Eduard Keilmann

Fahrenheitstr. 2 53639 Königswinter

E-Mail: <u>keilmann@ph1.uni-koeln.de</u> Website: <u>eduard-keilmann.github.io</u>

Linkedin: here

Education

04/2021 - present

PhD (Astrophysics) – I. Physikalisches Institut, University of Cologne

Title: *The Genesis of Stars: From Giant Molecular Clouds to Star-Forming Cores* Research on the interstellar medium (ISM) and star-formation processes in the Milky Way and external galaxies, performing astrophysical data analysis, dust-dynamics and photodissociation-region (PDR) modeling, along with developing specialized analytical techniques, etc. Investigate atomic and molecular cloud formation and stellar feedback's impact on the ISM using [C II] data from NASA SOFIA's FEEDBACK program.

Led student tutorial sessions, designing problem sets, and grading assignments and exams.

(Advisors: Prof. Dr. Jürgen Stutzki, Dr. Nicola Schneider)

2016 - 2019

Physics (Master of Science) – Johannes Gutenberg-Universität Mainz

Title: Standard Model Effective Field Theory Effects in Dijet Events at Tevatron (Grade: 1,3)

Focus: Elementary Particle Physics, Quantum Field Theory

Minor: Meteorology (Atmospheric Hydrodynamics)

Parts of the results of my master thesis are published at the renowned peer-

review journal JHEP:

https://doi.org/10.1007/JHEP09(2019)086

2011 - 2016

Physics (Bachelor of Science) – Johannes Gutenberg-Universität Mainz

Title: *Massenbestimmung steriler Neutrinos anhand von Supernovae*Minors: Mathematics und Informatics

2010-2011

Fachgebundene Hochschulreife (High School Diploma) – Berufsbildende Schule 1 Mainz

Employment

04/2021 - present

Doctoral Researcher (Wissenschaftlicher Mitarbeiter) – I. Physikalisches Institut, University of Cologne

Research on the interstellar medium (ISM) and star-formation processes in the Milky Way and external galaxies, performing astrophysical data analysis, dust-dynamics and photodissociation-region (PDR) modeling, and developing specialized analytical techniques, etc.

Investigate atomic and molecular cloud formation and stellar feedback's impact on the ISM using [C II] data from NASA SOFIA's FEEDBACK program.

Led student tutorial sessions, designing problem sets, and grading assignments and exams.

10/2019 - 03/2021

Aktuar (Mathematiker) – HDI, Cologne

Developed and implemented the internal "Leben" mathematical model for Solvency II – compliant risk modeling of life insurance portfolios.

06/2019 - 09/2019

Software Developer – Hottgenroth, Cologne

Developed software for building simulations focused on the physical parameters critical to energy-efficient buildings, particularly climate data.

06/2017 - 12/2018

Software Development/-architecture (Werkstudent) – BioNTech, Mainz

Engineered software solutions and defined software architecture, overseeing project planning, documentation, and evaluating applications (with contact to U.S. teams).

Gained foundational project coordination experience by managing a focused software development initiative.

09/2014 - 12/2015

Research Assistant – Institut für Physik, Mainz

Built acousto-optic modulator (AOM) driver systems for laser-based quantum physics experiments.

06/2014 - 09/2014

Research Assistant – Institut für Kernphysik, Mainz

IT-Administration for the Institute of Nuclear Physics.

08/2009 - 12/2009	License Management – T-Systems, Darmstadt
-------------------	---

Managed software licensing for mainframe computer systems.

09/2006 - 06/2009 Apprenticeship IT-Specialist (Berufsausbildung zum Fachinformatiker) – Deutsche Telekom, Mainz

Designed and developed software applications in C++.

Publications

NASA ADS Link

Science/Research Presentations

09/2023 German Astronomical Society – Berlin (contributed talk)

FEEDBACK observations of RCW79

04/2024 Heritage of SOFIA – Scientific Highlights and Future

Perspectives, NASA/SOFIA Conference – Stuttgart (poster

presentation)

First Detection of the [CII] 158 µm Line in the Intermediate Velocity Cloud

Draco

07/2024 Research Group Prof. Walch-Gassner (seminar talk) –

University of Cologne (invited talk)

M33 Molecular Cloud Matching

09/2024 German Astronomical Society – Cologne (contributed talk)

M33 Molecular Cloud Matching

01/2025 Science with the Atacama Pathfinder Experiment (APEX), Max-

Planck Conference – Ringberg (poster presentation)

Unveiling Star Formation in the Milky Way: SOFIA's legacy in Cygnus X

05/2025 Star Formation, Stellar Feedback, and the Ecology of Galaxies

Conference – Visegrad, Hungary (poster presentation)

Reassessing the [CII]-Deficit in RCW79

Observing Proposals

Successful as PI

2022 APEX (18.6h)

CI Observations in the M33 Southern Arm

Project Code: #109.23FN

2024 APEX (17.7h)

An evolutionary tale of three interstellar bubbles

Project Code: #M9502A_113

Successful as Co-PI

2025

2025

2024 IRAM, 30m (25.4h)

The Diamond Ring in Cygnus X: Composition and Evolution of an unusual

ring in CII

Project Code: #P458622 PI: Simon Dannhauer IRAM, 30m (5.4h)

Molecular gas dynamic and conditions in a proplyd-like object in Cygnus X

Project Code: #P487526 PI: Dr. Nicola Schneider IRAM, NOEMA (12h)

Outflows and shocks in a proplyd in Cygnus

Project Code: #P484678 PI: Simon Dannhauer

Associated Research Collaborations

SFB956 Conditions and Impact of Star Formation
SFB1601 Habitats of massive stars across cosmic time

FEEDBACK NASA FEEDBACK SOFIA Legacy

Other

Strong abstract and analytical thinking with a problem-solving orientation, expertise in data science, strategic planning, and machine learning. Proficient in Python, C++, Mathematica, R (statistics), GILDAS, and ROOT (CERN).