

# Recent results from the OGLE survey of the Galactic bulge



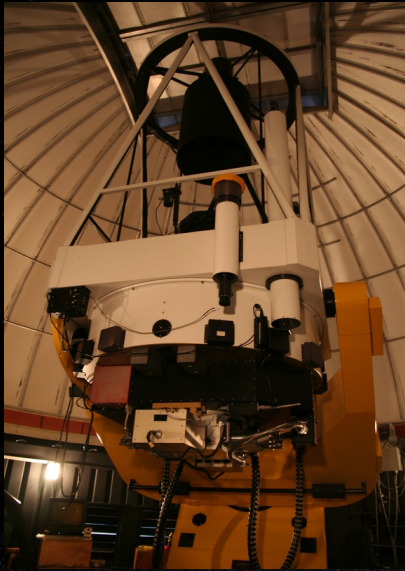
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**[ogle.astrouw.edu.pl](http://ogle.astrouw.edu.pl)**

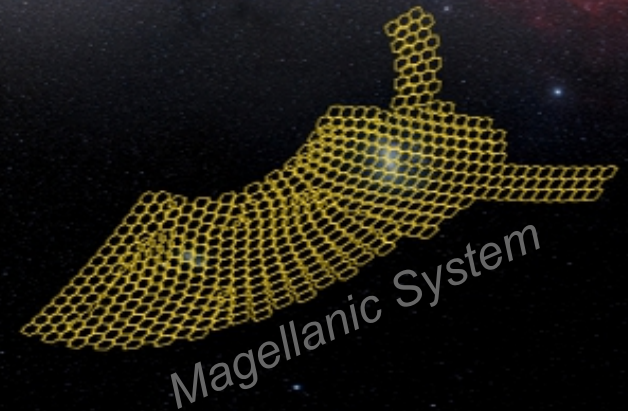
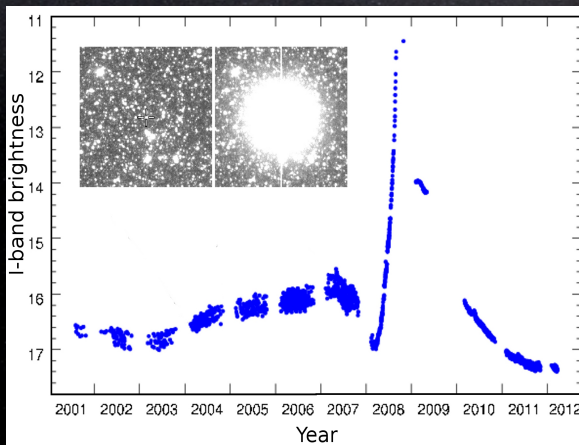


# OGLE – a Large Variability Sky Survey

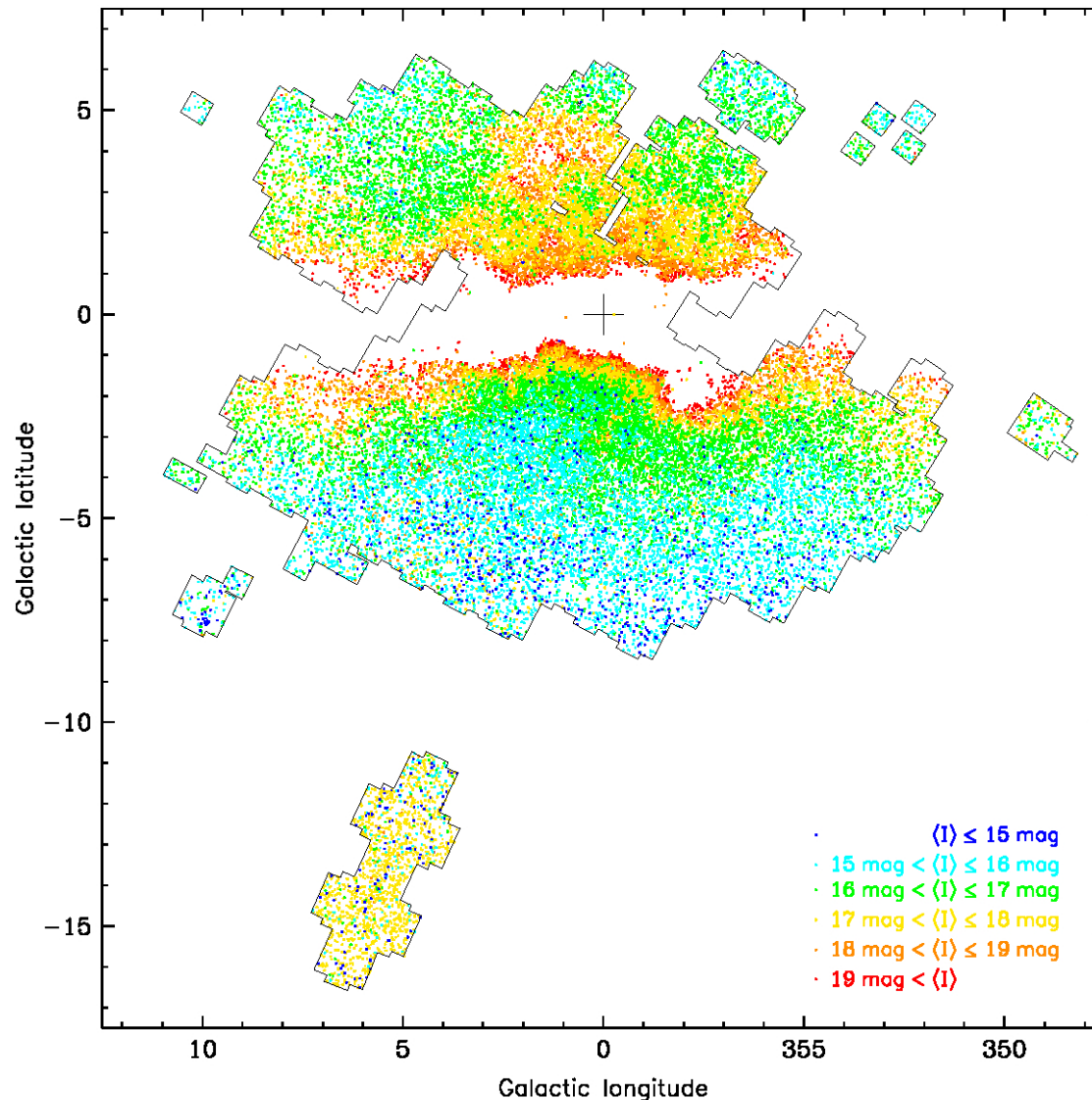


Warsaw 1.3-m @ Las Campanas

- in operation since 1992
- since 2010 as OGLE-IV (Udalski *et al.* 2015)
- 3500 deg<sup>2</sup> sky coverage
- 1.3 billion sources monitored every night
- 10<sup>12</sup> photometric measurements by 2016
- over 17,000 microlensing detections
- more than 50 extrasolar planets discovered
- 500,000 new variable stars



# Bulge RR Lyrae stars from OGLE-IV



Coverage: **182 deg<sup>2</sup>**

Number of detected stars:

27,258 R Rab

10,825 R Rc

174 R Rd

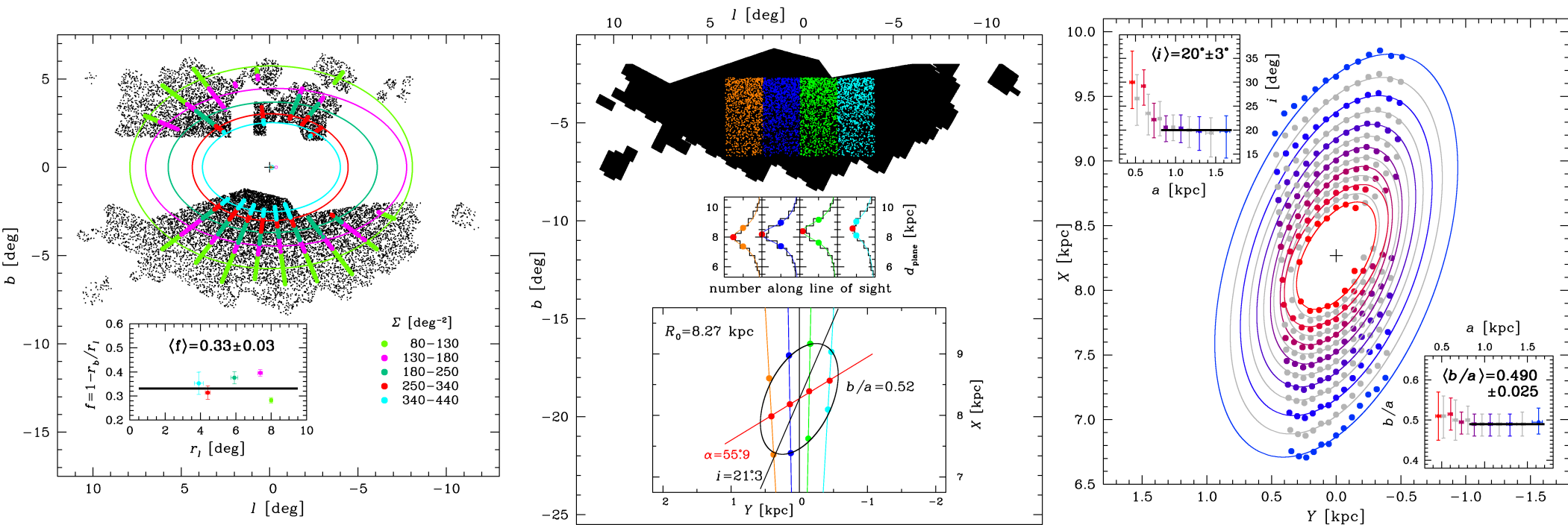
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**38,257** total

Soszyński *et al.* (2014,  
Acta Astronomica, 64, 177)



# The old bulge as a triaxial ellipsoid



Final parameters:

$$R_0 = 8.27 \pm 0.01_{\text{stat}} \pm 0.40_{\text{sys}} \text{ kpc}$$

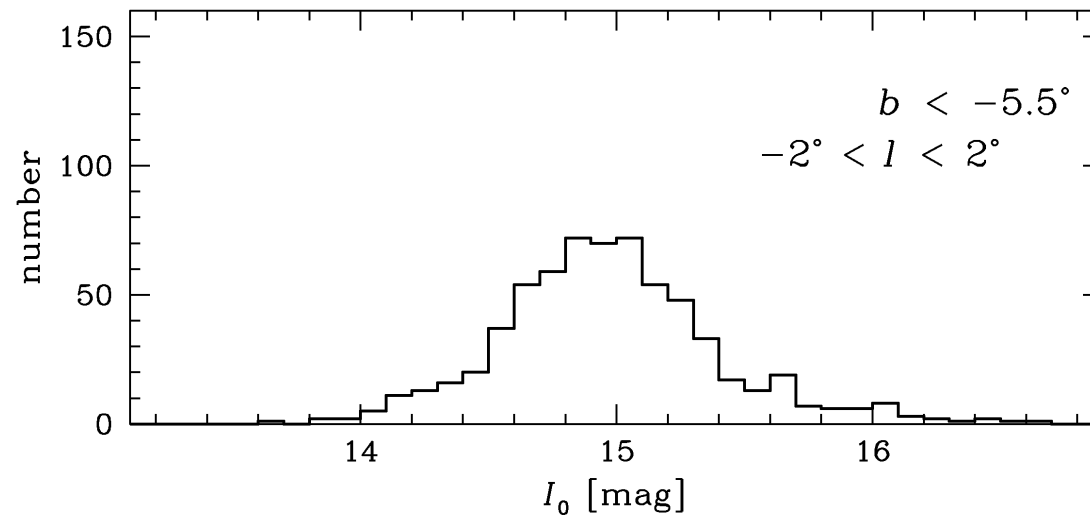
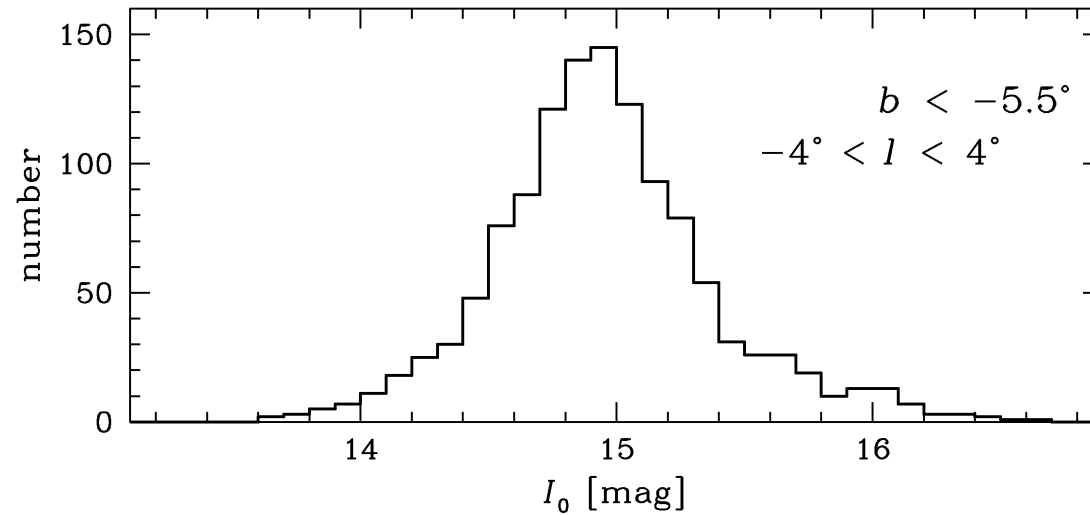
– in excellent agreement with other measurements

$$a : b : c = 1 : 0.49 : 0.39$$

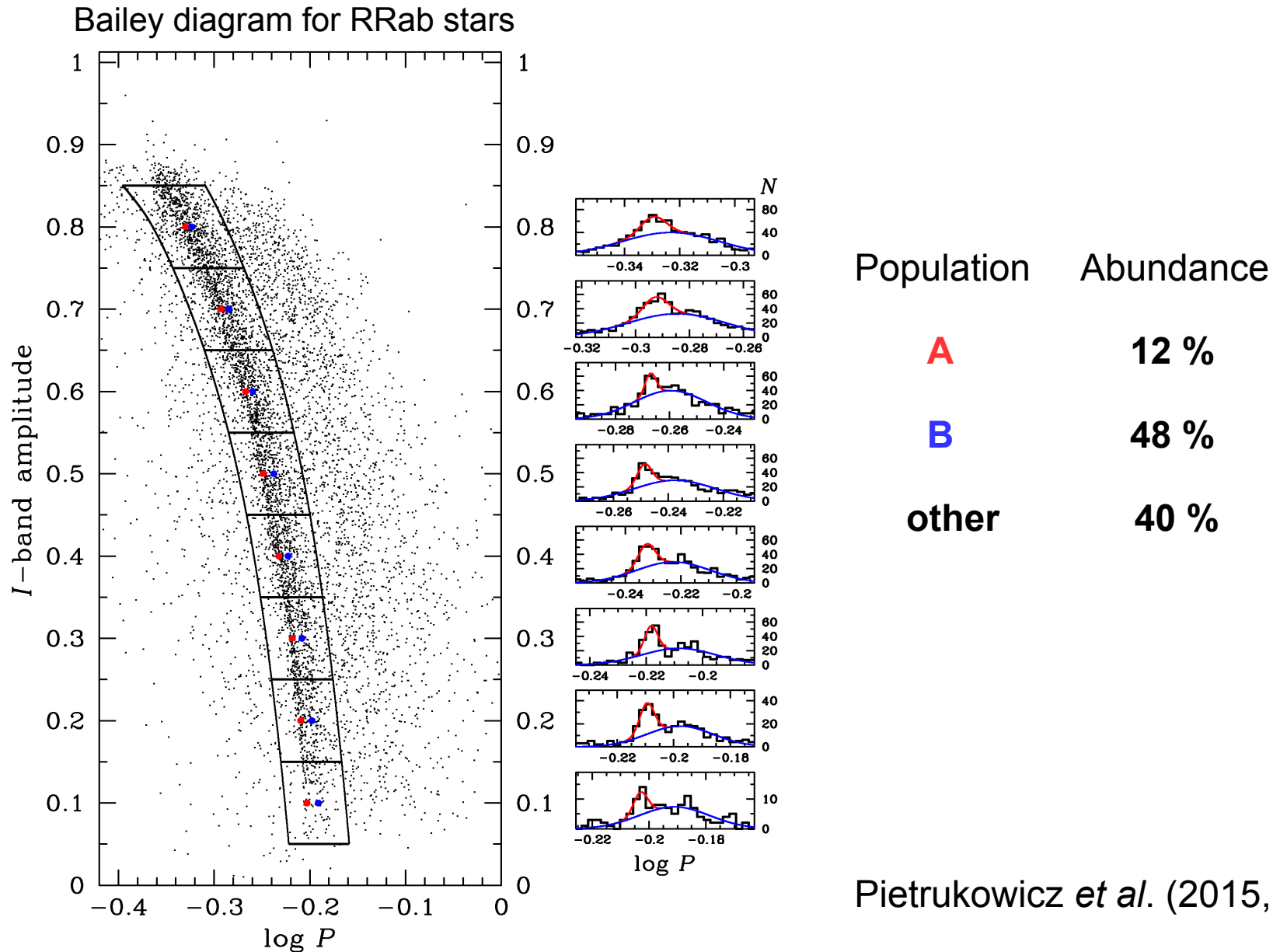
$$i = 20 \pm 3^\circ$$

– major axis along the Galactic bar (red clump stars)

# No X-shaped structure from RR Lyrae



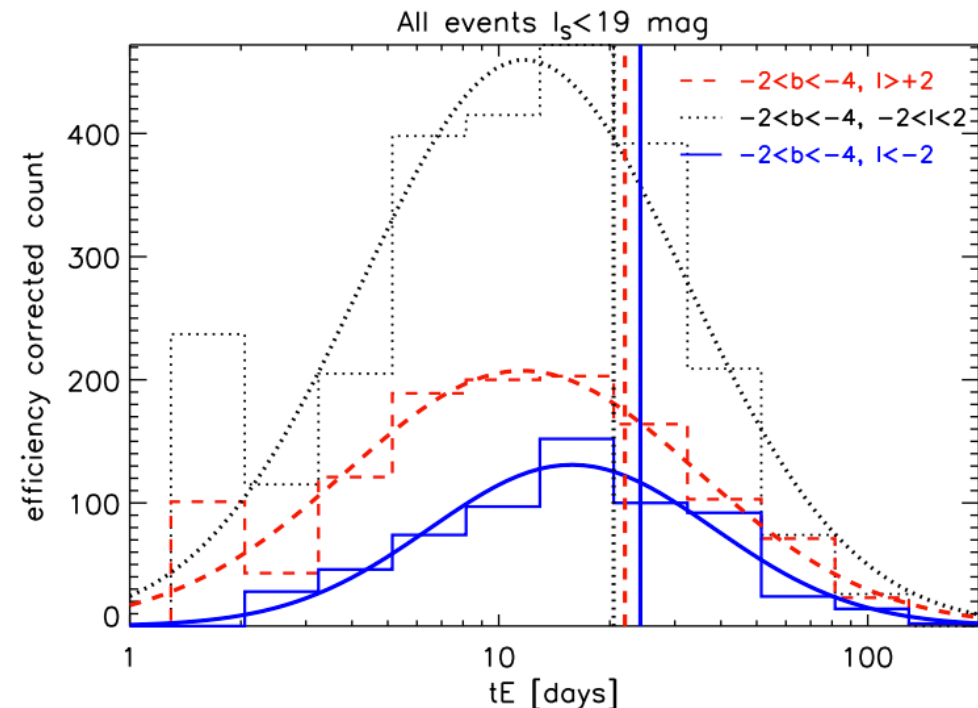
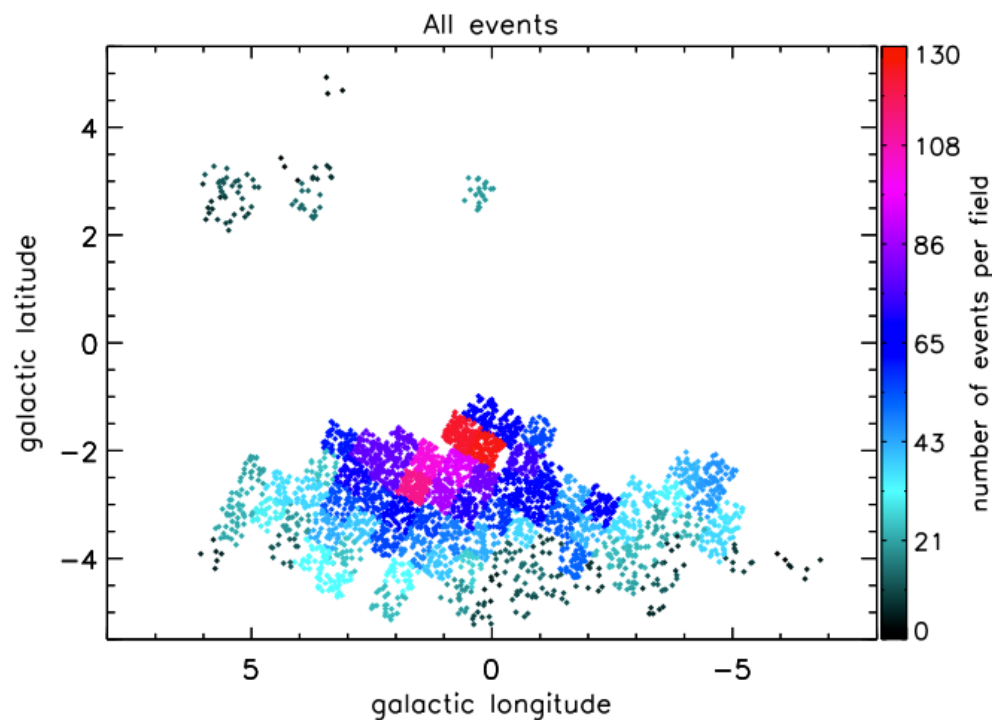
# Multiple populations of the old bulge – evidence for merger scenario



Pietrukowicz *et al.* (2015, ApJ, 811, 113)

# Signature of the bar from microlensing

So far, the largest catalogue of standard microlensing events: **3560**  
Based on OGLE-III (2001-2008) monitoring of 150 million stars.



Asymmetry in mean events' time-scale  
due to alignment of the bar.