

Aomawa L. Shields - Curriculum Vitae

- CONTACT** University of California, Irvine shields@uci.edu
Department of Physics and Astronomy http://faculty.sites.uci.edu/shields
4129 Frederick Reines Hall
Irvine, CA 92697-4575 USA
- INTERESTS** Climate and habitability of extrasolar planets orbiting low-mass stars. Multi-dimensional climate models. Interdisciplinary science education and communication.
- EDUCATION**
- University of Washington (UW)**, Seattle, WA
Ph.D., Astronomy and Astrobiology, 2014
“The Effect of Star-Planet Interactions on Planetary Climate”
Advisors: Victoria Meadows, Cecilia Bitz
M.Sc., Astronomy, 2011
- University of California, Los Angeles (UCLA)**, Los Angeles, CA
MFA, Acting, 2001
- Massachusetts Institute of Technology**, Cambridge, MA
Sc.B., Earth, Atmospheric, and Planetary Sciences, 1997
- Phillips Exeter Academy**, Exeter, NH
Graduated with High Honors, 1993
- APPOINTMENTS**
- UC Irvine, Department of Physics and Astronomy**, Irvine, CA
Clare Boothe Luce Assistant Professor (2016-Present)
- UCLA**, Los Angeles, CA
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA
NSF Postdoctoral Fellow (2014–2017)
UC President’s Postdoctoral Fellow (2014–2016)
- University of Washington**, Seattle, WA
NSF Graduate Research Fellow (2011–2014)
Academic Mentor, Pre-Major in Astronomy Program (2013–2014)
NSF IGERT Trainee (2009–2011)
Research & Teaching Assistant, Department of Astronomy (2009–2014)
- California Institute of Technology**, Pasadena, CA
Scientific Analysis Associate, Spitzer Space Telescope Observatory Planning and Scheduling Team (2008–2009)
Scientific Analysis Assistant, Spitzer Science User Support Team (2005–2008)
- Skirball Cultural Center**, Los Angeles, CA
External Affairs Assistant, Outreach and Communications (2003–2005)
- Griffith Observatory**, Los Angeles, CA
Museum Guide (2001–2003)

APPOINTMENTS
(CONTINUED)

University of Wisconsin, Madison, Madison, WI
Research Assistant (1997–1998)

Arecibo Observatory, Arecibo, Puerto Rico
Summer Research Assistant (1996)

Lowell Observatory, Flagstaff, AZ
Research Assistant (1994–1996)

MIT Center for Space Research (now Kavli Institute), Cambridge, MA
Research Assistant (1994–1995)

Jet Propulsion Laboratory, Pasadena, CA
Summer Research Assistant (1994)

FUNDING

NSF CAREER award, \$687,416, PI Shields, 2018-2023
NASA Habitable Worlds program grant, \$405,197, PI Shields, 2017-2020
Over \$420k in competitive fellowships from NSF, NASA, and the University of California, among others.
1.5 million CPU hours of computing time from the National Center for Atmospheric Research (NCAR).

SELECTED
FELLOWSHIPS,
AWARDS, AND
HONORS

NASA Habitable Worlds Program Grant (2017-2020)
Clare Boothe Luce Professorship (2016-2021)
The Origins Project Postdoctoral Award Lectureship (2016)
Kavli Fellow (2015)
TED Fellow (2015)
Rodger Doxsey Travel Prize, American Astronomical Society 225th Meeting (2015)
NSF Astronomy and Astrophysics Postdoctoral Fellowship (2014-2017)
UC President's Postdoctoral Program Fellowship (2014-2016)
First Place, Astrobiology Science Conference Student Poster Competition (2012)
"Audience Choice", US FameLab Astrobiology communication competition (2012)
NSF Graduate Research Fellowship (2011-2014)
Member, Minorities Striving and Pursuing Higher Degrees of Success in Earth System Science Professional Development Program (MS PHD'S PDP) (2011-2013)
NASA Group Achievement Award, Spitzer Science Operations Planning Team (2010)
NSF Integrative Graduate Education and Research Traineeship (2009-2011)
NASA Public Service Group Achievement Award, Spitzer Observatory Planning/Scheduling Team (2009)

TEACHING &
MENTORING

Physics 246: "Planetary Climate and Habitability", Winter 2019, UC Irvine
Physics 20E: "Life in the Universe", Fall 2017, Fall 2018, UC Irvine
Benjamin Banneker Institute, Harvard-Smithsonian Center for Astrophysics, (2015–16)
ESS 495 NASA Space Grant Seminar: "Rocks-n-Stars", UW (2014)
Teaching Assistant, ASTR 101, 102, and 150 ("The Planets"), UW (2010–2011)
Science communication workshop, Caltech, UW (2007)

EDUCATION &
PUBLIC
OUTREACH

Volunteer, UC Irvine Solar Eclipse Viewing Party, August 21, 2017
Founder & Director, Rising Stargirls, 2014–Present (www.risingstargirls.org)
Informal talk, "STEM Sisters" program, School District of Lancaster, Lancaster, PA, May 3, 2017.
"How we'll find life on other planets", TED (2015), over 1.5 million views on TED.com
"Should we be looking for life elsewhere in the universe?", TED-Ed (2016)

EDUCATION &
PUBLIC
OUTREACH
(CONTINUED)

“The Universe and Me” workshop for middle-school girls at YWCA Pasadena-Foothill Valley, Pasadena, CA, Sept. 20-Oct 27, 2016
Astronomy/Astrobiology week-long workshop in Science Club for Girls program
“Young Leaders in STEM”, Cambridge, MA, July 21-24 2015
“The Climates of Other Worlds: Search for the Next Habitable Planet”, UCI Physical Sciences Breakfast Lecture (2018)
“Universe: More Than Meets the Eye” workshop for middle-school girls at Irving STEAM Magnet Middle School, Eagle Rock, CA, Feb. 25-Mar 9, 2015
E/PO event for middle-/high-school students, Winter Meeting, American Astronomical Society, Seattle, WA (2015)
UCLA Astronomy Live! *Exploring Your Universe* (2014)
Panorama Retirement Center, Lacey, WA, June 6, 2014
Pacific Science Center/KCTS 9 Science Café, “Searching for Life Around Red Dwarf Stars” (2014)
Women Fly!, Museum of Flight (2014)
Boston Children’s Museum traveling exhibit “My Sky” (2014)
Astronomy Panel, *GeekGirlCon*, Seattle, WA (2014)
Astronomy and Astrobiology daylong workshop for girls in YWCA program “Girls Without Limits” in Olympia, WA (2013)
Lakewood High School, “Ice and Climate on Extrasolar Planets”, Seattle, WA (2013)
Burlington-Edison High school job shadow program (2013)
Registered role model, Fab Fems (www.fabfems.org) (2013-Present)
Making Connections Program, University of Washington, April 6, 2013
American Astronomical Society Astronomy Ambassadors Program (2012-Present)
Planetarium Lecturer, UW (2011-2014)

REFEREED
PUBLICATIONS

8. **Shields, A.L.**, Carns, R.C., (2019) Hydrohalite Salt-albedo Feedback Could Cool M-dwarf Planets, *The Astrophysical Journal*, 867,1.
7. Wolf, E.T., **Shields, A. L.**, Kopparapu, R. K., Haqq-Misra, J., Toon, O. B. (2017) *Constraints on Climate and Habitability for Earth-like Exoplanets Determined from a General Circulation Model*, *Astrophysical Journal*, 837, 2. <https://doi.org/10.3847/1538-4357/aa5ffc>.
6. **Shields, A. L.**, Ballard, S., Johnson, J. (2016) *The Habitability of Planets Orbiting M-dwarf Stars*, *Invited Review, Physics Reports*, 663:1-38. <https://doi.org/10.1016/j.physrep.2016.10.003>.
5. **Shields, A. L.**, Barnes, R., Agol, E., Charnay, B., Bitz, C. M., Meadows, V. S. (2016) *The Effect of Orbital Configuration on the Possible Climates and Habitability of Kepler-62f*, *Astrobiology*, 16, 6. <https://doi.org/10.1089/ast.2015.1353>.
4. **Shields, A. L.**, Bitz, C. M., Meadows, V. S., Joshi, M. M., Robinson, T. D. (2014) *Spectrum-driven Planetary Deglaciation Due to Increases in Stellar Luminosity*, *Astrophysical Journal Letters*, 785, 9. <https://doi.org/10.1088/2041-8205/785/1/L9>.
3. **Shields, A. L.**, Meadows, V. S., Bitz, C. M., Pierrehumbert, R. T., Joshi, M. M., Robinson, T. D. (2013) *The Effect of Host Star Spectral Energy Distribution and Ice-Albedo Feedback on the Climate of Extrasolar Planets*, *Astrobiology*, 13, 8. <https://doi.org/10.1089/ast.2012.0961>.

REFEREED
PUBLICATIONS
(CONTINUED)

2. Cowan, N. B., Robinson, T., Livengood, T. A., Deming, D., Agol, E., A'Hearn, M. F., Charbonneau, D., Lisse, C. M., Meadows, V. S., Seager, S., **Shields, A. L.**, Wellnitz, D. D. (2011) *Rotational Variability of Earth's Polar Regions: Implications for Detecting Snowball Planets*, *Astrophysical Journal*, 731, 76.
<https://doi.org/10.1088/0004-637X/731/1/76>.

1. Hunter, D. A., Elmegreen, B. G., **Baker, A. L.** (1998) *The Relationship between Gas, Stars, and Star Formation in Irregular Galaxies: A Test of Simple Models*, *Astrophysical Journal*, 493, 595. <https://doi.org/10.1086/305158>.

SELECTED PRESS
COVERAGE

"Modeling the Climates of Worlds Beyond Earth" *Earth and Space Science News*, January 14, 2019

"Three UCI School of Physical Sciences Faculty Earn Prestigious NSF Early Career Awards" *UCI School of Physical Sciences Communications*, June 18, 2018

"UCI Astronomer Wins NASA Habitable Worlds Grant to Study Surface Reflectivity of Exoplanets?" *UCI News*, October 23, 2017

"What Do You Have to Do to Get a Water Covered Planet Around Here?" *Astrobiters*, June 1, 2017

"Astrobiology's Rising Star"
UC News, February 7, 2017

"Faculty Highlight: Aomawa Shields"
Astronomy in Color, September 29, 2016

"A Planet 1,200 Light-Years Away is a Good Prospect for a Habitable World"
UCLA Newsroom, May 26, 2016

"Why I Changed My Life: Acting, Astronomy, and a One-of-a-Kind Career"
Glamour, May 10, 2016

"The Origins Project Announces Recipient of \$10,000 Postdoctoral Lectureship Award"
The Origins Project, February 24, 2016

"Aomawa Shields: Life in Unlikely Places"
Ozy.com, February 11, 2016

"Astronomer, actor, role model: TED Fellow Aomawa Shields looks for life on other planets"
TED Blog, July 10, 2015

"NSF Fellow Pairs Art, Astronomy to Hook Girls on Science"
Education Week, March 18, 2015

"Rising Stargirls: Girls of All Colors Learning, Discovering, and Exploring"
Women in Astronomy blog/The Planetary Society blog, February 4, 2015

"The Best Bet for Alien Life May Be in Planetary Systems Very Different From Ours"
Wired Magazine, January 16, 2015

"Meet the 2015 class of TED Fellows and Senior Fellows"

TED.com, December 17, 2014

- SELECTED PRESS COVERAGE (CONTINUED) “A Warmer Planetary Haven Around Cool Stars, as Ice Warms Rather Than Cools”
University of Washington News Release, July 18, 2013
- Guest Scientist, *Sci-Trek: Volcanoes*, The Discovery Channel (2009)
- Guest Scientist, *Universe*, The History Channel (2007)
- TV Host and Field Reporter, *Wired Science*, PBS (2007)
- SERVICE & MEMBERSHIPS Reviewer/Panelist: NSF, Astrophysical Journal
Member, Division for Planetary Sciences, American Astronomical Society,
American Geophysical Union
- INVITED TALKS Presentation, **American Astronomical Society**, AAS Meeting, January 2019
Presentation, **UC Irvine**, School of Physical Sciences, Breakfast Lecture Series, May 8, 2018
Presentation, **California Institute of Technology**, ExSoCal2017, September 18-19, 2017
Presentation, **Breakthrough Discuss Conference**, Stanford University, April 20–21, 2017
Colloquium, **UCLA**, April 12, 2017
Colloquium, **Cal Poly Pomona**, November 10, 2016
Colloquium, **Carnegie Observatories**, May 24, 2016
Seminar, Center for Astrophysics and Space Sciences, **UC San Diego**, May 18, 2016
Public Lecture and Colloquia, **Arizona State University**, April 4–8, 2016
ITC Colloquium, **Harvard-Smithsonian Center for Astrophysics**, February 25, 2016
Seminar, Center for Astronomy and Astrophysics, **Yale University**, February 23, 2016
Seminar, Institute of Geophysics and Planetary Physics, **UC Santa Cruz**, November 20, 2015
Presentation, **Kavli Frontiers of Science Symposium**, Beckman Center of the National Academies, November 5, 2015
Colloquium, **University of Rochester**, October 14, 2015
AST Colloquium, **Rochester Institute of Technology**, October 12, 2015
Astrophysics Colloquium, **UC Irvine**, September 8, 2015
Diversity Speaker Series Seminar, **NRAO** (Socorro), July 6, 2015
Colloquium, **NRAO** (Socorro), July 7, 2015
Planetary Sciences Seminar, **Caltech**, May 19, 2015
Keynote presentation, **President’s Postdoctoral Fellowship Program Spring Retreat**, April 25, 2015
TED talk, **TED Conference**, March 16, 2015
Astrophysics Colloquium, **UC Irvine**, February 24, 2015
Seminar, Institute for Planets and Exoplanets, **UCLA**, February 20, 2015
Bromery Lecture, **Johns Hopkins University**, November 6, 2014
Colloquium, **University of East Anglia (United Kingdom)**, February 7, 2014
Engage: The Science Speaker Seminar, **University of Washington**, (2013–2014)
Solar, Stellar, and Planetary Sciences seminar, **Harvard-Smithsonian Center for Astrophysics**, November 20, 2013
Planetary Science seminar, **Jet Propulsion Laboratory**, November 11, 2013

American Association of Physics Teachers Summer Meeting, July 15, 2013

CONTRIBUTED
TALKS

Hydrohalite Salt-albedo Feedback Could Cool M-dwarf Planets
American Astronomical Society, AAS Meeting, January 2019

Reaching Middle School Girls From Groups Underrepresented in the Sciences With an Innovative Approach to Astronomy and Astrobiology Teaching
Astrobiology Science Conference, Chicago, IL, June 16, 2015

The Effect of Orbital Configuration on the Possible Climates and Habitability of Kepler-62f
Astrobiology Science Conference, Chicago, IL, June 15, 2015

The Effect of Star-Planet Interactions on Planetary Climate
American Astronomical Society Meeting #225, #306.02D, Seattle, WA, January, 2015

Climate Hysteresis for Planets Orbiting Stars of Different Spectral Type
Division for Planetary Sciences Meeting #45, #103.04, Denver, CO, October 2013

The Effect of Host Star Spectral Energy Distribution and Ice-Albedo Feedback on the Climate of Extrasolar Planets
American Astronomical Society Meeting #221, #333.07, Long Beach, CA, January 2013

PROFESSIONAL
REFERENCES

Brad Hansen

Professor, UCLA Physics and Astronomy Department
Tel: 310-825-5924; Email: hansen@astro.ucla.edu

John Johnson

Professor, Harvard Astronomy Department
Tel: 617-496-9820; Email: jjohnson@cfa.harvard.edu

Jonathan Mitchell

Professor, UCLA Department of Earth and Space Sciences
Email: jonmitch@ucla.edu

Victoria Meadows

Professor Department of Astronomy
Director, UW Astrobiology Program
Principal Investigator, Virtual Planetary Laboratory Lead Team
University of Washington
Tel: 206-543-0206; Email: vsm@astro.washington.edu

Cecilia Bitz

Professor
Department of Atmospheric Sciences
University of Washington
Tel: 206-543-1339; Email: bitz@atmos.washington.edu

Rory Barnes

Research Assistant Professor, Astronomy
Department of Astronomy
University of Washington
Tel: 206-543-8979; Email: rory@astro.washington.edu

Mary Dussault

Science Education Department
Harvard-Smithsonian Center for Astrophysics
Tel: 617-496-7962; Email: mdussault@cfa.harvard.edu

Aomawa Shields: Publications

REFEREED PUBLICATIONS

8. **Shields, A. L.** and Carns, R., *Hydrohalite Salt-albedo Feedback Could Cool M-dwarf Planets*, The Astrophysical Journal, 867,1.
7. Wolf, E.T., **Shields, A. L.**, Kopparapu, R. K., Haqq-Misra, J., Toon, O. B.(2017) *Constraints on Climate and Habitability for Earth-like Exoplanets Determined from a General Circulation Model*, Astrophysical Journal, 837, 2.
<https://doi.org/10.3847/1538-4357/aa5ffc>.
6. **Shields, A. L.**, Ballard, S., Johnson, J. (2016) *The Habitability of Planets Orbiting M-dwarf Stars*, Invited Review, Physics Reports, 663:1-38.
<https://doi.org/10.1016/j.physrep.2016.10.003>.
5. **Shields, A. L.**, Barnes, R., Agol, E., Charnay, B., Bitz, C. M., Meadows, V. S. (2016) *The Effect of Orbital Configuration on the Possible Climates and Habitability of Kepler-62f*, Astrobiology, 16, 6. <https://doi.org/10.1089/ast.2015.1353>.
4. **Shields, A. L.**, Bitz, C. M., Meadows, V. S., Joshi, M. M., Robinson, T. D. (2014) *Spectrum-driven Planetary Deglaciation Due to Increases in Stellar Luminosity*, Astrophysical Journal Letters, 785, 9. <https://doi.org/10.1088/2041-8205/785/1/L9>.
3. **Shields, A. L.**, Meadows, V. S., Bitz, C. M., Pierrehumbert, R. T., Joshi, M. M., Robinson, T. D. (2013) *The Effect of Host Star Spectral Energy Distribution and Ice-Albedo Feedback on the Climate of Extrasolar Planets*, Astrobiology, 13, 8.
<https://doi.org/10.1089/ast.2012.0961>.
2. Cowan, N. B., Robinson, T., Livengood, T. A., Deming, D., Agol, E., A'Hearn, M. F., Charbonneau, D., Lisse, C. M., Meadows, V. S., Seager, S., **Shields, A. L.**, Wellnitz, D. D. (2011) *Rotational Variability of Earth's Polar Regions: Implications for Detecting Snowball Planets*, Astrophysical Journal, 731, 76.
<https://doi.org/10.1088/0004-637X/731/1/76>.
1. Hunter, D. A., Elmegreen, B. G., **Baker, A. L.** (1998) *The Relationship between Gas, Stars, and Star Formation in Irregular Galaxies: A Test of Simple Models*, Astrophysical Journal, 493, 595. <https://doi.org/10.1086/305158>.

POSTERS AND PROCEEDINGS

13. **Shields, A. L.** Carnes R. *Hydrohalite Salt-albedo Feedback Could Cool M-dwarf Planets*, The Astrophysical Journal, 867,1. January 2019
12. **Shields, A. L.**, Barnes, R., Agol, E., Charnay, B., Bitz, C. M., Meadows, V. S. *The Effect of Orbital Configuration on the Possible Climates and Habitability of Kepler-62f*, Exoclines, Squamish, BC, August 2016
11. **Shields, A. L.**, Barnes, R., Agol, E., Charnay, B., Bitz, C. M., Meadows, V. S. *The Effect of Orbital Configuration on the Possible Climates and Habitability of Kepler-62f*, American Astronomical Society Meeting #227, #406.04, January 2016
10. **Shields, A.**, Meadows, V., Bitz, C., Pierrehumbert, R., Joshi, M., Robinson, T., Agol, E., Barnes, R., Charnay, B., and Virtual Planetary Laboratory (2015) *The Effect of Star-Planet Interactions on Planetary Climate*, American Astronomical Society Meeting #225, #306.02, January 2015

POSTERS AND
PROCEEDINGS
(CONTINUED)

9. **Shields, A. L.**, Bitz, C. M., Meadows, V. S., Joshi, M. M., Robinson, T. D. *Spectrum-driven Planetary Deglaciation Due to Increases in Stellar Luminosity*, Exo-climes III, Davos, Switzerland, February 2014
8. **Shields, A.**, Meadows, V., Bitz, C., Pierrehumbert, R., Joshi, M., Robinson, T., and Virtual Planetary Laboratory (2013) *Climate Hysteresis for Planets Orbiting Stars of Different Spectral Type*, American Astronomical Society Meeting, DPS meeting #45, #103.04, October 2013
7. **Shields, A.**, Meadows, V., Bitz, C., Pierrehumbert, R., Joshi, M., Robinson, T. (2013) *The Effect of Host Star Spectral Energy Distribution and Ice-Albedo Feedback on the Climate of Extrasolar Planets*, American Astronomical Society Meeting #221, #103.04, January 2013
6. **Shields, A. L.**, Meadows, V. S., Bitz, C. M., Pierrehumbert, R. T., Joshi, M. M., Robinson, T. D. *The Effect of Host Star Spectral Energy Distribution on Ice Line Latitude in Terrestrial Exoplanetary Systems*, Astrobiology Science Conference, Atlanta, GA, April 2012
5. **Shields, A. L.**, Abbey, W., Vance, S. *The Effect of Temperature on Fatty Acid Vesicle Formation in Simulated Deep-ocean Conditions*, American Geophysical Union, #P21B-1662, San Francisco, CA, December 2011
4. **Shields, A. L.**, Meadows, V. S., Robinson, T., Crisp, D., Deming, D., A'Hearn, M. F., Charbonneau, D., Livengood, T. A., Seager, S., Barry, R. K., Hearty, T., Hewagama, T., Lisse, C. M., McFadden, L., Wellnitz, D. D., EPOXI Earthling Team. *Earth as an Extrasolar Planet: Comparing Polar and Equatorial Views of Modern Day and Snowball Earth* American Astronomical Society Meeting #217, #349.04, January 2011
3. Scire, E., Chan, B. H. P., Silbermann, N., **Shields, A. L.**. *The Spitzer Bibliography Database: bibliographic statistics*, 2010, Proceedings of the SPIE, 7737.
2. **Shields, A. L.**, Meadows, V. S., Robinson, T. D., Deming, L. D., A'Hearn, M. F., Charbonneau, D., Hewagama, T., Lisse, C., Livengood, T., McFadden, L., Seager, S., Wellnitz, D. D., EPOXI Earthling Team. *Earth as an Extrasolar Planet: Comparing Polar and Equatorial Views* Astrobiology Science Conference, 2010, LPI Contribution No. 1538.
1. **Shields, A. L.**, Nolan, M. C. *Impact Simulations into Ice on Europa* American Astronomical Society Meeting #189, #19.01, January 1996