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# Dr. Hannah Diamond-Lowe

## Experience

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| 2023– | **Senior Researcher**, Department of Space Research and Space Technology, Technical University of Denmark |
| 2020–2023 | **Postdoctoral Researcher**, Department of Space Research and Space Technology, Technical University of Denmark |
| 2015–2020 | **NSF Graduate Research Fellow**, Center for Astrophysics \| Harvard & Smithsonian |
| 2013–2014 | **Research Assistant**, Department of Astronomy & Astrophysics, University of Chicago |

## Education

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| 2015–2020 | **Harvard University**, M.A. in Astronomy (May 2018), Ph.D. in Astronomy (May 2020) |
| 2010–2014 | **University of Chicago**, B.S. in Geophysical Sciences, with general and departmental honors |

## Research Interest

In my work I focus on characterizing small exoplanet systems by using spectroscopy to investigate planetary atmospheres and the high-energy outputs of their host stars. I use ground- and space-based telescopes in my research.

## Fellowships, Awards, & Honors

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| 2023 | Co-PI on Carlsberg Conference Grant for the ExØresund Meeting, Copenhagen, DK |
| 2023 | Project Supervisor of the Year 2023, based on student nominations, DTU Space, DK |
| 2023 | Co-I on Carlsberg Foundation Semper Ardens Advance Grant (PI L. Buchhave), DK |
| 2020 | Rodger Doxsey Travel Prize, AAS 235$^{\text{rd}}$ Meeting, Honolulu, HI, US |
| 2016, 2019 | Certificate of Distinction in Teaching for Teaching Fellows, Harvard University, US |
| 2015–2020 | National Science Foundation Graduate Research Fellowship, Harvard University, US |
| 2014 | Best Poster Award, Exoclimes III: The Diversity of Planetary Atmospheres, Davos, Switzerland |

## Publications

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| (15) | Eastman, **Diamond-Lowe**, & Tayar, "Beating stellar systematic error floors using transit-based densities," 2023, *AJ*, 166, 132, doi: 10.3847/1538-3881/aceda2 |
| (14) | **Diamond-Lowe**, Mendonça, Charbonneau, & Buchhave, "Ground-based optical transmission spectroscopy of LTT 1445Ab," 2023, *AJ*, 165, 169, doi:10.3847/1538-3881/acbf39 |
| (13) | Brown, et al., *incl.* **Diamond-Lowe**, "X-ray Emission from the Exoplanet Hosting LTT 1445 Triple Star System," 2022, *AJ*, 164, 206, doi:10.3847/1538-3881/ac8f25 |
| (12) | **Diamond-Lowe**, Kreidberg, Harman, et al., "The K2-3 system revisited: testing photoevaporation and core-powered mass loss with three small planets spanning the radius valley," 2022, *AJ*, 164, 172, doi:10.3847/1538-3881/ac7807 |
| (11) | Feinstein, et al., *incl.* **Diamond-Lowe**, "AU Microscopii in the FUV: Observations in Quiescence, During Flares and Implications for AU Mic b and c," 2022, *AJ*, 164, 110, doi:10.3847/1538-3881/ac8107 |
| (10) | Libby-Robers, Berta-Thompson, **Diamond-Lowe**, et al., "The Featureless HST/WFC3 Transmission Spectrum of the Rocky Exoplanet GJ 1132b: No Evidence For A Cloud-Free Primordial Atmosphere and Constraints on Starspot Contamination," 2022, *AJ*, 164, 59, doi:10.3847/1538-3881/ac75de |

(9) Xu, **Diamond-Lowe**, MacDonald, et al., "Gemini/GMOS Transmission Spectroscopy of the Grazing Planet Candidate WD 1856+534 b," 2021, *AJ*, 162, 296, doi:10.3847/1538-3881/ac2d26

(8) **Diamond-Lowe**, Youngblood, Charbonneau, et al., "The high-energy spectrum of the nearby planet-hosting inactive mid-M dwarf LHS 3844," 2021, *AJ*, 162, 10, doi:10.3847/1538-3881/abfa1c, YouTube: https://youtu.be/a8YXAapmqgs

(7) **Diamond-Lowe**, Charbonneau, Malik, Kempton, & Beletsky, "Optical Transmission Spectroscopy of the Terrestrial Exoplanet LHS 3844b from 13 Ground-Based Transit Observations," 2020, *AJ*, 160, 188, doi:10.3847/1538-3881/abaf4f

(6) **Diamond-Lowe**, Berta-Thompson, Charbonneau, Dittmann, & Kempton, "Simultaneous Optical Transmission Spectroscopy of a Terrestrial, Habitable-Zone Exoplanet with Two Ground-Based Multi-Object Spectrographs," 2020, *AJ*, 160, 27, doi:10.3847/1538-3881/ab935f

(5) Winters, et al., *incl.* **Diamond-Lowe**, "Three Red Suns in the Sky: A Transiting, Terrestrial Planet in a Triple M Dwarf System at 6.9 Parsecs," 2019, *AJ*, 158, 152, doi:10.3847/1538-3881/ab364d

(4) **Diamond-Lowe**, Berta-Thompson, Charbonneau, & Kempton, "Ground-based transmission spectroscopy of the small, rocky exoplanet GJ 1132b," 2018, *AJ*, 156, 42, doi:10.3847/1538-3881/aac6dd

(3) Line, Stevenson, Bean, Desert, Fortney, Kreidberg, Madhusudhan, Showman, & **Diamond-Lowe**, "No Thermal Inversion and a Solar Water Abundance for the Hot Jupiter HD209458b from HST WFC3 Emission Spectroscopy," 2016, *AJ*, 152, 203, doi:10.3847/0004-6256/152/6/203

(2) Ingalls, et al., *incl.* **Diamond-Lowe**, "Repeatability and Accuracy of Exoplanet Eclipse Depths Measured with Post-cryogenic Spitzer," 2016, *AJ*, 152, 44, doi:10.3847/0004-6256/152/2/44

(1) **Diamond-Lowe**, Stevenson, Bean, Line, & Fortney, "New Analysis Indicates No Thermal Inversion in the Atmosphere of HD 209458b," 2014, *ApJ*, 796, 66, doi:10.1088/0004-637X/796/1/66

## Accepted Observing Proposals

2023 "Hot Rock Stars: Capturing high-energy spectra of 5 M dwarfs hosting terrestrial exoplanets that JWST will test for atmospheres," *Hubble Space Telescope* Cycle 31, 47 orbits, **PI Diamond-Lowe**; Co-PI King, Co-Is Buchhave, Guenther, Kreidberg, Mendonça, Mikal-Evans, Youngblood

2023 "The Hot Rocks Survey: Testing 9 Irradiated Terrestrial Exoplanets for Atmospheres," *James Webb Space Telescope* Cycle 2, 115 hours, **PI Diamond-Lowe**; Co-PI Mendonça, Co-Is Buchhave, Espinoza, Burgasser, Heng, Olivier-Demory, +17 more

2022 "Revealing an atmosphere shrouded in mystery with high-resolution spectroscopy," *Very Large Telescope*, P109, 13 hours, **PI Diamond-Lowe**; Co-Is Mendonça, Buchhave, Bello-Arufe, Kreidberg, Molliere, Dittmann, Blain, Birkby, Vaughan

2021 "An HST exclusive look at two rising stars: high-energy spectra of the two closest M dwarfs to host transiting terrestrial exoplanets," *Hubble Space Telescope* Cycle 29, 15 orbits, **PI Diamond-Lowe**; Co-Is Buchhave, Corales, King, Kozakis, Kreidberg, Medina, Mendonça, Winters

2021 "Transmission spectroscopy of our newest terrestrial neighbor only 8 pc away, Gliese 486b," *Very Large Telescope*, P108, 13 hours, **PI Diamond-Lowe**; Co-Is Mendonça, Buchhave, Rathcke, Bello-Arufe

2021 "The thermal emission spectrum of the closest M dwarf transiting rocky planet," *James Webb Space Telescope*, Cycle 1, 17.8 hours, PI Berta-Thompson; Co-Is **Diamond-Lowe**, Winters

2021 "Probing the Terrestrial Planet TRAPPIST-1c for the Presence of an Atmosphere," *James Webb Space Telescope*, Cycle 1, 25.1 hours, PI; Rathcke; Co-Is *incl.* **Diamond-Lowe**

2021 "Exploring the morning and evening limbs of a transiting exoplanet," *James Webb Space Telescope*, Cycle 1, 15.6 hours, PI Espinoza; Co-Is *incl.* **Diamond-Lowe**

2021 "The first near-infrared spectroscopic phase-curve of a super-Earth," *James Webb Space Telescope*, Cycle 1, 14.9 hours, PI Espinoza; Co-Is *incl.* **Diamond-Lowe**

2019 "Investigating the atmosphere of LTT 1445Ab, a terrestrial world at 6.9 pc," *Magellan Telescope* 2020B semester, 2.5 nights, PI Charbonneau; Co-Is **Diamond-Lowe**, Irwin, Winters

2019 "Transmission spectroscopy of a terrestrial exoplanet 6.87 parsecs away," *Magellan Telescope* 2019B semester, 3.125 nights, **PI Diamond-Lowe**; Co-Is Charbonneau, Irwin, Winters

2019 "A First Opportunity to Test Models of Atmospheric Escape for a Terrestrial Exoplanet," *Hubble Space Telescope* Mid-Cycle 26, 10 orbits, **PI Diamond-Lowe**; Co-Is Charbonneau, Kreidberg, Winters, Youngblood

2018 "Investigating the short-period exo-Earth LHS 3844b," *Magellan Telescope* 2019A semester, 2 nights, **PI Diamond-Lowe**; Co-Is Charbonneau, Irwin

2018 "Exploring a habitable zone terrestrial exoplanet with LDSS3C & IMACS," *Magellan Telescope* 2018B semester, 1 night, **PI Diamond-Lowe**, Co-Is Charbonneau, Irwin, Dittmann, Newton, Berta-Thompson, Kempton

2017 "Exploring a habitable zone terrestrial exoplanet with LDSS3C & IMACS," *Magellan Telescope* 2017B semester, 1 night, **PI Diamond-Lowe**; Co-Is Charbonneau, Irwin, Dittmann, Newton, Berta-Thompson, Jenkins, Ramirez, Wordsworth, Morley, Kempton, Schaefer

2017 "Initial Reconnaissance of a Transiting Rocky Planet in a Nearby M-Dwarf's Habitable Zone," *Hubble Space Telescope* Cycle 24, 10 orbits, PI Dittmann; Co-Is Astudillo-Defru, Berta-Thompson, Bonfils, Charbonneau, **Diamond-Lowe**, Irwin, Newton

2016 "The Hydrogen Content of a Rocky Earth-Size Exoplanet," *Hubble Space Telescope* Cycle 24, 20 orbits, PI Berta-Thompson; Co-Is Charbonneau, **Diamond-Lowe**, Dittmann, Irwin, Kempton, Newton

2016 "Star spot double take: Constraining spin-orbit alignment and star spot temperatures for a young, cool M dwarf," *Magellan Telescope* 2016B semester, 4 nights, **PI Diamond-Lowe**; Co-Is Charbonneau, Newton

2015 "The First Exploration of a Terrestrial Exoplanet," *Magellan Telescope* 2016A semester, 8 nights, **PI Diamond-Lowe**; Co-Is Charbonneau, Berta-Thompson, Irwin, Newton, Dittmann

## Talks & Posters

2023 Invited talk: "Observing exoplanets: populations, atmospheres, and open questions," StarPlan Seminar, University of Copenhagen, Copenhagen, DK

2023 Invited talk: "Observing exoplanets: populations, atmospheres, and open questions," Blaauw Workshop: The (geo)chemistry of terrestrial planet formation and evolution, Groningen, NL

2023 Contributed talk: "K2-3 revisited: Testing photoevaporation and core-powered mass loss with 3 small planets spanning the radius valley," Exoplanets: Atmospheres IV, AAS 241$^{st}$ Meeting, Seattle, WA

2022 Contributed talk: "K2-3 revisited: three small planet test models of the radius valley," Plenary session, Exoplanets IV, Las Vegas, USA

2021 Contributed talk: "What we know about the atmospheres of terrestrial exoplanets," Annual Danish Astronomy Meeting (virtual meeting), Denmark

2021 Contributed talk: "The LHS 3844 system: Ground-based transmission spectroscopy of LHS 3844b and an HST/COS high-energy spectrum of LHS 3844," Special Session: Atmospheric Characterization of TESS Exoplanets, AAS 237$^{th}$ Meeting, Virtually, Anywhere

2020 Contributed talk: "Reconnaissance of terrestrial exoplanet atmospheres from the ground in advance of JWST," Exo-Webb Summer Series (virtual meeting), The Transiting Exoplanet Community Early Release Science Program

2020 Invited talk: "Observational constraints on the atmospheres of terrestrial planets orbiting M dwarfs," What makes a planet uninhabitable? (virtual meeting), University of Chicago, Chicago, IL

2020 Invited talk: "Investigating the atmospheres of terrestrial exoplanets with ground-based optical transmission spectroscopy," Yale Exoplanet Seminar, New Haven, CT

2020 Contributed talk: "A first look at the atmospheres of four terrestrial exoplanets with ground-based optical transmission spectroscopy," Exoplanets: Atmospheres IV, AAS 235$^{th}$ Meeting, Honolulu, HI

2019 Invited talk: "Ground-based transmission spectroscopy of nearby terrestrial exoplanets," ITC Lunch, Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA

2019 Poster: "Simultaneous optical transmission spectroscopy of a terrestrial, habitable-zone exoplanet with two ground-based multi-object spectrographs," Extreme Solar Systems IV, Reykjavík, Iceland

2019 Contributed talk: "Ground-based transmission spectroscopy of LHS 1140b," Extrasolar Planets: Characterization & Theory Track 1: I. Measurements and Models of Giant Atmospheres A, AAS 233rd Meeting, Seattle, WA

2018 Contributed talk: "Ground-based transmission spectroscopy of the terrestrial exoplanets GJ 1132b and LHS 1140b," Cloud Academy, École de Physique, Les Houches, FR

2018 Poster: "Ground-based transmission spectroscopy of the terrestrial exoplanets GJ 1132b and LHS 1140b," Exoplanets II, Cambridge, UK

2018 Invited talk:"Ground-based transmission spectroscopy of terrestrial exoplanets," Brown Astrophysics Seminar Series, Providence, RI

2017 Invited talk: "Transiting exoplanet observations of GJ 1132b & LHS 1140b with JWST," Enabling Transiting Exoplanet Observations with JWST, STScI, Baltimore, MD

2017 Contributed talk: "Ground-based spectroscopy of the rocky exoplanet GJ 1132b," Extrasolar Planets: Characterization & Theory IV, AAS 229th Meeting, Grapevine, TX

2016 Poster: "Investigating the atmosphere of the terrestrial exoplanet GJ 1132b," Exoclimes IV, Squamish, British Columbia

2014 Invited talk: "New analysis indicates no thermal inversion in the atmosphere of HD 209458b," Undergraduate Research Symposium, University of Chicago, Chicago, IL

## Teaching & Advising

2022–2023 **Advisor**, Masters thesis project, Mette Baungaard, University of Copenhagen

2022 **Advisor**, Bachelors thesis project, Sigrid Sissen and Tor Lund, DTU Space

2022 **Lecturer**, "The Mass-Radius Diagram," Exoplanet lecture in a proposed survey course in astronomy, DTU Space

2021 **Advisor**, Student project in exoplanet research (4 students), Course 30110 (10 ECTS points), DTU Space

2019 Teaching Fellow, *ASTRON 209: Exoplanet Systems*, Harvard University

2016 Teaching Fellow, *SPU-30: Life as a Planetary Phenomenon*, Harvard University

## Service in Astronomy

Referee: *Nature*; *Nature Astronomy*; *The Astrophysical Journal Letters*; *The Astronomical Journal*; *Astronomy & Astrophysics*

2023 Co-Organizer, ExØresund Meeting for Exoplanet Science, Copenhagen, DK

2023 Reviewer, Exoplanets Panel, ***James Webb Space Telescope* Time Allocation Committee**, Cycle 2

2022 Reviewer, Exoplanets Panel, ***Hubble Space Telescope* Time Allocation Committee**, Cycle 30

2021 Reviewer, **NASA Exoplanets Research Program (XRP)**

2020 Global Organizing Committee Member, Exoplanets III (virtual meeting), Heidelberg, DE

2019 Committee chair, Astronomy Graduate Student Mental Health Survey, Harvard University

2016–2020 Organizer, Planetary Journal Club, Harvard University

## Mentoring & Community Outreach

2023 "Exoplanets in the era of JWST," Folkeuniversitetet, Aarhus University

2022 "Exoplanets in a New Light: The Dawn of the JWST Era," Copenhagen Planetarium

2021 "Hannah Diamond-Lowe on 2021 AJ, 162, 10D," AAS Journal Author Series, youtu.be/a8YXAapmqgs

2021 "Out of this world: searching for life on exoplanets," Astronomy on Tap Copenhagen

2019 Panelist, Grad School from the Graduate Student Perspective, SAO Solar Physics REU

2019 "Worlds around other stars: the past, present, and future of exoplanets," Beacon Hill Seminar Series, *Unveiling the Cosmos*, Boston, MA

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| 2019–2020 | Peer mentor, Harvard Astronomy Department Peer Mentoring Program |
| 2017, 2018 | Presenter and panelist, $E^3$ Mentoring Program in Physical Sciences |
| 2017 | Panelist, Wellesley College Science Center Summer Research Program |
| 2016 | Astronomy workshop leader, Harvard Science Research Conference |
| 2015–2016 | Mentor, Harvard College Women in Science, Technology, Engineering, and Math Mentor Program |