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 CO_2 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 μROSI*

Selected Presentations

ISM Seminar — *University of Groningen*

Invited Seminar — *Jul. 2023*

Institutsseminar — *DLR Berlin*

Invited Colloquium — *Jul. 2023*

Origins Seminar — *University of Arizona*

Invited Seminar — *May 2023*

AstroBio23: Oxygen in Planetary Biospheres — *Green Bank Observatory*

Contributed Conference Talk — *May 2023*

ET Science Seminar Series — *Shanghai Astronomical Observatory (virtual)*

Invited Seminar — *Jan. 2023*

Forming and Exploring Habitable Worlds — *University of Edinburgh*

Contributed Conference Talk — *Nov. 2022*

JPL Astrophysics Luncheon Seminar — *NASA JPL (virtual)*

Invited Seminar — *Apr. 2022*

ESO workshop: The Star-Planet Connection — *Santiago de Chile (virtual)*

Contributed Conference Talk — *Oct. 2021*

Königstuhl Colloquium — *MPIA (virtual)*

Invited Colloquium — *Jun. 2021*

MIT Exoplanet Tea — *MIT Kavli Institute (virtual)*

Invited Seminar — *Nov. 2020*

Exoplanet Demographics Conference — *NExScI, IPAC/Caltech (virtual)*

Contributed Conference Talk — *Nov. 2020*

CfA Stars & Planets Seminar — *Harvard & Smithsonian (CfA) (virtual)*

Invited Seminar — *Nov. 2020*

Institute Colloquium — *Tautenburg Observatory*

Invited Colloquium — *Jun. 2019*

Planet Formation and Evolution Conference — *University of Rostock*
Contributed Conference Talk — *Mar. 2019*

Japanese-German Meeting on Exoplanets and Planet Formation — *Edesheim*
Contributed Conference Talk — *Sep. 2018*

Ad Valvas Seminar — *KU Leuven*
Invited Seminar — *Jul. 2018*

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 — *Berufsoberschule 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*

Community Services

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: 40 — first author: 5 — citations: 982 — h-index: 19 (*2023-10-18*) — *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*, ArXiv, 2023 (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

35 Palle, 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

7 Mallorquín, M. *et al.*, *TOI-1801 b: A temperate mini-Neptune around a young M0.5 dwarf*, ArXiv, 2023 (arXiv:2310.10244)

6 Desgrange, C. *et al.*, *Planetary system architectures with low-mass inner planets: Direct imaging exploration of mature systems beyond 1 au*, ArXiv, 2023 (arXiv:2310.06035)

5 Hobson, M. J. *et al.*, *TOI-199 b: A well-characterized 100-day transiting warm giant planet with TTVs seen from Antarctica*, ArXiv, 2023 (arXiv:2309.14915)

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 μROSI X-ray telescope*, SPIE, 8859, 885905, 2013