David **Hägele**

PhD Student haegele@mpia.de

Education

Oct 2025–present — **Doctor of Philosophy in Astronomy**
Max Planck Institute for Astronomy · Heidelberg, Germany
Modeling of substellar atmospheres with focus on the radiative transfer. New approach of using Doppler mapping to model atmospheres in two dimensions with different columns.

Aug 2023–Sep 2025 — **Master of Science in Physics**
Heidelberg University, Max Planck Institute for Astronomy · Heidelberg, Germany
Focus on exoplanets, astronomy, and environmental physics. Thesis with Paul Mollière on a Python package to calculate high-resolution opacities.

Aug 2023–Jan 2024 — **Erasmus Semester**
Uppsala University · Uppsala, Sweden
Lectures on planetary and space physics and astronomy. Research project with Nikolai Piskunov on principal component analysis-based removal of telluric lines from generated synthetic transmission spectra of gas giant exoplanets.

Sep 2020–Aug 2023 — **Bachelor of Science in Physics**
Heidelberg University, Max Planck Institute for Astronomy · Heidelberg, Germany
Focus on astronomy and exoplanets. Thesis with Maria Steinrück on an enhanced parameterization of 1D vertical mixing in hot Jupiter atmospheres.

Publications

As first-author

1. Haegele, D. B., Mollière, P., Min, M. (2026): line racer: rapid calculation of exoplanet radiative opacities. Submitted to the Journal of Open Source Software.

As co-author

1. Steinrueck, M. E. et al. (incl. **David Haegele**, submitted): Limb asymmetries on WASP-39b: A Multi-GCM Comparison of Chemistry, Clouds, and Hazes. Submitted to The Astrophysical Journal, arXiv:2509.21588.
2. Espinoza, N., Steinrueck, M.E., Kirk, J. et al. (incl. **David Haegele**) Inhomogeneous terminators on the exoplanet WASP-39 b. Nature **632**, 1017–1020 (2024). https://doi.org/10.1038/s41586-024-07768-4

Software

- **line racer**: open source software to calculate high resolution opacities. Role: main developer. The documentation can be found here: https://line-racer.readthedocs.io/en/latest/.
- **petitRADTRANS**: open source software for calculating spectra of exoplanets and for running retrievals. Role: maintainer, part of the active development team. The documentation can be found here: https://petitradtrans.readthedocs.io/en/latest/.

Presentations

- Hors3s, Granada, Spain, contributed talk, July 2026
- Exoplanets VI, Porto, Portugal, poster presentation, June 2026
- A New Era in Exoplanet Atmosphere Observation and Characterisation (summer school), Bad Honnef, Germany, poster presentation, July 2025
- Spectroscopy of Exoplanets Over All Wavelength, Broxbourne, UK, contributed talk, June 2025

Teaching experience

- Abitur preparation tutor for math and physics (2020, 2022, 2024, 2025): Repetition of the content of two years and exercises in preparation for the final exams. Groups of 12 students for one week of 6 hours per day.