Adam Sutherland

Astrophysicist

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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

Research Experience

Aug 2016 - Present — **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.

June 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`.

May 2015 - 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, "Instabilties in Multi-Planet Circumbinary Systems," Submitted to MNRAS Jan 2019

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

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