

Maria E. Steinrueck

Department of Astronomy and
Astrophysics
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William Eckhardt Research Center

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Education

University of Arizona, Tucson, AZ, USA 2016–2021

PhD in Planetary Sciences. December 2021.

Advisor: Prof. Adam Showman (deceased, 2020), Prof. Tommi Koskinen

Thesis title: *Atmospheric Circulation of Hot Jupiters: Implications of Disequilibrium Chemistry and Photochemical Hazes*

M.S. in Planetary Sciences. December 2018.

Vienna University of Technology, Vienna, Austria 2010–2015

M.S. in Technical Physics, specializing in Theoretical Physics. Graduated with distinction in November 2015.

B.S. in Technical Physics. Graduated with distinction in August 2013.

University of Washington, Seattle, WA, USA 2013–2014

Transatlantic Science Student Exchange Program – Study Abroad (full academic year)

Professional Experience

51 Pegasi b Fellow 2023-current

Department of Astronomy and Astrophysics, University of Chicago

APEx Prize Postdoctoral Fellow 2022–2023

Atmospheric Physics of Exoplanets (APEx) Department, Max Planck Institute for Astronomy, Heidelberg

NASA Earth and Space Sciences Fellow 2018–2021

Graduate Research and Teaching Assistant 2016–2021

Lunar and Planetary Laboratory, University of Arizona

Publications

23 published or accepted (incl. 4 first-author, 5 with major contributions), 1 submitted first-author publication. Cursive and underlined names indicate students advised.

1133 citations, h-index: 15 (source: Google Scholar, October 2025).

First-author publications

1. **Steinrueck, M. E.**, Savel, A. B., Christie, D. A., Carone, L., Tsai, S.-M., Akın, C., Kennedy, T. K., Kiefer, S., Lewis, D. A., Rauscher, E., Samra, D., Zamyatina, M., Arnold, K., Baeyens, R., Gkouvelis, L., Haegle, D., Helling, C., Mayne, N. J., Powell, D., Roman, M. T., Beltz, H., Espinoza, N., Heng, K., Iro, N., Kempton, E. M.-R., Kreidberg, L., Kirk, J., Murphy, M. M., Rackham, B. V., Tan, X. (submitted): *Limb asymmetries on WASP-39b: A Multi-GCM Comparison of Chemistry, Clouds, and Hazes*. Submitted to The Astrophysical Journal, arXiv:2509.21588.
2. **Steinrueck, M. E.**, Parmentier, V., Kreidberg, L., Gao, P., Kempton, E. M.-R., Zhang, M., Stevenson, K. B., Malsky, I., Roman, M. T., Rauscher, E., Malik, M., Lupu, R., Kataria, T., Piette, A. A. A., Bean, J. L., Nixon, M. (2025): *The radiative*

effects of photochemical hazes on the atmospheric circulation and phase curve of sub-Neptunes. The Astrophysical Journal, 985, 98, doi:10.3847/1538-4357/adc99a.

3. **Steinrueck, M. E.**, Koskinen, T., Lavvas, P., Parmentier, V., Zieba, S., Tan, X., Zhang, X., Kreidberg, L. (2023): *Photochemical hazes dramatically alter temperature structure & atmospheric circulation in 3D simulations of hot Jupiters.* The Astrophysical Journal, 951, 117, doi:10.3847/1538-4357/acd4bb.
4. **Steinrueck, M. E.**, Showman, A. P., Lavvas, P., Koskinen, T., Zhang, X., Tan, X. (2021): *3D Simulations of Photochemical Hazes in the Atmosphere of Hot Jupiter HD 189733b.* Monthly Notices of the Royal Astronomical Society, 504, 2783–2799, doi:10.1093/mnras/stab1053.
5. **Steinrueck, M. E.**, Parmentier, V., Showman, A. P., Lothringer, J. D., Lupu, R. E. (2019): *The Effect of Disequilibrium Carbon Chemistry on the Atmospheric Circulation and Phase Curves of Hot Jupiter HD 189733b.* The Astrophysical Journal, 880, 14, doi:10.3847/1538-4357/ab2598.

Co-author publications with major contributions

6. Espinoza, N. N., **Steinrueck, M. E.**, Kirk, J., MacDonald, R. J., Savel, A. B., Arnold, K., Kempton, E. M.-R., Murphy, M. M., Carone, L., Zamyatina, M., Lewis, David A., Samra, D., Kiefer, S., Rauscher, E., Christie, D., Mayne, N., Helling, C., Rustamkulov, Z., Parmentier, V., May, E. M., Carter, A. L., Zhang, X., López-Morales, M., Allen, N., Blecic, J., Decin, L., Mancini, L., Molaverdikhani, K., Rackham, B. V., Palle, E., Tsai, S.-M., Ahrer, E.-M., Bean, J. L., Crossfield, I. J. M., Haegle, D., Hebrard, E., Kreidberg, L., Powell, D., Schneider, A. D., Welbanks, L., Wheatley, P., Brahm, R., Crouzet, N. (2024): *Inhomogeneous terminators on the exoplanet WASP-39 b.* Nature, doi:10.1038/s41586-024-07768-4.
7. Gao, P., Piette, A. A. A., **Steinrueck, M. E.**, Nixon, M. C., Zhang, M., Kempton, E. M.-R., Bean, J. L., Rauscher, E., Parmentier, V., Batalha, N. E., Savel, A. B., Arnold, K. E., Roman, M. T., Malsky, I., Taylor, J. (2023): *The Hazy and Metal-Rich Atmosphere of GJ 1214 b Constrained by Near and Mid-Infrared Transmission Spectroscopy.* The Astrophysical Journal, 951, 96, doi:10.3847/1538-4357/acd16f.
8. Kempton, E. M.-R., Zhang, M., Bean, J. L., **Steinrueck, M. E.**, Piette, A. A. A., Parmentier, V., Malsky, I., Roman, M. T., Rauscher, E., Gao, P., Bell, T. J., Xue, Q., Taylor, J., Savel, A. B., Arnold, K. E., Nixon, M. C., Stevenson, K. B., Mansfield, M., Kendrew, S., Zieba, S., Ducrot, E., Dyrek, A., Lagage, P.-O., Stassun, K. G., Henry, G. W., Barman, T., Lupu, R., Malik, M., Kataria, T., Ih, J., Fu, G., Welbanks, L., McGill, P. (2023): *A reflective, metal-rich atmosphere for GJ 1214b from its JWST phase curve.* Nature, 620, 67-71, doi:10.1038/s41586-023-06159-5.
9. Tsai, S.-M., **Steinrueck, M. E.**, Parmentier, V., Lewis, N. K., Pierrehumbert, R. (2022): *The Climate and Compositional Variation of the Highly Eccentric Planet HD 80606 b—the rise and fall of carbon monoxide and elemental sulfur.* Monthly Notices of the Royal Astronomical Society, 520, 3867–3886, doi:10.1093/mnras/stad214.
10. Vorobyov, E. I., **Steinrueck, M. E.**, Elbakyan, V., Guedel, M. (2017): *Formation of freely floating sub-stellar objects via close encounters.* Astronomy & Astrophysics, 608, A107, doi:10.1051/0004-6361/201731565.

Co-author publications with minor contributions

11. Challener, R. C., Weiner Mansfield, M., Cubillos, P. E., Piette, Anjali A. A., Coulombe, L.-P., Beltz, H., Blecic, J., Rauscher, E., Bean, J. L., Benneke, B.,

- Kempton, E. M.-R., Harrington, J., Komacek, T. D., Parmentier, V., Casewell, S. L., Iro, N., Mancini, L., Nixon, M. C., Radica, M., **Steinrueck, M. E.**, Welbanks, L., Batalha, N. M., Caceres, C., Crossfield, I. J. M., Crouzet, N., Désert, J.-M., Molaverdikhani, K., Nikolov, N. K., Palle, E., Rackham, B. V., Schlawin, E., Sing, D. K., Stevenson, K. B., Tan, X., Turner, J. D., Zhang, X. (2025): *Horizontal and vertical exoplanet thermal structure from a JWST spectroscopic eclipse map*. Nature Astronomy, doi:10.1038/s41550-025-02666-9.
12. Mak, M. T., Sergeev, D. E., Mayne, N., Zamyatina, M., **Steinrueck, M. E.**, Manners, J., Hébrard, E., Sing, D. K., Kohary, K. (2025): *The Impact of Different Haze Types on the Atmosphere and Observations of Hot Jupiters: 3D Simulations of HD 189733b, HD 209458b and WASP-39b*. Monthly Notices of the Royal Astronomical Society, 542, 3, 1873-1900, doi:10.1093/mnras/staf1250.
 13. Luque, R., Piaulet-Ghorayeb, C., Radica, M., Xue, Q., Zhang, M., Bean, J. L., Samra, D., **Steinrueck, M.E.** (2025): *Insufficient evidence for DMS and DMDS in the atmosphere of K2-18 b. From a joint analysis of JWST NIRISS, NIRSpec, and MIRI observations*. Astronomy & Astrophysics, 700, A284, doi:10.1051/0004-6361/202555580.
 14. Arnold, K. E., Savel, A. B., Kempton, Eliza M.-R., Roman, M. T., Rauscher, E., Malsky, I., Beltz, H., **Steinrueck, M. E.** (2025): *Out on a Limb: The Signatures of East-West Asymmetries in Transmission Spectra from General Circulation Models*. The Astrophysical Journal, 986, 187, doi:10.3847/1538-4357/add3f6.
 15. Malsky, I., Rauscher, E., Stevenson, K., Savel, A. B., **Steinrueck, M. E.**, Gao, P., Kempton, E. M.-R., Roman, M. T., Bean, J. L., Zhang, M., Parmentier, V., Piette, A. A. A., Kataria, T. (2025): *Atmospheric characterization of rocky to giant exoplanets in thermal emission with JWST*. The Astrophysical Journal, 169, 221, doi:10.3847/1538-3881/adb7e8.
 16. Nixon, M. C., Piette, A. A., Kempton, E. M.-R., Gao, P., Bean, J. L., **Steinrueck, M. E.**, Mahajan, A. S., Eastman, J. D., Zhang, M., Rogers, L. A. (2024): *New insights into the internal structure of GJ 1214 b informed by JWST*. The Astrophysical Journal Letters, 970, L28, doi:10.3847/2041-8213/ad615b.
 17. Powell, D., Feinstein, A. D., Lee, E. K. H., Zhang, M., Tsai, S.-M., Taylor, J., Kirk, J., Bell, T., Barstow, J. K., Gao, P., Bean, J. L., Blecic, J., Chubb, K. L., Crossfield, I. J. M., Jordan, S., Kitzmann, D., Moran, S. E., Morello, G., Moses, J. I., Welbanks, L., Yang, J., Zhang, X., Ahrer, E.-M., Bello-Arufe, A., Brande, J., Casewell, S. L., Crouzet, N., Cubillos, P. E., Demory, B.-O., Dyrek, A., Flagg, L., Hu, R., Inglis, J., Jones, K. D., Kreidberg L., López-Morales, M. L., Lagage, P.-O., Meier Valdés, E. A., Miguel, Y., Parmentier, V., Piette, A. A. A., Rackham, B. V., Radica, M., Redfield, S., Stevenson, K. B., Wakeford, H. R., Aggarwal, K., Alam, M. K., Carter, A. L., Desert, J.-M., Harrington, J., Iro, N., Line, M. R., Lothringer, J. D., MacDonald, R. J., Mancini, L., Molaverdikhani, K., Mukherjee, S., Nixon, M. C., Oza, A. V., Palle, E., Rustamkulov, Z., Sing, D. K., **Steinrueck, M. E.**, Venot, O., Wheatley, P. J., Yurchenko S. N. (2024): *Sulphur Dioxide in the Mid-Infrared Transmission Spectrum of WASP-39b*. Nature, 626, 979-983, doi:10.1038/s41586-024-07040-9.
 18. Bell, T. J., Crouzet, N., Cubillos, P. E., Kreidberg, L., Piette, A. A. A., Roman, M. T., Barstow, J. K., Blecic, J., Carone, L., Coulombe, L.-P., Ducrot, E., Hammond, M., Mendonça, J. M., Julianne I. Moses, J. I., Parmentier, V., Stevenson, K. B., Teinturier, L., Zhang, M., Batalha, N. M., Bean, J. L., Benneke, B., Charnay, B., Chubb, K. L., Demory, B.-O., Gao, P., Lee, E. K. H., López-Morales, M., Morello, G., Rauscher, E., Sing, D. K., Tan, X., Venot, O., Wakeford, H. R., Aggarwal, K., Ahrer,

- E.-M., Alam, M. K., Baeyens, R., Barrado, D., Caceres, C., Carter, A. L., Casewell, S. L., Challener, R. C., Crossfield, I. J. M., Decin, L., Désert, J.-M., Dobbs-Dixon, I., Dyrek, A., Espinoza, N., Feinstein, A. D., Gibson, N. P., Harrington, J., Helling, C., Hu, R., Iro, N., Kempton, E. M.-R., Kendrew, S., Komacek, T. D., Krick, J., Lagage, P.-O., Leconte, J., Lendl, M., Lewis, N. T., Lothringer, J. D., Malsky, I., Mancini, L., Mansfield, M., Mayne, N. J., Mikal-Evans, T., Molaverdikhani, K., Nikolov, N. K., Nixon, M. C., Palle, E., Petit dit de la Roche, D. J. M., Piaulet, C., Powell, D., Rackham, B. V., Schneider, A. D., **Steinrueck, M. E.**, Taylor, J., Welbanks, L., Yurchenko, S. N., Zhang, X., Zieba, S. (2024): *Nightside clouds and disequilibrium chemistry on the hot Jupiter WASP-43b*. Nature Astronomy, 8, 879-808, doi:10.1038/s41550-024-02230-x.
19. Christie, D. A., Lee, E. K. H., Innes, H., Noti, P., Charnay, B., Fauchez, T., Mayne, N. J., Deitrick, R., Ding, F., Greco, J., Hammond, M., Malsky, I., Mandell, A., Rauscher, E., Roman, T., Sergeev, D., Sohl, L., **Steinrueck, M. E.**, Turbet, M., Wolf, E. T., Zamyatina, M., Carone, L. (2022): *CAMEMBERT: A Mini-Neptunes GCM Intercomparison, Protocol Version 1.0. A CUISINES Model Intercomparison Project*. The Planetary Science Journal, 3, 261, doi:10.3847/PSJ/ac9dfe.
20. The JWST Transiting Exoplanet Community Early Release Science Team (incl. **Steinrueck, M. E.** in authorship tier 3) (2022): *Identification of carbon dioxide in an exoplanet atmosphere*. Nature, 614, 649–652, doi:10.1038/s41586-022-05269-w.
21. King, G. W., Corrales, L., Wheatley, P. J., Lavvas, P., **Steinrueck, M. E.**, Bourrier, V., Ehrenreich, D., Lecavelier des Etangs, A., Louden, T. (2021): *The near-UV transit of HD189733b with the XMM-Newton Optical Monitor*. Monthly Notices of the Royal Astronomical Society, 506, 2453-2458, doi:10.1093/mnras/stab1863.
22. Venot, O., Parmentier, V., Blecic, J., Cubillos, P. E., Waldmann, I. P., Changeat, Q., Moses, J. I., Tremblin, P., Crouzet, N., Gao, P., Powell, D., Lagage, P.-O., Dobbs-Dixon, I., **Steinrueck, M. E.**, Kreidberg, L., Batalha, N., Bean, J. L., Stevenson, K. B., Casewell, S., Carone, L. (2020): *Global Chemistry and Thermal Structure Models for the Hot Jupiter WASP-43b and Predictions for JWST*. The Astrophysical Journal, 890, 176, doi:10.3847/1538-4357/ab6a94.
23. Helling, Ch., Iro, N., Corrales, L., Samra, D., Ohno, K., Alam, M. K., **Steinrueck, M. E.**, Lew, B., Molaverdikhani, K., MacDonald, R. J., Herbort, O., Woitke, P., Parmentier, V. (2019): *Understanding the atmospheric properties and chemical composition of the ultra-hot Jupiter HAT-P-7b. I. Cloud and chemistry mapping*. Astronomy & Astrophysics, 631, A79, doi:10.1051/0004-6361/201935771.
24. Lavvas, P., Koskinen, T., **Steinrueck, M.**, García Muñoz, A., Showman, A. P. (2019): *Photochemical hazes in sub-Neptunian atmospheres with focus on GJ 1214b*. The Astrophysical Journal, 878, 2, 118, doi:10.3847/1538-4357/ab204e.

Observing Proposals

Zhang, M., Savel, A. B., **Steinrueck, M. E. (co-PI)** and 8 co-Is (2025): The only known atmosphere on a rocky exoplanet? JWST Proposal ID #7875. (19.8 hours)

Piaulet Ghorayeb, C. and 17 Co-Is (incl. **Steinrueck, M. E.**) (2025): Combining Emission and Transmission Spectroscopy to reveal Exo-Neptune Aerosols, Chemistry, and Formation. JWST Proposal ID #9095. (38.0 hours)

Radica, M., Piaulet Ghorayeb, C., Bean, J. L., Gao, P., Line, M., Powell, D., **Steinrueck, M. E.**, Welbanks, L. (2025): Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey, JWST Proposal ID #9101. (94.7 hours)

Espinoza, N. and 39 Co-Is (incl. **Steinrueck, M.**) (2023): Hot Jupiter Atmospheric Forecast: are mornings cloudier than evenings in other worlds? JWST Proposal ID #3969. (61.53 hours)

Kreidberg, L. and 64 Co-Is (incl. **Steinrueck, M.**) (2022): The SPACE Program: A Sub-neptune Planetary Atmosphere Characterization Experiment. Hubble Proposal ID #17192. (205 orbits)

Parmentier, V., Evans, T., Kreidberg, L., Guenther, M., **Steinrueck, M.**, Crossfield, I., Irwin, P., Aigrain, S., Line, M., Van Eylen, V., Taylor, J. (2019): Seeing through the haze of two mini-Neptunes with Spitzer. Spitzer Proposal ID #14325. (26.1 hours)

Awards

51 Pegasi b Fellowship (amount: USD 415,000), Heising-Simons Foundation, 2023-2026
APEx Prize Postdoctoral Fellowship (fellowship duration: 4 years), Max Planck Institute for Astronomy, 2022-2023

NASA Earth and Space Sciences Fellowship (NESSF) (amount: USD 135,000), 2018-2021
Peter W. Likins Award for Inclusive Excellence (Student category), Univ. of Arizona, 2020
Galileo Circle Scholarship College of Science (amount: USD 1,000 each year), Univ. of Arizona, 2018 & 2020

Leif Andersson Graduate Student Award for Service, Lunar and Planetary Laboratory, Univ. of Arizona, 2018

Leistungsstipendium (Academic Merit Award), Vienna University of Technology, 2012

Grants

JWST Cycle 4 proposal #7875 (as co-PI, total amount: USD \$159,765, incl. USD 29,214 allocated to M. E. Steinrueck, budget approval pending), 2025

JWST Cycle 4 proposal #9095 (as co-I, USD 29,214 allocated to M. E. Steinrueck, budget approval pending), 2025

Other Worlds Laboratory (OWL) Mini-Grant (amount: USD 3,830) for a collaborative stay at the Université de Reims, Champagne-Ardenne, France, 2019

Other Worlds Laboratory (OWL) Mini-Grant (amount: USD 506) for travel to the Extreme Solar Systems IV Meeting, 2019

GPSC Travel Grant (amount: USD 1,750), Graduate and Professional Student Council (GPSC), Univ. of Arizona, 2018 & 2019

Lunar and Planetary Laboratory Student/Staff Travel Award (amount: USD 720), Univ. of Arizona, 2019

Theoretical Astrophysics Program Small Grant (amount: USD 500), Univ. of Arizona, 2019

Hartmann Student Travel Grant (amount: USD 350), Division for Planetary Science/AAS, 2017

Presentations

19 colloquia and seminars (7 invited, 12 other), 14 contributed conference talks, 5 poster presentations.

Invited colloquia and seminars

Colloquium, Department of Physics and Astronomy, University of Toledo (February 2025)

Colloquium, Astronomy Department, University of Michigan (February 2024)

ET Science Seminar, Shanghai Astronomical Observatory (August 2023)

Science Talk, 17th Heidelberg Summer School, International Max Planck Research School for Astronomy and Cosmic Physics at the University of Heidelberg (August 2022)

Königstuhl Colloquium, Max Planck Institute for Astronomy (March 2022)

Exoplanet, Star, and Planet Formation (ESPF) Seminar, Space Telescope Science Institute (May 2021)

Astronomy Colloquium, Jet Propulsion Laboratory (August 2020)

Other seminars

Exo-Coffee, MPIA Heidelberg (June 2024)

Seminar talk, Astronomy Department, University of Wisconsin-Madison (October 2022)

Crater Café, Department of Earth, Atmospheric and Planetary Sciences, Purdue University (May 2022)

Origins Seminar, University of Arizona (March 2021)

Exo-Coffee, MPIA Heidelberg (September 2020)

Planetary Lunch, UC Santa Cruz (September 2020)

Presentation at Exoplanets & Disks Meeting, University of Amsterdam (September 2020)

Planetary and Exoplanetary Astronomy Seminar, University of Maryland (September 2020)

Exoplanet Atmospheres Seminar, Geneva Observatory (March 2020)

Presentation to Exoplanet Atmospheres Group, Center for Space and Habitability, University of Bern (March 2020)

Seminar talk, Institute for Astrophysics, University of Vienna (September 2019)

Origins Seminar, University of Arizona (April 2019)

Contributed conference talks

The radiative effects of photochemical hazes on the atmospheric circulation and phase curves of sub-Neptunes. Aspen Center for Physics Workshop on “Atmospheric characterization of rocky to giant exoplanets in thermal emission with JWST”, Aspen, CO. (April 2025)

The radiative effects of photochemical hazes on the atmospheric circulation and phase curves of sub-Neptunes. 46th Bay Area Exoplanets Meeting, Santa Cruz, CA. (July 2024)

Limb asymmetries on WASP-39b: A GCM perspective. Exoplanets 5, Leiden, Netherlands. (June 2024)

Photochemical hazes dramatically alter atmospheric circulation and temperature structure of short-period giant planets. Cloud Zwei Con, Ringberg, Germany. (January 2023)

Radiative feedback of photochemical hazes in GCMs of hot Jupiters and mini-Neptunes. “Celebrating JWST’s first six months of exoplanet data” workshop, Ringberg, Germany. (November 2022)

Photochemical hazes dramatically alter temperature structure & atmospheric circulation in 3D simulations of hot Jupiters. European Planetary Science Congress, Granada, Spain. (September 2022)

Simulating radiative feedback of photochemical hazes in general circulation models of hot Jupiters. 53rd Meeting of the Division for Planetary Science, virtual. (October 2021)

Simulating radiative feedback of photochemical hazes in general circulation models of hot Jupiters. European Planetary Science Congress, virtual. (September 2021)

Simulating radiative feedback of photochemical hazes in general circulation models of hot Jupiters. Cloud Nine Con, virtual. (August 2021)

Three-dimensional Simulations of Photochemical Hazes in the Atmosphere of Hot Jupiter HD 189733b. 52nd Meeting of the Division for Planetary Science, virtual. (October 2020)

Three-dimensional Simulations of Photochemical Hazes in the Atmosphere of Hot Jupiter HD 189733b. European Planetary Science Congress, virtual. (September 2020)

The Effect of Disequilibrium Carbon Chemistry on the 3-D Atmospheric Structure and Phase Curves of Hot Jupiters. 29th Bay Area Exoplanets Meeting, Santa Cruz, CA. (June 2019)

The effect of disequilibrium carbon chemistry on the atmospheric circulation and phase curves of hot Jupiters. 233rd Meeting of the American Astronomical Society, Seattle, WA. (January 2019)

The effects of disequilibrium carbon chemistry in general circulation models of hot Jupiters. 49th Division for Planetary Science meeting, Provo, UT. (October 2017)

Poster Presentations

The effect of heating and cooling by photochemical hazes on the phase curve of sub-Neptune GJ 1214b. Exoclimes VI (June 2023)

Simulating radiative feedback of photochemical hazes in general circulation models of hot Jupiters. Exoplanets IV, Las Vegas, NV. (May 2022)

Three-Dimensional Mixing of Photochemical Hazes in the Atmospheres of Hot Jupiters. European Planetary Science Congress and Divison for Planetary Science Joint Meeting, Geneva, Switzerland. (September 2019)

Three-Dimensional Mixing of Photochemical Hazes in the Atmospheres of Hot Jupiters. Extreme Solar Systems IV, Reykjavik, Iceland. (August 2019)

The effect of disequilibrium carbon chemistry in general circulation models of hot Jupiters. Poster presentation at the Cloud Academy at the Les Houches School of Physics, France. (September 2018)

Mentoring Experience

Students advised

Thomas Kennedy (September 2025–current)

PhD student at University of Michigan, advising for one publication

Vighnesh Nagpal (October 2024–current)

PhD student at University of Chicago, co-advising for PhD thesis project

David Haegle (March–July 2023)

undergraduate student at University of Heidelberg, advised for project internship and bachelor's thesis

admitted to the IMPRS PhD program at University of Heidelberg

Nicole Wolff (July–September 2022)

MPIA summer internship student (undergraduate)

now a PhD student at UC Santa Cruz

Berk Demirci (June 2021–February 2022)
undergraduate student in Visual FX and 3D Animation at SAE Institute Vienna, co-advised for bachelor's thesis on creating a realistic 3D rendering of a scene set on the surface of Titan, provided advising from a science perspective

Pupils Attending University 2012–2015

Program enabling high school students to enroll early at university, run by the Austrian Research and Support Centre for the Gifted and Talented (OEZBF)
Mentored four students over the course of a year each

Teaching Experience

Department of Astronomy & Astrophysics, University of Chicago 2025

Guest lecture on planetary interiors for ASTR 30350 *Exoplanets* (graduate-level class, core requirement for PhD program in Astronomy & Astrophysics, class size: 8 students)

Lunar and Planetary Laboratory, University of Arizona 2017–2018

Teaching assistant for the following courses:

- PTYS 170B2 *The Universe and Humanity: Origins and Destiny* (Spring semester 2017 and 2018)
- PTYS 170A1 *Planet Earth: Evolution of the Habitable World* (Fall semester 2017)

All of these were general-education courses for non-science majors with class sizes between 40 and 80 students.

Institute for Theoretical Physics, Vienna University of Technology 2011–2014

Teaching assistant for the following courses:

- *Quantum Mechanics 1* (Fall semester 2014 and 2012)
- *Electrodynamics 1* (Spring semester 2013)
- *Mathematical Methods of Theoretical Physics* (Fall semester 2011)

All of these were upper-level courses aimed at Physics majors. I led weekly tutorial sections with class sizes of 20–30 students and taught review sessions for all students in the lecture section (ca. 100 students). about once/semester.

Outreach

German-language JWST First Images Event, Haus der Astronomie, Heidelberg, Germany July 2022

15-minute talk on the first JWST exoplanet spectrum as part of a 2-hour-long event with 5 speakers to an in-person audience of ca. 50 members of the general public and a livestream audience of 560. (<https://youtu.be/KNFxH81I39U?t=5884>; over 60,000 views as of November 2022)

Science Careers for Students at Oscar F. Smith High School, Chesapeake, Virginia May 2021

Panelist on a remote panel (via Zoom) for an audience of 16 high school students

Faszination Astronomie Online (Fascination Astronomy Online) February 2021

30-minute-long virtual talk in German titled "Wie photochemischer Dunst die Atmosphären von Exoplaneten verschleiert" (How Photochemical Hazes Obscure the Atmospheres of Exoplanet). Part of an outreach series organized by Haus der Astronomie Heidelberg (<https://youtu.be/-z8gRkC39ws>; over 1,500 views as of July 2022)

Lunar and Planetary Laboratory, University of Arizona 2016–2021

Volunteer at the graduate student outreach booth at a range of events

The Art of Planetary Science, University of Arizona 2017-2019

Volunteer at the art exhibition helping with setup, information desk, monitoring floors and taking down art after the event

University of Arizona Women's Hackathon 2016–2018

Member of the organizing committee of the University of Arizona Women's Hackathon (formerly Women Techmakers Tucson Hackathon)

Strange New Worlds: A Star Trek and Science Podcast 2017

Guest on Episode 18: *The Chemistry & Clouds of Hot Jupiters*

(<https://tinyurl.com/yyj5wx4b>) and Episode 52: *The Cloud Academy* (<https://tinyurl.com/yxr3y9lb>)

Physikmobil, Vienna 2012–2013

Physics outreach campaign

- Explained physics interactively to children (ages 6–14) with experiments using everyday life objects at schools, in public parks and at events

Media Coverage

SWR Aktuell, Südwestdeutscher Rundfunk July 2022

German-language interview for a news segment on JWST first images

Max Planck Society Newsroom July 2022

Quoted in article „The universe in a new dimension” / “Das Universum in einer neuen Dimension” (Published in English & German)

Exocast podcast January 2021

Episode “Exocast-48c: Monthly Exoplanet News” (<https://www.exocast.org/exocast-48c/>)

Science & Vie March 2020

Issue 1231 "Les voyageurs de l'au-delà", pp. 80-81. Also reprinted in the Chinese edition of Science & Vie.

MITgcm Blog August 2019

Featured paper and interview “Wild and Windy Exoplanets”

(<https://tinyurl.com/windyexoplanets>)

Professional & Departmental Service

Coordinator of the University of Chicago Exoplanet Journal Club 2024–2025

Coordinator of the University of Chicago Inclusion, Diversity and Equity in Astronomy Group 2024–current

Panelist for a Time Allocation Committee at the Space Telescope Science Institute 2024–2025

Referee for Nature Astronomy, Monthly Notices of the Royal Astronomical Society and Astronomy and Astrophysics 2023–current

External Reviewer for Time Allocation Committees at the Space Telescope Science Institute 2023–2024

Coordinator of the Planetary Agender, Non-binary, Women and Trans Scientists and Staff group (PLANETS-LPL), formerly Lunar and Planetary Laboratory Women's group 2016–2021

UA Graduate and Professional Student Council Travel Grant Judge 2018-2019

Member of the Lunar and Planetary Laboratory Conference (LPLC) planning committee
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References

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