

Martin Schlecker

POSTDOCTORAL RESEARCHER · EXOPLANETEER · OPEN SCIENCE ENTHUSIAST

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Education and Experience

Postdoctoral Researcher

Tucson, AZ, USA

UNIVERSITY OF ARIZONA

since 2022

Study planetary habitability in the context of planet formation and exoplanet demographics
Inform next-generation exoplanet missions via statistical hypothesis testing
Contribute to a scalable solution for atmospheric CO₂ removal

PhD (Dr. rer. nat.) in Astronomy

Heidelberg, Germany

MAX PLANCK INSTITUTE FOR ASTRONOMY/UNIVERSITY OF HEIDELBERG

2017 – 2021

Thesis: *The Architectures of Planetary Systems: Population Synthesis Meets Observations*
Advisors: Thomas Henning, Hubert Klahr
Fellow of the International Max Planck Research School (IMPRS) for Astronomy and Cosmic Physics

Master of Science (MSc) in Nuclear, Particle and Astrophysics

Munich, Germany

TECHNICAL UNIVERSITY OF MUNICH

2013 – 2017

Thesis @European Southern Observatory (ESO): *Irregular Variability in Kepler Photometry*
Discovered and characterized a new exoplanet candidate

Bachelor of Science (BSc) in Physics

Munich, Germany

TECHNICAL UNIVERSITY OF MUNICH

2010 – 2013

Thesis @Max-Planck Institute for Extraterrestrial Physics: *Alignment and Calibration of the X-Ray Telescope μ ROSI*

Teaching, Leadership, and Outreach

Popular science article: Kleine M-Sterne überraschen mit Gasriesen

Sterne und Weltraum (Circulation: 16'000 copies)

Authored popular science article on giant planets around M dwarfs (in German)

Aug. 2022

Guest lecturer: Introduction to Space Travel

University of Applied Sciences Upper Austria Steyr

Held a lecture on Solar System formation

Nov. 2021

Research Advisor: Bachelor Student Antonia Seifert (Uni Heidelberg)

MPIA Heidelberg

Designed and guided Bachelor project (Planetary systems around M dwarfs)

Apr. 2021 – Jul. 2021

Team Lead: EDEN Transit Survey

MPIA Heidelberg/University of Arizona

Coordinated a team of 14 observers; managed ~180 nights (CAHA 1.23m)

Jun. 2018 – Jan. 2021

Research Advisor: Summer Student Dang Pham (Cornell)

MPIA Heidelberg

Designed and guided summer project (see *paper*)

Jul. 2019 – Jan. 2021

Teaching Assistant: Numerical Methods Block Course

Heidelberg University

Held lectures and tutorials on numerical methods for BSc/MSc students

Feb. 2018, Feb. 2020

Author: Q&A feature

All About Space Magazine

Wrote a short article about planet formation around Population III stars

Nov. 2019

Invited Speaker: Student Information Day

Berufshochschule Technik, Augsburg

Advised senior grade students on perspectives in the natural sciences

Apr. 2017

Team Lead: MOVE II Cubesat

Scientific Workgroup for Rocketry and Spaceflight

Head of communications and ground control; successful launch in Dec. 2018

Jan. 2011 – Apr. 2015

Tutor: Math Prep Course for Physics Students

Technical University of Munich

Taught 30 first year students in mathematical concepts in physics

Sep. 2011

Selected Presentations

Density Matters Ringberg Meeting

CONTRIBUTED CONFERENCE TALK

Ringberg Castle

Feb. 2024

Exoplanet Team Meeting

INVITED SEMINAR

Universitäts-Sternwarte München, LMU

Feb. 2024

Stellar Coffee and Planetary Tea

INVITED SEMINAR

ESO Garching

Feb. 2024

TOP Seminar

INVITED SEMINAR

Observatoire de la Côte d'Azur, Nice

Feb. 2024

ROCKE-3D Journal Club

INVITED SEMINAR

NASA Goddard Institute for Space Studies (virtual)

Dec. 2023

ISM Seminar

INVITED SEMINAR

University of Groningen

Jul. 2023

Institutsseminar

INVITED COLLOQUIUM

DLR Berlin

Jul. 2023

Origins Seminar

INVITED SEMINAR

University of Arizona

May 2023

AstroBio23: Oxygen in Planetary Biospheres

CONTRIBUTED CONFERENCE TALK

Green Bank Observatory

May 2023

ET Science Seminar Series

INVITED SEMINAR

Shanghai Astronomical Observatory (virtual)

Jan. 2023

Forming and Exploring Habitable Worlds

CONTRIBUTED CONFERENCE TALK

University of Edinburgh

Nov. 2022

JPL Astrophysics Luncheon Seminar

INVITED SEMINAR

NASA JPL (virtual)

Apr. 2022

ESO workshop: The Star-Planet Connection

CONTRIBUTED CONFERENCE TALK

Santiago de Chile (virtual)

Oct. 2021

Königstuhl Colloquium

INVITED COLLOQUIUM

MPIA (virtual)

Jun. 2021

MIT Exoplanet Tea

INVITED SEMINAR

MIT Kavli Institute (virtual)

Nov. 2020

Exoplanet Demographics Conference

CONTRIBUTED CONFERENCE TALK

NExSci, IPAC/Caltech (virtual)

Nov. 2020

CfA Stars & Planets Seminar

INVITED SEMINAR

Harvard & Smithsonian (CfA) (virtual)

Nov. 2020

Institute Colloquium

INVITED COLLOQUIUM

Tautenburg Observatory

Jun. 2019

Planet Formation and Evolution Conference

CONTRIBUTED CONFERENCE TALK

University of Rostock

Mar. 2019

Japanese-German Meeting on Exoplanets and Planet Formation

CONTRIBUTED CONFERENCE TALK

Edesheim

Sep. 2018

Ad Valvas Seminar

INVITED SEMINAR

KU Leuven

Jul. 2018

Community Services

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| 2023 | Speaker: “How to PhD” , Lunch with a Steward Scientist | University of Arizona |
| 2023 | Reviewer for a graduate research fellowship (New Frontiers Initiative) , NSF/University of Illinois | |
| 2023 | EDEN Science Workshop: SOC+LOC , Organized an international conference | virtual |
| 2022 | Subject-matter expert panelist for a research program review , NASA | |
| since 2022 | Lead developer of the python package arxiv-scan , personalized literature recommendations | |
| 2021 | Science Data Officer for a Mars analog mission , Austrian Space Forum | Innsbruck/Negev |
| 2021 | Journal Referee , Astronomy & Astrophysics | |
| 2017–2021 | PhD Student Representative , Intl. Max Planck Research School | Heidelberg |
| 2017–2021 | Fellowship Selection Board , Intl. Max Planck Research School | Heidelberg |
| 2020 | Co-organized Climate Hackathon , Scientists for Future | virtual |
| 2019 | MPIA Half Marathon Fundraise , Raised 2000+ EUR for rare disease research (Milly’s Mission) | Heidelberg |
| 2019 | HGSFP Winter School: SOC+LOC , Co-organized a winter school for 60 participants | Obergurgl |
| 2018 | Japanese-German Meeting on Planet Formation: SOC+LOC , Co-organized an international workshop | Edesheim |

Observing Experience

Accepted PI proposal:

31 nights **2.2 m MPG/ESO telescope** [La Silla Observatory](#)

Observations:

18 nights **1.23 m telescope** [Calar Alto Observatory](#)
13 nights **2.2 m MPG/ESO telescope** [La Silla Observatory](#)
12 nights **61” Kuiper telescope** [Mount Bigelow Observatory](#)
8 nights **1.8 m Vatican Advanced Technology Telescope** [Mount Graham International Observatory](#)
4 nights **1.22 m telescope** [Asiago Astrophysical Observatory](#)
2 nights **1.8 m telescope** [Asiago Astrophysical Observatory](#)
1 night **92 cm telescope** [Asiago Astrophysical Observatory](#)

Publications

refereed: 44 — first author: 5 — citations: 1158 — h-index: 20 (2024-02-26) — [ads search](#)

Lead Author

- 5 **Schlecker, M.**; Apai, D.; Lichtenberg, T. *et al.*, *Bioverse: The Habitable Zone Inner Edge Discontinuity as an Imprint of Runaway Greenhouse Climates on Exoplanet Demographics*, PSJ, 5, 3, 2024 ([arXiv:2309.04518](#))
- 4 **Schlecker, M.**; Burn, R.; Sabotta, S. *et al.*, *RV-detected planets around M dwarfs: Challenges for core accretion models*, A&A, 664, 2022 ([arXiv:2205.12971](#))
- 3 **Schlecker, M.**; Pham, D.; Burn, R. *et al.*, *The New Generation Planetary Population Synthesis (NGPPS). V. Predetermination of planet types in global core accretion models*, A&A, 656, 2021 ([arXiv:2104.11750](#))
- 2 **Schlecker, M.**; Mordasini, C.; Emsenhuber, A. *et al.*, *The New Generation Planetary Population Synthesis (NGPPS). III. Warm super-Earths and cold Jupiters: a weak occurrence correlation, but with a strong architecture-composition link*, A&A, 656, 2021 ([arXiv:2007.05563](#))
- 1 **Schlecker, M.**; Kossakowski, D.; Brahm, R. *et al.*, *A Highly Eccentric Warm Jupiter Orbiting TIC 237913194*, AJ, 160, 275, 2020 ([arXiv:2010.03570](#))

Co-Author

- 39 Mallorquín, M. *et al.*, *TOI-1801 b: A temperate mini-Neptune around a young M0.5 dwarf*, A&A, 680, 2023 ([arXiv:2310.10244](#))

- 38 Desgrange, C. et al., *Planetary system architectures with low-mass inner planets. Direct imaging exploration of mature systems beyond 1 au*, A&A, 680, 2023 (arXiv:2310.06035)
- 37 Eberhardt, J. et al., *Three Warm Jupiters around Solar-analog Stars Detected with TESS*, AJ, 166, 271, 2023
- 36 Hobson, M. J. et al., *TOI-199 b: A Well-characterized 100 day Transiting Warm Giant Planet with TTVs Seen from Antarctica*, AJ, 166, 201, 2023 (arXiv:2309.14915)
- 35 Pale, E. et al., *GJ 806 (TOI-4481): A bright nearby multi-planetary system with a transiting hot low-density super-Earth*, A&A, 678, 2023 (arXiv:2301.06873)
- 34 Murgas, F. et al., *Two super-Earths at the edge of the habitable zone of the nearby M dwarf TOI-2095*, A&A, 677, 2023 (arXiv:2304.09220)
- 33 Gupta, A. F. et al., *A High-Eccentricity Warm Jupiter Orbiting TOI-4127*, AJ, 165, 234, 2023 (arXiv:2303.14570)
- 32 Brahm, R. et al., *Three Long-period Transiting Giant Planets from TESS*, AJ, 165, 227, 2023 (arXiv:2304.02139)
- 31 Trifonov, T. et al., *TOI-2525 b and c: A Pair of Massive Warm Giant Planets with Strong Transit Timing Variations Revealed by TESS*, AJ, 165, 179, 2023 (arXiv:2302.05694)
- 30 Dietrich, J.; Apai, D.; **Schlecker, M.** et al., *EDEN Survey: Small Transiting Planet Detection Limits and Constraints on the Occurrence Rates of Planets around Late-M Dwarfs within 15 pc*, AJ, 165, 149, 2023 (arXiv:2302.04138)
- 29 Ribas, I. et al., *The CARMENES search for exoplanets around M dwarfs. Guaranteed time observations Data Release 1 (2016-2020)*, A&A, 670, 2023 (arXiv:2302.10528)
- 28 Kossakowski, D. et al., *The CARMENES search for exoplanets around M dwarfs. Wolf 1069 b: Earth-mass planet in the habitable zone of a nearby, very low-mass star*, A&A, 670, 2023 (arXiv:2301.02477)
- 27 Chaturvedi, P. et al., *TOI-1468: A system of two transiting planets, a super-Earth and a mini-Neptune, on opposite sides of the radius valley*, A&A, 666, 2022 (arXiv:2208.10351)
- 26 Ulmer-Moll, S. et al., *Two long-period transiting exoplanets on eccentric orbits: NGTS-20 b (TOI-5152 b) and TOI-5153 b*, A&A, 666, 2022 (arXiv:2207.03911)
- 25 Luque, R. et al., *The HD 260655 system: Two rocky worlds transiting a bright M dwarf at 10 pc*, A&A, 664, 2022 (arXiv:2204.10261)
- 24 Mollière, P. et al., *Interpreting the Atmospheric Composition of Exoplanets: Sensitivity to Planet Formation Assumptions*, ApJ, 934, 74, 2022 (arXiv:2204.13714)
- 23 Kemmer, J. et al., *Discovery and mass measurement of the hot, transiting, Earth-sized planet, GJ 3929 b*, A&A, 659, 2022 (arXiv:2202.00970)
- 22 Espinoza, N. et al., *A Transiting, Temperate Mini-Neptune Orbiting the M Dwarf TOI-1759 Unveiled by TESS*, AJ, 163, 133, 2022 (arXiv:2202.01240)
- 21 González-Álvarez, E. et al., *A multi-planetary system orbiting the early-M dwarf TOI-1238*, A&A, 658, 2022 (arXiv:2111.14602)
- 20 Kossakowski, D. et al., *TOI-1201 b: A mini-Neptune transiting a bright and moderately young M dwarf*, A&A, 656, 2021 (arXiv:2109.09346)
- 19 Burn, R.; **Schlecker, M.**; Mordasini, C. et al., *The New Generation Planetary Population Synthesis (NGPPS). IV. Planetary systems around low-mass stars*, A&A, 656, 2021 (arXiv:2105.04596)
- 18 Trifonov, T. et al., *A Pair of Warm Giant Planets near the 2:1 Mean Motion Resonance around the K-dwarf Star TOI-2202*, AJ, 162, 283, 2021 (arXiv:2108.05323)

- 17 Sabotta, S.; **Schlecker, M.**; Chaturvedi, P. et al., *The CARMENES search for exoplanets around M dwarfs. Planet occurrence rates from a subsample of 71 stars*, A&A, 653, 2021 (arXiv:2107.03802)
- 16 Lin, C. et al., *EDEN: Flare Activity of the Nearby Exoplanet-hosting M Dwarf Wolf 359 Based on K2 and EDEN Light Curves*, AJ, 162, 11, 2021
- 15 Amado, P. J. et al., *The CARMENES search for exoplanets around M dwarfs. Two terrestrial planets orbiting G 264-012 and one terrestrial planet orbiting Gl 393*, A&A, 650, 2021 (arXiv:2105.13785)
- 14 Hobson, M. J. et al., *A Transiting Warm Giant Planet around the Young Active Star TOI-201*, AJ, 161, 235, 2021 (arXiv:2103.02685)
- 13 Addison, B. C. et al., *TOI-257b (HD 19916b): a warm sub-saturn orbiting an evolved F-type star*, MNRAS, 502, 3704, 2021 (arXiv:2001.07345)
- 12 Dreizler, S. et al., *The CARMENES search for exoplanets around M dwarfs. LP 714-47 b (TOI 442.01): populating the Neptune desert*, A&A, 644, 2020 (arXiv:2011.01716)
- 11 Stock, S. et al., *The CARMENES search for exoplanets around M dwarfs. Three temperate-to-warm super-Earths*, A&A, 643, 2020 (arXiv:2010.00474)
- 10 Brahm, R. et al., *TOI-481 b and TOI-892 b: Two Long-period Hot Jupiters from the Transiting Exoplanet Survey Satellite*, AJ, 160, 235, 2020 (arXiv:2009.08881)
- 9 Kemmer, J. et al., *Discovery of a hot, transiting, Earth-sized planet and a second temperate, non-transiting planet around the M4 dwarf GJ 3473 (TOI-488)*, A&A, 642, 2020 (arXiv:2009.10432)
- 8 Nowak, G. et al., *The CARMENES search for exoplanets around M dwarfs. Two planets on opposite sides of the radius gap transiting the nearby M dwarf LTT 3780*, A&A, 642, 2020 (arXiv:2003.01140)
- 7 Jahnke, K. et al., *An astronomical institute's perspective on meeting the challenges of the climate crisis*, Nature Astronomy, 4, 812, 2020 (arXiv:2009.11307)
- 6 Bluhm, P. et al., *Precise mass and radius of a transiting super-Earth planet orbiting the M dwarf TOI-1235: a planet in the radius gap?*, A&A, 639, 2020 (arXiv:2004.06218)
- 5 Gibbs, A. et al., *EDEN: Sensitivity Analysis and Transiting Planet Detection Limits for Nearby Late Red Dwarfs*, AJ, 159, 169, 2020 (arXiv:2002.10017)
- 4 Espinoza, N. et al., *HD 213885b: a transiting 1-d-period super-Earth with an Earth-like composition around a bright ($V = 7.9$) star unveiled by TESS*, MNRAS, 491, 2982, 2020 (arXiv:1903.07694)
- 3 Kossakowski, D. et al., *TOI-150b and TOI-163b: two transiting hot Jupiters, one eccentric and one inflated, revealed by TESS near and at the edge of the JWST CVZ*, MNRAS, 490, 1094, 2019 (arXiv:1906.09866)
- 2 Morales, J. C. et al., *A giant exoplanet orbiting a very-low-mass star challenges planet formation models*, Science, 365, 1441, 2019 (arXiv:1909.12174)
- 1 Luque, R. et al., *Planetary system around the nearby M dwarf GJ 357 including a transiting, hot, Earth-sized planet optimal for atmospheric characterization*, A&A, 628, 2019 (arXiv:1904.12818)

Preprints & Other

- 6 Murgas, F. et al., *Wolf 327b: A new member of the pack of ultra-short-period super-Earths around M dwarfs*, ArXiv, 2024 (arXiv:2401.12150)
- 5 Jones, M. I. et al., *A long-period transiting substellar companion in the super-Jupiters to brown dwarfs mass regime and a prototypical warm-Jupiter detected by TESS*, ArXiv, 2024 (arXiv:2401.09657)
- 4 **Schlecker, M.**, *The architectures of planetary systems: Population synthesis meets observations*, Ph.D. Thesis, 2021

- 3 **Schlecker, M.**, *lcps: Light curve pre-selection*, Astrophysics Source Code Library, 2018
- 2 **Schlecker, M.**, *Irregular Variability in Kepler Photometry*, Master's Thesis, 2016
- 1 Tiedemann, L. et al., *The development of the μ ROS X-ray telescope*, SPIE, 8859, 885905, 2013