Anik Halder

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Education

2020–present	**Doctoral student in Astrophysics**, *University Observatory (USM), Ludwig-Maximilians-Universität München*, Germany, **Advisors**: Stella Seitz, Ralf Bender.
2020	**Master of Science in Astrophysics**, *Ludwig-Maximilians-Universität München*, Germany.

Research and Work Experience

Ludwig-Maximilians-Universität München, Germany

Jan 2019–present	**Research and Teaching Assistant**, University Observatory Munich USM. **Responsibilities**: ○ Tutor for the course *Formation and Evolution of Cosmic structures* by Dr. Ariel Sanchez (Summer semester 2023). ○ Tutor for astrophysics labs. ○ Reduction of data obtained from the Wide-Field Imager at Mount Wendelstein Observatory's 2-m Telescope for studying gravitational weak lensing by galaxy clusters. ○ USM extragalactic astronomy working group seminar organiser and website maintainer.
2020 – present	**Research project supervision**. ○ **David Gebauer**, master's thesis (2023-present) : *Probing higher-order lensing statistics with simulation-based inference.* ○ **Yue Pan**, DAAD RISE undergraduate scholar (summer 2022): *Massive Data Compression on Convergence Two-Point Correlation Function.* ○ **Zhengyangguang Gong**, master's thesis (2020-2021): *Constraining Neutrino Masses with Weak Lensing Convergence 2-point Correlation Function.*

Forschungszentrum Jülich, Germany

Nov 2017–Dec 2018	**Student Research Assistant**. Software developer at the Scientific Computing group in the Jülich Centre for Neutron Science outstation at Heinz Maier-Leibnitz Research Centre, Garching. **Responsibilities**: Development and testing of the software BornAgain - used for simulating and fitting small-angle scattering at grazing incidence.

Instituto de Astrofisica de Canarias, Tenerife, Spain

June 2017–Aug 2017	**Internship**, *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	**Internship**, *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	**Internship**, Department of Lasers and Optics. Validating models for thermal surface deformation of lenses by implementing different numerical algorithms in C++ and analysing them using Zeemax OpticStudio and MATLAB.

Awards

December 2020	Travel grant for Early Career Scientists from the Dark Energy Survey (DES) collaboration to attend collaboration wide meeting.
March 2017	Awarded the DAAD RISE Weltweit 2017 Scholarship (second time) for conducting a research project in astronomy at the Instituto de Astrofisica de Canarias, Spain.
March 2016	Awarded the DAAD RISE Weltweit 2016 Scholarship for conducting a research project at the School of Physics and Astronomy, University of St Andrews, United Kingdom.

Talks and presentations

April 2023	**Talk**, *The Integrated 3-point correlation function of projected cosmic density fields*, Future Cosmology summer school, Cargese, France.
March 2023	**Talk**, *The Integrated 3-point correlation function of of projected cosmic density fields*, OPINAS group retreat, Ringberg, Germany.
Feb 2023	**Virtual Talk**, *The Integrated 3-point correlation function of cosmic shear*, Astromerique Speaker Series, University of Montreal, Canada.
Jan 2023	**Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Cosmo-Exgal seminar, University College London, UK.
Jan 2023	**Poster**, *The Integrated 3-point correlation function of cosmic shear*, Dark Energy Survey collaboration meeting, Univesity of Portsmouth, UK.
Jan 2023	**Talk**, *The Integrated 3-point correlation function of projected cosmic density fields*, Department of Physics, University of Washington, Seattle, USA.
Jan 2023	**Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Special Session on New Results from the Dark Energy Survey, 241st American Astronomical Society Meeting, Seattle, USA.
Nov 2022	**Talk**, *The Integrated 3-point correlation function of projected cosmic density fields*, Dark Energy Connector-4 Science Day of the ORIGINS Cluster, Max Planck Institute for Extraterrestrial Physics, Garching, Germany.
May 2022	**Virtual Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Cambridge-Munich cosmology journal club.
May 2022	**Virtual Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, German Centre for Cosmological Lensing, Ruhr University Bochum, Germany.
April 2022	**Virtual Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Cosmology with Weak Lensing: beyond the 2-point statistics, Yukawa Institute for Theoretical Physics, Kyoto University, Japan.
April 2022	**Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Cosmology seminar, Max Planck Institute for Astrophysics, Garching, Germany.
Feb 2022	**Virtual Talk**, *Response approach to the Integrated shear 3-point correlation function: impact of baryonic effects on small scales*, Coffee seminar, Institute for Advanced Study, Princeton, New Jersey, USA.
July 2021	**Virtual Talk**, *The Integrated 3-point correlation function of cosmic shear*, Density Split Statistics seminar, Stanford University, USA.
July 2021	**Virtual Talk**, *The Integrated 3-point correlation function of cosmic shear*, OPINAS seminar Max Planck Institute for Extraterrestrial Physics, Garching, Germany.

Sep 2019   **Talk**, *Position-dependent 2-point correlation function on lognormal density fields*, Workshop on Non-Gaussian Universe, University of Cambridge, UK.

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Publications

A. Barthelemy, A. **Halder**, Z. Gong, and C. Uhlemann, "Making the leap I: Modelling the reconstructed lensing convergence PDF from cosmic shear with survey masks and systematics," *arXiv e-prints* (July, 2023) arXiv:2307.09468, `arXiv:2307.09468 [astro-ph.CO]`.

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," *arXiv e-prints* (May, 2023) arXiv:2305.17132, `arXiv:2305.17132 [astro-ph.CO]`.

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.

A. **Halder** and A. Barreira, "Response approach to the integrated shear 3-point correlation function: the impact of baryonic effects on small scales," *Monthly Notices of the Royal Astronomical Society* (July, 2022) .

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," *Monthly Notices of the Royal Astronomical Society* **510** no. 4, (January, 2022) 5069–5087.

A. **Halder**, O. Friedrich, S. Seitz, and T. N. Varga, "The integrated 3-point correlation function of cosmic shear," *MNRAS* (June, 2021) .

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.

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References

Dr. Stella Seitz, LMU Munich, Email: `stella@usm.lmu.de`

Dr. Alexandre Barreira, LMU Munich, Email: `alex.barreira@origins-cluster.de`

Prof. Dr. Ralf Bender, LMU Munich, Email: `bender@mpe.mpg.de`

Dr. Oliver Friedrich, LMU Munich, Email: `Oliver.Friedrich@physik.uni-muenchen.de`

Prof. Dr. Daniel Gruen, LMU Munich, Email: `daniel.gruen@lmu.de`

Prof. Dr. Eiichiro Komatsu, MPA Munich, Email: `komatsu@MPA-Garching.MPG.DE`

Dr. Ariel Sanchez, MPE Munich, Email: `arielsan@mpe.mpg.de`