Anik Halder

(he/him/his)

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Citizenship: Indian

Education

Feb 2024	**PhD Physics**, *(magna cum laude) Ludwig-Maximilians-Universität München*, Germany.
March 2020	**MSc Astrophysics**, *(distinction) Ludwig-Maximilians-Universität München*, Germany.
June 2017	**BSc Physics**, *(distinction) Jacobs University Bremen*, Germany.
May 2014	**High school graduation (AISSCE)**, *Hem Sheela Model School*, Durgapur, India.

Employment

University of Cambridge, United Kingdom

Nov 2024 - present
Research Associate, *Institute of Astronomy & Kavli Institute for Cosmology, Cambridge*.
- Conducting research projects in gravitational lensing and galaxy formation and evolution.
- IoA Colloquium and KICC CMB-LSS seminar organiser.
- Postdoctoral Associate at Jesus College, Cambridge contributing to academic and college events.

Ludwig-Maximilians-Universität München, Germany

Jan 2019 - Dec 2023
Teaching and Research Assistant, *University Observatory Munich & Max Planck Institute for Extraterrestrial Physics Garching*.
- Conducting research projects in weak gravitational lensing cosmology.
- Supervision of student projects, labs and courses.
- Extragalactic Astronomy research group seminar organiser.

Heinz Maier-Leibnitz Research Centre, Garching, Germany

Nov 2017 - Dec 2018
Software Developer, *Scientific Computing group*.
- Developer of the small-angle x-ray scattering software BornAgain.

Internships

Instituto de Astrofisica de Canarias, Tenerife, Spain

June 2017 - Aug 2017
DAAD RISE Weltweit Scholar 2017.
- Quantifying the demographics of Boxy/Peanut structures in edge-on galaxies in the local Universe.

University of St Andrews, United Kingdom

June 2016 - Aug 2016
DAAD RISE Weltweit Scholar 2016.
- Analysis and validation of realistic synthetic observations of star-forming clouds.

Fraunhofer Institute for Laser Technology, Aachen, Germany

July 2015 - Aug 2015
Department of Lasers and optics.
- Model validation of thermal surface deformation of optical lenses due to laser beams.

Awards

Dec 2022	Awarded the Early Career Scientist Travel Grant from the Dark Energy Survey (DES) to attend collaboration-wide meeting. Also invited to present research in the Special Session on New Results from DES at the 241st American Astronomical Society Meeting, Seattle, USA.
Mar 2022	Awarded a grant from the DAAD RISE Germany programme to host an international undergraduate student for a summer research internship.

Jun 2017	Placed on the President's List of Jacobs University Bremen in recognition of academic performance during undergraduate study.
2016–2017	Awarded the DAAD RISE Weltweit Scholarships in two consecutive years for conducting research projects in the natural sciences at institutions outside Germany.
2014–2017	Awarded a merit-based scholarship for undergraduate studies at Jacobs University Bremen, Germany.
Jun 2014	Awarded the INSPIRE Scholarship for Higher Education (ranked in the top 1% nationally in the All India Senior Secondary Examination, India); *declined in favour of pursuing undergraduate studies in Germany*.
Sep 2013	Runner-up in the 21st Prof. Brahm Prakash Memorial Materials Essay and Elocution Competition, Indian Institute of Metals Kalpakkam, among 6 finalists from all over India.

Teaching experience

Oct 2019 - Oct 2024	Tutor, grader, and acting lecturer at LMU Munich for BSc Physics and MSc Astrophysics courses. Designed and introduced the *Weak Gravitational Lensing* MSc Astrophysics lab.
Sep 2015 - June 2017	Tutor and grader at Jacobs University Bremen for BSc Physics courses: *Classical Physics, Modern Physics, Statistical Physics, Renewable Energy*.

Mentoring experience

April 2023 - present	**David Gebauer** (currently graduate student at the University of Bielefeld) co-supervision of master's and PhD projects.
June 2022 - Aug 2022	**Yue Pan** (currently graduate student at Princeton University), DAAD RISE Germany summer intern at LMU Munich.
April 2020 - July 2025	**Zhengyangguang Gong** (currently postdoctoral researcher at the University of Arizona), co-supervision of master's and PhD projects.

Voluntary service

Reviewer	JCAP (Journal), DES (Collaboration), LSST DESC (Collaboration)
Social work	Royal Voluntary Service (Cafe retailer)

Skills

Languages	Bengali (native), English (bilingual), German (intermediate), Hindi (intermediate).
Computing	c, c++, python, high-performance computing

References

Dr. Oliver Friedrich, LMU Munich, Email: Oliver.Friedrich@physik.uni-muenchen.de
Prof. Eiichiro Komatsu, MPA Munich, Email: komatsu@MPA-Garching.MPG.DE
Prof. Hiranya Peiris, University of Cambridge, Email: hiranya.peiris@ast.cam.ac.uk
Prof. Cora Uhlemann, University of Bielefeld, Email: cuhlemann@physik.uni-bielefeld.de

Publications

Selected publications with major contributions. A full publication list, including other collaborative works, is available on my Google Scholar page.

D. Gebauer, A. **Halder**, S. Seitz, and D. Anbajagane, "SBi3PCF: Simulation-based inference with the integrated 3PCF," *arXiv e-prints* (Oct., 2025) arXiv:2510.13805, `arXiv:2510.13805 [astro-ph.CO]`.

L. Lucie-Smith, H. V. Peiris, A. Pontzen, A. **Halder**, J. Schaye, M. Schaller, J. Helly, R. J. McGibbon, and W. Elbers, "Cosmological feedback from a halo assembly perspective," *Phys. Rev. D* **112** no. 6, (Sept., 2025) 063541, `arXiv:2505.18258 [astro-ph.CO]`.

J. Harnois-Déraps and the LSST Dark Energy Science Collaboration (incl. A. **Halder**), "Non-linear infusion of intrinsic alignment and source clustering: impact on non-Gaussian cosmic shear statistics," *arXiv e-prints* (Sept., 2025) arXiv:2509.25166, `arXiv:2509.25166 [astro-ph.CO]`.

O. Friedrich, L. Castiblanco, A. **Halder**, and C. Uhlemann, "Bye binormal: analysing the joint PDF of galaxy density and weak lensing convergence," *(Accepted in MNRAS); arXiv e-prints* (July, 2025) arXiv:2507.16957, `arXiv:2507.16957 [astro-ph.CO]`.

Z. Gong, A. **Halder**, A. Bohrdt, S. Seitz, and D. Gebauer, "C3NN: Cosmological Correlator Convolutional Neural Network an Interpretable Machine-learning Framework for Cosmological Analyses," *ApJ* **971** no. 2, (Aug., 2024) 156, `arXiv:2402.09526 [astro-ph.CO]`.

A. Barthelemy, A. **Halder**, Z. Gong, and C. Uhlemann, "Making the leap. Part I. Modelling the reconstructed lensing convergence PDF from cosmic shear with survey masks and systematics," *J. Cosmology Astropart. Phys.* **03** (Mar., 2024) 060, `arXiv:2307.09468`.

A. **Halder**, Z. Gong, A. Barreira, O. Friedrich, S. Seitz, and D. Gruen, "Beyond 3×2-point cosmology: the integrated shear and galaxy 3-point correlation functions," *J. Cosmology Astropart. Phys.* **2023** no. 10, (Oct, 2023) 028, `arXiv:2305.17132`.

Z. Gong, A. **Halder**, A. Barreira, S. Seitz, and O. Friedrich, "Cosmology from the integrated shear 3-point correlation function: simulated likelihood analyses with machine-learning emulators," *J. Cosmology Astropart. Phys.* **2023** no. 7, (July, 2023) 040, `arXiv:2304.01187`.

A. **Halder** and A. Barreira, "Response approach to the integrated shear 3-point correlation function: the impact of baryonic effects on small scales," *MNRAS* **515** no. 3, (Sept., 2022) 4639–4654, `arXiv:2201.05607`.

O. Friedrich, A. **Halder**, A. Boyle, C. Uhlemann, D. Britt, S. Codis, D. Gruen, and C. Hahn, "The PDF perspective on the tracer-matter connection: Lagrangian bias and non-Poissonian shot noise," *MNRAS* **510** no. 4, (Mar., 2022) 5069–5087, `arXiv:2107.02300`.

A. **Halder**, O. Friedrich, S. Seitz, and T. N. Varga, "The integrated three-point correlation function of cosmic shear," *MNRAS* **506** no. 2, (Sept., 2021) 2780–2803, `arXiv:2102.10177`.

R. Marco Figuera, B. Pham Huu, A. P. Rossi, M. Minin, J. Flahaut, and A. **Halder**, "Online characterization of planetary surfaces: PlanetServer, an open-source analysis and visualization tool," *Planet. Space Sci.* **150** (Jan., 2018) 141–156.