Eva-Maria **Ahrer**

Junior Research Group Leader ✉ ahrer@mpia.de

Employment History

Jun 2025 – present	**Junior Group Leader** Max Planck Institute for Astronomy (MPIA) · Heidelberg, Germany Max-Planck-Gesellschaft (MPG) Minerva Fast Track Fellowship
Jul 2024 – Dec 2025	**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 in Physics** University of Vienna · Vienna, Austria Thesis supervisors: Prof Eberhard Widmann & Dr Martin Simon, *Stefan Meyer Institute*

Grants & Awards

- DLR (German Space Agency) grant for conducting my independent JWST research programme for 18 months (**EUR** ∼**135,000**; 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 conduct a research visit at 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: UNITY: A Uniform JWST/NIRSpec Investigation of Hot-Jupiter Dayside Emission Across the Temperature Regime (113 hours, GO 10786)
- as Co-I: Unveiling the Mysteries of the warm Neptune GJ 436b: Probing the atmospheric composition and interior properties (14 hours, GO 11144)
- as Co-I: MIRI Clarity: Uncovering the Mysteries of Water Worlds and Sub-Neptunes in the Mid-Infrared (58 hours, GO 12157)

- as Co-I: A Definitive Transmission Survey of the Atmosphere of 55 Cnc e (7 hours, GO 12237)
- as Co-I: The Warm Jupiter Opportunity for Understanding Giant Exoplanet Evolution (60 hours, GO 9025)
- as Co-I: Resolving Atmospheric Uncertainties and Building a Legacy Dataset for WASP-39b (19 hours, GO 8017)
- as Co-I: Warm Jupiters: the next step in uncovering giant planet formation and migration (74 hours, GO 7982)
- as Co-I: KRONOS: Keys to Revealing the Origin and Nature Of sub-neptune Systems (130 hours, GO 5959)
- 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: Continuing the Legacy of AU Mic: Simultaneous FUV and NIR Observations of AU Mic b (51 hours, GO 5311)
- as Co-I: Chemistry and Clouds of a Temperate Jupiter (13 hours, GO 4227)
- 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: Hot Jupiter Atmospheric Forecast: are mornings cloudier than evenings in other worlds? (62 hours, GO 3969)

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 **37 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)

Other Telescope Time Awarded

- **as PI:** Stellar Activity Cycle Monitoring of Exoplanet Host Stars, 211 hours awarded (per year) with MPG 2.2m/FEROS at La Silla, monitoring campaign, 2026
- **as Co-PI:** Stellar activity causing exoplanet GJ3090b's atmosphere variability?, 17 hours awarded with MPG 2.2m/FEROS at La Silla, 2026
- **as Co-PI:** Tracing the link between Exoplanet Formation and Composition: Degeneracy-breaking Optical Observations of two of JWST's Transiting Exoplanets, **4 nights** NOT/ALFOSC, La Palma, 2026A
- **as PI:** Optical transmission spectra of exoplanet atmospheres targeted by JWST, **2 nights** with Calar Alto 2.2m/CAFOS, 2026A
- as Co-I: Optical transmission spectroscopy of JWST target WASP-84 b, 13 hours awarded with Calar Alto 2.2m/CAFOS at La Silla, Nov 2026; PI of this proposal is my PhD student Cinta Vidante
- as Co-I: Characterizing the atmosphere of a sub-Neptune that shouldn't have survived atmospheric escape, **2** $\times$ **0.5 nights** with Keck/NIRSPEC, Hawaii, 2025B

List of Publications

(as of 23th March 2026, for up-to-date list see *NASA ADS Library*)

- 8 first-author publications with 277 citations combined
- >2,600 citations combined, h-index of 23

As first-author

1. **E. Ahrer** et al. 2025c, MNRAS, 543, 2442: "BOWIE-ALIGN: weak spectral features in KELT-7b's JWST NIRSpec/G395H transmission spectrum imply a high cloud deck or a low-metallicity atmosphere"
2. **E. Ahrer** et al. 2025b, MNRAS, 540, 2535: "Tracing the formation and migration history: molecular signatures in the atmosphere of misaligned hot Jupiter WASP-94Ab using JWST NIRSpec/G395H"
3. **E. Ahrer** et al. 2025a, ApJL, 985, L10: "Escaping helium and a highly muted spectrum suggest a metal-enriched atmosphere on sub-Neptune GJ3090b from JWST transit spectroscopy"
4. **E. Ahrer** et al. 2024, MNRAS, 530, 2749: "Atmospheric characterization and tighter constraints on the orbital misalignment of WASP-94 A b with HARPS"
5. **E. Ahrer** et al. 2023b, MNRAS, 521, 5636: "LRG-BEASTS: Evidence for clouds in the transmission spectrum of HATS-46 b"
6. **E. Ahrer** et al. 2023a, Nature, 614, 653: "Early Release Science of the exoplanet WASP-39b with JWST NIRCam"

7. **E. Ahrer** et al. 2022, MNRAS, 510, 4857: "LRG-BEASTS: Sodium absorption and Rayleigh scattering in the atmosphere of WASP-94A b using NTT/EFOSC2"
8. **E. Ahrer** et al. 2021, MNRAS, 503, 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 first-author, invited comment

1. **E. Ahrer** 2025, Nature Astronomy : "Carbon dioxide in an exoplanetary atmosphere and the JWST revolution"

As co-author with significant contributions

1. C. Fairman, H. R. Wakeford, A. B. Claringbold, J. Kirk, **E. Ahrer**, et al. 2026, in press, "BOWIE-ALIGN: Exploring degeneracies in the muted transmission spectrum of the aligned hot Jupiter NGTS-2b with NIRSpec/G395H."
2. A. B. Claringbold, C. E. Fisher, J. Kirk, **E. Ahrer**, et al. 2026, MNRAS, in press, "BOWIE-ALIGN: Sub-solar C/O ratio and metallicity atmosphere of the misaligned hot Jupiter HAT-P-30b"
3. A. Meech, A. B. Claringbold, **E. Ahrer**, et al. 2025, MNRAS, 539, 1381, "BOWIE-ALIGN: Sub-stellar metallicity and carbon depletion in the aligned TrES-4b with JWST NIRSpec transmission spectroscopy"
4. S. Schmidt, et al. incl. **E. Ahrer**, 2025, AJ, 170, 298, "A Comprehensive Reanalysis of K2-18 b's JWST NIRISS+NIRSpec Transmission Spectrum"
5. J. Kirk, **E. Ahrer**, et al. 2025, MNRAS, 537, 3027, "BOWIE-ALIGN: a transmission spectrum of the misaligned hot Jupiter WASP-15b"
6. R. Luque, et al. incl. **E. Ahrer**, 2025, AJ, 170, 49, "A dark, bare rock for TOI-1685 b from a JWST NIRSpec G395H phase curve"
7. C. Gapp, et al. incl **E. Ahrer** 2025, AJ, 169, 341, "WASP-121 b's transmission spectrum observed with JWST/NIRSpec G395H reveals thermal dissociation and SiO in the atmosphere"
8. T. Evans-Soma, et al. incl **E. Ahrer** 2025, Nature Astronomy, in press "SiO and a super-stellar C/O ratio in the atmosphere of the giant exoplanet WASP-121 b"
9. 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"
10. 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"
11. 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"
12. The JWST Transiting Exoplanet Community Early Release Science Team, **E. Ahrer** et al. 2023, Nature, 614, 649: "Identification of carbon dioxide in an exoplanet atmosphere"
13. T. J. Bell, **E. Ahrer** et al. 2022, JOSS, 7, 79, 4503: "Eureka!: An End-to-End Pipeline for JWST Time-Series Observations"

Supervised students' papers

1. P. Staudt, **E. Ahrer** et al. 2026, under review at MNRAS, "LRG-BEASTS: High-altitude aerosols in the atmosphere of WASP-69 b using WHT/ACAM and NTT/EFOSC2"

As co-author

1. A. B. Claringbold, P. J. Wheatley, J. Kirk, **E. Ahrer** et al. 2026, MNRAS, in press, "LRG-BEASTS: detection of sodium absorption and Rayleigh scattering in the hot Saturn HAT-P-44b"
2. A. Feinstein, et al. incl **E. Ahrer** 2026, under review at AAS journals, "On Linking Planet Formation Models, Protoplanetary Disk Properties, and Mature Gas Giant Exoplanet Atmospheres"
3. I. J. M. Crossfield, **E. Ahrer**, et al. 2026, AJ, 994, 184, "Mapping the SO2 Shoreline in Gas Giant Exoplanets"
4. V. Bourrier, et al. incl **E. Ahrer** 2025, A&A, 701, A190, "ATREIDES: I. Embarking on a trek across the exo-Neptunian landscape with the TOI-421 system"
5. L.-P. Coulombe, et al. incl **E. Ahrer** 2025, AJ, 170, 226, "Possible Evidence for the Presence of Volatiles on the Warm Super-Earth TOI-270 b"
6. C. Cadieux, et al. incl. **E. Ahrer**, 2025, AJ, 170, 154, "Detailed Architecture of the L 98-59 System and Confirmation of a Fifth Planet in the Habitable Zone"
7. C. Piaulet, et al. incl **E. Ahrer** 2024, ApJL, 974, L10, "JWST/NIRISS reveals the water-rich "steam world" atmosphere of GJ 9827 d"
8. N. Espinoza, et al. incl **E. Ahrer** 2024, Nature, 632, 1017, "Inhomogeneous terminators on the exoplanet WASP-39 b"
9. B. Benneke, et al. incl **E. Ahrer** 2024, arXiv, "JWST Reveals CH_4, CO_2, and H_2O in a Metal-rich Miscible Atmosphere on a Two-Earth-Radius Exoplanet"
10. T. J. Bell, et al. incl **E. Ahrer** 2024, Nature Astronomy, in press, "Nightside clouds and disequilibrium chemistry on the hot Jupiter WASP-43b"

11. M. Zamyatina, et al. incl **E. Ahrer** 2024, MNRAS, 529, 1776, "Quenching-driven equatorial depletion and limb asymmetries in hot Jupiter atmospheres: WASP-96b example"
12. D. Powell, et al. incl **E. Ahrer** 2024, Nature, 626, 979: "Sulfur dioxide in the mid-infrared transmission spectrum of WASP-39b"
13. C. McGruder, et al. incl **E. Ahrer** 2023, AJ, 166, 120: "ACCESS, LRG-BEASTS, and MOPSS: Featureless Optical Transmission Spectra of WASP-25b and WASP-124b"
14. L.-P. Coulombe, et al. incl **E. Ahrer** 2023, Nature, 620, 292: "A broadband thermal emission spectrum of the ultra-hot Jupiter WASP-18b"
15. J. Taylor, et al. incl **E. Ahrer** 2023, MNRAS, 524, 817: "Awesome SOSS: Atmospheric characterisation of WASP-96 b using the JWST early release observations"
16. D. Grant, et al. incl **E. Ahrer** 2023, ApJL, 949, L15: "Detection of Carbon Monoxide's 4.6 Micron Fundamental Band Structure in WASP-39b's Atmosphere with JWST NIRSpec G395H"
17. J. L. Bean, et al. incl **E. Ahrer** 2023, Nature, 618, 43: "High atmospheric metal enrichment for a Saturn-mass planet"
18. S. Tsai, et al. incl **E. Ahrer** 2023, Nature, 617, 483: "Direct Evidence of Photochemistry in an Exoplanet Atmosphere"
19. A. Feinstein, et al. incl **E. Ahrer** 2023, Nature, 614, 670: "Early Release Science of the exoplanet WASP-39b with JWST NIRISS"
20. L. Alderson, et al. incl **E. Ahrer** 2023, Nature, 614, 664: "Early Release Science of the exoplanet WASP-39b with JWST NIRSpec G395H"
21. Z. Rustamkulov, et al. incl **E. Ahrer** 2023, Nature, 614, 659: "Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM"
22. 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

- Cinta Vidante, **PhD student**, principal supervisor, Max Planck Institute for Astronomy, Jun 2025 – present
- Patrick Staudt, **Masters student**, principal supervisor, Max Planck Institute for Astronomy, Oct 2023 – Oct 2024 as a full-time research assistant Nov 2024 – Jan 2026
- Saitej Amonkar, **Masters student**, principal supervisor, Max Planck Institute for Astronomy, Feb 2026 – present
- Melanie Bayer, principal supervisor, part-time student research assistant, Max Planck Institute for Astronomy Nov 2024 – present
- Djemma Ruseva, co-supervision, summer intern, Max Planck Institute for Astronomy, May 2024 – Aug 2024

Teaching experience

- **Lecturer** for Bachelor seminar on exoplanets, University of Heidelberg, summer semester 2026
- **Lecturer** for impact of JWST on the science of exoplanets at "Astrophysics with the James Webb Space Telescope", Physics Department at ENS de Lyon, Jan 2026
- **Tutor at NEON Observing School**, Calar Alto Observatory, Spain, Feb 2025 (2 weeks)
- **Leader and Organiser at the International Astronomical Youth Camp (IAYC);** leading 8-9 participants through projects for 3 weeks in 2017, 2018, 2023, and its virtual replacement in 2020, 2021
- **Laboratory Demonstrator**, 2nd Year Undergraduate Labs, University of Warwick, 2019 – 2022, with a nomination for the **Warwick Awards for Teaching Excellence**

Selected Talks

Seminars & Colloquia

- University of Bern, Center for Space & Habitability Colloquia, Mar 2026
- University of Cambridge, Exoplanet Seminar, Feb 2025
- University of Leeds, Astrophysics Research Group, Apr 2024
- University of Leicester, Astrophysics Group, Mar 2024
- Königstuhl Colloquium, MPIA, Nov 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, Apr 2022
- Centre for Astrophysics (CfA) | Harvard & Smithsonian, Lunch Seminar, Mar 2021

Conference Talks

- Exoplanets VI, contributed talk, Jun 2026
- The Fate of Neptunian Worlds: exploring demographics, atmospheres and evolution, **invited** review talk, Sep 2025
- Exoclimes VII, contributed talk, Jul 2025
- EAS Session: New Frontiers in Characterising Gas-Giant Exoplanets and Brown Dwarfs, **invited** review talk, Jun 2025
- EAS Session: The chemistry of planet formation, **invited** review talk, Jun 2025
- Challenge Accepted: Linking Planet Formation with Present-Day Atmospheres, contributed talk, Jul 2024
- UK Exoplanet Community Meeting, keynote talk, Apr 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
- UK Exoplanet Community Meeting, contributed talk, Apr 2021

Academic Service

Referee service

- Nature Astronomy, Astronomy & Astrophysics (A&A), Journal of Open Source Software (JOSS), The Astronomical Journal (AJ), The Astrophysical Journal Letters (ApJL), Monthly Notices of the Royal Astronomical Society (MNRAS), RAS Techniques and Instruments (RASTI)

Conference Organising Committees

- **Co-Chair** of Organising Committee, "Signal in the Noise: The Ringberg Workshop on JWST Exoplanet Observations", 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 Committee Work

- Steering Committee Member for the BOWIE collaboration since September 2024
- Executive Committee Member for the STARGATE collaboration since July 2024
- PhD interview hiring committee, MPIA, Nov 2023 – Feb 2024
- PhD interview panel, University of Warwick, Feb 2023

Outreach and ED&I service

Service work

- Equality Committee member, Max Planck Institute for Astronomy, Jan 2024 – present
- 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, from 2021 – 2025
- 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. Dalgleish, D. Mortimer, CAP Proceedings 2021
  "Reaching Diverse Groups in Long-Term Astronomy Public Engagement Efforts" by M. Archipley, H. Dalgleish, **E. Ahrer**, D. Mortimer, ASP2020
- Leader and Organiser at the IAYC (see Teaching & Supervision)

Selected public and media engagements

- Invited guest for podcast series “Science Tea Time”, Munich, Bayerischer Rundfunk (BR), Mar 2026,
- Invited Speaker at “Pint of Science” Heidelberg, Jun 2025
- Invited Speaker at “Astro & Co”, online discussion about biosignatures on K2-18b, Haus der Astronomie, Apr 2025
- Invited Speaker at teacher training, Haus der Astronomie, Heidelberg, 1h lecture on current challenges in exoplanet science, Nov 2024
- Invited Speaker at teacher training, Marburg, 1h lecture on JWST and what it can do for exoplanet atmospheres, Feb 2024
- Public talk at the Open Day of the Max Planck Institute for Astronomy, Oct 2023
- Invited Speaker at SETI Live, press work for the JWST Early Release Science Transiting Exoplanet Community Team, Dec 2022
- Invited Speaker at “Faszination Astronomie Online”, press work for the JWST Early Release Science Transiting Exoplanet Community Team, 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)