

Eva-Maria Ahrer

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EMPLOYMENT HISTORY

Jul 2024 – present	Postdoctoral Researcher MAX PLANCK INSTITUTE FOR ASTRONOMY (MPIA) · Heidelberg, Germany DLR (German Space Agency) grant, PI: Ahrer
Sep 2023 – Jun 2024	Postdoctoral Researcher MAX PLANCK INSTITUTE FOR ASTRONOMY (MPIA) · Heidelberg, Germany Advisors: Dr Thomas Mikal-Evans and Prof Laura Kreidberg
Jul 2023 – Aug 2023	Postdoctoral Researcher UNIVERSITY OF EXETER · Exeter, UK Advisors: Prof Nathan Mayne

EDUCATION

Oct 2019 – Aug 2023	Doctor of Philosophy in Physics UNIVERSITY OF WARWICK · Coventry, UK Supervisor: Prof Peter Wheatley
Oct 2018 – Sep 2019	Master of Philosophy in Physics UNIVERSITY OF CAMBRIDGE · Cambridge, UK Supervisors: Prof Didier Queloz & Dr Vinesh Maguire-Rajpaul
Oct 2015 – May 2018	Bachelor of Science UNIVERSITY OF VIENNA · Vienna, Austria Thesis supervisors: Prof Eberhard Widmann & Dr Martin Simon, <i>Stefan Meyer Institute</i>

GRANTS & AWARDS

- DLR (German Space Agency) grant for conducting my JWST research for 18 months (EUR 135,300; from July 2024 – December 2025)
- **SEM Faculty Thesis Prize 2023**, best PhD thesis within the Faculty of Science, Engineering and Medicine (SEM) at the University of Warwick in the Year 2023 (GBP 500)
- Warwick Astronomy Knowledge Exchange Program (WAKE) to visit Johns Hopkins University Applied Physics Laboratory (GBP 3,000; June 2022)
- RAS PhD travel grant (GBP 860; May 2022)

AWARDED OBSERVING TIME

JWST Guest Observer (GO) Programs

- **as PI:** Testing the C/O Ratio Prediction for Hot Jupiters from Disk-Free Migration (**11 hours**, GO 3154)
- **as Co-PI with J. Kirk:** Does atmospheric composition actually trace formation? Observing aligned vs misaligned hot Jupiters as a testbed (**49 hours**, GO 3838)
- **as Co-I:** Continuing the Legacy of AU Mic: Simultaneous FUV and NIR Observations of AU Mic b (51 hours, GO 5311)
- **as Co-I:** Starspots, Hazes, and Disequilibrium Chemistry: A Deep Dive into the Atmosphere of HAT-P-18b (16 hours, GO 5844)
- **as Co-I:** KRONOS: Keys to Revealing the Origin and Nature Of sub-neptune Systems (130 hours, GO 5959)
- **as Co-I:** Hot Jupiter Atmospheric Forecast: are mornings cloudier than evenings in other worlds? (62 hours, GO 3969)
- **as Co-I:** Putting it all Together: Dynamics and Chemistry Probed Through Transmission Spectroscopy of a Cloud-Free Exoplanet (7 hours, GO 4082)
- **as Co-I:** Chemistry and Clouds of a Temperate Jupiter (13 hours, GO 4227)

HST Guest Observer (GO) Programs

- as Co-I: Continuing the Legacy of AU Mic: Simultaneous FUV and NIR Observations of AU Mic b (24 orbits, GO 17613)

ESO Time Awarded

- **as PI:** The LRG-BEASTS Survey: Transmission Spectroscopy of Gaseous Exoplanets, a total of **34 nights** since 2021 with NTT/EFOSC2
- **as PI:** Transmission spectroscopy of hot gaseous exoplanets targeted by JWST, two proposals with **24 nights** in total, with NTT/EFOSC2
- as Co-I: Investigating the role of atmospheric metallicity in inflating the lowest-density hot Jupiter WASP-193b (7h, VLT/CRIRES+)
- as Co-I: LTT 9779b: the only planet in the Neptune desert with a gaseous envelope? (3 nights, NTT/EFOSC2)
- as Co-I: Transmission spectroscopy of the lowest density hot Jupiter (3 nights, NTT/EFOSC2)

PUBLICATIONS

(as of 5 Dec 2024, for up-to-date list see [NASA ADS Library](#))

As first-author

1. **E. Ahrer** et al. 2024, MNRAS, 530, 3, 2749: "Atmospheric characterization and tighter constraints on the orbital misalignment of WASP-94 A b with HARPS" [↗](#)
2. **E. Ahrer** et al. 2023, MNRAS, 521, 4, 5636: "LRG-BEASTS: Evidence for clouds in the transmission spectrum of HATS-46 b" [↗](#)
3. **E. Ahrer** et al. 2023, Nature, 614, 7949, 653: "Early Release Science of the exoplanet WASP-39b with JWST NIRCam" [↗](#)
4. **E. Ahrer** et al. 2022, MNRAS, 510, 4, 4857: "LRG-BEASTS: Sodium absorption and Rayleigh scattering in the atmosphere of WASP-94A b using NTT/EFOSC2" [↗](#)
5. **E. Ahrer** et al. 2021, MNRAS, 503, 1, 1248: "The HARPS search for southern extra-solar planets - XLV. Two Neptune mass planets orbiting HD 13808: a study of stellar activity modelling's impact on planet detection" [↗](#)

As co-author

1. R. Luque, et al. incl. **E. Ahrer**, 2024, submitted to AAS Journals, "A dark, bare rock for TOI-1685 b from a JWST NIRSpec G395H phase curve" [↗](#)
2. J. Kirk, **E. Ahrer**, et al. 2024, under review to MNRAS, "BOWIE-ALIGN: a transmission spectrum of the misaligned hot Jupiter WASP-15b" [↗](#)
3. B. Benneke, et al. incl **E. Ahrer** 2024, under review ApJL, "JWST Reveals CH₄, CO₂, and H₂O in a Metal-rich Miscible Atmosphere on a Two-Earth-Radius Exoplanet" [↗](#)
4. J. Kirk, **E. Ahrer**, et al. 2024, RASTI, 3, 691, "BOWIE-ALIGN: A JWST comparative survey of aligned vs misaligned hot Jupiters to test the dependence of atmospheric composition on migration history" [↗](#)
5. A. B. T. Penzlin & R. Booth, J. Kirk, J. Owen, **E. Ahrer** et al. 2024, MNRAS, 535, 171, "BOWIE-ALIGN: How formation and migration histories of giant planets impact atmospheric compositions" [↗](#)
6. C. Piaulet, et al. incl **E. Ahrer** 2024, ApJL, 974, L10, "JWST/NIRISS reveals the water-rich "steam world" atmosphere of GJ 9827 d" [↗](#)
7. N. Espinoza, et al. incl **E. Ahrer** 2024, Nature, 632, 1017, "Inhomogeneous terminators on the exoplanet WASP-39 b" [↗](#)
8. A. Carter & E. M. May, N. Espinoza, L. Welbanks, **E. Ahrer**, et al. 2024, Nature Astronomy, 8, 1008, "A Benchmark JWST Near-Infrared Spectrum for the Exoplanet WASP-39b" [↗](#)
9. T. J. Bell, et al. incl **E. Ahrer** 2024, Nature Astronomy, in press, "Nightside clouds and disequilibrium chemistry on the hot Jupiter WASP-43b" [↗](#)
10. M. Zamyatina, et al. incl **E. Ahrer** 2024, MNRAS, 529, 2, 1776, "Quenching-driven equatorial depletion and limb asymmetries in hot Jupiter atmospheres: WASP-96b example" [↗](#)
11. D. Powell, et al. incl **E. Ahrer** 2024, Nature, 626, 8001, 979: "Sulfur dioxide in the mid-infrared transmission spectrum of WASP-39b" [↗](#)
12. C. McGruder, et al. incl **E. Ahrer** 2023, AJ, 166, 3, 120: "ACCESS, LRG-BEASTS, and MOPSS: Featureless Optical Transmission Spectra of WASP-25b and WASP-124b" [↗](#)
13. L.-P. Coulombe, et al. incl **E. Ahrer** 2023, Nature, 620, 7973, 292: "A broadband thermal emission spectrum of the ultra-hot Jupiter WASP-18b" [↗](#)
14. J. Taylor, et al. incl **E. Ahrer** 2023, MNRAS, 524, 1, 817: "Awesome SOSS: Atmospheric characterisation of WASP-96 b using the JWST early release observations" [↗](#)

15. D. Grant, et al. incl **E. Ahrer** 2023, ApJL, 949, 1, L15: "Detection of Carbon Monoxide's 4.6 Micron Fundamental Band Structure in WASP-39b's Atmosphere with JWST NIRSpec G395H" [↗](#)
16. J. L. Bean, et al. incl **E. Ahrer** 2023, Nature, 618, 7963, 43: "High atmospheric metal enrichment for a Saturn-mass planet" [↗](#)
17. S. Tsai, et al. incl **E. Ahrer** 2023, Nature, 617, 7961, 483: "Direct Evidence of Photochemistry in an Exoplanet Atmosphere" [↗](#)
18. A. Feinstein, et al. incl **E. Ahrer** 2023, Nature, 614, 7949, 670: "Early Release Science of the exoplanet WASP-39b with JWST NIRISS" [↗](#)
19. L. Alderson, et al. incl **E. Ahrer** 2023, Nature, 614, 7949, 664: "Early Release Science of the exoplanet WASP-39b with JWST NIRSpec G395H" [↗](#)
20. Z. Rustamkulov, et al. incl **E. Ahrer** 2023, Nature, 614, 7949, 659: "Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM" [↗](#)
21. The JWST Transiting Exoplanet Community Early Release Science Team, **E. Ahrer** et al. 2023, Nature, 614, 7949, 649: "Identification of carbon dioxide in an exoplanet atmosphere" [↗](#)
22. T. J. Bell, **E. Ahrer** et al. 2022, JOSS, 7, 79, 4503: "Eureka!: An End-to-End Pipeline for JWST Time-Series Observations" [↗](#)
23. N. Unger et al. incl **E. Ahrer** 2021, A&A, 654, A104: "The HARPS search for southern extra-solar planets. XLVI: 12 super-Earths around the solar type stars HD39194, HD93385, HD96700, HD154088, and HD189567" [↗](#)

TEACHING & SUPERVISION

Students advised

- Patrick Staudt, Masters student, Max Planck Institute for Astronomy, Oct 2023 – Oct 2024 as a research assistant from Nov 2024 – summer 2025
- Melanie Bayer, student research assistant, since Nov 2024
- Djemma Ruseva, Summer Intern, Max Planck Institute for Astronomy, May 2024 – Aug 2024

Other teaching experience

- **Tutor at NEON Observing School**, Calar Alto Observatory, Spain, February 2025
- **Leader and Organiser at the International Astronomical Youth Camp (IAYC)**; leading eight participants through projects for three weeks in 2017, 2018, 2023, and its virtual replacement in 2020 and 2021
- **Laboratory Demonstrator**, 2nd Year Undergraduate Labs, University of Warwick, 2019 – 2022, with a nomination for the Warwick Awards for Teaching Excellence

TALKS

Seminars & Colloquia

- University of Leeds, Astrophysics Research Group, April 2024
- University of Leicester, Astrophysics Group, March 2024
- Königstuhl Colloquium, MPIA, November 2023
- Seminar at the UK Science and Technology Facilities Council (STFC) Strategy Team Meeting, Jun 2023
- University of Birmingham, Exoplanet Group Meeting, Jun 2023
- ESO Santiago, 30 minutes talk, Feb 2023
- University of Oxford, Early-Career Researcher Astrophysics Seminar, Jan 2023
- University of Exeter, Astrophysics Group, Jan 2023
- Observatoire de Genève, Exoplanets Seminar, April 2022
- Centre for Astrophysics (CfA) | Harvard & Smithsonian, Lunch Seminar, Mar 2021
- University of Heidelberg, Planet Formation Group Seminar, Jul 2020

Conference Talks

- Challenge Accepted: Linking Planet Formation with Present-Day Atmospheres, contributed talk, July 2024
- UK Exoplanet Community Meeting, keynote talk, April 2024
- Density Matters, Ringberg, contributed talk, Feb 2024
- Celebrating JWST's first six months of exoplanet data, Ringberg, contributed talk, Nov 2022
- UK Exoplanet Community Meeting, highlighted talk, Sep 2022
- ESO: Atmospheres, Atmospheres! Do I look like I care about atmospheres?, contributed talk, Aug 2021
- IAU: Communicating Astronomy with the Public (CAP), contributed talk, May 2021
- UK Exoplanet Community Meeting, contributed talk, Apr 2021

ACADEMIC SERVICE

Referee service

- Nature Astronomy (1)
- Astronomy & Astrophysics (A&A) (1)
- Journal of Open Source Software (1)
- The Astrophysical Journal Letters (1)
- Monthly Notices of the Royal Astronomical Society (1)

Conference Organising Committees

- Chair of Scientific (SOC) and Local Organising Committee (LOC), Peeking through JWST's noise: developing new techniques for exoplanet atmospheres, MPIA / Schloss Ringberg, 2025
- Local Organising Committee (LOC) Member, Challenge Accepted: Linking Planet Formation with Present-Day Atmospheres, MPIA 2024
- Chair of the session "Exoplanet Atmospheres in the 2020s and beyond" at the National Astronomy Meeting (NAM), University of Warwick, 2022
- Local Organising Committee (LOC) Member, National Astronomy Meeting (NAM), University of Warwick, 2022

Other

- Steering Committee Member for the BOWIE collaboration since September 2024
- Executive Committee Member for the STARGATE collaboration since July 2024
- Panel member for PhD interviews at the University of Warwick, Feb 2022

OUTREACH AND ED&I SERVICE

Service work

- Equality Committee member, Max Planck Institute for Astronomy, since January 2024
- Equitea seminar series committee member, University of Warwick, from Nov 2020 – Jan 2023
- Wellbeing and Peer Support Representative for the Physics Postgraduate students at the University of Warwick

Outreach work: International Workshop for Astronomy (IAYC)

- Board member, treasurer of the international organisation behind the IAYC, the International Workshop for Astronomy, overseeing budgets and all monetary decisions (of order 60,000-70,000 EUR per year)
- As a member we represent and grow an over 50-year-old organisation, e.g. we present at outreach community conferences and publish our efforts:
"Redefining Astronomy Summer Camps in the Age of the Pandemic: a Break from the IAYC's 50-Year History" by **E. Ahrer**, M. Archipley, H. S. Dalglish, D. Mortimer, CAP Proceedings 2021 [↗](#)
"Reaching Diverse Groups in Long-Term Astronomy Public Engagement Efforts" by M. Archipley, H. Dalglish, **E. Ahrer**, D. Mortimer, ASP2020 [↗](#)
- Leader and Organiser at the IAYC (see Teaching & Supervision)

Selected public engagements

- Invited Speaker at teacher training, Haus der Astronomie, Heidelberg, Nov 2024
- Invited Speaker at teacher training, Marburg, Feb 2024
- Public talk at the Open Day of the Max Planck Institute for Astronomy, Oct 2023
- Invited Speaker at SETI Live, Dec 2022
- Invited Speaker at "Faszination Astronomie Online", Dec 2022
- Panel member for the in-person and online event about the first scientific observations with JWST organised by the Royal Astronomical Society (RAS)