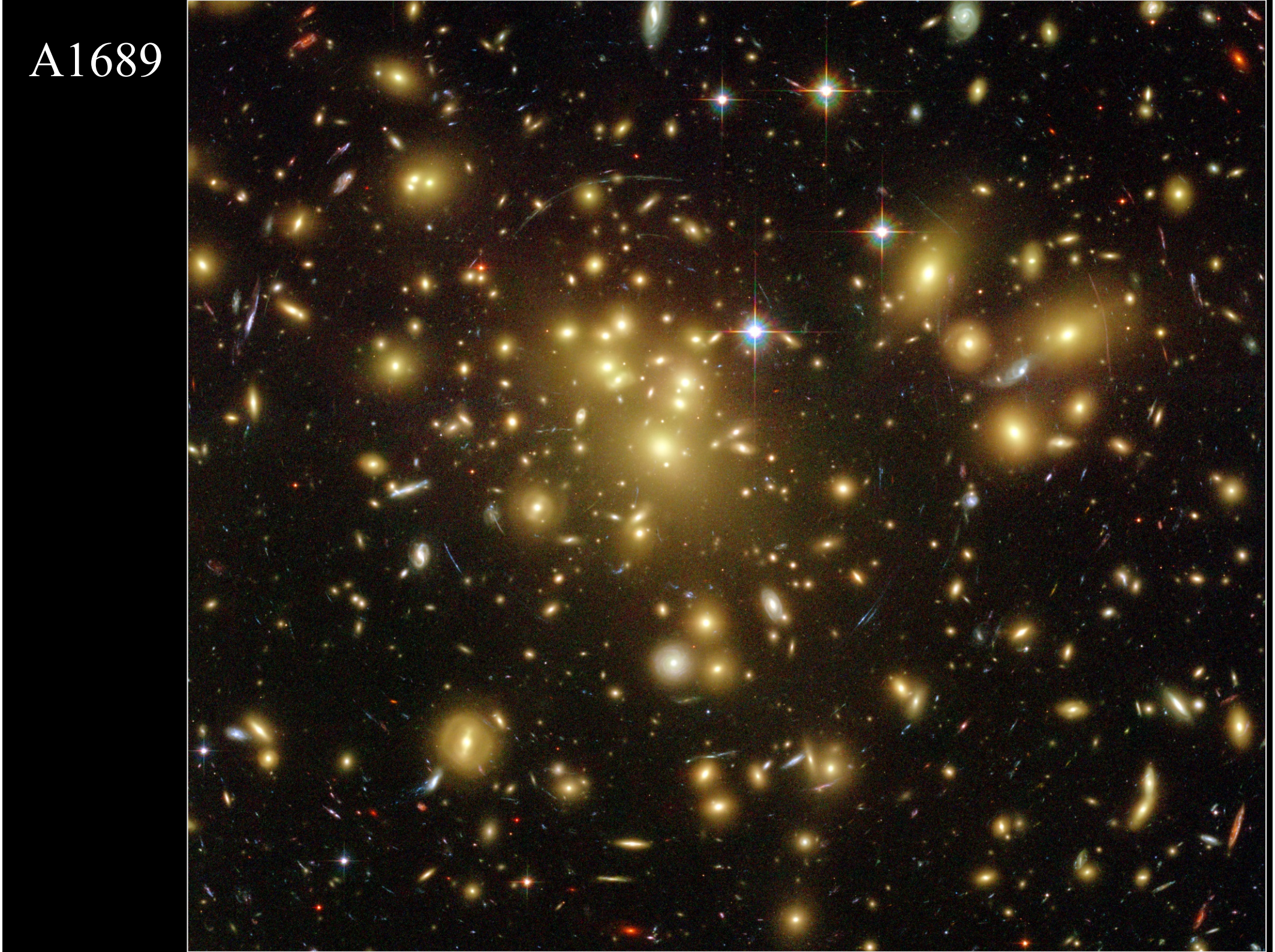
Leos Ondra: http://www.bm.cesnet.cz/~ondra/

MG1131+0456

8 GHz, VLA (Chen, Kochanek, & Hewitt 1995)



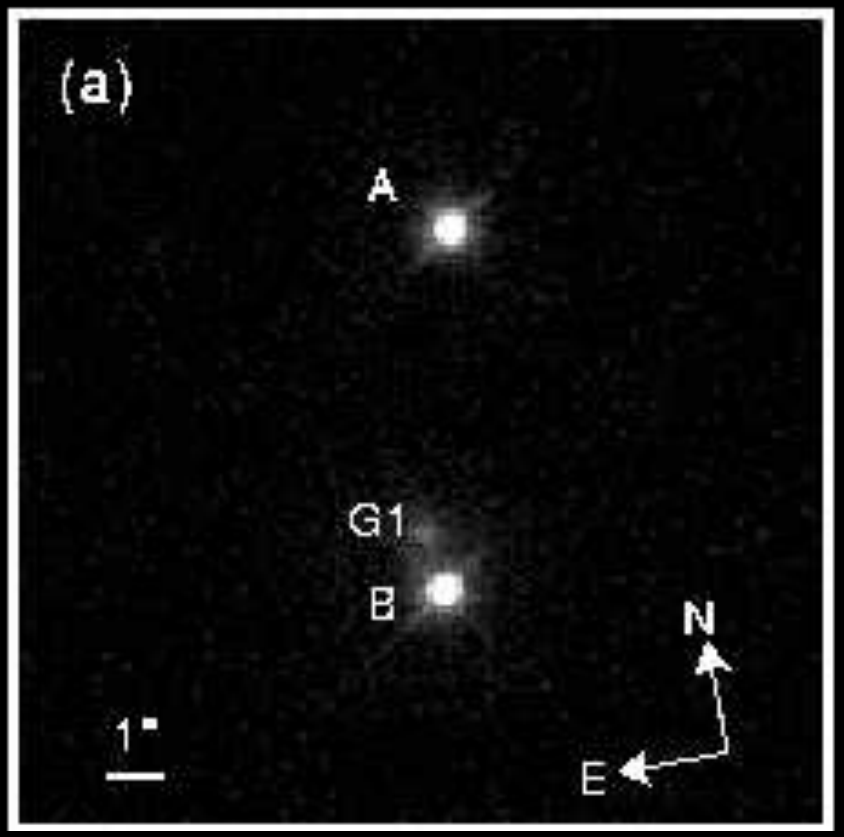
A2218


A1689

Q0957+561

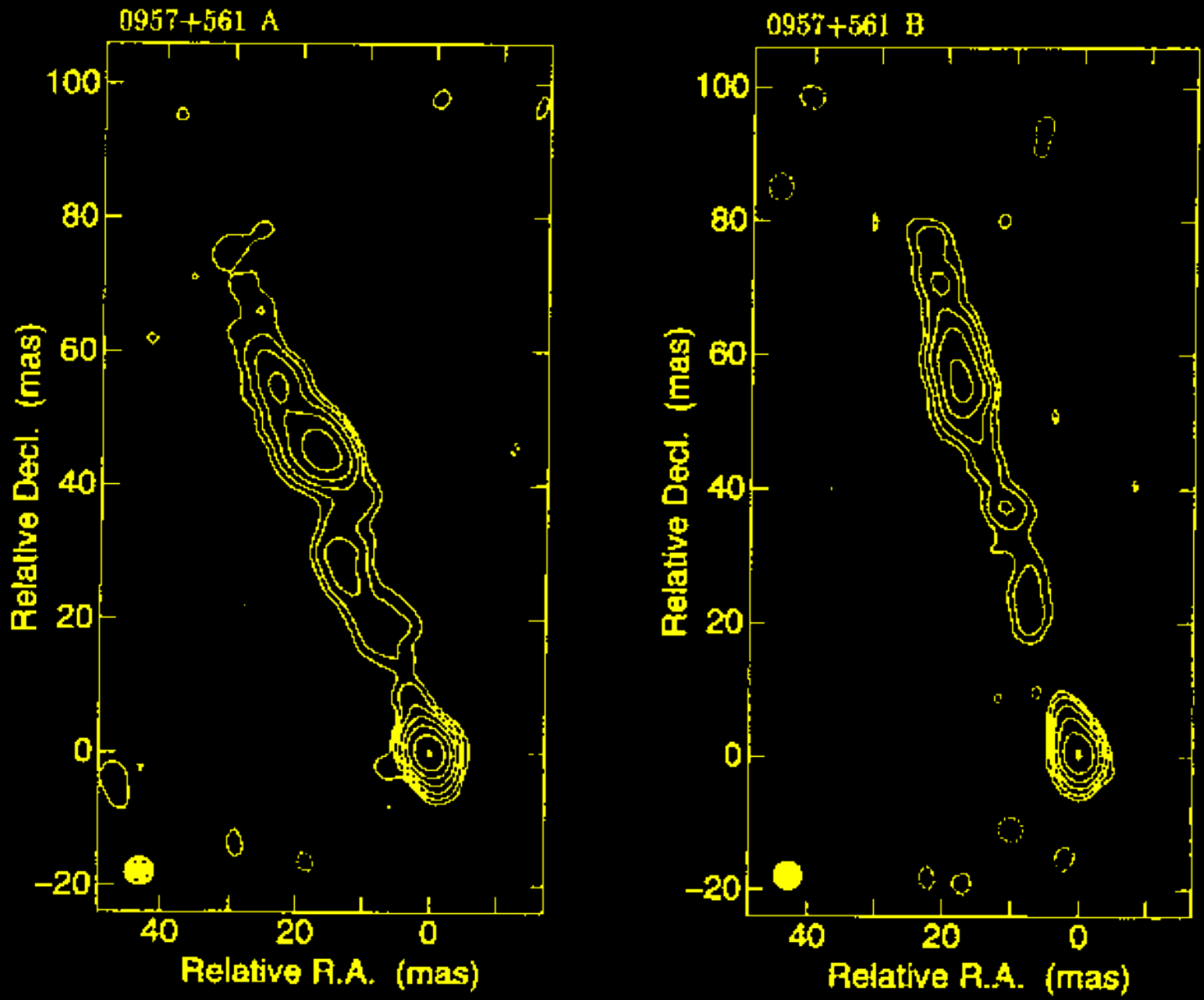
Walsh, Carswell, Weymann 1979

$$z_L = 0.36, \quad z_S = 1.4$$



Bernstein et al. 1997

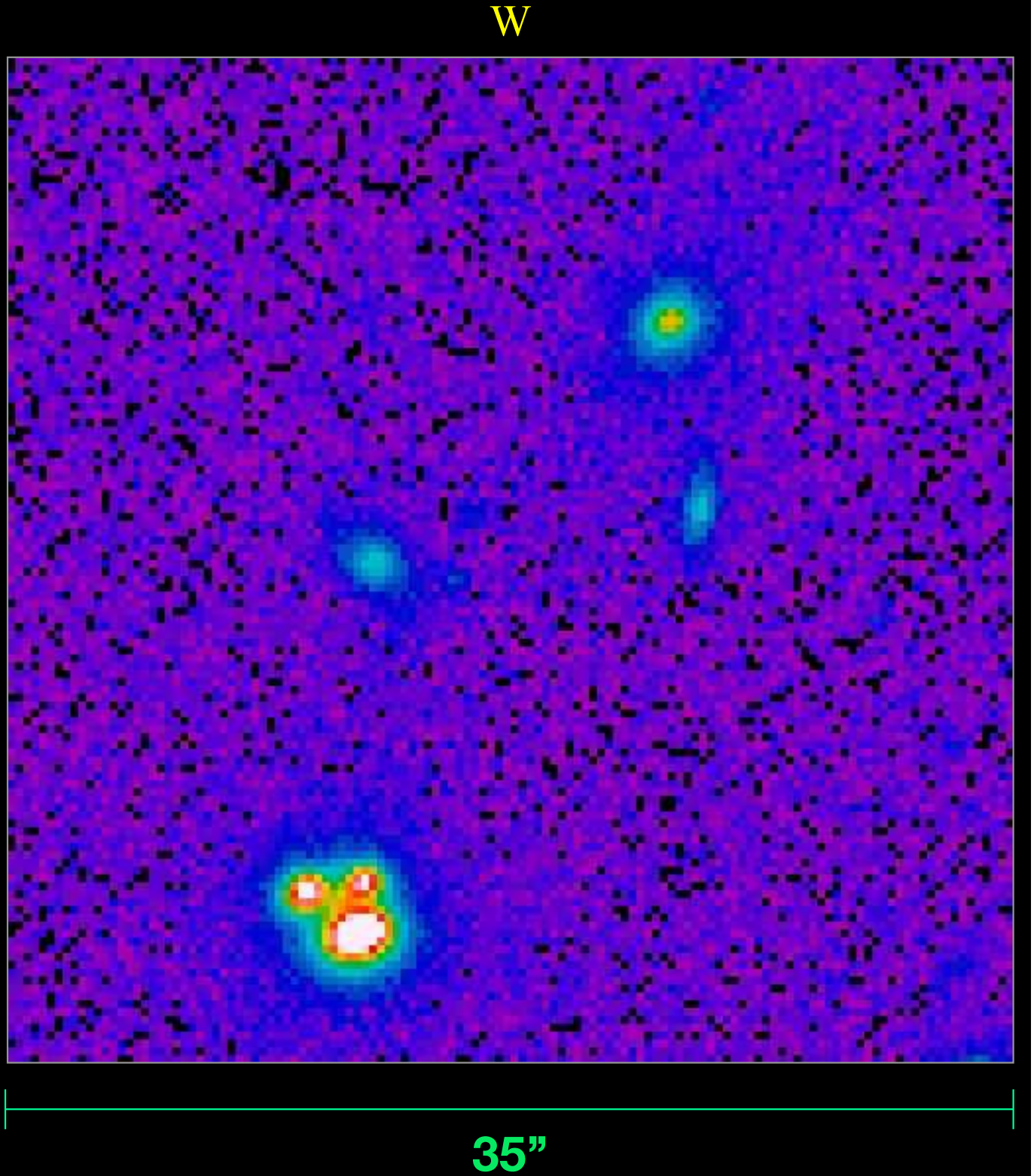
Q0957+561 jets (Garrett et al. 1994)



PG1115+080

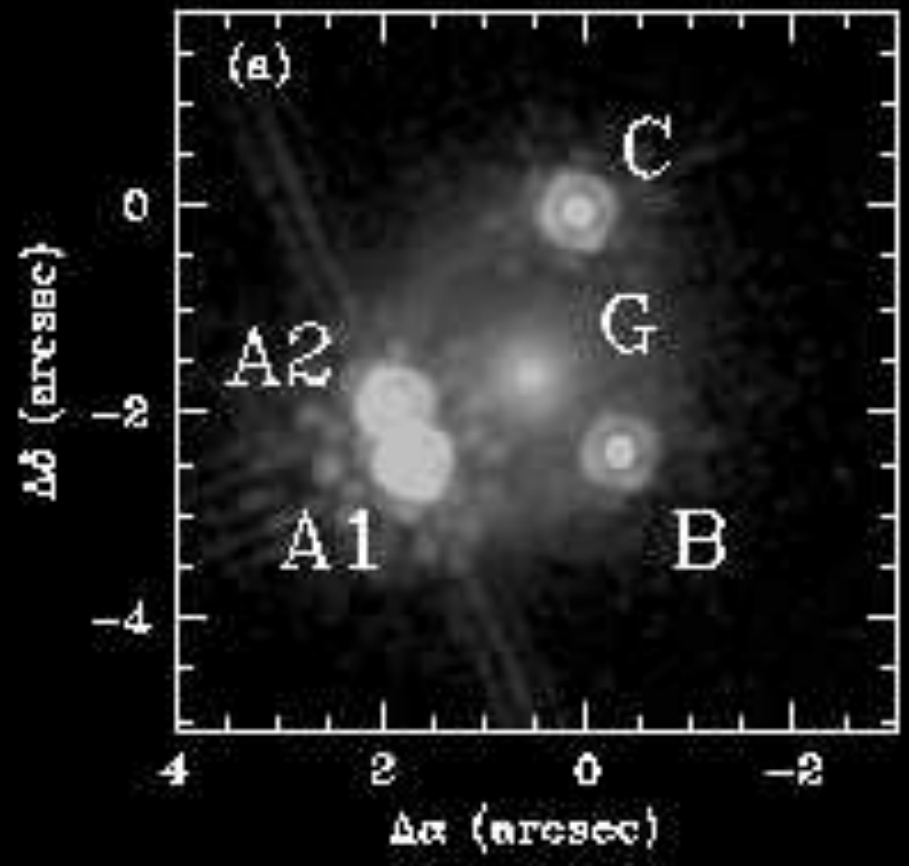
Weymann et al. 1980

$z_L = 0.3, \quad z_S = 1.7$

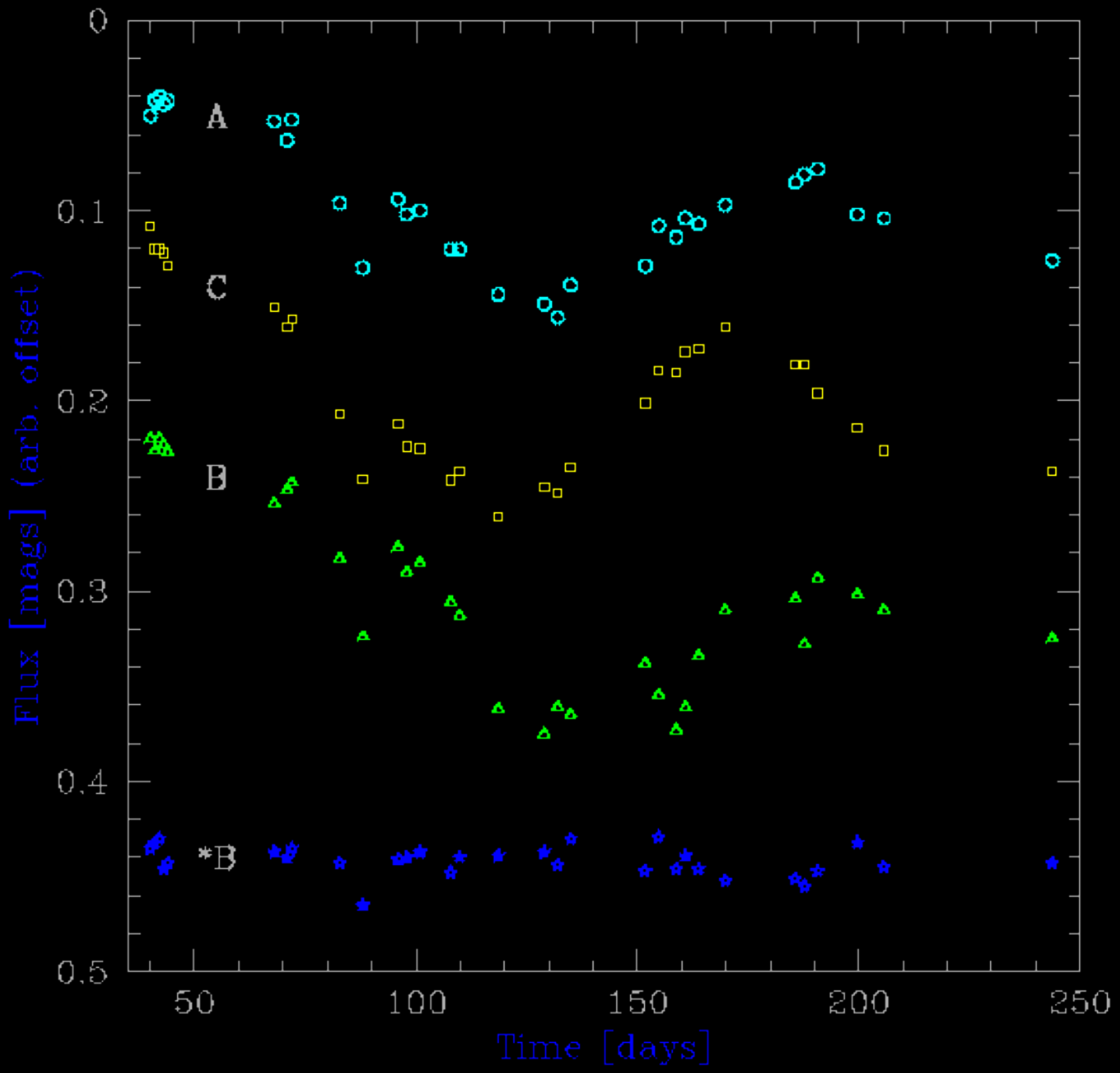


(image: Paul Schechter)

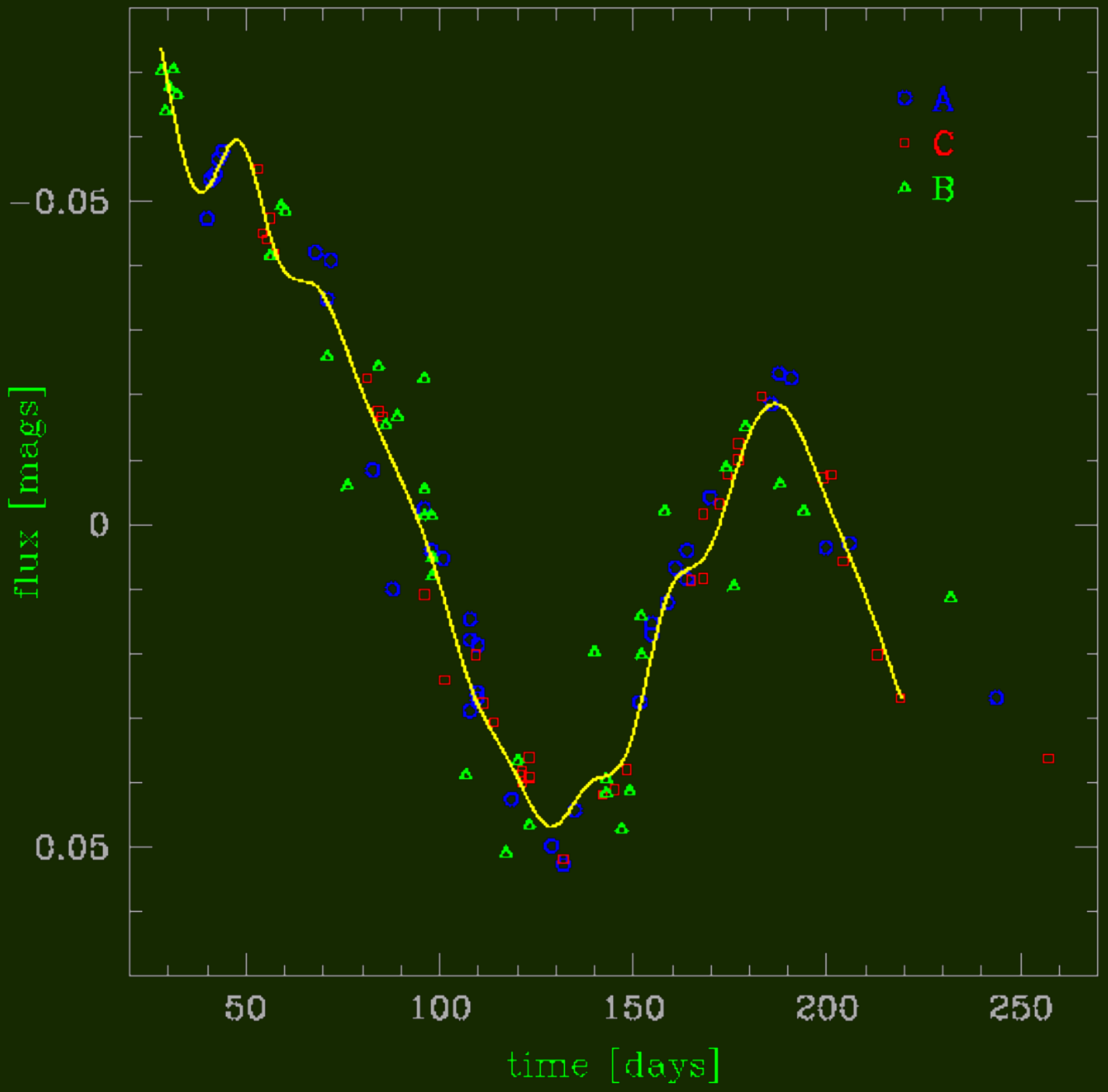
PG1115+080: NICMOS (Impey et al. 1998)

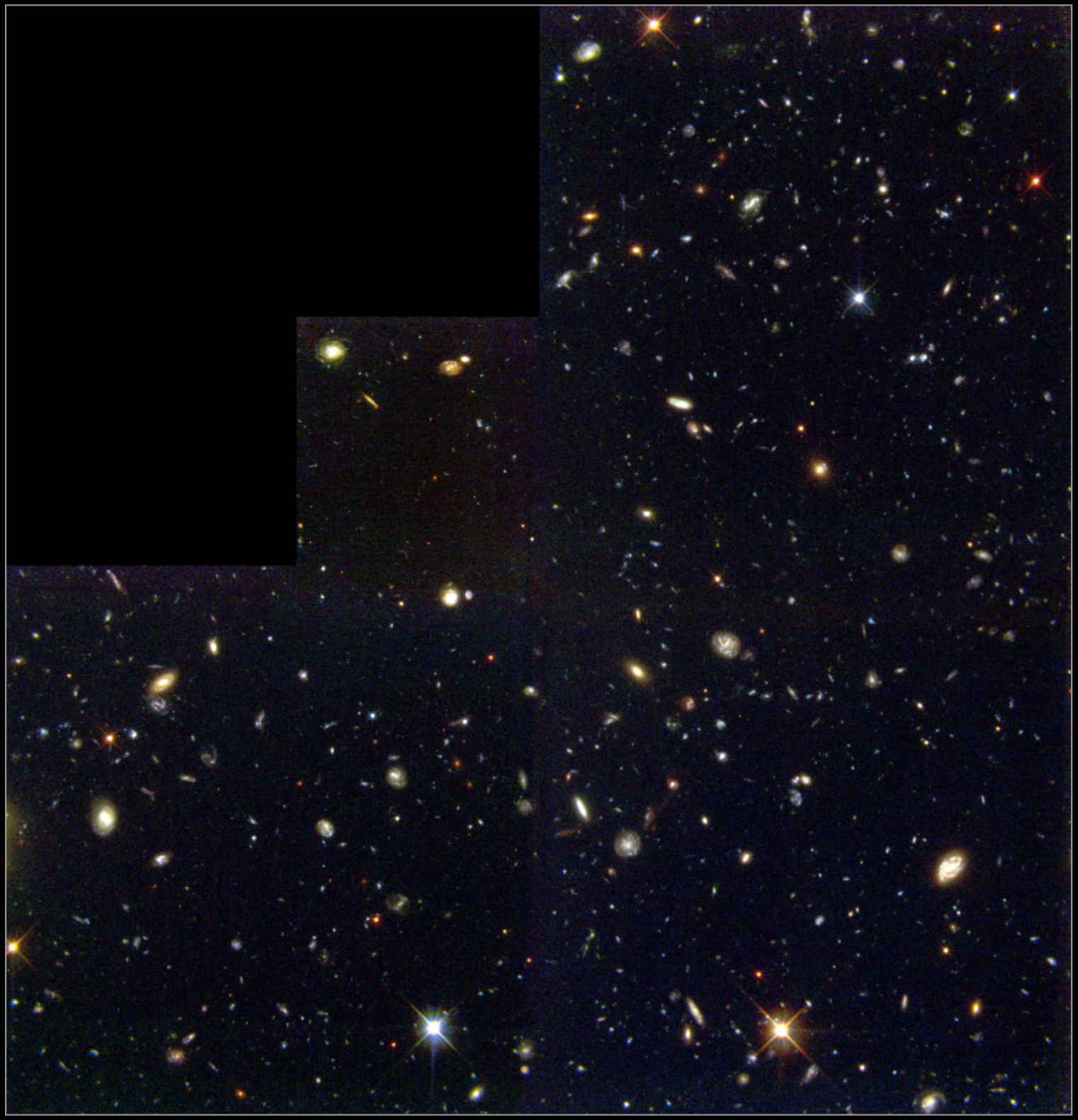


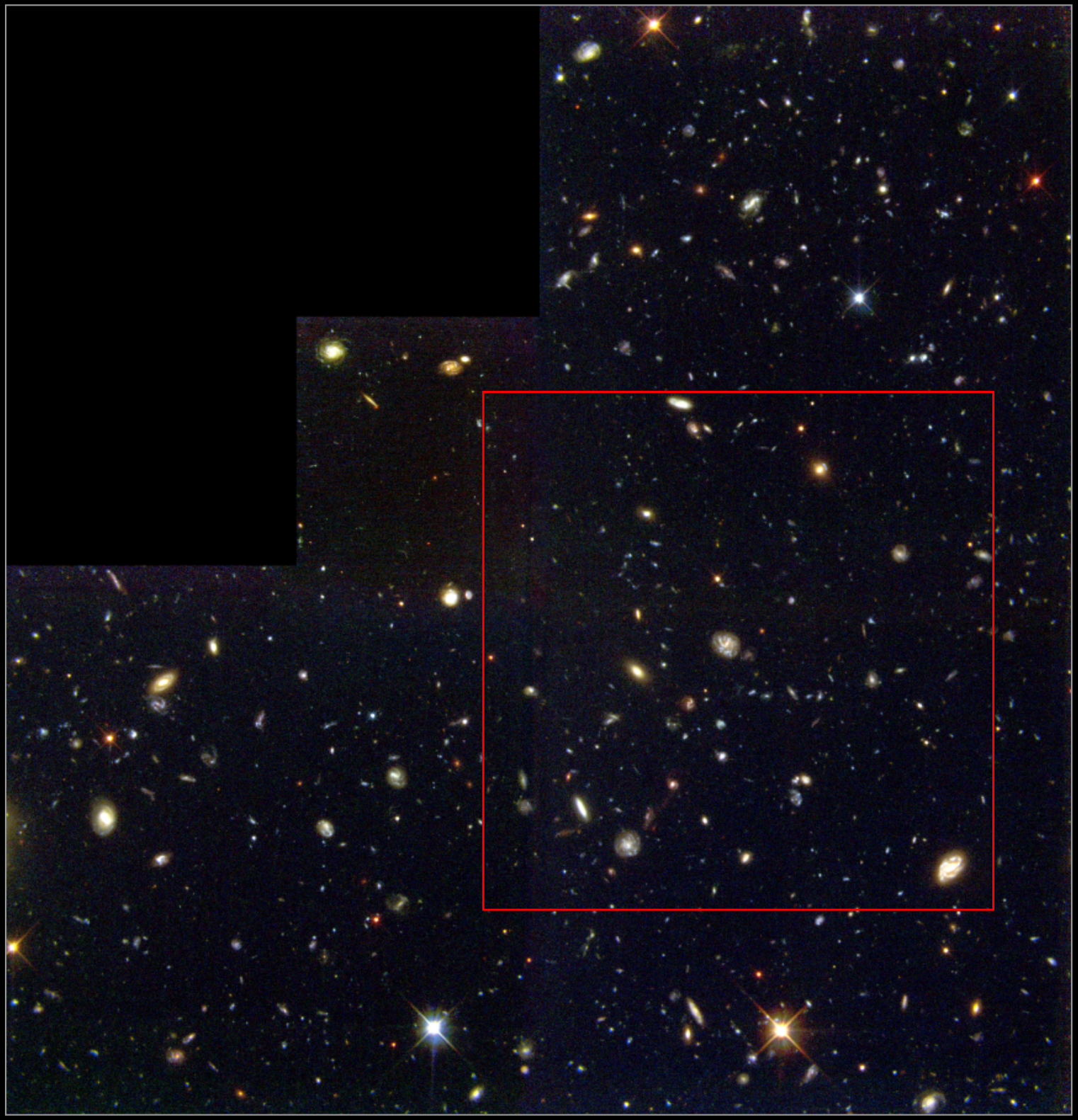
PG1115+080 light curves (Schechter et al. 1997)

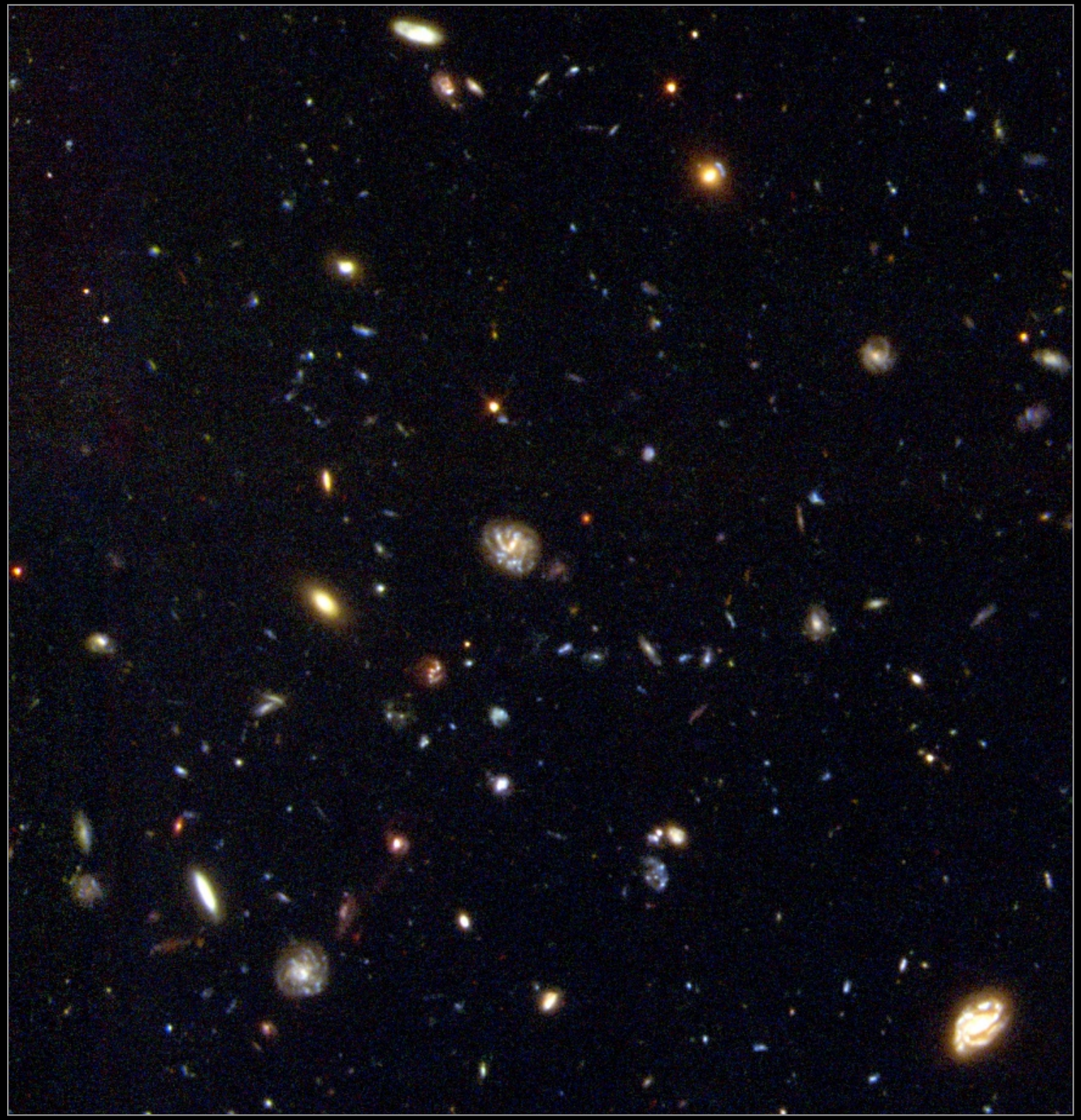


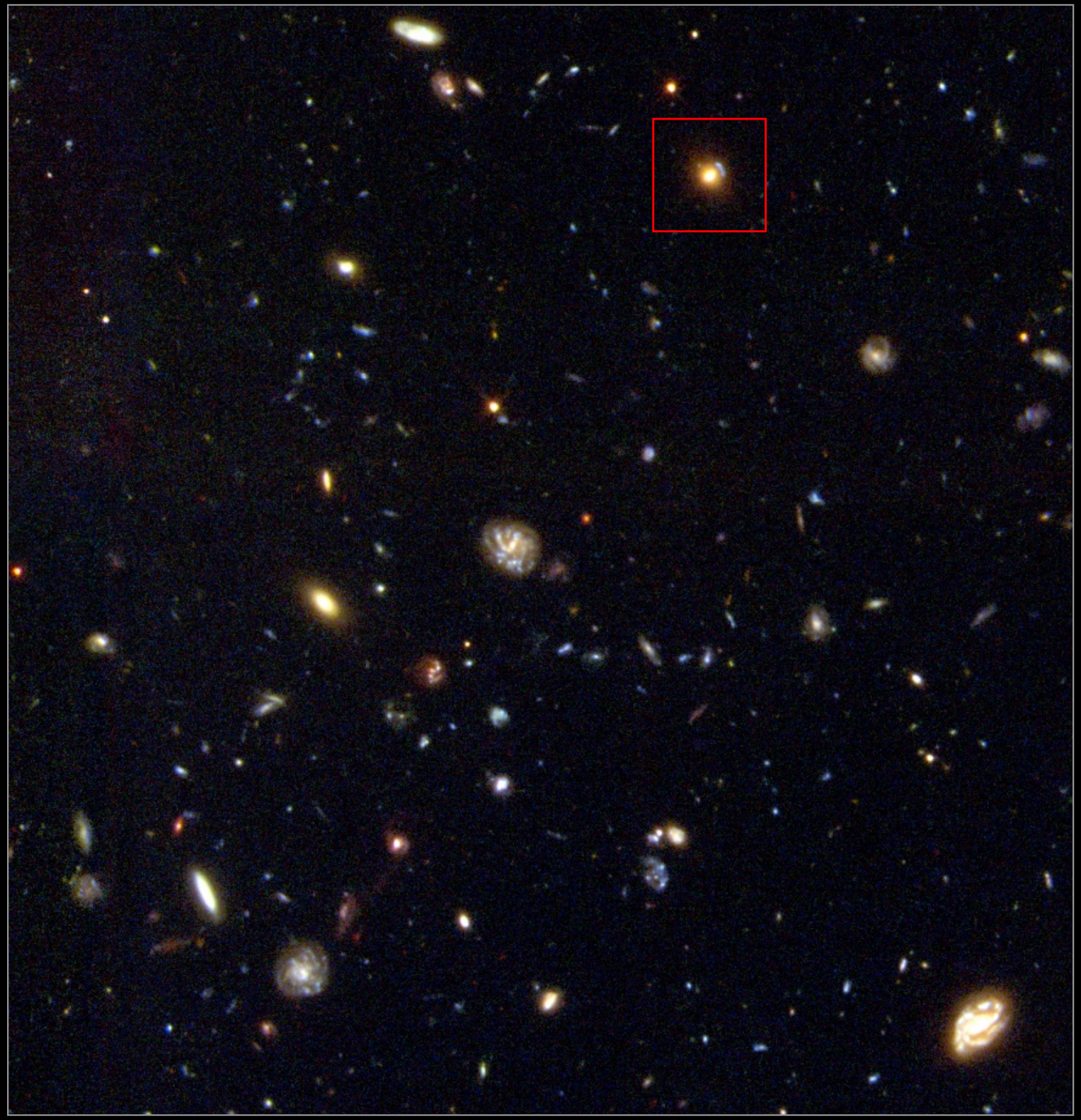
PG1115+080 light curve fit (Barkana 1997)









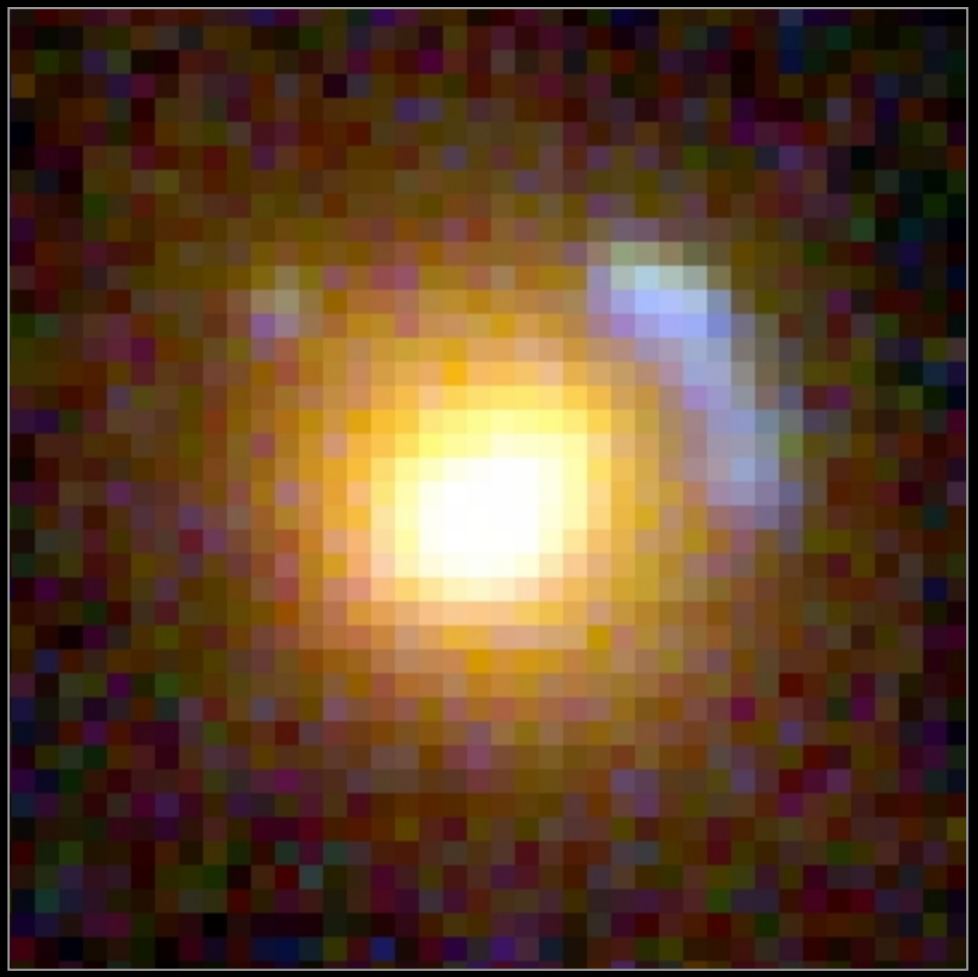


Lens Candidate: HDFS 2232509 – 603243

V=22 mag elliptical, V=25 mag arc

$M \sim 3 \times 10^{11} M_\odot$

Barkana,
Blandford, &
Hogg 1999



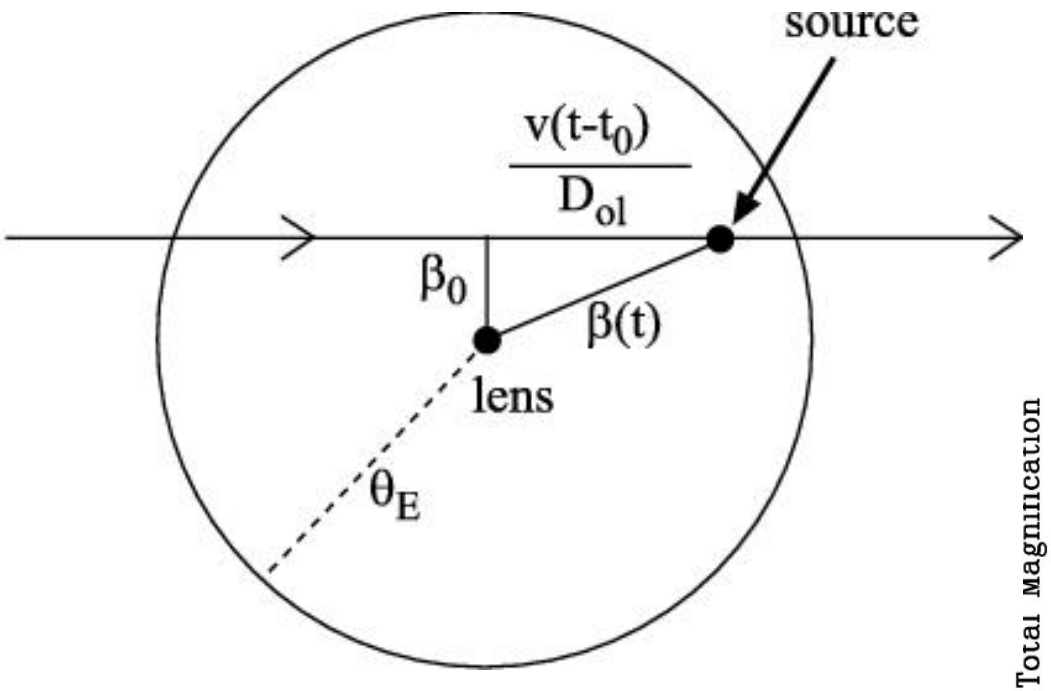
$3\farcs2$

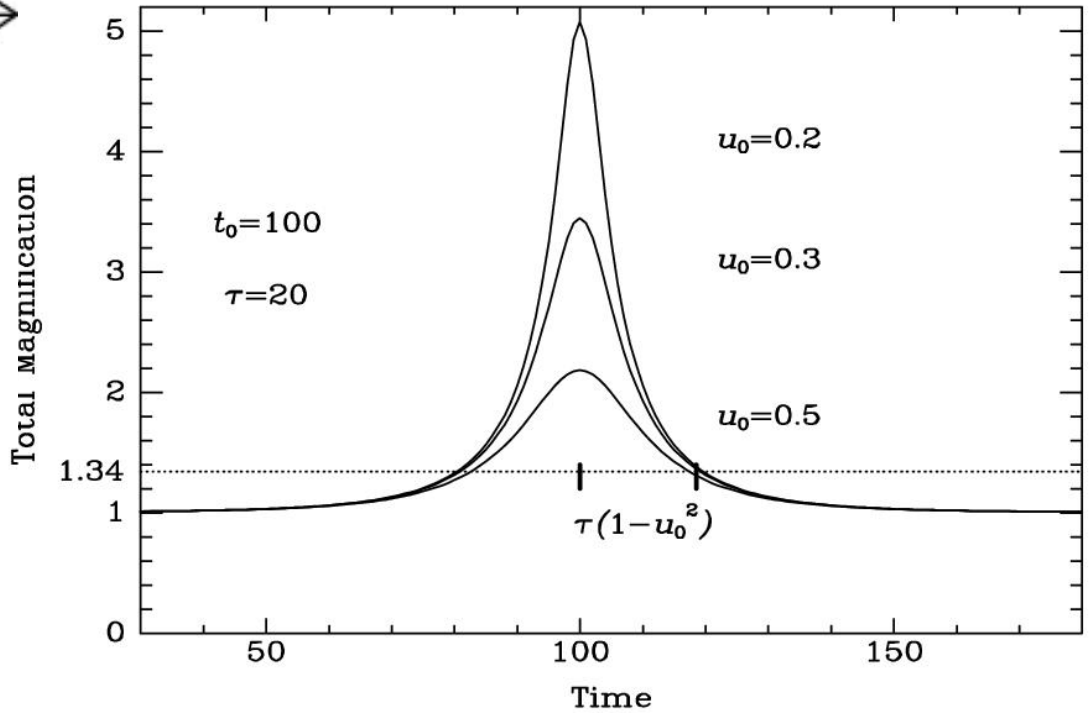
Microlensing :

$\theta_{\rm E} \sim 10^{-3}$ arcsec

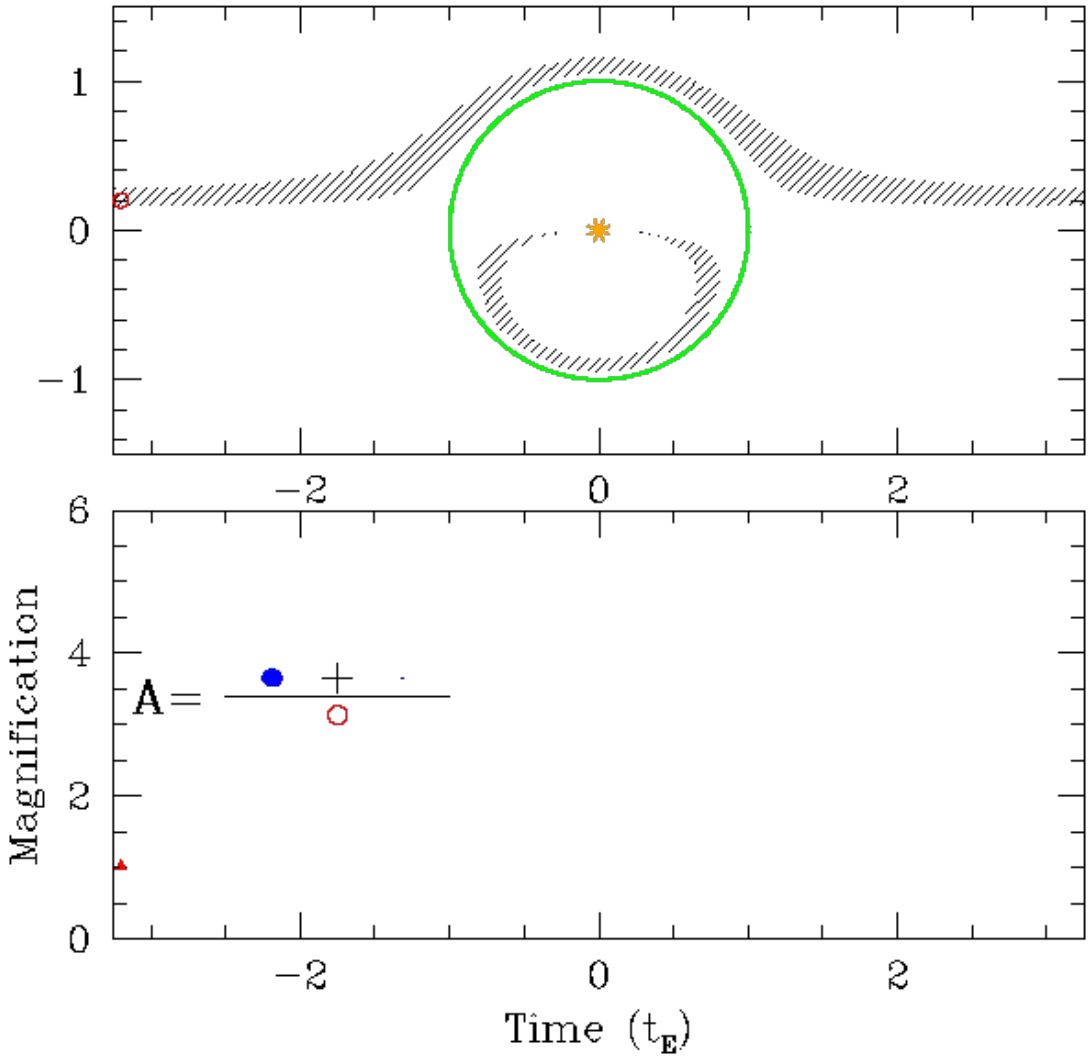
$$a_{\rm tot} = a_+ + a_- = \frac{u^2+2}{u(u^2+4)^{1/2}},$$

$$u \equiv \frac{\beta}{\theta_E}$$





S. Gaudi



Einstein-ring crossing timescale:

$\tau = \theta_E D_{OL} / v \sim M^{1/2}$

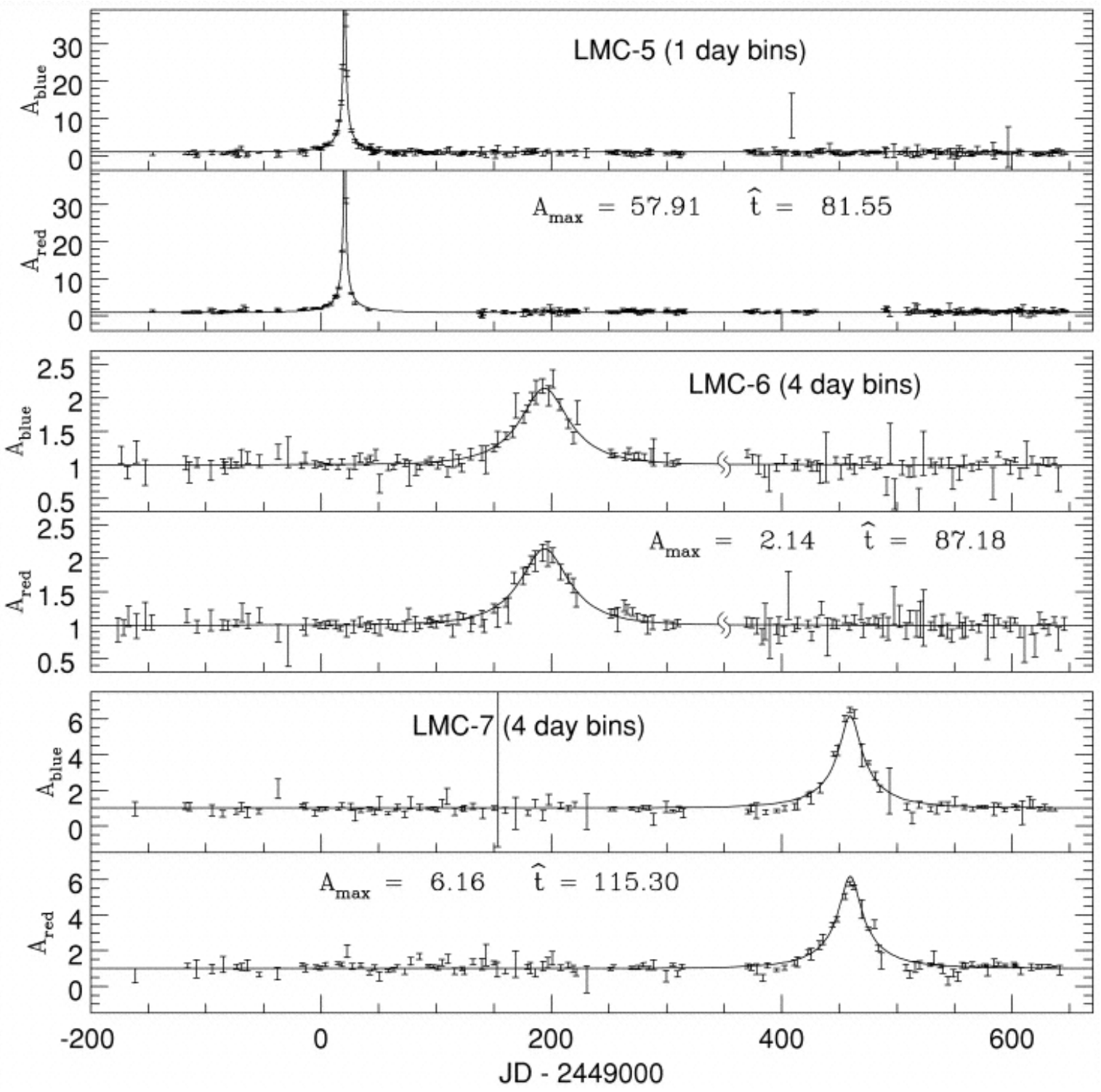
For D_{OL}=25 kpc,

v=220 km/s

$\tau(1M_{sun})$ = 6 months

$\tau(1M_J)$=6 days

Alcock et al.


LMC-5 (1 day bins)
A_blue
A_red
A_max = 57.91 t̂ = 81.55
LMC-6 (4 day bins)
A_max = 2.14 t̂ = 87.18
LMC-7 (4 day bins)
A_max = 6.16 t̂ = 115.30
-200
0
200
400
600
JD - 2449000