

Curriculum Vitae

Dr. rer. nat. Knut Müller–Caspary



Personal Information

Family name	Müller-Caspary
Given names	<u>Knut</u> Sebastian Nils
Birth name	Müller
Birth	1981 in Germany.
Email	k.mueller-caspary@fz-juelich.de

Pre-University education

07/2000	University-entrance diploma, Albert-Schweitzer Secondary School, Kassel.
08/2000 - 09/2001	Civilian Service at Sozialer Friedensdienst Kassel e.V.

University education

10/2007 – 05/2011	Graduation (Ph.D/Dr. rer. nat.) at the University of Bremen. Thesis: <i>“Transmission electron microscopy of semiconductor nanostructures using ab-initio structure factors for strain-relaxed supercells”</i> . Referees: Prof. Dr. A. Rosenauer, Prof. Dr. D. Gerthsen, (summa cum laude).
10/2001 – 09/2007	Studies of Physics at the University of Bremen. <ul style="list-style-type: none">• Graduation (Diplom) 08/2006-08/2007. Thesis: <i>“Determination of structure factors for GaAs by electron diffraction - Development and test of a measurement method”</i>. Advisor: Prof. Dr. Rosenauer (1.0).• Student research project 03-06/2006. Thesis: <i>“Quantitative analysis of InGaN islands by high-resolution TEM”</i>. Advisor: Prof. Dr. Rosenauer (1.0).• Professional practical training at the Hamburger Synchrotron Strahlungslabor 02-04/2004.• Student assistant: Teaching and TEM specimen preparation since 2004.

Postdoc experience

06/2018 – 05/2024	Group leader of the <i>moreSTEM</i> group in the framework of a Helmholtz Young Investigator Group fellowship, dedicated to momentum-resolved Scanning TEM.
03/2018 – 05/2018	Postdoc researcher at the institute of solid-state physics at the University of Bremen.
10/2016 – 02/2018	Postdoc researcher at the Institute for Electron Microscopy in Materials Science (EMAT), Universiteit Antwerpen, Belgium. Member of the group of Prof. Dr. Sandra Van Aert in the field of theoretical physics with focus on statistical parameter estimation.
09/2014 – 09/2016	Postdoc researcher at the institute of solid-state physics at the University of Bremen. Own DFG project under contract MU 3660/1-1.

03/2012 – 08/2014	Postdoc researcher within the framework of a competitive program to establish young postdocs, granted by the Central Research Development Fund of the University of Bremen. Own acquisition of funding for two independent funding periods.
04/2011 – 02/2012	Postdoc researcher at the institute of solid-state physics at the University of Bremen.

Teaching activities

University teaching positions

Summer term 2015	Electrodynamics and Optics for B. Sc., University of Bremen. (6 SWS).
Summer term 2014	Transmission Electron Microscopy for M. Sc., University of Bremen. (2 SWS).
Summer term 2013	Transmission Electron Microscopy for M. Sc., University of Bremen. (2 SWS).

Further teaching activities

06/2017	Leading of 5 professional trainings at the EMAT summer school for electron microscopy.
2011 – 2016	Substitution in lectures (B.Sc., M. Sc.) on basic quantum mechanics, atom and molecular physics, statistical physics, basic electrodynamics and optics, solid-state physics II.
2010 – 2016	Leading of the TEM education within the international course of studies <i>Materials Chemistry and Mineralogy</i> (M. Sc.). This included introductory lectures, electron microscopy training, written examination.
2008	Advanced Methods in Transmission Electron Microscopy. Workshop lecture Riezlern, Austria. Workshop of the institute of solid-state physics, Bremen.
2007 – 2015	Leading of advanced and basic practicals, tutorials and seminars. Development of advanced and basic practicals and weekly exercises (quantum mechanics, electrodynamics, optics, statistics, atom- and molecular physics).

Software developments

Since 2012	<i>ImageEval</i> software development. Implementation of 13 advanced quantitative methods for (S)TEM evaluation. The software has a COM interface to the microscope for automated experiments and scripting.
2007 – 2010	<i>Bloch4TEM</i> software development. Simulation of high-resolution TEM images and TEM diffraction patterns, Structure and temperature factor refinement.
Since 2007	Contributions to the <i>STEMsim</i> software of the Rosenauer group, Bremen. Comprehensive simulation suite for (S)TEM using Bloch wave and multislice methods.

Memberships in scientific organisations

Since 2010	Deutsche Gesellschaft für Elektronenmikroskopie (DGE).
Since 2010	European Microscopy Society (EMS).
Since 2000	Deutsche Physikalische Gesellschaft (DPG).

Funding record

2018 – prov. 2024	Helmholtz Young Investigator group moreSTEM at FZ Jülich, Ernst-Ruska Centre. Total volume: EUR 1.526.259,00.
2014 – 2016	Proposal MU 3660/1-1 granted by the Deutsche Forschungsgemeinschaft (DFG): Strain Analysis by Nano-Beam Diffraction using convergent electron nanoprobes. Total volume: EUR 246,070. Major instrumentation: EUR 63,170 (Ultrafast delay-line detector).
2012 – 2014	Proposal granted by the Central Research Development Fund of the Bremen University: Characterisation of Si-based nanostructures by scanning and conventional Z-contrast transmission electron microscopy. Personnel costs for 2 years postdoc. Materials expenses: EUR 10.000.

Awards and further qualifications

2011	Ph.D graduation with distinction (summa cum laude).
2011	Best Poster Award, Microscopy Conference Kiel, Germany.
2009	Best Poster Award, Microscopy Conference Graz, Austria.
2008	OHB Price for outstanding diploma studies in physics.
07/2012	Session chair at the EMSI XXXIII meeting. Afternoon 2 nd session, Bangalore, India.
08/2013	Co-chairing (with Prof. Dr. J. Zweck) of Workshop WS 1: <i>New information from lateral beam movement detection in STEM</i> . Microscopy Conference (MC), Regensburg.
Since 2012	Reviewer for journals: Science, Science Advances, Scientific Reports, Applied Physics Letters, Ultramicroscopy, Applied Physics A.

Jülich, 20 July 2018

Dr. Knut Müller-Caspary