Emily Sandford

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Education

Columbia University, New York, NY
Ph.D., Astronomy — expected 2020
M.A., M.Phil., Astronomy — 2016, 2017

Yale University, New Haven, CT
B.Sc., Physics, Cum Laude, with distinction in the Physics major — 2014

Publications

1. **E. Sandford**, D. Kipping & M. Collins. The Multiplicity Distribution of *Kepler*'s Exoplanets. Accepted to MNRAS, 2019.
2. **E. Sandford**, N. Espinoza, R. Brahm, & A. Jordán. Estimation of Singly-Transiting K2 Planet Periods with Gaia Parallaxes. Accepted to MNRAS, 2019.
3. Z. Penoyre & **E. Sandford**. Higher Order Harmonics in the Light Curves of Eccentric Planetary Systems. Accepted to MNRAS, 2019.
4. Z. Penoyre & **E. Sandford**. The Spaceline: A Practical Space Elevator Alternative Achievable with Current Technology. In prep.
5. **E. Sandford** & D. Kipping. Shadow Imaging of Transiting Objects. AJ, 2018, 157, 42.
6. D. Kipping, **E. Sandford**, & T. Jansen. Over 2000 *Kepler* Phase Curves from `Phasma`. RNAAS, 2018 2b, 14.
7. **E. Sandford** & D. Kipping. Know the Planet, Know the Star: Precise Stellar Densities from *Kepler* Transit Light Curves. AJ, 2017, 154, 288.
8. **E. Sandford**, A. H. W. Küpper, K. V. Johnston, & J. Diemand. Quantifying tidal stream disruption in a simulated Milky Way. MNRAS, 2017, 470, 522.
9. D. M. Kipping, C. Cameron, J. D. Hartman, J. R. A. Davenport, J. M. Matthews, D. Sasselov, J. Rowe, R. J. Siverd, J. Chen, **E. Sandford** et al. No conclusive evidence for transits of Proxima b in MOST photometry. AJ, 2017, 153, 93.
10. D. M. Kipping & **E. Sandford**. Observational biases of transiting planets. MNRAS, 2016, 463, 1323.
11. D. M. Kipping, G. Torres, C. Henze, A. Teachey, H. Isaacson, E. Petigura, G. W. Marcy, L. A. Buchhave, J. Chen, S. T. Bryson, & **E. Sandford**. A Transiting Jupiter Analog. ApJ, 2016, 820, 112.

Scientific Talks

1. Linguistic Modeling of *Kepler*'s Exoplanets. Contributed talk, Extreme Solar Systems IV, Reykjavik, Iceland, August 2019.
2. Shadow Imaging of Transiting Objects. Invited seminar, Pennsylvania State University Center for Exoplanets and Habitable Worlds, March 2019.
3. How to Read a Light Curve. Seminar, Cambridge Institute of Astronomy, January 2019.
4. Shadow Imaging of Transiting Objects. Contributed talk, Diversis Mundi, Santiago, Chile, March 2018.
5. Shadow Imaging of Transiting Objects. Invited seminar, Pontifícia Universidad Católica de Chile, Santiago, Chile, March 2018.
6. Know the Star, Know the Planet: Precise Stellar Parameters with *Kepler*. Contributed talk, Kepler/K2 Science Conference IV, Mountain View, CA, June 2017.

7. Know the Star, Know the Planet: Precise Stellar Parameters with *Kepler*. Contributed talk, 229th Meeting of the American Astronomical Society, Grapevine, TX, January 2017.

Posters

1. Shadow Imaging of Transiting Objects. Exoplanets II, Cambridge, UK, July 2018.
2. Machine Learning Identification of Dwarf Galaxy Satellites around Milky Way Analogs. 223rd Meeting of the American Astronomical Society, Washington, DC, January 2014; Tri-State Astronomy Conference, City University of New York, September 2013.
3. The Distribution of Wolf-Rayet Stars in NGC 6744. 221st Meeting of the American Astronomical Society, Long Beach, CA, January 2013.

Teaching and Advising

Research Mentor, American Museum of Natural History Science Research Mentoring Program 2017-2018
Project: The Kepler Atlas, an interactive 3D model of *Kepler*'s exoplanet discoveries
Students advised: Christopher Ambrus, Catherine Atalig, James Hamue, and Caroline Klewinowski

Instructor: Columbia University Astronomy UN1904, Astronomy Lab II 2016-2017
Astronomy UN1903, Astronomy Lab I 2015

T.A.: Astronomy W3986, Astrostatistics (with Prof. D. Kipping) Fall 2016
Astronomy W4260, Modeling the Universe (with Prof. M. Mac-Low) Fall 2016
Astronomy W1753, Another Earth (with Prof. D. Schiminovich) Spring 2015

Awards

Columbia University President's Global Innovation Fund Grant, for study in Santiago, Chile 2018
Columbia University Dean's Fellowship 2014 - 2020
Honorable Mention, National Science Foundation Graduate Research Fellowship 2016
American Astronomical Society Chambliss Student Poster Award 2014
Yale College Dean's Office Science, Technology, and Research Scholars Fellowship 2013 - 2014
National Merit Scholarship 2010 - 2014

Open-Source Code Development

Lead developer:

`EightBitTransit`, a `Python` package which generates light curves of arbitrary transiting shapes, and infers the transiting shape which produced an arbitrary light curve. 2018

`phasma.py`, a `Python` implementation of the Phasma algorithm, which produces exoplanet phase curves. 2018

Contributing developer:

`OoT`, a `Python` package which generates self-consistent planet light curves including transits, secondary eclipses, tides, reflections, and relativistic beaming. 2019

`SEDBuilder`, a `Python` package which collates archival photometric data points for any object with a 2MASS ID and generates its SED. 2018

Kepler Atlas, a `javascript`-implemented interactive 3D model of *Kepler*'s exoplanet discoveries. 2018

Public Outreach

Sky & Telescope freelance contributor 2018
Astrobites staff writer 2016 - 2018
Cool Worlds YouTube channel contributor 2016 - 2018
Columbia Astronomy outreach volunteer, bi-weekly community stargazing 2014 - 2018
Columbia Astronomy public outreach talk, "Oh, the Planets You'll Go!" 2017
Kids Week at the Intrepid Sea, Air, & Space Museum volunteer 2016

Columbia Girls' Science Day experiment leader	2014 - 2015
Columbia Science Saturday Starters experiment leader	2014
StarLab at Yale volunteer	2011 - 2012
Demos at Yale volunteer	2011 - 2012

Service

Astrobites editorial committee chair	2018 - 2019
Astrobites vision committee chair	2018 - 2019
Columbia Astronomy graduate student representative to faculty meetings	2017 - 2019
Columbia Astrophysics Laboratory computing committee member	2017 - 2018
Mentor, Columbia Astronomy graduate mentorship program	2016 - 2018
Columbia Astronomy graduate admissions committee member	2016 - 2017