Ludwig Böss

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LudwigBoess
October 4th 1991
https://LudwigBoess.github.io
GER, EN, FR, IT

Education

2024–now
Munich
Postdoctoral Researcher, Ludwig-Maximilians-Universität

2020–2024
Munich
Astrophysics, PhD, Ludwig-Maximilians-Universität, *magna cum laude*

Thesis: On Simulations of Cosmic Rays in the Large-Scale Structure of the Universe
Supervisors: Prof. Dr. Harald Lesch & Prof. Dr. Klaus Dolag

2017–2020
Munich
Astrophysics, M.Sc., Ludwig-Maximilians-Universität

GPA: 4.0
Thesis: Cosmic Rays in Galaxy Clusters - An on-the-fly Fokker-Planck Solver for OpenGadget3; Supervisor: Prof. Dr. Klaus Dolag

2014–2017
Munich
Physik, B.Sc., Ludwig-Maximilians-Universität

GPA: 2.7
Thesis: Radial Orbit Instability - Analysis of geometry in unperturbed and perturbed systems; Supervisor: Prof. Dr. Andreas Burkert

2011–2014
Munich
Musicology, B.A., Ludwig-Maximilians-Universität

GPA: 3.0
Thesis: Witold Lutoslawski's Concerto for Orchestra in the context of Socialist Realism; Supervisor: Prof. Dr. Wolfgang Rathert

2011
Munich
Highschool Diploma, Theodolinden Gymnasium

GPA: 3.3
Majors: English and Music

Contributions at Conferences and Workshops

September 2024 **Clusters & Relics II**, Boston, *USA (Invited Talk)*

June 2024 **ICM Theory and Computation Workshop**, Ann Arbor, *USA (Invited Talk)*

October 2023 **Revealing Cosmic Magnetism in the new Future**, Paris, *FR (Talk)*

July 2023 **International Cosmic Ray Conference**, Nagoya, *JP (Talk)*

January 2023 **Cosmic Magnetism in Voids and Filaments**, Bologna, *IT (Talk)*

August 2022 **International Astronomical Union General Assembly**, Busan, *KOR (Poster)*

March 2022 **Clusters & Relics**, Tautenburg, *GER (Talk)*

July 2021 **MIAPP workshop - High energy phenomena in astrophysics**, Munich, *GER (Talk)*

Invited Seminar Talks

November 2023 **MPE High-Energy Clusters & Cosmology Group Seminar**, Garching, *GER*

June 2023 **CfA Galaxy Cluster Group Seminar**, Boston, *USA*

May 2023 **CfA Lars Hernquist Group Seminar**, Boston, *USA*

April 2023 **CCA Plasma Physics Group Seminar**, New York, *USA*

Awarded Computing Time

2024 **GCS Project (PI)**, Simulations of Cosmic Rays in Galaxy Clusters at Unprecedented Resolution
29 Million CPUh

2023 **GAUSS Large Scale Project (co-I, PI: Klaus Dolag)**, The Local Universe: Galaxies, Clusters, The LSS and Cosmic Rays
69 Million CPUh

2022 **C2PAP Computing Grant (PI)**, Galaxy Clusters with Spectral Cosmic Rays
6.5 Million CPUh

2020 **GAUSS Large Scale Project (co-I, PI: Klaus Dolag)**, COMPASS
50 Million CPUh

Teaching & Supervision

2024 **PhD Thesis**, Student: Daniel Karner

Assisting supervisor

2023 **Masters Thesis**, Students: Daniel Karner, Julian Sommer

Assisting supervisor

2021 **Bachlor Thesis**, Student: Julian Sommer

Assisting supervisor

2020 **Theoretical Astrophysics**, Seminar: Prof. Harald Lesch

Teaching Assistant

2020-2024 **Astrophysics I-III (alternating)**, Lecture: Prof. Harald Lesch

Teaching Assistant

Public Outreach

2023 **Café & Kosmos**, Outreach event by ORIGINS/LMU/TUM

Public Talk

2021 **Entropia**, Podcast

Interview

2019 **BR Campus Magazin**, TV documentary

Interview

2019 **Tag der Physik**, Public outreach day of the LMU physics department

Mentor

2016-2019 **LMU Campus Tag**, Public outreach day of the LMU

Mentor

Skills

Languages

German	First language
English	Fluent
French	Conversation skills
Italian	Basic communication skills

Programming skills

Julia	●●●●○	C/C++	●●●●○	Python	●●●●○	Fortran	●●●○○
SQL	●●●●○	HTML/CSS	●●○○○				

Work experience

March 2023–Now
Munich/Garching

Connector Manager

Excellence Cluster ORIGINS, Turbulence Connector

Tasks:

- Organisation of yearly collaboration meeting
- Summary of ongoing projects for scientific outreach
- PI rights (e.g. steering, visitor invitation)

Jan. 2017–March 2019
Munich/Haar

Working student

attocube Systems AG, Customer Success / Business Intelligence

Process optimization and data analysis, e.g.:

- Development of an automated customer satisfaction survey (NPS) using SSIS and Python
- Gathering and evaluating of key data concerning quality assurance, customer satisfaction and R&D

First-Author Publications

2023 **Simulating the LOcal Web (SLOW) - *III*: Synchrotron Emission from the Local Cosmic Web**, **Böss, L.**, Dolag, K., Steinwandel, U., Hernández-Martínez, E., Seidel, B., Sorce, J. G., arXiv:2310.13734, recommended for publication in A&A

2023 **A formation mechanism for 'Wrong Way' Radio Relics**, **Böss, L.**, Steinwandel, U., Dolag, K, ApJL, 957, L16

2023 **CRESCENDO: An on-the-fly Fokker-Planck Solver for Spectral Cosmic Rays in Cosmological Simulations**, **Böss, L.**, Steinwandel, U., Dolag, K., Lesch, H., MNRAS, 519,1, pp.548-572

to be submitted **Simulating the LOcal Web (SLOW) - *V*: γ-ray Emission from the Local Universe**, **Böss, L.**, Khabibullin, I., Dolag, K., Steinwandel, U., Hernández-Martínez, E., Sorce, J. G.

Co-Author Publications

2023 **Towards cosmological simulations of the magnetized intracluster medium with resolved Coulomb collision scale**, Steinwandel, U., Dolag, K., **Böss, L.**, Marin, T., arXiv:2306.04692

Contributions: Scientific input, Fig. 3, 4, 10 & 13 in publication.

2023 **Insights on the origin of ORCs from cosmological simulations**, Dolag, K., **Böss, L.**, Koribalski, B., Steinwandel, U., Valentini, M., ApJ, 945, 74

Contributions: Modeling of the CR component, related figures and chapters in the paper. Interactivate figure in the online publication.

2022 **Virgo: Scalable Unsupervised Classification of Cosmological Shock Waves**, Lamparth, M., **Böss, L.**, Steinwandel, U., Dolag, K., arXiv:2208.06859

Contributions: Scientific input, development contribution, all figures in publication.

2022 **On the small scale turbulent dynamo in the intra cluster medium: A comparison to dynamo theory**, Steinwandel, U., **Böss, L.**, Dolag, K., Lesch, H., ApJ, 933, 2, 131

Contributions: Analysis tools and scripts. Related test simulations.

2019 **WVTICs - SPH initial conditions for everyone**, Arth, A., Donnert, J, Steinwandel, U., **Böss, L.**, et al., arXiv:1907.11250

Contributions: Implementation of the artificial bias correction and writing the corresponding section. Rerunning the tests and figures for the paper.