Dr. Manuel Meyer | Curriculum vitæ

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- Languages: German (native), English (fluent), Swedish (proficient), Danish (basic), French (basic), Spanish (basic)
- Identifiers: ORCID:0000-0002-0738-7581, INSPIRE HEP: Manuel.Meyer.1, Scopus Researcher ID: 55463373300, Google Scholar

Research Interests

My interests lie in the field of astroparticle physics and experimental searches for dark matter, in particular in the form of axions and axion-like particles. My research has provided stringent limits on the coupling between photons and axion-like particles using astrophysical observations. I also participate in the characterization and commissioning of the transition edge sensor to be used in the ALPS II experiment and lead the development of machine-learning-based data analysis.

Experience

Since 2023 **Associate Professor for Experimental Physics** Odense, Denmark
- Center for Cosmology and Particle Physics Phenomenology (CP3), University of Southern Denmark

2021-2022 **Research group leader** Hamburg, Germany
- Institute for Experimental Physics, University of Hamburg
- Parental leave: July 2021, March-July 2022

2019 - 2021 ***Marie Skłodowska-Curie* Research Fellow** Erlangen, Germany
- Erlangen Center for Astroparticle Physics, University Erlangen-Nuremberg. PI: Prof. Stefan Funk

2019 ***Feodor Lynen* Research Return Fellow** Hamburg, Germany
- Deutsches Elektron Synchrotron (DESY). PI: Dr. Axel Lindner

2017 - 2019 ***Feodor Lynen* Research Fellow** Stanford, CA, USA
- Kavli Institute for Particle Astrophysics and Cosmology, Stanford University. PI: Prof. Roger Blandford

2013 - 2016 **Post doctoral researcher** Stockholm, Sweden
- Oskar Klein Centre for Cosmoparticle Physics, Stockholm University. PI: Prof. Jan Conrad

Education

2010 - 2013 **Ph.D., Physics, University of Hamburg** Hamburg, Germany
- Ph.D. thesis: The opacity of the Universe for high and very high energy γ-rays.
  Grade: "Magna Cum Laude" – with Honors
- Advisor: Prof. Dieter Horns

2004 - 2010 **Diploma in Physics, University of Hamburg** Hamburg, Germany
- Diploma thesis: Spectral Modeling of the Crab Nebula and Search for oscillatory features in X-ray data induced by hidden Photons. *Grade: "Excellent, with Honors"*
- Advisor: Prof. Dieter Horns

Selected Grants

2021 **DFG Research Unit "Relativistic Jets in Active Galaxies"** Bonn, Germany

- Associated member of a research group funded by the German Research Foundation (DFG).
- Amount of funding: 3,600,000€

2020 **ERC Starting Grant** Brussels, Belgium

- Research grant for early career scientists awarded by European Research Council (ERC).
- Amount of funding: 1,441,000€

2019 ***Marie Skłodowska-Curie* Research Fellowship** Brussels, Belgium

- Marie Skłodowska-Curie Actions Research Fellowship awarded by the ERC.
- Amount of funding: 175,000€

2016 ***Feodor Lynen* Research Fellowship** Bonn, Germany

- Sponsorship for own research position from the German Humboldt Foundation.
- Amount of funding: 126,000€

Awards

2017 **Marie Skłodowska-Curie Actions Seal of Excellence** Brussels, Belgium

- Award for proposal submitted under the Horizon 2020 Marie Skłodowska-Curie actions

2010 ***Otto Stern* Prize** Hamburg, Germany

- Prize for best diploma thesis in physics of the 2010 summer term at the University of Hamburg

Collaboration Memberships

since 2021 **Any Light Particle Search (ALPS) Collaboration**

- Leading the machine-learning-based data analysis development for the TES detector; member of the executive board

since 2013 ***Fermi* Gamma Ray Space Telescope Collaboration**

- Former coordinator of the dark matter and new physics working group

since 2012 **Cherenkov Telescope Array (CTA) Consortium**

- Convener of the Dark Matter and Exotic Physics working group

since 2012 **High Energy Stereoscopic System (H.E.S.S.) Collaboration**

- Member of the executive and multi-wavelength boards, former deputy convener of the astroparticle working group

Institutional and Organizational Boards

since 2023 **SDU Quantum Hub** Odense, Denmark

- Member of the steering committee

since 2023 **European COST Action CA21106 "Cosmic WISPers"**

- Danish country representative in management committee

since 2023 **Quantum Universe Excellence Cluster** Hamburg, Germany

- Representative of the young science group leaders in the steering committee

Selected Corresponding Author Publications

38 publications in peer-reviewed journals with major contribution (17 as corresponding author). Co-author of more than 65 publications of the H.E.S.S. collaboration, 25 publications of the *Fermi*-LAT collaboration, 26 conference proceedings, and 5 white papers. According to NASA ADS, the publications have in total more than 10,000

citations with an h index of 47. A publication list including all collaboration papers can be found on ORCID.

1. M. **Meyer** et al., *A first application of machine and deep learning for background rejection in the ALPS II TES detector*, Annals of Physics, 202200545 2023, arXiv: 2304.08406 [hep-ex]
2. J. Biteau and M. **Meyer**, *Gamma-Ray Cosmology and Tests of Fundamental Physics*, Galaxies, Vol. 10, No. 2, p. 39, 2022, arXiv: 2202.00523 [astro-ph.CO]
3. M. **Meyer** and T. Petrushevska, *Search for Axionlike-Particle-Induced Prompt γ-Ray Emission from Extragalactic Core-Collapse Supernovae with the Fermi Large Area Telescope*, Phys. Rev. Lett. Vol. 124, No. 23, 231101, p. 231101, 2020, arXiv: 2006.06722 [astro-ph.HE]
4. M. **Meyer**, J. D. Scargle, and R. D. Blandford, *Characterizing the gamma-ray variability of the brightest flat spectrum radio quasars observed with the Fermi LAT*, ApJ, Vol. 877, No. 1, 39, p. 39, 2019, arXiv: 1902.02291 [astro-ph.HE].
5. M. **Meyer**, M. Giannotti, A. Mirizzi, M. Sánchez-Conde, and J. Conrad, *The Fermi Large Area Telescope as a Galactic Supernovae Axionscope*, Phys. Rev. Lett. Vol. 118, No. 1, p. 011103, 2017, arXiv: 1609.02350 [astro-ph.HE].

Conference Contributions

Contributed to more than 25 conferences, workshops, and seminars (18 invited).

Selected Invited Presentations

2023	Cosmic magnetism in voids and filaments Conference	Italy
2022	28th Epiphany Conference on Recent Advances in Astroparticle Physics	Poland
2021	Virtual Spring meeting of the German Physical Society	Germany
2020	Virtual Kashiwa Dark Matter Symposium 2020	Japan
2019	15th Patras Workshop on Axions, WIMPs, and WISPs	Germany

Selected Contributed Presentations

2022	7th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy	Spain
2019	1st CTA Symposium	Italy
2018	8th International *Fermi* Symposium	USA
2018	TeV Particle Astrophysics 2018	Germany
2017	TeV Particle Astrophysics 2017	USA

Supervision & Mentoring

Fall 2023	Current group: 1 PI, 2 post docs, 2 PhD students, 1 master student
Since 2023	Mentor for the SDU Physics Mentoring program (currently 2 mentees)
Since 2021	Mentor of the Fermi-LAT mentoring program (currently 1 mentee, 1 mentee in past cycle)
2018-2022	(Co-) Supervision of 3 PhD students: J. Davies (2020-2022), M. Crnogorčević (2018-2023), A. Yusafzai (2020-2022).
2014-2023	(Co-) Supervision of 3 master students, supervision of 5 bachelor students

Teaching and Formal Training in Teaching

Courses and Classes taught

2023 - 2024 **Introduction to Quantum Mechanics** Odense, Denmark

- 5 ECTS lecture and exercise classes on quantum mechanics for undergraduate students, winter term 2023/2024.

2023 - 2024 **Research Activities in Experimental Physics** Odense, Denmark

- 5 ECTS course project work on experimental physics and data analysis for small groups of graduate students, winter term 2023/2024.

2021 - 2022 **Particle and Astroparticle Physics** Hamburg, Germany

- Seminars prepared by students in winter term 2021/2022.

2020 - 2022 **Gamma-ray Telescope in the Classroom** Erlangen, Germany

- Lectures, exercise classes, and observation nights for bachelors and masters students in winter term 2020/2021.

2019 - 2020 **Data Analysis II and Introduction to Machine Learning** Erlangen, Germany

- Lectures and exercise classes given for masters students in winter term 2019/2020.

2018 **Lectures for pre-collegiate students** Stanford, CA, USA

- Lectures given for high school students during particle physics and cosmology summer courses.

2011-2012 **Lab assistant for undergraduate physics students** Hamburg, Germany

- Supervision of small groups of students for week-long labs. Included teaching, supervision, feedback and grading.

Training

2018 **Stanford Scientific Teaching Summer Institute** Stanford, CA, USA

- Three day workshop on science-based teaching, inclusion, and equity.

2017 **Introduction to Undergraduate STEM Teaching** Stanford, CA, USA

- Online course offered by the Center for the Integration of Research Teaching and Learning, stemteachingcourse.org. Passed with distinction.

Outreach

7 outreach talks for general public and high schools students, **7 articles for press releases, blogs, and newspapers**. Examples can be found here, here, here, here, here, here, here, here, and here. Also worked as a advisor for high school students at the DESY school labs (2008-2009).

Computer skills

Operating systems:	Mac OS, Ubuntu, Windows
Programming languages:	python, Root, C++, C
Scientific Computing:	numpy, scipy, astropy, scikit-learn, iminuit, emcee, tensorflow & keras, matplotlib, hdf5, pandas, git
Developed Software:	gammaALPs, ebltable
Data analysis	*Fermi*-LAT (FERMIPY and *Fermi Tools*); H.E.S.S. and CTA (HAP and GAMMAPY); *Swift* XRT, NuSTAR, and XMM-Newton (pipelines and XSPEC); ALMA (CASA), ALPS II (TES)
Document preparation	LaTeX, Keynote, OpenOffice, Microsoft Office

Reviewing

Member of scientific organizing committees	Phystat gamma conference, International Cosmic Ray Conference (ICRC) 2021; "Recontres du Vietnam: Very High Energy Phenomena in the Universe" 2018 conference; "The puzzle of dark matter 2018" conference
Journal reviewer	Physical Review Letters, Physical Review D, Astrophysical Journal (ApJ), the Journal of Cosmology and Astroparticle Physics (JCAP), Physics Letters B, Monthly Notes of the Royal Astronomical Society (MNRAS), European Physical Journal C