

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

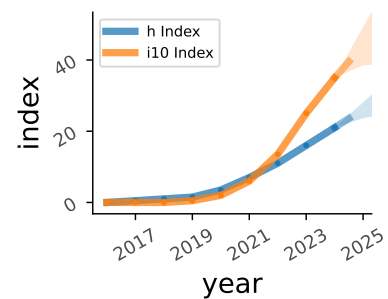
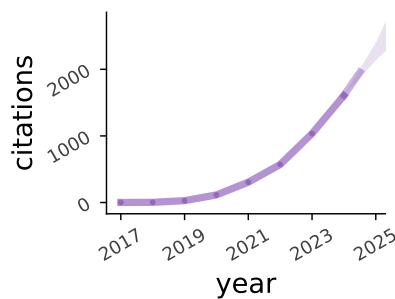
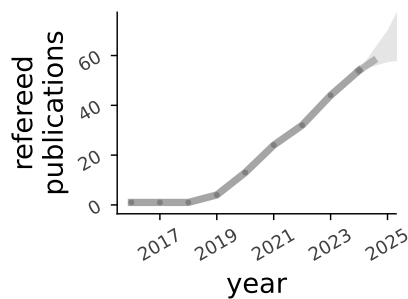
Munich, Germany

TECHNICAL UNIVERSITY OF MUNICH

2010 – 2013

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

Metrics



Teaching, Leadership, and Outreach

Founder: Space Night Augsburg

Augsburg

Initiated science communication and charity event (>100 in-person participants)

since Mar. 2024

Guest lecturer: Astrobiology

University of Arizona

Held a lecture on rocky planet habitability

Apr. 2024

Popular science article: Kleine M-Sterne überraschen mit Gasriesen

Sterne und Weltraum (printed circulation: 16'000)

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

MPIA Heidelberg

Designed and guided Bachelor project (Antonia Seifert, Uni Heidelberg)

Primary advisor for summer project (Dang Pham, Cornell. See [paper](#))

Jul. 2019 – 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

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

Wrote a short article about planet formation around Population III stars

[All About Space Magazine](#)

Nov. 2019

Invited Speaker: Student Information Day

Advised senior grade students on perspectives in the natural sciences

[Berufsbildungsschule Technik, Augsburg](#)

Apr. 2017

Team Lead: MOVE II Cubesat

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

[Scientific Workgroup for Rocketry and Spaceflight](#)

Jan. 2011 – Apr. 2015

Tutor: Math Prep Course for Physics Students

Taught 30 first year students in mathematical concepts in physics

[Technical University of Munich](#)

Sep. 2011

Selected Presentations

Centre for Origin and Prevalence of Life Seminar

INVITED SEMINAR

[ETH Zürich](#)

Aug. 2024

Center for Integrative Planetary Science (CIPS) Seminar

INVITED SEMINAR

[UC Berkeley \(virtual\)](#)

Mar. 2024

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

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

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

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

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*

Awards

2024	Research grant (USD 15,200) , JWST Cycle 2 program JWST-GO-03731.009-A (PI: M. Schlecker)	<i>Baltimore, USA</i>
2023	NASA PI Launchpad , Competitive mission development program and travel grant	<i>U Michigan, USA</i>
2016	Mobility grant , TUM Physics Department	<i>Garching, Germany</i>
2013	Travel Award , TUMexchange Program	<i>Munich/Singapore</i>
2012	Best Business Plan , UnternehmerTUM Business Plan Seminar	<i>Garching, Germany</i>
2007	Outstanding Performance Award , MAN Training Center	<i>Augsburg, Germany</i>
2007	Talent Promotion , “Begabtenförderung Berufliche Bildung”, Chamber of Trade and Industry	<i>Augsburg, Germany</i>

Publications

refereed: 57 — first author: 6 — citations: 1611 — h-index: 23 (2024-12-17) — [ads search](#)

Lead Author

- 6 **Schlecker, M.**; Apai, D.; Affholder, A.; Ranjan, S. *et al.*, [Bioverse: Potentially Observable Exoplanet Biosignature Patterns Under the UV Threshold Hypothesis for the Origin of Life](#), submitted
- 5 **Schlecker, M.**; Apai, D.; Lichtenberg, T.; Bergsten, G. *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](#)) [7 citations]

- 4 **Schlecker, M.**; Burn, R.; Sabotta, S.; Seifert, A. et al., *RV-detected planets around M dwarfs: Challenges for core accretion models*, A&A, 664, 2022 ([arXiv:2205.12971](#)) [44 citations]
- 3 **Schlecker, M.**; Pham, D.; Burn, R.; Alibert, Y. 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](#)) [44 citations]
- 2 **Schlecker, M.**; Mordasini, C.; Emsenhuber, A.; Klahr, H. 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](#)) [71 citations]
- 1 **Schlecker, M.**; Kossakowski, D.; Brahm, R.; Espinoza, N. et al., *A Highly Eccentric Warm Jupiter Orbiting TIC 237913194*, AJ, 160, 275, 2020 ([arXiv:2010.03570](#)) [26 citations]

Co-Author

- 52 Heidari, N. et al., *Characterization of seven transiting systems including four warm Jupiters from SOPHIE and TESS*, A&A, in press ([arXiv:2412.08527](#))
- 51 Vítková, M. et al., *TOI-4504: Exceptionally large Transit Timing Variations induced by two resonant warm gas giants in a three planet system*, ApJL, in press ([arXiv:2412.05609](#))
- 50 Hardegree-Ullman, K. K.; Apai, D.; Haffert, S. Y.; **Schlecker, M.** et al., *Bioverse: GMT and ELT Direct Imaging and High-Resolution Spectroscopy Assessment – Surveying Exo-Earth O₂ and Testing the Habitable Zone Oxygen Hypothesis*, AJ, in press ([arXiv:2405.11423](#))
- 49 Barnes, R. et al., *History and Habitability of the LP 890-9 Planetary System*, PSJ, in press ([arXiv:2412.02743](#))
- 48 Cesario, L. et al., *Large Interferometer For Exoplanets (LIFE): XIV. Finding terrestrial protoplanets in the galactic neighborhood*, A&A, 692, 2024 ([arXiv:2410.13457](#))
- 47 Carleo, I. et al., *Mass determination of two Jupiter-sized planets orbiting slightly evolved stars: TOI-2420 b and TOI-2485 b*, A&A, 690, 2024 ([arXiv:2408.05612](#))
- 46 Mallorquín, M. et al., *Revisiting the dynamical masses of the transiting planets in the young AU Mic system: Potential AU Mic b inflation at 20 Myr*, A&A, 689, 2024 ([arXiv:2407.16461](#))
- 45 Gill, S. et al., *Correction to: TOI-2447 b / NGTS-29 b: a 69-day Saturn around a Solar analogue*, MNRAS, 533, 109, 2024 ([arXiv:2405.07367](#))
- 44 Gill, S. et al., *TOI-2447 b / NGTS-29 b: a 69-day Saturn around a Solar analogue*, MNRAS, 532, 1444, 2024
- 43 Kuzuhara, M. et al., *Gliese 12 b: A Temperate Earth-sized Planet at 12 pc Ideal for Atmospheric Transmission Spectroscopy*, ApJ, 967, 2024 ([arXiv:2405.14708](#))
- 42 Goffo, E. et al., *TOI-4438 b: a transiting mini-Neptune amenable to atmospheric characterization*, A&A, 685, 2024 ([arXiv:2403.09833](#)) [3 citations]
- 41 Murgas, F. et al., *Wolf 327b: A new member of the pack of ultra-short-period super-Earths around M dwarfs*, A&A, 684, 2024 ([arXiv:2401.12150](#)) [4 citations]
- 40 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*, A&A, 683, 2024 ([arXiv:2401.09657](#)) [4 citations]
- 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](#)) [7 citations]
- 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](#)) [2 citations]

- 37 Eberhardt, J. et al., *Three Warm Jupiters around Solar-analog Stars Detected with TESS*, AJ, 166, 271, 2023 ([arXiv:2402.17592](#)) [8 citations]
- 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](#)) [9 citations]
- 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](#)) [10 citations]
- 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](#)) [14 citations]
- 33 Gupta, A. F. et al., *A High-Eccentricity Warm Jupiter Orbiting TOI-4127*, AJ, 165, 234, 2023 ([arXiv:2303.14570](#)) [9 citations]
- 32 Brahm, R. et al., *Three Long-period Transiting Giant Planets from TESS*, AJ, 165, 227, 2023 ([arXiv:2304.02139](#)) [10 citations]
- 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](#)) [16 citations]
- 30 Dietrich, J.; Apai, D.; **Schlecker, M.**; Hardegree-Ullman, K. K. 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](#)) [7 citations]
- 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](#)) [47 citations]
- 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](#)) [20 citations]
- 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](#)) [17 citations]
- 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](#)) [23 citations]
- 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](#)) [19 citations]
- 24 Mollière, P. et al., *Interpreting the Atmospheric Composition of Exoplanets: Sensitivity to Planet Formation Assumptions*, ApJ, 934, 74, 2022 ([arXiv:2204.13714](#)) [104 citations]
- 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](#)) [11 citations]
- 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](#)) [17 citations]
- 21 González-Álvarez, E. et al., *A multi-planetary system orbiting the early-M dwarf TOI-1238*, A&A, 658, 2022 ([arXiv:2111.14602](#)) [10 citations]
- 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](#)) [29 citations]
- 19 Burn, R.; **Schlecker, M.**; Mordasini, C.; Emsenhuber, A. et al., *The New Generation Planetary Population Synthesis (NGPPS). IV. Planetary systems around low-mass stars*, A&A, 656, 2021 ([arXiv:2105.04596](#)) [140 citations]

- 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) [18 citations]
- 17 Sabotta, S.; **Schlecker, M.**; Chaturvedi, P.; Guenther, E. W. 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) [104 citations]
- 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 [20 citations]
- 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) [21 citations]
- 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) [34 citations]
- 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) [46 citations]
- 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) [34 citations]
- 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) [40 citations]
- 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) [31 citations]
- 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) [35 citations]
- 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) [66 citations]
- 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) [28 citations]
- 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) [42 citations]
- 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) [22 citations]
- 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) [56 citations]
- 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) [23 citations]
- 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) [104 citations]
- 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) [118 citations]

Preprints & Other

- 6 Tala Pinto, M. et al., *Three Warm Jupiters orbiting TOI-6628, TOI-3837, TOI-5027 and one sub-Saturn orbiting TOI-2328*, ArXiv, 2024 (arXiv:2412.02069)

- 5 Hardegree-Ullman, K. K.; Apai, D.; Haffert, S. Y.; **Schlecker, M.** et al., *Bioverse: GMT and ELT Direct Imaging and High-Resolution Spectroscopy Assessment – Surveying Exo-Earth O₂ and Testing the Habitable Zone Oxygen Hypothesis*, ArXiv, 2024 ([arXiv:2405.11423](https://arxiv.org/abs/2405.11423))
- 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 [2 citations]
- 1 Tiedemann, L. et al., *The development of the μ ROS X-ray telescope*, SPIE, 8859, 885905, 2013