

Elizabeth Bailey

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EDUCATION

- Ph.D. Planetary Science**, California Institute of Technology **2020**
Dissertation: *Interior and Orbital Dynamics at the Innermost and Outermost Reaches of Planetary Systems*
co-advisors: Profs. K. Batygin, D. J. Stevenson
- S.B. Mathematics**, Massachusetts Institute of Technology **2014**
Thesis (in Earth, Atmospheric, and Planetary Science): *Testing models of ultra-fast India-Asia convergence: new paleomagnetic results from Ladakh, Western Himalaya*
advisor: Prof. B. P. Weiss

ACADEMIC APPOINTMENTS

- Heising-Simons Foundation 51 Pegasi b Postdoctoral Fellow**
University of California, Santa Cruz - Department of Astronomy & Astrophysics **2020-present**
- NASA FINESST Graduate fellow**
California Institute of Technology - Division of Geological and Planetary Sciences **2019-2020**
- Graduate research assistant**
California Institute of Technology - Division of Geological and Planetary Sciences **2014-2019**
- Undergraduate research assistant**
Massachusetts Institute of Technology - Department of Earth, Atmospheric, and Planetary Sciences **2012-2014**

SELECTED HONORS AND AWARDS

- Raynor Duncombe Prize for Outstanding Research in Dynamical Astronomy**, AAS/DDA **2018**
- Earth-Life Science Institute (ELSI) travel award**, Tokyo Institute of Technology **2016**

FIRST-AUTHOR PUBLICATIONS

- 4 **Bailey, E.** & D. J. Stevenson, (*accepted/in press*, *The Planetary Science Journal*). Thermodynamically governed interior models of Uranus and Neptune.
- 3 **Bailey, E.**, K. Batygin (2018), The hot Jupiter period-mass distribution as a signature of in situ formation, *The Astrophysical Journal Letters*, 866:1, L2
- 2 **Bailey, E.**, M. E. Brown, K. Batygin (2018), Feasibility of a resonance-based search for Planet Nine, *The Astronomical Journal*, 156:2
- 1 **Bailey, E.**, K. Batygin, & M. E. Brown (2016), Solar obliquity induced by Planet Nine, *The Astronomical Journal*, 152:5

ADDITIONAL PUBLICATIONS

- 2 Martin, C. R., O. Jagoutz, R. Upadhyay, L. H. Royden, M. P. Eddy, **E. Bailey**, C. I. O. Nichols, B. P. Weiss (2020). Paleocene latitude of the Kohistan-Ladakh arc indicates multi-stage India-Eurasia collision. *PNAS* 117:47; pp. 29487-29494
- 1 Black, B. A., J. T. Perron, D. Hemingway, **E. Bailey**, F. Nimmo, and H. Zebker (2017), Global drainage patterns and the origins of topographic relief on Earth, Mars, and Titan, *Science*, 356:6339, 727-731

TEACHING EXPERIENCE

Graduate Teaching Assistant, Caltech

Astrobiology [Geo/Astro 159]. Graduate level course.

Designed and supervised student research projects.

Spring 2018

Planetary Structure and Evolution [Geo 131]. Graduate level course.

Graded assignments and led office hour discussions.

Spring 2018

Planetary Physics [Geo/Astro 137]. Graduate level course.

Graded assignments and led office hour discussions.

Winter 2017

Introduction to Earth and Environment [Geo 1]. Undergraduate level course.

Graded assignments, ran hands-on laboratory demonstrations,

Carried out 1-on-1 instruction in the field.

Spring 2016

Undergraduate Teaching Assistant, MIT

6.163 Strobe Project Lab. (high-speed imaging)

Ran hands-on student lab-based classes in the outreach-focused MIT Edgerton Center.

Spring 2013

INVITED LECTURES

Yale Department of Astronomy, Exoplanet and Stellar Astrophysics Seminar

Upcoming Spring 2021

International Space Science Institute, Bern, 2nd Ice Giants Workshop

March 2, 2020

University of California, Santa Cruz, Planetary Lunch Seminar

December 2, 2019

University of California, Los Angeles, Planetary Science Seminar

June 7, 2019

Exoplanetary Science Initiative (ESI) Symposium, NASA Jet Propulsion Laboratory

March 25, 2019

Interstellar Probe Exploration Workshop, Explorers Club, NYC

October 11, 2018

SELECTED OUTREACH

SkypeAScientist

Fall 2020-ongoing

Caltech FUTURE of Physics symposium - Presentation to undergraduate womxn considering applying to graduate programs in the physical sciences - "Dynamics of Planetary Systems"

Fall 2019

SMARTnight, Hamilton Elementary, Pasadena Unified School District - Presentation to k-12 students, "Planet Nine and the Solar System"

Spring 2019

Presentation to Girl Scout Troop 775 - "Planetary Tour" - received honorary troop membership

Spring 2018

Lunch talk to fellow tenants of San Gabriel Valley Management - "All About Planet Nine"

Summer 2017

Exhibit Docent - Memphis Zoo, Memphis, Tennessee. Designed and performed regular public lectures focusing on specific planet-scale impacts of human activity on biodiversity, with a focus on individual actions.

2008-2009

Exhibit Docent - Pink Palace Museum of cultural and natural history, Memphis, Tennessee.

2007

CAMPUS ENGAGEMENT

Departmental team member - AIP TEAM-UP program

January 2021-present

Co-organizer, UC Santa Cruz Planetary Lunch Seminar ("Plunch")

2020-present

Domestic violence awareness campaign, Caltech campus

2019-2020

Caltech Student Life & Housing Faculty Board committee - student representative

2017-2018

PROFESSIONAL SERVICE

Referee for *MNRAS*, *A&A*, *PSJ*

Reviewer for National Research, Development and Innovation Office (NRDI), Hungary

SELECTED PRESS

"Scientists Question Popular Planet Formation Theory" - Sky and Telescope

Winter 2019

"Hot Jupiter' Exoplanets May be Born Uncomfortably Close to

"Their Stars"- Discover Magazine	Winter 2019
"The mysterious 'Planet Nine' might be causing the whole solar system to wobble"- Washington Post	Summer 2016
"Planet Nine may have tilted entire solar system except the sun"- New Scientist	Summer 2016

CONFERENCE ABSTRACTS

C. Martin, O. E. Jagoutz, R. Upadhyay, L. Royden, M. P. Eddy, **E. Bailey**, C. I. O. Nichols, B. P. Weiss. Paleocene latitude of the Kohistan-Ladakh Arc indicates multi-stage India-Eurasia Collision. Geological Society of America 2020 Annual Meeting.

E. Bailey. Investigating the Possible Role of Chitin Deposition in the Shuram-Wonoka $\delta^{13}\text{C}$ Excursion. AGU Fall Meeting, San Francisco, CA/Zoom, December 2020.

C. Martin, O. E. Jagoutz, R. Upadhyay, L. Royden, M. P. Eddy, **E. Bailey**, C. I. O. Nichols, B. P. Weiss. Paleocene Latitude of the Kohistan-Ladakh Arc Indicates Multi-Stage India-Eurasia Collision. AGU Fall Meeting, San Francisco, CA/Zoom, December 2020.

E. Bailey, D. J. Stevenson. Hydrogen-water demixing in the deep interiors of Uranus and Neptune: Implications for heat flow and atmospheric composition. Bay Area Planetary Science Meeting, 2020.

E. Bailey, D. J. Stevenson. Thermodynamically Governed Interior Models of Uranus and Neptune. AGU Fall Meeting, San Francisco, CA, USA, December 2019.

E. Bailey, K. Batygin, S. Naoz. The Multiple Origins of Hot Jupiters. EPSC-DPS Joint Meeting, Geneva, Switzerland, September 2019.

E. Bailey, D. J. Stevenson. Thermodynamically Governed Interior Models of Uranus and Neptune. EPSC-DPS Joint Meeting, Geneva, Switzerland, September 2019.

E. Bailey, K. Batygin. The hot Jupiter period-mass distribution as a signature of in-situ formation. AAS/Division on Dynamical Astronomy (DDA) Meeting, Boulder, CO, USA, June 2019.

E. Bailey, K. Batygin. The hot Jupiter period-mass distribution as a signature of in-situ formation. Meeting of the American Astronomical Society (AAS), Seattle, WA, USA, January 2019.

P. C. Brandt, R. L. McNutt Jr, K. Mandt, [and 83 others, including **E. Bailey**]. Interstellar Probe: The Compelling Science Case, Strawman Payload and Resources. AGU Fall Meeting, Washington, DC, USA, December 2018.

E. Bailey, K. Batygin. The hot Jupiter period-mass distribution as a signature of in-situ formation. AAS/Division for Planetary Science (DPS) Meeting, Knoxville, TN, USA, October 2018.

E. Bailey, S. Naoz, K. Batygin. Probing the parameters of the HAT-P-2 system. AAS/Division on Dynamical Astronomy (DDA) Meeting, San Jose, CA, USA, April 2018.

E. Bailey, D. J. Stevenson. Impactor-Delivered Versus Home-Grown Amino Acids in the Prebiotic Earth Environment. AGU Fall Meeting, New Orleans, LA, USA, December 2017.

E. Bailey, M. E. Brown, K. Batygin. Mean-Motion Resonances and the Search for Planet Nine. AAS/Division for Planetary Science (DPS) Meeting, Provo, UT, USA, October 2017.

E. Bailey, M. E. Brown, K. Batygin. The Role of Resonances in the Search for Planet Nine. AAS Division on Dynamical Astronomy (DDA) Meeting, London, June 2017.

E. Bailey, K. Batygin, M. E. Brown. Solar Obliquity Induced by Planet Nine. AAS/Division for Planetary Sciences (DPS) Meeting, Pasadena, CA, USA, October 2016.

E. Bailey, D. J. Stevenson. Quantifying impactor delivery of amino acids during the timespan relevant to emergence of life. Fourth ELSI International Symposium, Tokyo, Japan, January 2016.

E. Bailey, D. J. Stevenson. Modeling Ice Giant Interiors Using Constraints on the H_2 - H_2O Critical Curve. AGU Fall Meeting, San Francisco, CA, USA, December 2015.

E. Bailey, S. Tikoo, O. Jagoutz, L. Royden, B. P. Weiss. New paleomagnetic results from Ladakh, Western Himalaya support multi-stage collision scenario between India and Eurasia. AGU Fall Meeting, San Francisco, CA, USA, December 2014.

M. Sori, **E. Bailey**, J. T. Perron, P. J. Huybers, O. Aharonson, A. Limaye. Ages and Accumulation Rates of the Martian Polar Layered Deposits Estimated From Orbital Tuning. AGU Fall Meeting, San Francisco, CA, USA, December 2013.