

Joseph D. Long

Education

- in progress* **Ph.D. in Astronomy & Astrophysics**, *University of Arizona*, Tucson, Arizona.
Advisor: Dr. Jared Males.
- 2014 **Bachelor of Arts in Physics**, *Pomona College*, Claremont, California.
Astrophysics track.
Senior thesis: "Seeing Clearly with KAPAO: Measuring Performance with Data Analysis Tools for Adaptive Optics" advised by Dr. Philip I. Choi.

Employment

- 2017–present **Research Assistant**, *University of Arizona*, Tucson, Arizona.
Development of tools and techniques to leverage instrument telemetry from the upcoming MAGAO-X instrument (P.I.: Dr. Jared Males) in the reduction of high-contrast imaging data. Evaluation of data reduction strategies to characterize directly-imaged planets with computational statistics and cloud computing.
- 2015–2017 **Research & Instrument Analyst II**, *Space Telescope Science Institute*, Baltimore, Maryland.
- 2014–2015 **Research & Instrument Analyst I**, *Space Telescope Science Institute*, Baltimore, Maryland.
Worked with members of the STScI Telescopes Group on optical simulation software for the upcoming James Webb Space Telescope (JWST) and Wide Field Infrared Survey Telescope (WFIRST), JWST commissioning target selection, and other projects.
- Summer 2013 **hackNY Fellow**, *Datadog Inc. and hackNY.org*, New York, New York.
Selected as a fellow by hackNY, a non-profit organization to promote software entrepreneurship. Developed Python and JavaScript software at Datadog Inc. to visualize huge quantities of time-series data quickly.

Research

- ongoing* **Analysis of coronagraphic time-series imaging data**, *Supervisor: Dr. Jared Males, University of Arizona*.
Searching for directly imaged exoplanets around nearby stars with linear algebra, software, and cloud computing.
- 2016–2017 **Deblending objects in seeing-limited LSST images**, *Supervisor: Dr. Harry Ferguson, Space Telescope Science Institute*.
Identified objects in both the CANDELS survey fields and simulated observations derived from ILLUSTRIS that would be blended in ground-based observations. From these, created synthetic LSST images to serve as a training and evaluation set for deblending algorithms that attempt to assign flux to components in blended images.

- 2013–2014 **KAPAO natural guide star adaptive optics instrument**, *Supervisor: Dr. Philip I. Choi*.
Developed tools for instrument telemetry analysis and took data on a first-light observing run. Analyzed instrument telemetry to characterize atmospheric conditions and the performance of the instrument.
- 2012–2015 **Identifying close binary central stars of PN with Kepler**, *Supervisor: Dr. George Jacoby*.
Identified candidate unresolved binary central stars of planetary nebulae using periodogram analysis of Kepler light curves. When Kepler was revived as K2, additional light curves for PN in K2 mission fields were obtained and corrections for pointing drift systematics were applied.

Awards and Recognition

- 2017 **STScI Team Achievement Award**, *JWST Coronagraph Visibility Tool Team*.
Joseph Long, Chris Stark, Bill Blair, Kyle Van Gorkom
- 2014 **Frank Parkhurst Brackett, Jr. & Davida Wark Brackett Prize in Astronomy**.
- 2014 **Pomona College Scholar**.
- 2014 **Pomona College Senior Service Award**.

Publications and presentations

Refereed publications

O. De Marco, **J. Long**, G. H. Jacoby, T. Hillwig, M. Kronberger, S. B. Howell, N. Reindl, and S. Margheim. Identifying close binary central stars of PN with Kepler. *MNRAS*, 448:3587–3602, April 2015.

Publications

M. D. Perrin, D. S. Acton, C.-P. Lajoie, J. S. Knight, M. D. Lallo, M. Allen, W. Baggett, E. Barker, T. Comeau, E. Coppock, B. H. Dean, G. Hartig, W. L. Hayden, M. Jordan, A. Jurling, T. Kulp, **J. Long**, M. W. McElwain, L. Meza, E. P. Nelan, R. Soummer, J. Stansberry, C. Stark, R. Telfer, A. L. Welsh, T. P. Zielinski, and N. T. Zimmerman. Preparing for JWST wavefront sensing and control operations. In *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, volume 9904 of *Proc. SPIE*, page 99040F, July 2016.

S. A. Severson, P. I. Choi, K. E. Badham, D. Bolger, D. S. Contreras, B. N. Gilbreth, C. Guerrero, E. Littleton, **J. Long**, L. P. McGonigle, W. A. Morrison, F. Ortega, A. R. Rudy, J. R. Wong, E. Spjut, C. Baranec, and R. Riddle. KAPAO first light: the design, construction and operation of a low-cost natural guide star adaptive optics system. In *Adaptive Optics Systems IV*, volume 9148 of *Proc. SPIE*, page 914839, July 2014.