Tim Eifler CV

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Education

Feb 2009 **PhD in Astronomy** (Dr. rer. nat.), Argelander Institute for Astronomy, University of Bonn

2006 - 2009 **Member of the International Max Planck Research School of Astronomy and Astrophysics** (MPIfR Bonn)

March 2005 "**Diplom" in Physics**, University of Bonn

Employment

since April 2014 **Research Scientist** at NASA Jet Propulsion Laboratory/California Institute of Technology
Visiting Associate in Physics, California Institute of Technology

March 2012 - March 2014 **Postdoctoral Researcher** at the University of Pennsylvania's Center for Particle Cosmology

Sept 2009 - March 2012 **CCAPP Fellow** at the Ohio State University's Center for Cosmology and Astro-Particle Physics

Teaching Experience

2002-2004 Problem-solving section Introduction to Statistics Lecture (UBonn)
2005/06/07 Problem-solving section Introduction to Extragalactic Astronomy (UBonn)
2006/07/08 Problem-solving section Cosmology Lecture (graduate level) (UBonn)
2007/08/09 **Seminar on Statistical Methods in Astronomy** (UBonn)

2010-2012 **Organizing Cosmology JournalClub** (CCAPP, Ohio State University)

2014 **Teaching Astro 012 Lecture**, "Introduction to Astrophysics II", (University of Pennsylvania)

2014/2015 **Mentor of 3 SURF** (summer undergraduate research fellowship) students at JPL/Caltech

PROFESSIONAL EXPERIENCE

- **51 publications** in (or submitted to) major, peer reviewed journals

- **LSST-DESC** (Large Synoptic Survey Telescope-Dark Energy Science Collaboration)
  - **Leading Task Force on "Advanced Statistical Methods for Cosmological Parameter Inference"**

- **DES** (Dark Energy Survey)**:**
  - **Builder Status** (authorship on all DES key science papers)
  - **Associate Member Status** (DES data rights, postdoc supervision rights at non-DES institutions)
  - **Leading the correlation functions and covariances analysis group** within the DES Weak Lensing Working Group
  - **Leading "Essential DES Project":** Developing Multi-Probe Analysis Pipelines for DES
  - **Member of the DES computing task force**

- **Collaborator SPHEREx** (NASA SMEX mission proposal, selected for Phase A study)

- **Co-I SuperBIT** (Superpressure Balloon-borne Imaging Telescope) mission, launch 2017/18

- **High-Performance Computing: Developed and implemented the CosmoLike Multi-Probe Analysis Framework** at the US-National Energy Research Scientific Computing Center (NERSC) and at the JPL High Performance Computing Facilities

- **Data analysis:** Participation in various ground/space based cosmological data analyses
  - **SDSS (ground):** Sloan Digital Sky Survey (Huff, Eifler, et al 2014)
  - **COSMOS (space):** Cosmic evolution survey (Schrabback et al 2007, 2010)
  - **CFHTLS (ground):** Canada-France-Hawaii Legacy Survey (Eifler et al 2010)
  - **GaBoDs (ground):** the Garching-Bonn deep survey (Hildebrandt et al 2007)
  - **DES (ground)**: The DES collaboration et al (2015) and references therein

- **Referee for the Astrophysical Journal and the Monthly Notices of the Royal Astronomical Society (since 2010)**

- **Talks/workshops (most recent):**
  - Munich 2015: Invited talk at the Excellence Cluster Universe
  - Pittsburgh 2015: Invited talk at the Carnegie Mellon University
  - Davis 2015: Invited talk at the UC Davis Physics Department
  - **3x invited to Aspen Center for Physics workshops:**
    - "Impact of baryons on WL parameter constraints" 2012
    - "The next decade of Weak Lensing Science" 2013
    - "Combining Probes in Cosmological Surveys" 2014

List of Publications
Refereed:

1. Bechtol, K. *et al.* Eight New Milky Way Companions Discovered in First-Year Dark Energy Survey Data. *Astrophys. J.* **807,** 50 (2015).
2. Buddendiek, A. *et al.* Optical and Sunyaev-Zel' dovich observations of a new sample of distant rich galaxy clusters in the ROSAT All Sky. *Mon. Not. R. Astron. Soc.* **450,** 4248–4276 (2015).
3. Chang, C. *et al.* Modeling the Transfer Function for the Dark Energy Survey *Astrophys. J.* **801,** 73 (2015).
4. Chang, C. *et al.* Wide-Field Lensing Mass Maps from DES Science Verification Data. PRL, 115, 5, id.051301 (2015).
5. Diehl, H. T. *et al.* The Dark Energy Survey and operations: Year 1. *Proc. SPIE* **9149,** 91490V (2014).
6. Drlica-Wagner, A. *et al.* Search for Gamma-Ray Emission from DES Dwarf Spheroidal Galaxy Candidates with Fermi-LAT Data, APJ, **809**, 1, 8 (2015)
7. Eifler, T., Kilbinger, M. & Schneider, P. Comparing cosmic shear measures. *Astron. Astrophys.* **482,** 9–19 (2008).
8. Eifler, T., Krause, E., Schneider, P. & Honscheid, K. Combining probes of large-scale structure with COSMOLIKE. *Mon. Not. R. Astron. Soc.* **440,** 1379–1390 (2014).
9. Eifler, T., Schneider, P. & Hartlap, J. Dependence of cosmic shear covariances on cosmology. *Astron. Astrophys.* **502,** 721–731 (2009).
10. Eifler, T., Schneider, P. & Krause, E. Measuring cosmic shear with the ring statistics. *Astron. Astrophys.* **510,** A7 (2010).
11. Eifler, T. Weak-lensing statistics from the Coyote Universe. *Mon. Not. R. Astron. Soc.* **418,** 536–544 (2011).
12. Eifler, T. *et al.* Accounting for baryonic effects in cosmic shear tomography: Determining a minimal set of nuisance parameters using PCA. *MNRAS* , 454, 3, 2451-2471 (2015).
13. Goldstein, D. A. *et al.* Automated Transient Identification in the Dark Energy Survey. The Astronomical Journal, Volume 150, Issue 3, article id. 82, 15 pp. (2015)
14. Hildebrandt, H. *et al.* GaBoDS: The Garching-Bonn Deep Survey VIII. Lyman-break galaxies in the ESO Deep Public Survey. *Astron. Astrophys.* **462,** 865–873 (2007).
15. Huff, E. M. *et al.* Seeing in the dark - II. Cosmic shear in the Sloan Digital Sky Survey. *Mon. Not. R. Astron. Soc.* **440,** 1322–1344 (2014).
16. Joachimi, B., Schneider, P. & Eifler, T. Analysis of two-point statistics of cosmic shear III. Covariances of shear measures made easy. *Astron. Astrophys.* **477,** 43–54 (2008).
17. Kilbinger, M., Schneider, P. & Eifler, T. E- and B-mode mixing from incomplete knowledge of the shear correlation. *Astron. Astrophys.* **457,** 15–19 (2006).
18. Kitching, T. D. *et al.* Image analysis for cosmology: results from the GREAT10 Galaxy Challenge. *Mon. Not. R. Astron. Soc.* **423,** 3163–3208 (2012).
19. Krause, E., Schneider, P. & Eifler, T. A new third-order cosmic shear statistic: separating E-/B-mode correlations on a finite interval. *Mon. Not. R. Astron. Soc.* **423,** 3011–3017 (2012).

20. Papadopoulos, A. *et al.* DES13S2cmm: the first superluminous supernova from the Dark Energy Survey. *Mon. Not. R. Astron. Soc.* **449,** 1215–1227 (2015).
21. Schneider, P., Eifler, T. & Krause, E. COSEBIs: Extracting the full E-/B-mode information from cosmic shear correlation functions. *Astron. Astrophys.* **520,** A116 (2010).
22. Schrabback, T. *et al.* Cosmic shear analysis of archival HST/ACS data: I. Comparison of early ACS pure parallel data to the HST/GEMS Survey. *Astron. Astrophys.* **468,** 823–847 (2007).
23. Schrabback, T. *et al.* Evidence of the accelerated expansion of the Universe from weak lensing tomography with COSMOS. *Astron. Astrophys.* **516,** A63 (2010).
24. Vanderveld, R. A., Mortonson, M. J., Hu, W. & Eifler, T. Testing dark energy paradigms with weak gravitational lensing. *Phys. Rev. D* **85,** 103518 (2012).
25. Yuan, F. *et al.* OzDES multifibre spectroscopy for the Dark Energy Survey: first-year operation and results. *Mon. Not. R. Astron. Soc.* **452,** 3047–3063 (2015).
26. Zentner, A. R. *et al.* Accounting for baryons in cosmological constraints from cosmic shear. *Phys. Rev. D* **87,** 043509 (2013).

Under Review:

1. Agnello, A. , Discovery of two gravitationally lensed quasars in the Dark Energy Survey. *eprint arXiv:1508.01203* (2015)
2. Becker, M. R. *et al.* Cosmic Shear Measurements with DES Science Verification Data. *eprint arXiv:1507.05598* (2015).
3. Bonnett, C. *et al.* Redshift distributions of galaxies in the DES Science Verification shear catalogue and implications for weak lensing. *eprint arXiv:1507.05909* (2015).
4. Comparat, J. *et al*. The SDSS-IV eBOSS emission-line galaxy pilot survey, eprint arXiv:1509.05045, (2015)
5. Crocce, M. *et al.* Galaxy clustering, photometric redshifts and diagnosis of systematics in the DES Science Verification data. *eprint arXiv:1507.05360* (2015).
6. Doré, O. *et al.* Cosmology with the SPHEREX All-Sky Spectral Survey. *eprint arXiv:1412.4872* 1–38 (2014).
7. Friedrich, O., Seitz, S., Eifler, T. F., Gruen, D., Performance of internal Covariance Estimators for Cosmic Shear Correlation Functions, *eprint arXiv:1508.00895* (2015)
8. Gerdes, D. W. *et al.* Observation of Two New L4 Neptune Trojans in the Dark Energy Survey Supernova Fields. *eprint arXiv:1507.05177* (2015).
9. Giannantonio, T. *et al.* CMB lensing tomography with the DES Science Verification galaxies. *eprint arXiv:1507.05551* (2015).
10. Gruen, D. *et al.* Weak lensing by galaxy troughs in DES Science Verification data. *eprint arXiv:1507.05090* 15**,** 1–15 (2015).
11. Huff, E. M., Krause, E., Eifler, T., George, M. R. & Schlegel, D. Cosmic shear without shape noise. *eprint arXiv:1311.1489* (2013).
12. Jouvel, S. et al. Photometric redshifts and clustering of emission line galaxies selected jointly by DES and eBOSS, *eprint: arXiv150907121J* (2015)
13. Jarvis, M. *et al.* The DES Science Verification Weak Lensing Shear Catalogs. *eprint arXiv:1507.05603* (2015).

14. Kessler, R. *et al.* The Difference Imaging Pipeline for the Transient Search in the Dark Energy Survey. *eprint arXiv:1507.05137* (2015).
15. Krause, E., Eifler, T. & Blazek, J. The impact of intrinsic alignment on current and future cosmic shear surveys. *eprint arXiv:1506.08730* (2015).
16. Leistedt, B. *et al.* Mapping and simulating systematics due to spatially-varying observing conditions in DES Science Verification data. *eprint arXiv:1507.05647* (2015).
17. Luque, E. *et al.* Digging deeper into the Southern skies: a compact Milky-Way companion discovered in first-year Dark Energy Survey data. *eprint arXiv:1508.02381* (2015)
18. Poci, A. *et al.* DESAlert: Enabling Real-Time Transient Follow-Up with Dark Energy Survey Data. *eprint arXiv:1504.02996* (2015).
19. Rozo, E. *et al.* redMaGiC: Selecting Luminous Red Galaxies from the DES Science Verification Data. *eprint arXiv:1507.05460* (2015).
20. Saro, A. *et al.* Constraints on the Richness-Mass Relation and the Optical-SZE Positional Offset Distribution for SZE-Selected Clusters. *eprint arXiv:1506.07814* (2015).
21. Suchyta, E. *et al.* No galaxy left behind: accurate measurements with the faintest objects in the Dark Energy Survey. *eprint arXiv:1507.08336* (2015).
22. The Dark Energy Survey Collaboration *et al.* Cosmology from Cosmic Shear with DES Science Verification Data. *eprint arXiv:1507.05552* (2015).
23. The Dark Energy Survey Collaboration *et al.* Eight New Milky Way Companions Discovered in First-Year Dark Energy Survey Data. *eprint arXiv:1503.02584* (2015).
24. The Dark Energy Survey Collaboration *et al.* Eight Ultra-faint Galaxy Candidates Discovered in Year Two of the Dark Energy Survey, *eprint arXiv:1508.03622* (2015)
25. Zhang, Y. *et al.* Galaxies in X-ray Selected Clusters and Groups in Dark Energy Survey Data: Stellar Mass Growth of Bright Central Galaxies Since z~1.2. *eprint arXiv:1504.02983* (2015).