

## EDUCATION

<b>University of Colorado Boulder</b>	PhD Astrophysics & Planetary Sciences M.S. Astrophysics & Planetary Sciences	Expected 2023 2019
<b>University of Oregon</b>	B.S. Physics, minor in mathematics B.S. Theatre Arts	2013-2017 2006-2010

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## RESEARCH INTERESTS

Planetary atmospheres	Planetary habitability	Surface-to-atmosphere interactions of terrestrial planets
Planetary climate evolution	Solar system formation and evolution	
Astrobiology, origin of life		

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## RESEARCH EXPERIENCE

2017 - present	<b>Graduate Research Assistant</b> <i>Laboratory for Atmospheric and Space Physics, Boulder, CO</i>	<i>Advisor: Mike Chaffin</i>
	Using 1D photochemical modeling to study the complex interactions of the D/H ratio and atmospheric escape effects on planetary water inventory at Mars and Venus	
2016 - 2017	<b>Student research assistant</b> <i>Department of Physics, University of Oregon</i>	<i>Advisor: Greg Bothun</i>
	Developed a procedure to apply astronomical imaging techniques to the detection of high-altitude cirrus clouds.	
June 2016 - Aug 2016	<b>REU Student research assistant</b> <i>High Altitude Observatory, CU Boulder</i>	<i>Advisor: Astrid Maute</i>
	Tested and compared two different methods of delineating the solar and lunar semidiurnal migrating tides in Earth general circulation models.	
June 2015 - Aug 2015	<b>REU Student research assistant</b> <i>Center for Interdisciplinary Exploration and Research in Astrophysics, Northwestern University</i>	<i>Advisor: Daniel Abrams</i>
	Developed an N-body simulation in MATLAB to study the application of	

nonlinear synchronization models to astrophysical systems such as dust rings, satellite formation, galactic spiral arm formation to obtain mean-field characterizations of pattern formation.

June 2014 - June 2015 **Student research assistant**  
*Department of Physics, University of Oregon*

*Advisor: Ben McMorran*

Performed sample measurements of optical materials using Mach-Zehnder interferometer and instructed fellow undergrads in its operation

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## PUBLICATIONS

**Cangi, E.**, Chaffin, M.S., Yelle, R. V., Gregory, B. and Deighan, J. (2022). The amount of non-thermal D escape driven by planetary ion-neutral reactions on Mars. (in prep)

Holmes, J. A., Lewis, S. R., Patel, M. R., Chaffin, M. S., **Cangi, E. M.**, Deighan, J., Schneider, N. M., Aoki, S., Fedorova, A. A., Kass, D. M., & Vandaale, A. C. (2021), *Earth and Planetary Science Letters*, 571, 117109.

**Cangi, E. M.**, Chaffin, M. S., & Deighan, J. 2020. Higher Martian atmospheric temperatures at all altitudes increase the D/H fractionation factor and water loss. *Journal of Geophysical Research: Planets*, 125, e2020JE006626. <https://doi.org/10.1029/2020JE006626>

Broeren, T., **Cangi, E.**, and Abrams, D.M. (2020). A coupled-oscillator model for the formation of planetary rings. (in prep)

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## TRAININGS AND WORKSHOPS

May - Aug 2022 **Planetary Science Summer School**  
*Jet Propulsion Laboratory*

Collaborated with 17 other grad students and post docs to design a multiple flyby mission to Io according to the New Frontiers 4 Announcement of Opportunity. Served as one of six key team leaders in the position of Proposal Manager.

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## TEACHING EXPERIENCE

Jan - March 2015 **Science Literacy Program Scholar**  
*Department of Physics, University of Oregon*

Teaching assistant for course Physics of Energy and Environment, taught by Dr. Raghuvier Parthasarathy. Assisted in class, performed demos, drafted homework, held office hours, peer mentor, led review lectures.

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## CONFERENCE CONTRIBUTIONS

- December 2021      **American Geophysical Union Fall Meeting**  
*New Orleans, LA*  
Poster P35F-2184: Photochemical modeling of non-thermal processes affecting D escape on Mars
- December 2020      **American Geophysical Union Fall Meeting**  
[Poster #P033-0015](#): Photochemical modeling of upper atmospheric D/H on Mars
- December 2019      **American Geophysical Union Fall Meeting**  
*San Francisco, CA*  
[Talk #P52C-04](#): The Mars D/H Fractionation Factor as a Function of Temperature and Water Vapor
- September 2019    **Joint meeting, European Planetary Science Congress / AAS Division for Planetary Science**  
*Geneva, Switzerland*  
[Talk #1000](#): Constraining the Mars D/H Fractionation Factor and Water Loss in Photochemical Modeling
- July 2019            **Ninth International Conference on Mars**  
*Pasadena, CA*  
[Talk #6068](#): The Mars D/H Fractionation Factor as a Function of Temperature and Water Vapor
- October 2018        **AAS Division for Planetary Science 50th meeting**  
*Knoxville, TN*  
Poster #315.09: Effect of variations in temperature and water vapor profiles in photochemical modeling of H and D escape from Mars
- May 2018            **ESTEC Symposium on Comparative Aeronomy and Plasma Environment of Terrestrial Planets**  
*Katwijk, Netherlands*  
Poster: Studying the Effect of the D/H Ratio in Photochemical Modeling
- January 2017        **American Meteorological Society 97th meeting**  
*Seattle, WA*  
[Poster #233](#): Delineating the Migrating Solar and Lunar Semidiurnal Atmospheric Tides in the General Circulation Model
- November 2016      **NASA Oregon Space Grant Symposium**  
*McMinnville, OR*  
[Poster & talk](#): Flux Ratio Detection of Global Thin Cirrus Clouds
- November 2016      **Society of Physics Students (Sigma Pi Sigma) Quadrennial Physics Congress**

San Francisco, CA

[Poster #S11-1](#): Delineating the Migrating Solar and Lunar Semidiurnal Atmospheric Tides in the General Circulation Model

January 2016

**American Astronomical Society 227th Meeting**

*Kissimmee, FL*

[Poster #141.14](#): Searching for Simpler Models of Astrophysical Pattern Formation

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## NON-ACADEMIC EXPERIENCE

2013-2017

**Undergraduate Coordinator**

*Department of Women's & Gender Studies, University of Oregon*

Co-organized and managed the Center for the Study of Women in Society's 40th anniversary symposium and conference celebrating the works of Ursula K. Le Guin and feminist science fiction (2013); served as undergraduate coordinator for the department.

2011-2013

**Information Technology Consultant**

*College of Arts & Sciences Information Technology, University of Oregon*

Provided on-site, email and phone support for 70% of university. Organized and led two all-day WordPress training sessions for faculty and staff. Served as primary documentation author.

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## OUTREACH AND SERVICE

2019 - present

**Graduate school mentor**

*Graduate school, University of Colorado Boulder*

Peer mentorship for two other graduate students (1 PhD, 1 masters)

2019 - 2021

**Graduate Concerns and Curriculum Committee**

*Astrophysical and Planetary Sciences, University of Colorado Boulder*

Worked with 3 other graduate students and 4-6 faculty members to address concerns for the department level, as well as perform major revisions to the graduate curriculum including removal of the written comprehensive exam, formalization and documentation of the research presentation and oral comprehensive exam requirements, and refinement of required course syllabi

May 2019 - present

**Co-founder, Planetary Journal Club**

*Laboratory for Atmospheric and Space Physics, Boulder, CO*

Co-founded (with geology colleague Liza Wernicke) interdisciplinary bimonthly journal club for local Mars community, later extended to planetary science at large

- Sept 2018 - present **Mentor, Astropals**  
*Astrophysical and Planetary Sciences, University of Colorado Boulder*
- Mentored junior graduate students and received mentorship from senior graduate students and postdocs
- Aug 2017 - present **Friday Open House Host**  
*Sommers-Bausch Observatory, Boulder, CO*
- Responsible for running 2-3 hour public observing nights using in-house 20" Modified Dal-Kirkham telescopes, Dobsonians, binoculars.
- 2017-2018 **Undergraduate curriculum committee**  
*Astrophysical and Planetary Sciences, University of Colorado Boulder*
- 2014-2016 **Society of Physics Students**  
*University of Oregon Chapter, Eugene, OR*
- Student advisor 2016-2017  
 President 2015-2016  
 Webmaster 2014-2015
- 2015-2016 **After School Program Visiting Scientist**  
*River Road Elementary, Eugene, OR*
- Performed science demonstrations and informally instructed children in basic physical principles at an after-school program with fellow UO physics undergraduate and graduate students, once every 6 weeks
- June-August 2014 **Sky Guide**  
*Pine Mountain Observatory, Bend, OR*
- Entertained and welcomed observatory guests at weekly star parties; used 10" Dobsonian telescopes to take guests on a tour of the Northern Hemisphere summer night sky.
- January - March 2014 **After School Program Visiting Scientist**  
*Fidgets2Widgets, Eugene, OR*
- Created weekly presentations and demonstrations on subjects related to the thematic topic of the week, including: physics of snowboarding, center of mass with penny-stacking, cool coding and web tools, the International Space Station

## HONORS AND AWARDS

- 2022 NASA FINESST fellowship recipient
- 2019 NSF Graduate Research Fellowship
- 2017 Weiser Leadership Award  
*University of Oregon Department of Physics*
- 2016 Weiser Leadership Award

	<i>University of Oregon Department of Physics</i>
2016	Weiser Undergraduate Research Prize <i>University of Oregon Department of Physics</i>
2016	Chambliss Astronomy Achievement Student Award <i>American Astronomical Society</i>
2015	Nontraditional Student Award <i>University of Oregon</i>
2014-15	Henry V. Howe Scholarship for Natural Science Majors <i>University of Oregon</i>
2014-15	Jessie Bostelle Memorial Scholarship <i>SEIU Local 503</i>
2014-15	General Scholarship <i>University of Oregon</i>

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## TECHNICAL SKILLS

- ❖ Programming & data science
  - Working with noisy data
  - Image processing
  - Data visualization
  - Languages: Python, Julia, MATLAB, Mathematica, C++, IDL
  - Related tools: IRAF, PyRAF, Jupyter Notebook, DS9, NetCDF
- ❖ Operating systems: Linux, Windows, Mac OSX, high performance clusters
- ❖ Lab skills
  - Optical systems and components
  - Interferometry
  - Computer repair and construction, soldering
- ❖ Communication media
  - LaTeX
  - HTML/CSS
  - Adobe Creative Suite (Photoshop, Illustrator, InDesign)
  - Affinity Designer