Public Microlensing Analysis Tools and Survey Data

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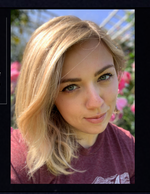


Abstract

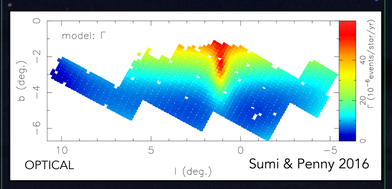
In the era of big survey astronomy, microlensing has become increasingly more accessible to astronomers with a wide variety of backgrounds and expertise. It is now possible for people with only a minimal background in the field to both find and fit microlensing events. This is accomplished via a coder's choice of open source microlensing tools that have been designed with you in mind. PyLIMA, MuLAN, MuLensModel, and VBBinaryLensing are open source microlensing modelling codes that fit complicated microlensing light curves and derive the physical quantities of individual systems. In addition, several years of near infrared photometry of the Galactic Bulge from the United Kingdom Infrared Telescope and optical data from MOA and KMTNET are now publically available on the NASA Exoplanet Archive. Our goal is to introduce a wider variety of experts to the field of gravitational microlensing and recruit scientists with fresh ideas in preparation for WFIRST and LSST.

Public Data

Microlensing-source.org
Glossary of terms
Repository of animations
Links to data and software

NASA Exoplanet Archive
First publically available comprehensive database of microlensing model parameters

Microlensing Observations in Astrophysics (MOA)

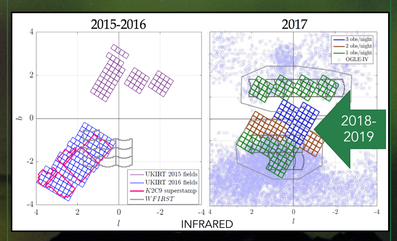


2009-2014 high cadence optical microlensing survey and overlap with OGLE

Korea Microlensing Telescope Network (KMTNet)

Wide-field continuous photometric survey of the Galactic center

United Kingdom Infrared Telescope Microlensing Survey



Fully publically available H and K NIR-band observations 2015-2019

Code

PyLIMA
- Python-based and continuously adapted model fitting
- Tested and used at 2017 Sagan Summer Workshop

Mulens Model
- Model magnification curves with goodness-of-fit statistics
- Higher order effects fitting for PSPL and binary lenses

MuLAn
- Fitting software for a wide variety of microlensing events

VBBinary Lens
- MNRAS 497 (2018) 5157 and MNRAS 208 (2010) 2188
- The engine under the hood of many light curve fitting routines

What YOU Can do Today in Preparation for Tomorrow

- We want you to join the microlensing community!
- Potential for auxiliary science (transients and variables)
- Synergies between facilities such as *WFIRST* and *LSST*