Brett M. Morris

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Education

Bachelor of Science with High Honors from the Department of Astronomy
Astronomy and Physics Double Major at the University of Maryland, College Park, MD.
Astronomy GPA: 3.75. Overall GPA: 3.36. Expected graduation: December 2012

Computer Skills

Languages: Python, IDL, Matlab, HTML. *Operating Systems:* Unix, Mac OS X, MS.

Research

NASA Goddard Space Flight Center Research Associateship in Astrobiology June – August 2012
Undergraduate research associateship with mentor Dr. Avi Mandell at the Goddard Center for Astrobiology.

- Wrote original Python algorithms to compute differential photometry of transiting exoplanet HAT-P-7b to detect the secondary eclipse using near-infrared observations from the Hale Telescope at the Palomar Observatory.
- Generated composite light curves with Kepler photometry to measure the orbital parameters and atmospheric properties of HAT-P-7b with original analysis code in Python and IDL.

Undergraduate Research with Professor Drake Deming Aug 2011 – present
Research for credit (ASTR498), two semesters.

- Traveled to Arizona to act as co-investigator on an observing campaign on the 2.1m telescope at Kitt Peak National Observatory for transiting exoplanet observations in the near-infrared.
- Developed observing techniques and wrote Python algorithms to compute differential photometry of transiting extrasolar planets using observations obtained at the UMD Observatory, Kitt Peak National Observatory and Palomar Observatory.
- Made the first exoplanet transit light curves produced at the UMD Observatory.
- Released and maintain an open source differential photometry code, "oscaar[1]".
- Submitted transit light curves Czech Astronomical Society Exoplanet Transit Database.

Department of Astronomy Senior Honors Thesis Aug 2010 – May 2012
"Numerical Modeling of Rotational Fission of Contact Binary Asteroids" with Professor Derek Richardson.

- Modeled binary asteroid systems in Python and interfaced with an N-body integrator to probe the relative configuration equilibria of continuously torqued contact binary asteroid systems. Used resources at the Department of Astronomy's Center for Theory and Computation and UMD's High Performance Computing Cluster, computed for more than 4 years of CPU time.
- Cited with "High Honors" by the Department of Astronomy for this work.

Honors

- Presidential Scholar, 2009-2012.
- Alum of College Park Scholars- Science, Discovery and the Universe (CPS SDU), an honors college program at UMD.
- Invited to present thesis for Department of Astronomy Honors, received High Honors.
- Feature article in "Scholars Newsletter" for research achievements (Feb 2012).

Publications

- Morris, B.M., Mandell, A.M. & Deming, D. "Stellar Gravity Darkening and the Secondary Eclipse of HAT-P-7b with Kepler". In preparation.
- Morris, B.M. & Richardson, D.C. "Numerical Modeling of Rotational Fission of Contact Binary Asteroids". In preparation.
- Morris, B.M. "Observations of Transiting Exoplanets with Differential Photometry". Scientific Terrapin, Vol. III, Issue I. Fall 2011.

[1] `http://oscaar.googlecode.com/`

Presentations

- Symposium: 2012 NASA Goddard Space Flight Center Summer Research Associate Symposium. Goddard Space Flight Center, Greenbelt, MD, August 9, 2012.
- Abstract: Springmann, S., Dalba, P., Marchis, F., Vachier, F., Berthier, J., Descamps, P., Morris B., Marciniak, A., Ros, S., Kryszczynska, A. "Physical and orbital properties of the (22) Kalliope system from mutual eclipse observations." Asteroids, Comets, Meteors. 2012.

Observing Experience

- KNPO 2.1m: Kitt Peak, AZ: 6 nights observing transiting extrasolar planets in the near-infrared.

Teaching Experience

- Teaching assistant for ASTR310 Observational Astronomy for majors, experienced teaching night labs at the campus observatory (Fall 2011)
- Teaching assistant for ASTR100 Introduction to Astronomy for non-majors (Fall 2012)
- Research and service mentor to six undergraduates in the College Park Scholars students who work on building open source differential photometry code in Python.

Public Outreach

- President of the "AstroTerps" (2011-2012), the UMD Astronomical Society
- Volunteer for Visitor Services at the Smithsonian Air and Space Museum in Washington, D.C.

References

Dr. Avi Mandell avi.mandell@nasa.gov
Professor Derek Richardson dcr@astro.umd.edu
Professor L. Drake Deming lddeming@gmail.com