

Steward Observatory
University of Arizona
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EMPLOYMENT

2022 - **Associate Professor of Astronomy with tenure**, University of Arizona
2018 - 2022 **Assistant Professor of Astronomy**, University of Arizona
2014 - 2018 **Research Scientist (Level III, Permanent Staff)**, NASA-Jet Propulsion Laboratory/California Institute of Technology
Visiting Associate in Physics, California Institute of Technology
2012 - 2014 **Postdoctoral Researcher**, University of Pennsylvania
2009 - 2012 **CCAPP Postdoctoral Fellow**, Ohio State University

EDUCATION

2009 **PhD in Astronomy**, (Dr. rer. nat.), University of Bonn, Germany
2006 - 2009 International Max Planck Research School (IMPRS) of Astronomy and Astrophysics, Bonn, Germany
2005 **Diplom in Physics**, University of Bonn, Germany

AWARDS (PI ONLY)

2022 DOE AI/HEP Accelerating cosmological inference for LSST and DESI with neural networks
2019 DOE Early Career Multi-Probe Cosmology with DES and LSST
2017 NASA ATP Kinematic Weak Lensing with space missions and ground-based surveys
2016 NASA ATP Modeling the Universe – Interfacing Numerical Simulations, Theory, Statistical Methods, and Observations
2016 NASA ADAP Analyzing Planck and low redshift data sets with advanced statistical methods

TEACHING (PRIMARY INSTRUCTOR)

- *General education level (UArizona):*
 - 2019 (S) "The Physical Universe" (ASTR170B)
 - 2021 (F) "Cosmology" (ASTR201)
- *Astronomy/Physics majors level (UArizona):*
 - 2020 (S) "Computational Physics" (PHYS305)
- *Graduate student level (UArizona):*
 - 2020 (F) "Extragalactic Astronomy and Cosmology (ASTR541)
 - 2022 (S) "Machine Learning and Data Mining in Astronomy" (ASTR502)
 - 2022, 2023 (F) "Computational and Statistical Methods for Astrophysics" (ASTR513)
 - 2022, 2023(F) "Introduction to Computing" (ASTR501)
- Lecturer, ICTP-SAIFR winter school "Observational Cosmology" , 2019
- Lecturer, University of Michigan "Cosmology Summer School" , 2020

SCIENCE LEADERSHIP

Nancy Grace Roman Space Telescope (launch 2026)

- Co-I PIT “Maximizing Cosmological Science with the Roman High Latitude Imaging Survey” (2023-) (co-lead: Cosmological Parameter Inference Group)
- Co-I WFS team (large) “Kinematic Lensing with the Roman Space Telescope” (2023-)
- Co-I SIT “Cosmology with the High Latitude Survey” (2016-2021)

Vera Rubin Observatory - Dark Energy Science Collaboration (DESC)

- DESC Operations Committee (2019 - 2021)
- Lead Forecaster DESC science requirement document (DESC Collaboration et al 2017)
- Co-Convener “Weak Lensing Working Group” (2017- 2019)

SPHEREx NASA mid explorer mission (launch 2025)

- Co-I SPHEREx Science Team

Dark Energy Spectroscopic Instrument (DESI)

- Co-lead DESC-DESI interface task force (2023-)

Dark Energy Survey (DES)

- Co-Convener “Theory and Combined Probes Working Group” (2019 - 2021)
- Co-Lead DES Y6 Task Force: (Quantifying science gain of an extended DES survey) (2016)
- Builder and Associate Member (DES data rights, authorship rights on DES papers)

Lead Developer CosmoLike <https://github.com/CosmoLike>

CosmoLike (Krause & Eifler, 2017) is a versatile software framework for cosmological data analysis. It is designed to fast and accurately solve the problem of jointly analyzing correlated large-scale structure probes of the Universe. It includes advanced modeling routines for astrophysical systematics and analytic covariance computation capabilities that calculate statistical cross-correlation terms between different probes. It has been used in multiple DES data analyses, LSST-DESC forecasting and science requirement documents, and Roman science return forecasts.

SERVICE

Tucson Initiative for Minoritized student Engagement in Science and TEchnology Program (TIMESTEP)

- Co-I of program and lead for computational workshops
- Organizer and mentor for multiple research internships in cosmological data analysis per semester

Panel Reviewer, Referee:

DOE Office of Science Graduate Student Research Program; DOE ASCR Leadership Computing Challenge; NASA HST TAC; NASA Postdoctoral Program; NASA ROSES ATP; NSF AAG; European Research Council (Starting Grants); Dutch Research Council (NWO) VIDI; Referee for MNRAS and ApJ since ' 10 and ' 12, respectively

Workshop/Conference Organizer:

20th annual international Conference on Particle Physics and Cosmology (COSMO-16), session on " Cosmic Probes and Future Experiments" ; SnowPAC 2018, session on " Software and Computing" ; LSST Project and Community Workshop 2019 SOC; chair SOC LSSTC workshop on " Synergies of LSST and suborbital missions" , DESC collaboration meeting at UArizona 2020

UArizona, Department of Astronomy:

Grad admission committee (2018-2023, chair 2020), Bok postdoctoral fellowship selection committee (2021/22), Steward Observatory Advisory Committee (2020-2022), Academic Program Committee (2022-)

PUBLICATIONS

318 publications (241 refereed in major science journals, all others pending refereeing) with a total of 23917 citations (22623 citations in refereed Journals), h-index=68 (refereed) according to NASA/ADS Metrics Summary (Aug 2023).

Selected significant publications

1. Boruah, S. S., **Eifler, T.**, et al., *Accelerating cosmological inference with Gaussian processes and neural networks -- an application to LSST Y1 weak lensing and galaxy clustering*, MNRAS, 518, 4, (2023)
2. Xu, J., **Eifler, T.**, et al., *Kinematic Lensing with the Roman Space Telescope*, MNRAS 519, 2, (2023)
3. Fang, X., **Eifler, T.**, et al., *Cosmology from clustering, cosmic shear, CMB lensing, and cross correlations: combining Rubin observatory and Simons Observatory*, MNRAS, 509, 5721, (2022)
4. **Eifler, T.**, et al *Cosmology with the Roman Space Telescope – Multi-Probe Strategies*, MNRAS, 507, 2, (2021)
5. **Eifler, T.**, et al *Cosmology with the Roman Space Telescope – Synergies with the Rubin Observatory Legacy Survey of Space and Time*, MNRAS, 507, 1, (2021)
6. Huang, H.-J., **Eifler, T.**, et al, *Dark Energy Survey Year 1 Results: Constraining Baryonic Physics in the Universe*, MNRAS, 502, 4, (2020)
7. DES Collaboration et al (incl Eifler): *Cosmological Constraints from Multiple Probes in the Dark Energy Survey*, Physical Review Letters, 122, 171301, (2019)
8. Friedrich, O., & **Eifler, T.**, *Precision matrix expansion - efficient use of numerical simulations in estimating errors on cosmological parameters*, MNRAS, 473, 4150, (2018)
9. The LSST Dark Energy Science Collaboration, Mandelbaum, R., **Eifler, T.**, et al., *The LSST Dark Energy Science Collaboration (DESC) Science Requirements Document*, arXiv e-prints, arXiv:1809.01669, (2018)
10. Krause, E., & **Eifler, T.**, *cosmolike - cosmological likelihood analyses for photometric galaxy surveys*, MNRAS, 470, 2100, (2017)