

Ruhr-Universität Bochum

Astronomisches Institut

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0 Allgemeines

1 Personal und Ausstattung

1.1 Personalstand

Direktoren und Professoren: 6

Prof. Dr. Dominik Bomans (apl. Prof)

Prof. Dr. Rolf Chini (senior researcher)

Prof. Dr. Ralf-Jürgen Dettmar

Prof. Dr. Anna Franckowiak (Geschäftsführende Direktorin)

Prof. Dr. Catherine Heymans (Gastprofessorin; University of Edinburgh)

Prof. Dr. Hendrik Hildebrandt

Wissenschaftliche Mitarbeiter: 21

Dr. Björn Adebahr, Dr. Andrej Dvornik, Dr. Vandad Fallah Ramazani, Dr. Klaus Fuhrmann, Dr. Simone Garrappa, Dr. Peter Kamphuis, Dr. Emma Kun, Dr. Massimiliano Lincetto, Dr. Thomas Luks, Dr. Constance Mahony, Dr. Ancla Müller, Dr. Anna Porredon, Dr. Elisa Pueschel, Dr. Robert Reischke, Dr. Xavier Rodriguez, Dr. Benjamin Stölzner, Dr. Jan Luca van den Busch, Dr. Jun Wang, Dr. Angus Wright, Dr. Ziang Yan, Dr. Mijin Yoon.

Doktoranden: 21

Anna Berger, Julia Blex, Susanne Blex, Paul Simon Blumenkamp, Luke Conmy, Lukas Dirks, Adam Enders, Eray Genc, Günther Heemann, Marianne Langener, Crystal Mele, Martin Ochmann, Giacomo Sommani, Michael Stein, Fabian Symietz, Anastasiia Ome-liukh, Sam Taziaux, Patrik Veres, Sven Weimann, Anna Wittje, Shiyang Zhang.

Bachelor- und Masterstudenten: 22

Bachelorstudenten: 11

Nadine Altenhoff, Julia Bašier, Louis Borkhardt, Julius Dreisbach, Nisa Eyilmez, Alexander Grunewalt (2-fach Bachelor), Alexander Kier, Simon Pick, Jannik Pospiech, Philipp Salewsky, Fatma Yasa.

Masterstudenten: 11

Frederike Apel, Elena Marci Boehnke, Niklas Esendiller, Leon Gawlytta, Koustav Konar, Marcel Mielach, Dennis Neumann, Tim Sedlaczek, Leonard Stromberg, Pascal Venedey, Maurice Weigelt.

Sekretariat und Verwaltung: 2

Bettina Göldner, Vera Nowak.

Technische Mitarbeiter: 2

Tim Falkenbach, Meike Jahn (beurlaubt).

Studentische Mitarbeiter: 6

Frederike Apel, Aisha Bachmann, Elena Marci Boehnke, Marcel Mielach, Alexander Kier, Pascal Venedey.

Gäste: 5

Prof. Dr. Susanne Hüttemeister (apl. Prof.), Helmut Niemsch, Prof. Dr. Tom Richtler (U. Conception, Chile), Prof. Dr. Elmar Träbert (apl. Prof.), Priv.-Doz. Dr. Kerstin Weis.

1.2 Instrumente und Rechenanlagen

Das im Aufbau befindliche neue Campus-Observatorium wurde um ein 3m-Radioteleskop der Firma radio2space erweitert und das Radio Teleskop mit einer Fiber Link Verbindung zum Kontrollraum im Oktober 2023 erfolgreich in Betrieb genommen.

2 Wissenschaftliche Arbeiten

Leitung von Kollaborationen

- German Centre for Cosmological Lensing (GCCL)
- Kilo-Degree Survey (KiDS) weak lensing team

Mitarbeit in Kollaborationen

- ESA/NASA Euclid Mission
- NASA Aspera Mission
- LSST Dark Energy Science Collaboration (DESC)
- Physics of the Accelerating Universe Survey (PAUS)
- Ultraviolet Near Infrared Optical Northern Survey (UNIONS)
- Low Frequency Array (LOFAR) Magnetism Key Science Projekt
- Low Frequency Array (LOFAR) Survey Key Science Projekt
- Australian Square Kilometer Array Pathfinder (ASKAP) Evolutionary Map of the Universe (EMU) survey
- IceCube Observatory
- Fermi Large Area Telescope (LAT)
- Zwicky Transient Factory (ZTF)
- All Sky Automated Survey for SuperNovae (ASAS-SN)

- Cherenkov Telescope Array (CTA)
- Very Energetic Radiation Imaging Telescope Array System (VERITAS)
- D-MeerKAT-II und D-MeerKAT-III (BMBF ErUM Pro)
- D-LOFAR-2.0 und D-LOFAR-ERIC (BMBF ErUM Pro)
- DFG SFB 1491
- Big Bang to Big Data (B3D) (NRW Profilbildung)

3 Akademische Abschlussarbeiten

3.1 Bachelorarbeiten

Abgeschlossen: 7

Nadine Altenhoff: „Evaluating 2D Parametric Light Distributions’ Performance at Extracting Intrinsic Galaxy Disk Shapes with a Focus on Inclination and Scale Heights“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Louis Brokhardt: „Determining Structural Parameters of Green Pea and Similar Galaxies from HST and SUBARU Imaging“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Julius Dreisbach: „Analyse anormaler [OIII]-Linienverhältnisse in Emissionsliniengalaxien mittels hochauflösender Spektren“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Alexander Grunewald: „Messung von Sternentstehungsraten von Galaxien mittels Daten der SHASSA Weitfeld H-alpha Durchmusterung“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Simon Pick: „Search for Correlations of Neutrino Hotspots in the 7-Year IceCube Sky Map with the 5th Edition of the ROMA-BZ Catalogue of Blazars“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Jannik Pospiech: „Study of Hydrogen-Poor Superluminous Supernovae as Candidate Sources for High-Energy Neutrinos“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

Fatma Yasa: „The Dependence of Beyond-linear Halo Bias on Interpolation Choices“, Bochum, Astronomisches Institut, Bachelorarbeit, 2023

3.2 Masterarbeiten

Abgeschlossen: 3

Aisha Bachmann: „Highly Ionized, Compact Dwarf Galaxies: Searching for and Characterizing of Low Luminosity AGNs with X-Ray and Multi-Wavelength Data“, Bochum, Astronomisches Institut, Masterarbeit, 2023

Günther Heemann: „Suche nach Galaxien mit niedriger Flächenhelligkeit (LSB Galaxien) mittels Supernovae unter Verwendung von Convolutional Neural Networks“, Bochum, Astronomisches Institut, Masterarbeit, 2023

Dennis Neumann: „Testing Gravity on Cosmological Scales with Fast Radio Bursts“, Bochum, Astronomisches Institut, Masterarbeit, 2023

3.3 Dissertationen

Abgeschlossen: 0

3.4 Habilitationen

Abgeschlossen: 0

4 Veröffentlichungen

4.1 In referierten Zeitschriften (Anzahl)

- Abbasi, R., Ackermann, M., Adams, J., et al.: A Search for IceCube Sub-TeV Neutrinos Correlated with Gravitational-wave Events Detected By LIGO/Virgo. *The Astrophysical Journal* 959 (2023) 96.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Search for neutrino lines from dark matter annihilation and decay with IceCube. *Physical Review D* 108 (2023) 102004.
- Abbasi, R., Ackermann, M., Adams, J., et al.: IceCat-1: The IceCube Event Catalog of Alert Tracks. *The Astrophysical Journal Supplement Series* 269 (2023) 25.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Searches for connections between dark matter and high-energy neutrinos with IceCube. *Journal of Cosmology and Astroparticle Physics* 2023 (2023) 003.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Search for Extended Sources of Neutrino Emission in the Galactic Plane with IceCube. *The Astrophysical Journal* 956 (2023) 20.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Observation of seasonal variations of the flux of high-energy atmospheric neutrinos with IceCube. *European Physical Journal C* 83 (2023) 777.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Search for Correlations of High-energy Neutrinos Detected in IceCube with Radio-bright AGN and Gamma-Ray Emission from Blazars. *The Astrophysical Journal* 954 (2023) 75.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Search for sub-TeV Neutrino Emission from Novae with IceCube-DeepCore. *The Astrophysical Journal* 953 (2023) 160.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Measurement of atmospheric neutrino mixing with improved IceCube DeepCore calibration and data processing. *Physical Review D* 108 (2023) 012014.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Constraints on Populations of Neutrino Sources from Searches in the Directions of IceCube Neutrino Alerts. *The Astrophysical Journal* 951 (2023) 45.
- Abbasi, R., Ackermann, M., et al.: Observation of high-energy neutrinos from the Galactic plane. *Science* 380 (2023) 1338.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Constraining High-energy Neutrino Emission from Supernovae with IceCube. *The Astrophysical Journal Letters* 949 (2023) L12.
- Abbasi, R., Ackermann, M., Adams, J., et al.: D-Egg: a dual PMT optical module for IceCube. *Journal of Instrumentation* 18 (2023) P04014.
- Abdollahi, S., Ajello, M., Baldini, L., et al.: The Fermi-LAT Lightcurve Repository. *The Astrophysical Journal Supplement Series* 265 (2023) 31.
- Abbasi, R., Ackermann, M., Adams, J., et al.: A Search for Coincident Neutrino Emission from Fast Radio Bursts with Seven Years of IceCube Cascade Events. *The Astrophysical Journal* 946 (2023) 80.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Limits on Neutrino Emission from GRB

- 221009A from MeV to PeV Using the IceCube Neutrino Observatory. *The Astrophysical Journal Letters* 946 (2023) L26.
- Abbasi, R., Ackermann, M., Adams, J., et al.: Searches for Neutrinos from Large High Altitude Air Shower Observatory Ultra-high-energy γ -Ray Sources Using the IceCube Neutrino Observatory. *The Astrophysical Journal Letters* 945 (2023) L8.
- Abbasi, R., Ackermann, M., Adams, J., et al.: IceCube Search for Neutrinos Coincident with Gravitational Wave Events from LIGO/Virgo Run O3. *The Astrophysical Journal* 944 (2023) 80.
- Abdollahi, S., Ajello, M., Baldini, L., et al.: The Fermi-LAT Lightcurve Repository. *The Astrophysical Journal Supplement Series* 265 (2023) 31.
- Acciari, V. A., Agudo, I., Aniello, T., et al.: A lower bound on intergalactic magnetic fields from time variability of 1ES 0229+200 from MAGIC and Fermi/LAT observations. *Astronomy & Astrophysics* 670 (2023) A145.
- Amon, A., Robertson, N. C., Miyatake, H., et al.: Consistent lensing and clustering in a low- S_8 Universe with BOSS, DES Year 3, HSC Year 1, and KiDS-1000. *Monthly Notices of the Royal Astronomical Society* 518 (2023) 477.
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- Cabayol, L., Eriksen, M., Carretero, J., et al.: The PAU Survey and Euclid: Improving broadband photometric redshifts with multi-task learning. *Astronomy & Astrophysics* 671 (2023) A153.
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- de Jaeger, T., Shappee, B. J., Kochanek, C. S., et al.: Optical/ γ -ray blazar flare correlations: understanding the high-energy emission process using ASAS-SN and Fermi light curves. *Monthly Notices of the Royal Astronomical Society* 519 (2023) 6349.
- Deg, N., Palleske, R., Spekkens, K., et al.: WALLABY pilot survey: the potential polar ring galaxies NGC 4632 and NGC 6156. *Monthly Notices of the Royal Astronomical Society* 525 (2023) 4663.
- Dirks, L., Dettmar, R.-J., Bomans, D. J., Kamphuis, P., & Schilling, U.: Evidence for a large off-centered galactic outflow and its connection to the extraplanar diffuse ionized gas in IC 1553. *Astronomy & Astrophysics* 678 (2023) A84.
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- Enders, A. U., Bomans, D. J., & Wittje, A.: Lyman continuum leaker candidates among highly ionised, low-redshift dwarf galaxies selected from He II. *Astronomy & Astrophysics* 672 (2023) A11.
- EPTA Collaboration, InPTA Collaboration, Antoniadis, J., et al.: The second data release from the European Pulsar Timing Array. III. Search for gravitational wave signals. *Astronomy & Astrophysics* 678 (2023) A50.
- EPTA Collaboration, InPTA Collaboration, Antoniadis, J., et al.: The second data release from the European Pulsar Timing Array. II. Customised pulsar noise models for

- spatially correlated gravitational waves. *Astronomy & Astrophysics* 678 (2023) A49.
- EPTA Collaboration, Antoniadis, J., Babak, S., et al.:The second data release from the European Pulsar Timing Array. I. The dataset and timing analysis. *Astronomy & Astrophysics* 678 (2023) A48.
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- Euclid Collaboration, Schirmer, M., Thürmer, K., et al.:Euclid preparation. XXIX. Water ice in spacecraft Part I: The physics of ice formation and contamination. *Astronomy & Astrophysics* 675 (2023) A142.
- Euclid Collaboration, Ajani, V., Baldi, M., et al.:Euclid preparation. XXVIII. Forecasts for ten different higher-order weak lensing statistics. *Astronomy & Astrophysics* 675 (2023) A120.
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- Euclid Collaboration, Bisigello, L., Conselice, C. J., et al.:Euclid preparation - XXIII. Derivation of galaxy physical properties with deep machine learning using mock fluxes and H-band images. *Monthly Notices of the Royal Astronomical Society* 520 (2023) 3529.
- Euclid Collaboration, Bretonnière, H., Kuchner, U., et al.:Euclid preparation. XXVI. The Euclid Morphology Challenge: Towards structural parameters for billions of galaxies. *Astronomy & Astrophysics* 671 (2023) A102.
- Euclid Collaboration, Merlin, E., Castellano, M., et al.:Euclid preparation. XXV. The Euclid Morphology Challenge: Towards model-fitting photometry for billions of galaxies. *Astronomy & Astrophysics* 671 (2023) A101.
- Euclid Collaboration, Castro, T., Fumagalli, A., et al.:Euclid preparation. XXIV. Calibration of the halo mass function in $\Lambda(\nu)$ CDM cosmologies. *Astronomy & Astrophysics* 671 (2023) A100.
- Euclid Collaboration, Humphrey, A., Bisigello, L., et al.:Euclid preparation. XXII. Selection of quiescent galaxies from mock photometry using machine learning. *Astronomy & Astrophysics* 671 (2023) A99.
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- Li, S.-S., Kuijken, K., Hoekstra, H., et al.:KiDS-Legacy calibration: Unifying shear and redshift calibration with the SKiLLS multi-band image simulations. *Astronomy & Astrophysics* 670 (2023) A100.
- Liu, D. Z., Meng, X. M., Er, X. Z., et al.:Potential scientific synergies in weak lensing studies between the CSST and Euclid space probes. *Astronomy & Astrophysics* 669 (2023) A128.
- Longley, E. P., Chang, C., Walter, C. W., et al.:A unified catalogue-level reanalysis of stage-III cosmic shear surveys. *Monthly Notices of the Royal Astronomical Society* 520 (2023) 5016.
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- Lu, L.-Y., Li, J.-T., Vargas, C. J., et al.:eDIG-CHANGES I: extended H(alpha)emission from the extraplanar diffuse ionized gas (eDIG) around CHANG-ES galaxies. *Monthly Notices of the Royal Astronomical Society* 519 (2023) 6098.
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- Naidoo, K., Johnston, H., Joachimi, B., et al.:Euclid: Calibrating photometric redshifts with spectroscopic cross-correlations. *Astronomy & Astrophysics* 670 (2023) A149.
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- telescope. *Journal of Geodesy* 97 (2023) 116.
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- Reischke, R.: Propagating photo-z uncertainties: A functional derivative approach. *Monthly Notices of the Royal Astronomical Society* (2023).
- Reischke, R., & Hagstotz, S.: Cosmological covariance of fast radio burst dispersions. *Monthly Notices of the Royal Astronomical Society* 524 (2023) 2237.
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- Schuldt, S., Suyu, S. H., Cañameras, R., et al.: HOLISMOKES. X. Comparison between neural network and semi-automated traditional modeling of strong lenses. *Astronomy & Astrophysics* 673 (2023) A33.
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- Stein, M., Heesen, V., Dettmar, R.-J., et al.: CHANG-ES. XXVI. Insights into cosmic-ray transport from radio halos in edge-on galaxies. *Astronomy & Astrophysics* 670 (2023) A158.
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Anna Franckowiak