# 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, Prof. Dr. Catherine Heymans (Gastprofessorin; University of Edinburgh), Prof. Dr. Hendrik Hildebrandt (Geschäftsführender Direktor).

*Wissenschaftliche Mitarbeiter: 18*

Dr. Björn Adebahr, Dr. Andrej Dvornik, Dr. Klaus Fuhrmann, Dr. Simone Garrappa, Dr. Peter Kamphuis, Dr. Thomas Luks, Dr. Constance Mahony, Dr. Ancla Müller, Dr. Francisco Pozo-Nuñez, Dr. Robert Reischke, Dr. Xavier Rodriguez, Dr. Benjamin Stölzner, Dr. Jan Luca van den Busch, Dr. Jun Wang, Dr. Angus Wright, Dr. Mijin Yoon, Dr. Vandad Fallah Ramazani, Dr. Massimiliano Lincetto.

*Doktoranden: 20*

Anna Berger, Julia Blex, Susanne Blex, Paul Simon Blomenkamp, Lukas Dirks, Adam Enders, Eray Genc, Marianne Langener, Crystal Mele, Ancla Müller, Martin Ochmann, Giacomo Sommani, Michael Stein, Fabian Symietz, Anastasiia Omeliukh, Sam Taziaux, Patrik Veres, Sven Weimann, Anna Wittje, Shiyang Zhang.

*Bachelor- und Masterstudenten: 18*

*Bachelorstudenten: 7*

Fabian Kampshoff, Alexander Kier, Simon Pick, Yannik Pospiech, Satnam Singh, Andreas Willeke, Fatma Yasa.

*Masterstudenten:*

Aisha Bachmann, Klara Bertmann, Niklas Espendiller, Lukas Fladung, Günter Heemann, Nicola Hunfeld, Dennis Neumann, Sharif El Mentawi (Gast; RWTH Aachen), William Roster (Gast; Uni Tübingen), Leonard Stromberg, Sam Taziaux.

*Sekretariat und Verwaltung: 2*

Bettina Göldner, Vera Nowak.

*Technische Mitarbeiter: 2*

Tim Falkenbach, Meike Jahn.

*Studentische Mitarbeiter: 8*

Frederike Apel, Elena Marci Boehnke, John Diagne-Erdmann, Julius Feldmann, Leonard Kosziol, Marcel Mielach, Jannik Teuchert, Pascal Vennedey.

*Gäste: 4*

Prof. Dr. Susanne Hüttemeister (apl. Prof.), Helmut Niemsch, Prof. Dr. Elmar Träbert (apl. Prof.), Priv.-Doz. Dr. Kerstin Weis.

### 1.2 Instrumente und Rechenanlagen

Im Rahmen der Neubaumaßnahme auf dem Campus der Ruhr-Universität wird auch ein neues Campus-Observatorium errichtet. Zum Ende des Berichtsjahres wurden dazu zwei Kuppeln errichtet.

## 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
- LSST Dark Energy Science Collaboration (DESC)
- Physics of the Accelerating Universe Survey (PAUS)
- Ultraviolet Near Infrared Optical Northern Survey (UNIONS)
- Low Frequency Array (LOFAR) Magnetic Key Science Projekt
- Low Frequency Array (LOFAR) Survey Key Science Project
- 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)
- D-MeerKAT-II (BMBF ErUM Pro)
- D-LOFAR-2.0 (BMBF ErUM Pro)
- DFG SFB 1491
- Big Bang to Big Data (B3D) (NRW Profilbildung)

# 3 Akademische Abschlussarbeiten

## 3.1 Bachelorarbeiten

*Abgeschlossen: 5*

Klara Bertmann: „Bestimmung von baryonischer Rückkopplung mittels Kreuzkorrelation von schnellen Radioausbrüchen und kosmischer Scherung“, Bochum, Astronomisches Institut, Bachelorarbeit, 2022

Fabian Kampshoff: “Analysing the Nature of Circumstellar Bubbles Around Massive Stars Using the MeerKAT Galactic Center Radio Continuum Mosaic “, Bochum, Astronomisches Institut, Bachelorarbeit, 2022

Alexander Kier: “Einsatz maschinellen Lernens in der Astronomie: Eine Suche nach blauen diffusen Galaxien“, Bochum, Astronomisches Institut, Bachelorarbeit, 2022

Sadnam Singh: “Identification and characterization of X-ray emission from LBVs and LBV candidates using data from the CHANDRA- and XMM-NEWTON telescopes “, Bochum, Astronomisches Institut, Bachelorarbeit, 2022

Andreas Willeke:„Search for High-Energy Neutrinos from Supernova iPTF14hls“, Bochum, Astronomisches Institut, Bachelorarbeit, 2022

## 3.2 Masterarbeiten

*Abgeschlossen: 4*

Lukas Fladung: “Analyse der Umgebung stellarer Transienten in ihrer jeweiligen Host-Galaxie: Ein Vergleich von Supernova Impostors und Supernovae des Typs IIn“, Bochum, Astronomisches Institut, Masterarbeit, 2022

Nicola Hunfeld: „Analysis of Statistical Methods for Galaxy Clus- ters weak Gravitational Lensing Mass Modelling“, Bochum, Astronomisches Institut, Masterarbeit, 2022

William Roster: „Photometric Redshift Calibration For Cosmic Shear Using Self-Organizing-Maps“, Bochum, Astronomisches Institut, Masterarbeit, 2022

Sam Taziaux: „Investigation of Assembly Bias in KiDS AMICO Galaxy Clusters“, Bochum, Astronomisches Institut, Masterarbeit, 2022

## 3.3 Dissertationen

*Abgeschlossen: 2*

Jan Luca van den Busch: „A Study in Redshift - Simulating and Calibrating Cosmic Shear Surveys“, Bochum, Astronomisches Institut, Doktorarbeit, 2022

Ancla Müller: „Polarized radio emission of cluster galaxies : clue to the physics of ram-pressure stripping and its influence on galaxy evolution “Bochum, Astronomisches Institut, Doktorarbeit, 2022

## 3.4 Habilitationen

*Abgeschlossen: 0*

# 4 Veröffentlichungen

## 4.1 In referierten Zeitschriften (94)

Abbasi, R., Ackermann, M., Adams, J., et al.: Graph Neural Networks for low-energy event classification & reconstruction in IceCube. Journal of Instrumentation **17** (2022), P11003

Abbasi, R., Ackermann, M., Adams, J., et al.: Searches for Neutrinos from Gamma-Ray Bursts Using the IceCube Neutrino Observatory. Astrophys. J. **939** (2022), 116

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Abbasi, R., Ackermann, M., Adams, J., et al.: Density of GeV muons in air showers measured with IceTop. Phys. Rev. D **106** (2022), 032010

Abbasi, R., Ackermann, M., Adams, J., et al.: Search for neutrino emission from cores of active galactic nuclei. Phys. Rev. D **106** (2022), 022005

Abbasi, R., Ackermann, M., Adams, J., et al.: Framework and tools for the simulation and analysis of the radio emission from air showers at IceCube. Journal of Instrumentation **17** (2022), P06026

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Abdollahi, S., Acero, F., Baldini, L., et al.: Incremental Fermi Large Area Telescope Fourth Source Catalog. Astrophys. J. Suppl. Ser. **260** (2022), 53

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Hendrik Hildebrandt