

Miriam Brosi

Dr. rer. nat.

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Experience

- Jan. 2022 – current **PostDoc, MAX IV, Lund University, Sweden**
Research scientist in the accelerator development group at MAX IV. In the accelerator development group of the Swedish national synchrotron laboratory, I focus on theoretical and experimental studies of collective effects in the ultra-low emittance ring of the 4th generation synchrotron light source.
- Oct. 2021 – Dec. 2021 **Guest-scientist, Laboratoire de Physique des Lasers, Atomes et Molécules (PhLAM), Université des Sciences et Technologies de Lille, France**
Guest scientist at PhLAM laboratory, financed by the Helmholtz Doctoral Prize. I conducted a detailed comparison of two Vlasov-Fokker-Planck simulation codes for the propagation of particle distributions under the influence of collective effects.
- Feb. 2020 – Dec. 2021 **PostDoc, Institute for Beam Physics and Technology (IBPT), Karlsruhe Institute of Technology**
Research scientist and expert operator at the KIT synchrotron. I continued my studies of collective effects in short electron bunches. With a PhD student, I implemented a new operation mode enabling more extreme beam properties. I coordinated and wrote the specification for the procurement of optimized power-supplies for the storage ring magnets, including calculations on the stability tolerances.
- Feb. 2015 – Jan. 2020 **HIRST Doctoral Researcher, Helmholtz International Research School for Terahertz (HIRST), Karlsruhe Institute of Technology**
Member of the HIRST Graduate school from KIT.
Participated in regular seminars and completed successfully the following technical and management modules: Synchrotrons, Microwave Engineering and Measurement Techniques, MBA Unit 1: International Project Management, Postgraduate transferable Skills: Career and Leadership.
- Sep. 2016 – Oct. 2016 **Student, Cern Accelerator School, Warsaw, Poland**
Participating in the two weeks summer school CAS (Cern Accelerator School) on Advanced Accelerator Physics in Warsaw.
- Nov. 2014 – Dec. 2014 **Graduate Assistant, Institute for Data Processing and Electronics (IPE), Karlsruhe Institute of Technology**
Development of a Graphical User Interface for the KAPTURE system (KARlsruhe Pulse Taking and Ultrafast Readout Electronics) based on Python bindings for Qt.
- Mar. 2013 – Dec. 2014 **Student Assistant, ANKA Synchrotron Lightsource, Karlsruhe Institute of Technology**
Maintaining and further improving the Beam Position Monitor Systems at ANKA. The field of works included development of Graphical User Interfaces in Matlab as well as the analysis of orbit information.

Education

- Jan. 2015 – Jan. 2020 **Dr. rer. nat.**, *Department of Physics*, Karlsruhe Institute of Technology, (summa cum laude)
Dissertation: "In-Depth Analysis of the Micro-Bunching Characteristics in Single and Multi-Bunch Operation at KARA" at the Institute for Beam Physics and Technology (IBPT), doi: 10.5445/IR/1000120018.
- 2012 – Sep. 2014 **Master of Science**, *Department of Physics*, Karlsruhe Institute of Technology, (with distinction)
Master thesis in accelerator physics, title: "*A Study of Bursting Behavior of Synchrotron Radiation in the THz Regime*".
Major subject in *Accelerator Physics* and *Particle Physics*.
Minor subject in *Nanotechnology* and *Semiconductor Physics*, as well as *Electronics*.
- 2008 – 2012 **Bachelor of Science**, *Department of Physics*, Karlsruhe Institute of Technology
Bachelor thesis in astroparticle physics.
Basic study of Physics with *Computer Science* as minor subject.
- 2008 **Abitur**, *Hohenlohe Gymnasium Öhringen*

Teaching and Supervision

- ongoing **Supervisor Bachelor thesis**, *Department of Physics*, Lund University, Sweden
Supervising Bachelor thesis on the topic of "Time-Correlated Single-Photon Counting for Electron Bunch Diagnostic at MAX IV" (J. Schmand).
- Apr. 2019 **Co-supervisor Master thesis**, *Department of Physics*, Karlsruhe Institute of Technology
Co-supervisor for the Master thesis on the topic of "Rekonstruktion der Form von THz-Pulsen aus kurzen Elektronenpaketen mit hohen Wiederholraten an KARA" (M. Martin) (translation: "Reconstruction of the shape of THz pulses from short electron packets with high repetition rates at KARA").
- Apr. 2018 **Co-supervisor Master thesis**, *Department of Physics*, Karlsruhe Institute of Technology
Co-supervisor for the Master thesis on the topic of "Systematic Studies of the Influences of Impedances on Longitudinal Beam Dynamics" (P. Schreiber).
- Jan. 2017 **Supervisor Master thesis**, *Department of Physics*, Karlsruhe Institute of Technology
Scientific supervisor for the Master thesis on the topic of "Analysis of Bursting Spectrograms using Machine Learning Techniques" (F. Rämisch).
- Juni. 2015 – Jul. 2018 **Tutor**, *Department of Physics*, Karlsruhe Institute of Technology
For four summer semester, supervising the one day simulation course and the one day practical hands-on course accompanying the accelerator science 1 lecture from Prof. A.-S. Müller.
- Apr. 2015 – Jul. 2017 **Tutor**, *Department of Physics*, Karlsruhe Institute of Technology
For three summer semester, tutoring the exercise accompanying the accelerator science 1 lecture from Prof. A.-S. Müller.
- May 2015 **Supervisor Bachelor thesis**, *Department of Physics*, Karlsruhe Institute of Technology
Supervisor for the Bachelor thesis on the topic of "Vergleich der zeitlichen Strukturen von Strahlungsausbrüchen der kohärenten Synchrotronstrahlung" (P. Schreiber) (translation: "Comparison of the temporal structures in radiation bursts of coherent synchrotron radiation").

Grants and Awards

- July 2023 **Otto-Haxel-Award for Physics 2020**, *KIT Freundeskreis und Fördergesellschaft e. V. (KFG)*, (2nd place)
Dissertation Prize by the Universities of Göttingen, Heidelberg and the Karlsruhe Institute of Technology in cooperation with the German Physical Society
- May 2021 **Helmholtz Doctoral Prize 2020**, *Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V*
Doctoral Prize 2020 in the research field Matter
- Jul. 2019 **Participant at the Lindau Nobel Laureate Meeting**, Lindau, Germany
Selected as one of 580 young scientists from 89 countries to participate in the 69th Lindau Nobel Laureate Meeting dedicated to Physics.
- May 2017 **IPAC Student Grant**, *International Particle Accelerator Conference*, Copenhagen, Denmark
- Feb. 2016 **Full Scholarship**, *Helmholtz International Research School for Teratronics (HIRST)*,
– Feb. 2017 Karlsruhe Institute of Technology
- Feb. 2016 **Best Poster Prize**, *Wilhelm und Else Heraeus-Stiftung*, Bad Honnef
Best poster prize at the 607. WE-Heraeus-Seminar on Semiconductor detectors in astronomy, medicine, particle physics and photon science.
- Feb. 2015 **Full Scholarship**, *Helmholtz International Research School for Teratronics (HIRST)*,
– Feb. 2016 Karlsruhe Institute of Technology
- Apr. 2014 **Travel Grant**, *WE Heraeus Communication Programme for the DPG Spring Meetings*

Languages

German	Native	Swedish	Basic
English	Fluent	French	Basic

Skills

Python	Expert	Operation systems	Linux, macOS, Windows
Matlab	Intermediate	Inovesa	Expert
C++	Beginner	AT, mbtrack2, MAD-X	Intermediate
Version control	(GIT) Expert	OPA	Beginner