

Adam Sutherland Research Experience

Astrophysicist



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adamsutherland

Technical Skills

Overview



Programming

Intro —————> Expert

Python • Mathematica • pandas

Fortran • \LaTeX

C • Julia • IDL

Education

MSc., Astronomy & Astrophysics

University of Arizona

2016 - 2018 | Tucson, AZ

B.A. w/ Honors, Physics, B.A., Geophysical Sciences

Specialization: Astrophysics

University of Chicago

2012 - 2016 | Chicago, IL

Aug 2016 - Jan 2020 **Graduate Research Assistant**

University of Arizona

- Studying the dynamics of planets in mean motion resonances around binary stars. I identified a number of instabilities for circumbinary planets and determined how planetary migration can contribute to these instabilities.
- Developed analytic theory of mean motion resonances.
- Ran numerical simulations in C and analyzed the results with Python and pandas, comparing to the analytic theory.

May 2015 - June 2016 **Senior Honors Thesis & Research Assistant**

University of Chicago

- Investigated the properties of optical fibers for the development of the MAROON-X high precision radial velocity spectrograph, an instrument for discovering planets around other stars.
- Built optical testing station and developed methods for characterizing the effectiveness of optical fibers of different geometries.
- Project involved image processing, PIL, OpenCV, SciPy, and correlating input and output images using pandas.

Oct 2013 - Apr 2015 **Undergraduate Research Assistant**

University of Chicago

- Researched the stability of circumbinary planets and determined the rates at which unstable planets were ejected or collided with one of the parent stars.
- Ran extensive numerical simulations of circumbinary planets in Fortran and analyzed the results in IDL.
- Published results were featured in AAS NOVA and SPACE.COM.

Publications

Sutherland, Adam P.; Kratter, Kaitlin, "Instabilities in Multi-Planet Circumbinary Systems," MNRAS Aug 2019. Volume 487, Issue 3, p.3288-3304

Sutherland, Adam P.; Stürmer, Julian; Miller, Katrina R.; Seifahrt, Andreas; Bean, Jacob L., "Characterizing octagonal and rectangular fibers for MAROON-X," Proc. SPIE 9912, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation II, 99125C

Stürmer, Julian; Schwab, Christian; Grimm, Stephan; Kalide, Andre; **Sutherland, Adam P.**; Seifahrt, Andreas; Schuster, Kay; Bean, Jacob L.; Quirrenbach, Andreas, "Optimal non-circular fiber geometries for image scrambling in high-resolution spectrographs," Proc. SPIE 9912, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation II, 99121T

Sutherland, Adam P.; Fabrycky, Daniel C., "On the Fate of Circumbinary Planets: Tatooine's Close Encounters with a Death Star," The Astrophysics Journal, Volume 818, Issue 1, article id. 6, 7 pp.

Conferences

Extreme Solar Systems IV: Reykjavík, Iceland, Aug, 2019

Poster: Instabilities in Multi-planet Circumbinary Systems

Star and Planet Formation in the Southwest 2: Arizona, March, 2018

Poster: Mean Motion Resonances in Migrating Circumbinary Systems

Exoplanets I: Davos, Switzerland, July, 2016

Poster: Characterization of Optical Fibers for the Use in Precision Radial Velocity Spectrographs