Zeuthen

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0 Allgemeines

Seit 2019 ist die Astroteilchenphysik ein eigener Forschungsbereich bei DESY. Der wissenschaftliche Schwerpunkt des Standortes Zeuthen liegt auf der Astroteilchenphysik (Gammaastronomie, Neutrinoastronomie, Theorie), Gravitationswellenforschung und Multimessenger-Astronomie. Neben der Analyse von wissenschaftlichen Daten, sind die Arbeitsgruppen in vielen Instrumentierungsprojekten involviert. Es wird Hard- und Software für das Cherenkov-Telescope Array Observatory, für das IceCube Neutrino Observatory sowie das Radio Neutrino Observatory Greenland produziert. DESY Zeuthen beherbergt zusätzlich eine Einrichtung zur Graduiertenförderung, die International Helmholtz-Weizmann Research School on Multimessenger Astronomy.

1 Personal und Ausstattung

1.1 Personalstand

Direktoren und Professoren:

Direktoren: 1

Prof. Dr. Christian Stegmann

Professoren: 8

Prof. Dr. David Berge (Humboldt-Universität zu Berlin), Jun.-Prof. Dr. Sara Buson (Julian-Maximilians Universität Würzburg), Prof. Dr. Marek Kowalski (Humboldt-Universität zu Berlin), Prof. Dr. Anna Nelles (Friedrich-Alexander-Universität Erlangen-Nürnberg), Prof. Dr. Samaya Nissanke (Universität Potsdam), Prof. Dr. Martin Pohl (Universität Potsdam), Prof. Dr. Christian Stegmann (Universität Potsdam), Prof. Dr. Huirong Yan (Universität Potsdam)

Wissenschaftliche Mitarbeiter: 90

Doktoranden: 31

Technische Mitarbeiter: 58

Studentische Mitarbeiter: 6

2 Akademische Abschlussarbeiten

2.1 Masterarbeiten

Abgeschlossen: 1

G. Cantarini. Modeling the reflection of radio signals from atmospheric clouds as a near-horizon background for astroparticle observatories. University of Milano Bicocca, 2025.

2.2 Dissertationen

Abgeschlossen: 5

S. Bouma. Direction Reconstruction of Radio Signals in Neutrino Detectors in Ice. Friedrich-Alexander-Universität Erlangen-Nürnberg, 2025.

J. M. Haces Crespo. Investigation of a focal plane array for a spaceborne wide-field Schmidt telescope. Technisches Universität Berlin, 2025.

M. C. Kherlakian. Search for very-high-energy gamma-ray emission from astrophysical transients with VERITAS. Humboldt Universität zu Berlin, 2025.

N. N. Lad. Measurement of Astrophysical Neutrino flavour composition with Twelve Years of IceCube Data. HU Berlin Mathematisch-Naturwissenschaftliche Fakultät, 2025.

J. D. Necker. Searching for High-Energy Neutrinos from Transient Sources with IceCube. Humboldt University of Berlin, 2025

3 Veröffentlichungen

3.1 In referierten Zeitschriften

K. Abe et al. Characterization of Markarian 421 during its most violent year: Multi-wavelength variability and correlations. Astronomy and astrophysics, 694:A195, and PUBDB-2025- 05643, arXiv:2501.03831. doi: 10.1051/0004-6361/202451624.

K. Abe et al. Very high-energy gamma-ray detection and long-term multiwavelength view of the flaring blazar B2 1811+31. Astronomy and astrophysics, 697:Al 72, and PUBDB-2025- 05633, arXiv:2503.19054. arXiv:2503.19054. doi: 10.1051/0004-6361/202452942.

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M. Ackermann and D. Malyshev. Diffuse continuum emission and large extended sources at MeV energies. Space science reviews, 221(7):92, and PUBDB-2025-00833, arXiv:2510.07311. doi: 10.1007/s11214-025-01215-0.

S. Adhikari et al. Decade-long periodicity study of 2FHL blazars with historical optical data. Monthly notices of the Royal Astronomical Society, 540(2):1449, and PUBDB-2025-04990, arXiv:2409.18334. doi: 10.1093/mnraslstaf783.

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S. Aiello et al. Author Correction: Observation of an ultra-high-energy cosmic neutrino with KM3NeT. Nature, 640(8050):376, and PUBDB-2025-05138. doi: 10.1038/s41586-025-08836-z.

M. S. A. Alawashra et al. Electromagnetic field solver for QED polarization in superstrong magnetic fields of magnetar and laser plasmas. Physics of plasmas, 32(11):15, and PUBDB-2025-01013. doi: 10.1063/5.0286700.

M. S. A. Alawashra et al. MeV cosmic-ray electrons modify the TeV pair-beam plasma instability. The astrophysical journal / Part 1, 989:37, and PUBDB-2025- 01652. doi: 10.3847/1538-4357/adec9e

C. Alispach et al. Observation of the Crab Nebula with the Single-Mirror SmallSize Telescope stereoscopic system at low altitude. Astronomy and astrophysics, 699:A255, and PUBDB-2025- 05690, arXiv:2506.01733. doi: 10.1051/0004-6361/202555292.

A. Archer et al. Constraints on the X-Ray and Very-high-energy Gamma-Ray Flux from Supernova Remnant W44. The astrophysical journal / Part 1, 983(1):73, and PUBDB-2025-04855, arXiv:2503.09778. doi: 10.3847/1538-4357/adc07d.

A. Azzollini, S. Buson and A. Coleiro. The changing look of the neutrino-emitter blazar candidate SBZQ J1243+4043. Astronomy and astrophysics, 703:L13, and PUBDB-2025- 04047. doi: 10.1051/0004-6361/202557347

A. Azzollini et al. The physical properties of candidate neutrino-emitter blazars. 9th Roma International Conference on AstroParticle Physics, Rome (Italy), 23 Sep 2024 - 27 Sep 2024. The European physical journal / Web of Conferences, vol. 319:06005, and PUBDB-2026-00379. EDP Sciences, Les Ulis. doi: 10.1051/epjconf/202531906005.

A. Azzollini et al. The physical properties of candidate neutrino-emitter blazars. Astronomy and astrophysics, 700:A228, and PUBDB-2025- 05520, arXiv:2507.03613. doi: 10.1051/0004-6361/202451328.

I. Bartos, M. Ackermann and M. Kowalski. Bayesian Deep-stacking for High-energy Neutrino Searches. Journal of cosmology and astroparticle physics, 2025(06):064, and PUBDB-2025-02448, arXiv:2502.01452. doi: 10.1088/1475-7516/2025/06/064.

M. Becchetti, C. Dlapa and S. Zoia. Canonical differential equations for the elliptic two-loop fivepoint integral family relevant to $t\bar{t}$ + jet production at leading colour. Physical review / D, 112(3):L031501, and PUBDB-2025- 04765, arXiv:2503.03603. DESY-25-029. ZU-TH 13/25. doi: 10.1103/zt4 w-cljk.

A. R. Bell et al. Cosmic ray transport and acceleration with magnetic mirroring. Monthly notices of the Royal Astronomical Society, 539(2):1236, and PUBDB-2025-04373, arXiv:2504.06140. doi: 10.1093/mnras/staf562.

S. Bouma et al. Integrating radio detectors of cosmic-ray air showers into the open-source NuRadio framework. Proceedings of Science / International School for Advanced Studies, (ICRC2025):345, and PUBDB-2025-04722. doi: 10.22323/1.501.0345.

F. Brun et al. HEGS : Revisiting a decade of H.E.S.S. extragalactic observations. 3067586. 39th International Cosmic Ray Conference, Geneva (Switzerland), 14 Jul 2025 - 24 Jul 2025. Proceedings of Science / International School for Advanced Studies, vol. (ICRC2025):585, and PUBDB-2026-00031, arXiv:2512.16005. SISSA, Trieste. doi: 10.22323/1.501.0585.

G. Brunelli et al. Investigating the mysterious nature of 1LHAASO J17 40+0948u through deep XMM-Newton observations. Astronomy and astrophysics, 704:A30, and PUBDB-2025- 01145, arXiv:2510.17970. doi: 10.1051/0004-6361/202554761.

S. Buson et al. High-energy neutrinos from blazars. RICAP-24, 9th Roma International Conference on Astroparticle Physics, Rome (ltaly), 23 Sep 2024 - 27 Sep 2024. The European physica/ journal / Web of Conferences, vol. 319:04001, and PUBDB-2025-05518. EDP Sciences, Les Ulis. doi: 10.1051/epjconf/202531904001.

F. R. Candón et al. NuSTAR Bounds on Radiatively Decaying Particles from M82. Physical review letters, 134(17):171004, and PUBDB-2025- 01537, arXiv:2412.03660. doi: 10.1103/PhysRevLett.134.171004.

A. Corstanje et al. A LOFAR-style reconstruction of cosmic-ray air showers with SKA-Low. Physical review/D, 112(2):023017, and PUBDB-2025-01233, arXiv:2504.16873. doi: 10.1103/l8mt-994v.

CTAO Collaboration. Galactic transient sources with the Cherenkov Telescope Array Observatory. Monthly notices of the Royal Astronomical Society, 540(1):205, and PUBDB-2025-04848, arXiv:2405.04469. doi: 10.1093/mnras/staf655.

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A. Dinesh et al. A systematic search for spectral hardening in blazar flares with the Fermi-Large Area Telescope. Astronomy and astrophysics, 703:A162, and PUBDB-2026-00410, arXiv:2507.02718. doi: 10.1051/0004-6361/202556241.

C. Dlapa et al. Local-in-Time Conservative Binary Dynamics at Fifth Post-Minkowskian and First Self-Force Orders. Physical review letters, 135(25):251401, and PUBDB-2026- 00396, DESY-25-089. arXiv:2506.20665. arXiv:2506.20665. DESY 25-089. doi: 10.1103/215k-27sj.

L. Fasselt et al. Charge reconstruction from binary hit data on irradiated MALTA2 Czochralski sensors. Vienna Conference on Instrumentation 2025, Vienna (Austria), 17 Feb 2025 - 21 Feb 2025. Nuclear instruments & methods in physics research / Section A, vol. 1080:170747, and PUBDB-2025-01979. Elsevier, [Amsterdam]. doi: 10.1016/j.nima.2025.170747.

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D. F. G. Fiorillo, T. Pitik and E. Vitagliano. Supernova production of axion-like particles coupling to electrons, reloaded. Physical review / D, 112(8):083008, and PUBDB-2025-05666, arXiv:2503.15630. doi: 10.1103/ylr2- gtb5.

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D. F. G. Fiorillo et al. Can the neutrinos from TXS 0506+056 have a coronal origin? The astrophysical journal / Part 1, 986:104, and PUBDB-2025-01901, arXiv:2502.01738 . doi: 10.3847/1538-4357/add267.

D. F. G. Fiorillo et al. Leading Bounds on Micrometer to Picometer Fifth Forces from Neutron Star Cooling. Physical review letters, 135(21):211003, and PUBDB-2026-00041, arXiv:2506.19906. BARI-TH/776-25. doi: 10.1103/tlqz-713s.

Fiorillo, Damiano Francesco Giuseppe. Fast flavor pendulum: Instability condition. Physical review/D, 111(8):083028, and PUBDB-2025-01525, arXiv:2412.09027. doi: 10.1103/PhysRevD.111.083028.

M. Ginolin et al. ZTF SN Ia DR2: Environmental dependencies of stretch and luminosity for a volume-limited sample of 1000 type Ia supernovae. Astronomy and astrophysics, 695:A140, and PUBDB-2026-00353, arXiv:2405.20965. doi: 10.1051/0004-6361/202450378.

H. E. S. S. Collaboration. Detection of very high-energy gamma-ray emission from Eta Carinae during its 2020 periastron passage. Astronomy and astrophysics, 694:A328, and PUBDB-2025- 05501, arXiv:2501.12238. doi: 10.1051/0004-6361/202453052.

H. E. S. S. Collaboration. H.E.S.S. programme searching for VHE gamma rays associated with FRBs. Journal of cosmology and astroparticle physics, 07(07):086, and PUBDB-2025-05484, arXiv:2507.02143. doi: 10.1088/1475-7516/2025/07/086.

H. E. S. S. Collaboration. The H.E.S.S. extragalactic sky survey with the first decade of observations. Astronomy and astrophysics, 695:A261, and PUBDB-2025- 05488, arXiv:2504.21221. doi: 10.1051/0004-6361/202452723.

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T. L. Holch. Investigating the effect of aerosol variations in high-level analyses of Cherenkov telescope data. 1. Atmospheric Monitoring for High Energy Astroparticle Detectors 2024, Ischia (Italy), 15 Jul 2024 - 17 Jul 2024. Journal of physics / Conference Series, vol. 29851:012004, and PUBDB-2024-05055. IOP Publ., Bristol. doi: 10.1088/17 42-6596/2985/1/012004.

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IceCube Collaboration. Measurement of the mean number of muons with energies above 500Ge V in air showers detected with the IceCube Neutrino Observatory. Physical review/D, 112(8):082004, and PUBDB-2025-05579, arXiv:2506.19241. doi: 10.1103/lrjy-3hht.

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sphere with 12yr of Data Collected by the IceCube Neutrino Observatory. The astrophysical journal / Part 1, 981(2):182, and PUBDB-2025-05400, arXiv:2412.05046. doi: 10.3847/1538-4357/adblde.

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IceCube Collaboration. Search for dark matter from the center of the Earth with 10 years of IceCube data. The European physical journal / C, 85(5):490, and PUBDB-2025-04487, arXiv:2412.12972. doi: 10.1140/epjds10052-025-14144-7.

IceCube Collaboration. Search for Extremely-High-Energy Neutrinos and First Constraints on the Ultrahigh-Energy Cosmic-Ray Proton Fraction with IceCube. Physical review /etters, 135(3):12, and PUBDB-2025-04229, arXiv:2502.01963. arXiv:2502.01963. doi: 10.1103/PhysRevLett.135.031001.

IceCube Collaboration. Search for Neutrino Doublets and Triplets Using 11.4 yr of IceCube Data. The astrophysical journal / Part 1, 981(2):159, and PUBDB-2025-05399, arXiv:2501.09276. doi: 10.3847/1538-4357/adb312.

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IceCube Collaboration. Seasonal variations of the atmospheric muon neutrino spectrum measured with IceCube. The European physical journal / C, 85(12):1368, and PUBDB-2025-05581, arXiv:2502.17890. doi: 10.1140/epjds10052-025-14844-0.

IceCube Collaboration. The LED calibration systems for the mDOM and D-Egg sensor modules of the IceCube Upgrade: Design, production, testing and use in module calibration. Journal of Instrumentation, 20(11):P11026, and PUBDB- 2025-05583, arXiv:2508.03822. doi: 10.1088/174 8-0221/20/11/P11026.

Q. Jiang, G.-X. Li and H. Singh. Dispersion relation for the linear theory of relativistic Rayleigh-Taylor instability in a magnetized medium revisited. Journal of high energy astrophysics, 50:7, and PUBDB-2024- 00158, DESY-24-008. arXiv:2411.03347. doi: 10.1016/j.jheap.2025.100488.

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