

William Kennedy Misener

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RESEARCH INTERESTS

The physics of the formation and evolution of planets, planetary atmospheres, and planetary systems

EDUCATION

University of California, Los Angeles, 2018-Present

Ph.D. candidate, Planetary Science (degree anticipated June 2024)

Master of Science, Geophysics and Space Physics, March 2021

University of Chicago, 2014-2018

Bachelor of Arts, Physics with Specialization in Astrophysics, June 2018

With General and Departmental Honors

RESEARCH EXPERIENCE

Graduate Student Researcher, 2018-Present

Advisor: Professor Hilke Schlichting

Department of Earth, Planetary, and Space Sciences, University of California, Los Angeles

Thesis title: “Exploring the thermal and chemical coupling between the silicate cores and hydrogen atmospheres of super-Earth and sub-Neptune exoplanets”

Research Assistant, 2016-2018

Advisor: Professor Fred Ciesla

Department of the Geophysical Sciences, University of Chicago

Investigated solid material transport dynamics and grain growth via Monte Carlo simulation of protoplanetary disk conditions

PUBLICATIONS

5. H. Schlichting, A. Gupta, **W. Misener**, and J. Rogers 2023. “Formation of Super-Earths and Sub-Neptunes”, *Handbook of Exoplanets*, 2nd edition, submitted.
4. **W. Misener**, H. Schlichting, and E. Young 2023. “Atmospheres as windows into sub-Neptune interiors: coupled chemistry and structure of hydrogen-silane-water envelopes”, *Monthly Notices of the Royal Astronomical Society*, 524:981. DOI: [10.1093/mnras/stad1910](https://doi.org/10.1093/mnras/stad1910) arXiv: [2303.09653](https://arxiv.org/abs/2303.09653)
3. **W. Misener** and H. Schlichting, 2022. “The importance of silicate vapour in determining the structure, radii, and envelope mass fractions of sub-Neptunes”, *Monthly Notices of the Royal Astronomical Society*, 514:6025. DOI: [10.1093/mnras/stac1732](https://doi.org/10.1093/mnras/stac1732) arXiv: [2201.04299](https://arxiv.org/abs/2201.04299)
2. **W. Misener** and H. Schlichting, 2021. “To cool is to keep: residual H/He atmospheres of super-Earths and sub-Neptunes”, *Monthly Notices of the Royal Astronomical Society* 503:5658. DOI: [10.1093/mnras/stab895](https://doi.org/10.1093/mnras/stab895) arXiv: [2103.09212](https://arxiv.org/abs/2103.09212)

1. **W. Misener, S. Krijt, and F. Ciesla, 2019.** “Tracking Dust Grains During Transport and Growth in Protoplanetary Disks”, *The Astrophysical Journal* 885:118. DOI: [10.3847/1538-4357/ab4a13](https://doi.org/10.3847/1538-4357/ab4a13) arXiv: [1910.00609](https://arxiv.org/abs/1910.00609)

SEMINARS & TALKS

27. **Exoplanet Journal Club, University of Chicago**, “Magma-atmosphere interactions in sub-Neptunes”, Chicago, IL, USA, October 30, 2023
26. **Exoplanet Pizza Lunch, Harvard-Smithsonian Center for Astrophysics**, “Magma-atmosphere interactions in sub-Neptunes”, Cambridge, MA, USA, October 25, 2023
25. **Monday Afternoon Talk, Massachusetts Institute of Technology**, “Magma-atmosphere interactions in sub-Neptunes”, Cambridge, MA, USA, October 23, 2023
24. **Exoplanet Journal Club, University of Maryland**, “Magma-atmosphere interactions in sub-Neptunes”, College Park, MD, USA, September 19, 2023
23. **Astrophysics Coffee, Institute for Advanced Study**, “Magma-atmosphere interactions in sub-Neptunes”, Princeton, NJ, USA, September 15, 2023
22. **Exoplanets and Stars Seminar, Yale University**, “Magma-atmosphere interactions in sub-Neptunes”, New Haven, CT, USA, September 11, 2023
21. **Invited Talk, ExoSS II, Jet Propulsion Laboratory**, “Magma-atmosphere interactions in sub-Neptunes”, La Cañada Flintridge, CA, USA, August 30, 2023
20. **Invited Talk, EXCALIBUR Workshop**, “A Theorist’s Quest for EXCALIBUR”, Pasadena, CA, USA, July 29, 2023
19. **OWL Exoplanets Summer Program Seminar**, “Magma-atmosphere interactions in sub-Neptunes”, Santa Cruz, CA, USA, July 19, 2023
18. **Contributed Talk, ExoClimes VI**, “Magma-atmosphere interactions in sub-Neptunes”, Exeter, UK, June 28, 2023
17. **School of Mathematics Statistics and Physics Seminar, Newcastle University**, “A window into sub-Neptune interiors: coupled chemistry and structure of hydrogen-silane-water atmospheres”, Newcastle upon Tyne, UK, June 23, 2023
16. **Contributed Talk, ERES Symposium**, “A window into sub-Neptune interiors: coupled chemistry and structure of hydrogen-silane-water atmospheres”, New Haven, CT, USA, June 20, 2023
15. **Planetary Science Seminar, University of California, Los Angeles**, “Effects of silicate vapor on sub-Neptune atmospheres”, Los Angeles, CA, USA, June 8, 2023
14. **AETHER Collaboration Workshop Flash Talk**, “Chemical equilibrium between magma oceans and hydrogen atmospheres”, Washington, DC, USA January 18, 2023
13. **Astrophysics Group Seminar, Imperial College London**, “Effects of silicate vapour on sub-Neptune atmospheres”, London, UK, October 13, 2022
12. **Contributed Talk, Bay Area Exoplanet Meeting #41**, “Effects of silicate vapor on sub-Neptune atmospheres”, Santa Cruz, CA, USA, July 15, 2022
11. **Research Talk, MIAPbP Planet Formation Workshop**, “Formation and Evolution of Super-Earth and Sub-Neptune Atmospheres”, Garching bei München, Germany, June 29, 2022
10. **Contributed Talk, Exoplanets IV Atmospheric Escape Splinter Session**, “To Cool is to Keep: Residual H/He Atmospheres of Super-Earths”, Las Vegas, NV, USA, May 4, 2022

9. **Planetary Science Seminar, University of California, Los Angeles**, “The consequences of silicate vapor in determining the structure, radii, and evolution of sub-Neptunes”, Los Angeles, CA, USA, February 24, 2022
8. **Contributed Talk, Bay Area Exoplanet Meeting #38**, “To Cool is to Keep: Residual H/He Atmospheres of Super-Earths”, [virtual due to COVID-19], September 17, 2021
7. **Lightning Talk, 12th EPSS Student Research Symposium**, “Residual H/He Atmospheres of Super-Earths”, May 14, 2021
6. **Planetary Science Seminar, University of California, Los Angeles**, “To Cool is to Keep: Residual H/He Atmospheres of Super-Earths”, Los Angeles, CA, USA, April 23, 2021
5. **Panelist, Habitable Worlds 2021**, “Super-Earths”, [virtual due to COVID-19], March 25, 2021
4. **Contributed Talk, Exoplanet Demographics**, “To Cool is to Keep: Residual H/He Atmospheres of Super-Earths”, [virtual due to COVID-19], November 13, 2020
3. **Contributed Talk, Exoplanets in Southern California**, “Residual H/He Atmospheres of Super-Earths”, [virtual due to COVID-19], September 15, 2020
2. **Planetary Science Seminar, University of California, Los Angeles**, “Dust Grain Growth and Transport in Protoplanetary Disks”, Los Angeles, CA, USA, April 26, 2019
1. **Honors Bachelor’s Thesis Defense, University of Chicago**, “Modeling Dust Grain Growth and Transport in the Protoplanetary Disk”, Chicago, IL, USA, May 24, 2018

POSTERS

7. **W. Misener**, H. Schlichting, and E. Young, “Coupled chemistry and structure of hydrogen-silane-water sub-Neptune atmospheres”, *STScI Spring Symposium*, Baltimore, MD, USA, May 18, 2023
6. **W. Misener** and H. Schlichting, “Silicate vapor in sub-Neptune atmospheres”, *Exoplanets in our Backyard 2*, Albuquerque, NM, USA, November 2, 2022
5. **W. Misener** and H. Schlichting, “Silicate vapor in sub-Neptune atmospheres”, *Exoplanets IV*, Las Vegas, NV, USA, May 2, 2022
4. **W. Misener** and H. Schlichting, “Residual H/He Atmospheres of Super-Earths”, *TESS Science Conference II* [virtual due to COVID-19], August 2, 2021
3. **W. Misener** and H. Schlichting, “Residual H/He Atmospheres of Super-Earths”, *Sagan Summer Workshop* [virtual due to COVID-19], July 19, 2021
2. **W. Misener** and H. Schlichting, “To Cool is to Keep: Residual H/He Atmospheres of Super-Earths”, *Habitable Worlds 2021*, [virtual due to COVID-19], March 22, 2021
1. **W. Misener** and H. Schlichting, “Residual H/He Atmospheres of Super-Earths”, *Exoplanets III*, [virtual due to COVID-19], July 27, 2020

HONORS AND FUNDING AWARDS

- UCLA Dissertation Year Fellowship, 2023-24
- AAS International Travel Grant, 2023
- Travel Support for Exoplanets in our Backyard 2 conference, 2022
- UCLA Graduate Division Doctoral Travel Grant

- Honorarium for attending Planet Formation: From Dust Coagulation to Final Orbit Assembly workshop
- EPSS Department Teaching Award, University of California, Los Angeles, 2020
- Graduate Division Fellowship, University of California, Los Angeles, 2018-23
- Alumni Scholarship, University of California, Los Angeles, 2018
- General and Physics Departmental Honors, University of Chicago, 2018
- Dean's List, University of Chicago, 2015-2018
- University Scholar, University of Chicago, 2014
- University National Merit Scholarship, University of Chicago, 2014

TEACHING EXPERIENCE

Teaching Assistant, *University of California, Los Angeles*

EPS SCI 9: Solar System and Planets, Fall Quarter 2019, 2020, 2021

Ran weekly lab/discussion sections, expanded on topics related to general lecture and ran lab demonstrations for 80 non-major students

OUTREACH ACTIVITIES

Volunteer, *UCLA EPSS Eclipse Viewing Event*, 2023

Ran telescope observations and informed members of the public at an event for the October 2023 annular eclipse at a public park in Los Angeles.

Demonstrator, *UCLA AstroLive*, 2020

Demonstrated astrophysical concepts including relativity and rocket launching to 5th grade students visiting campus

Letter Writer, *Letters to a Pre-Scientist*, 2019-20, 2022-23

Exchanged a series of letters with a middle school student emphasizing careers in STEM fields and my experiences

Volunteer, *Exploring Your Universe*, 2018-2020

Demonstrated exoplanet observation techniques and answered questions from public about exoplanetary science at public science festival which draws over 7,000 people

President, *Ryerson Astronomical Society*, 2017-2018

Led the University of Chicago's student-run amateur astronomy organization, which organized events and trips and ran weekly observation nights

PUBLIC OUTREACH TALKS

Planetarium Talk, *UCLA Planetarium*, "Planetary Interiors", May 2023

Planetarium Talk, *UCLA Planetarium*, "Native American Astronomy and Constellations", February 2023

Research in Space Fields, *ConnectEd Research Student Organization*, February 2022

Planetarium Talk, *UCLA Planetarium*, "Super-Earths", October 2021

WISRD Fall Lecture, *Wildwood School*, "Fantastic Trans-Neptunian Objects and What They Tell Us about Our Origin", November 4th, 2019

Planetarium Talk, *UCLA Planetarium*, "Exoplanets", September 2019

Meeting Talks, *Ryerson Astronomical Society*, various topics including "Planetary Atmospheres", "Pluto", "Life in the Solar System", "The James Webb Space Telescope", and "Planet Formation", among others, 2015-2018

TECHNICAL WORKSHOPS ATTENDED

EXCALIBUR Workshop, July 2023. *Organized by NASA Exoplanet Science Institute.*
Sagan Exoplanet Summer Workshop: Characterizing Exoplanet Atmospheres: The Next Twenty Years, July 2023. *Organized by NASA Exoplanet Science Institute.*
Other Worlds Laboratory Exoplanets Summer Program, July 2023. *Organized by the UC Santa Cruz Other Worlds Laboratory.*
AETHER Team Workshop, January 2023.
Formation, evolution & dispersal of protoplanetary discs, October 2022. *Organized by the Royal Astronomical Society.*
Planet Formation: From Dust Coagulation to Final Orbit Assembly, June 2022. *Organized by Munich Institute for Astro-, Particle, and BioPhysics (MIAPbP)*
Sagan Exoplanet Summer Workshop: Astrobiology for Astronomers, July 2019. *Organized by NASA Exoplanet Science Institute.*
Communicating Science Effectively in Today's World, May 2019. *Organized by UCLA Department of Earth, Planetary, and Space Sciences and UCLA Division of Physical Sciences.*

UNDERGRADUATE STUDENT SUPERVISED

Manasa Lakshmi Narasimhan, 2021-2022

SERVICE ACTIVITIES

Graduate Student Representative, *UCLA EPSS Curriculum Committee*, 2020-2022.
Reviewer, *The Astrophysical Journal*, *The Astrophysical Journal Letters*.
Session Chair, *AETHER Team Workshop*, 2023.

COLLABORATION MEMBERSHIPS

AETHER, 2021-Present.