Ekaterina Makarenko

Curriculum Vitae

ABOUT ME

Date of birth: 24.05.1996
Work address: Gießenbachstraße 1, 85748, Garching bei München
E-mail: makarenko@ph1.uni-koln.de
ORCID: 0000-0002-9694-1790

EDUCATION

PhD student (Aug 2019 – Mar 2025), magna cum laude
I Physics Institute, University of Cologne, Germany
Research supervisor: Prof. Dr. Stefanie Walch-Gassner
Thesis title: "Tracing the radiative cooling from supernova shocks in the interstellar medium"

Specialist (equal to BA & MA) (Sep 2014 – Jun 2019),
Saint Petersburg State University,
Department of Theoretical Astrophysics, Saint Petersburg, Russia
Research supervisor: Dr. Andrei P. Igoshev & Prof. Dr. Alexander F. Kholtygin
Thesis title: "Evolution of stellar magnetic fields of OBA stars"

SKILLS

Languages: English (fluent), Russian (native), German (intermediate), Spanish (basic).
IT: Python, Fortran 90/95, C/C++(basic), R, IRAF (basic), LaTeX.
Visualisation: ParaView, yt (Volume Rendering).
Codes: FLASH, MAPPINGS V, NINA.
Scientific Interests: supernova remnants, stellar feedback, massive stars, magnetohydrodynamics, radiative transfer, interstellar medium, statistical methods, cosmic rays.

CERTIFICATIONS

IBM Data Science Professional Certificate (Coursera) 2024
Courses: Generative AI, Machine Learning with Python, Data Analysis with Python, Python for Data Science, AI & Development, Databases and SQL for Data Science with Python.

HONORS AND AWARDS

- Travel grant (Bonn-Cologne Graduate School of Physics and Astronomy) Aug 2022
- Award "Best Diploma Thesis" (Saint Petersburg State University) Jun 2019

WORK EXPERIENCE

Postdoctoral researcher, Max Planck Institute for Extraterrestrial Physics Aug 2025 - ...
Researcher, University of Cologne Apr – Jun 2025
Visualisation project assistant, The CAVE (Cave Automatic Virtual Environment), University of Cologne Apr – Oct 2024
SFB[1] **proposal assistant**, University of Cologne Jul – Dec 2022
Proofreading the CRC 1601 proposal, creating pictures for it and other administrative tasks
Internship: Israel Institute of Technology, Haifa, Israel Feb – Mar 2019
Development of additional routines of the NINA code on the evolution of magnetic fields of neutrons stars and magnetars (C/C++)
Internship: Special Astrophysical Observatory, Russia Jul – Sep 2018
Development of a Python code on population synthesis and evolution of magnetic fields of massive stars (Python)

TEACHING AND LEADERSHIP

Session Organiser & Chair: German Astronomical Society Annual Meeting 2023, 2024
Student Supervisor: BSc student (Polina Smirnova) 2022 -2024
Tutor: led courses for master and bachelor students in Hydrodynamics, Computational Physics, and Theoretical Physics III 2020 -2024
Speaker of the Student Council, SFB 1601 2023 – 2024

[1] Collaborative Research Centres (CRC) or Sonderforschungsbereiche (SFB): a long-term, multidisciplinary university-based institution coordinating researchers from several disciplines to develop innovative projects.

Member of the Diversity Board 2020 – 2024
Member of the Student Council, SFB 956 2022 – 2023
Member of the LOC, SFB 956 Machine Learning workshop 2020
Reviewer of Canada-France-Hawaii Telescope (CFHT) observational proposals 2021

SELECTED TALKS

○ Invited seminar in Erlangen Centre for Astroparticle Physics (ECAP), **"Thermal X-ray emission from supernova remnants in 3D (M)HD simulations"**,
Erlangen, Germany 2024

○ Annual Meeting of the Astronomische Gesellschaft 2023 (German Astronomical Society), **"X-ray emission from cooling supernova shocks in (M)HD simulations"**
Berlin, Germany 2023

○ 3D Supernova (Remnants). How to connect simulations and observations?, **"3D cooling emission from SNR: morphology and shocks"**,
Valencia, Spain 2022

○ Star Formation in Different Environments 2022, **"Optical emission from cooling supernovae shocks"**
Quy Nhon, Vietnam 2022

○ Invited SeBa and binary stellar evolution meeting by Dr. Andrei Igoshev & Dr. Silvia Toonen, **"Magnetic field distribution in massive stars and its consequences for magnetar formation."**
Online 2021

○ Third Virtual Workshop on Numerical Modeling in MHD and Plasma Physics: Methods, Tools, and Outcomes, **"Emission from cooling supernova shocks in MHD simulations"**
Novosibirsk, Russia (hybrid) 2020

REFERENCES

Prof. Dr Stefanie Walch
I. Physics Institute, University of Cologne, Germany

Dr Richard Wünsch
Astronomical institute of the Czech Academy of Sciences, Prague, Czech Republic

Asst. Prof. Dr Seamus Clarke
National Cheng Kung University, Taiwan

Dr Thorsten Naab
Max Planck Institute for Astrophysics, Germany