# Dr. Ulrike Boehm — Curriculum Vitae


**Contact Information**

Janelia Research Campus
Advanced Imaging Center
19700 Helix Drive
Ashburn, VA 20147 USA

Phone: +1 (202) 527-8121
E-mail: boehmu@janelia.hhmi.org
Home: ulrikeboehm.org


**Research Interests**

- Microscope design, development, and application across a wide range of biological models
- Development of image and data processing and analysis tools
- Machine learning and its application in microscopic image analysis
- Statistical methods for large datasets
- Open software and hardware tools for imaging and microscopy

**Positions**

**Research Specialist** 2019 - present
Janelia Research Campus, Advanced Imaging Center, Ashburn, VA, USA

- Handling and troubleshooting of advanced instruments (iPALM, Lattice Light Sheet Microscope, SiMView Light Sheet Microscope, Aberration Corrected Multifocal Microscope, MOSAIC, FIB-SEM, cryo-SIM, etc) and sample preparation
- Support of (inter)national visitors during technical consultations and their imaging sessions at AIC instruments
- Development and implementation of new image and data analysis strategies for users from around the world
- Review of AIC proposals
- Design and realization of imaging and microscopy workshops and conferences

**Postdoctoral Research Fellow** 2017 - 2018
National Institutes of Health, National Cancer Institute, Bethedsa, MD, USA

- Design and construction a microscope for live-cell 5-color single-molecule transcription imaging in eukaryotic cells at high resolution in time and space to capture promoter-enhancer interactions
- Development of advanced fluorescence labeling strategies for the genome based on dCas9 (CAS-FISH)
- Computational modeling and data analysis of 4D genome data

**Ph.D. Student** 2010 - 2016
Max Planck Institute for Biophysical Chemistry, Göttingen, Germany
Department of NanoBiophotonics (Prof. Dr. Stefan Hell)
*Dissertation title:* "4Pi-RESOLFT nanoscopy"
*Advisor:* Prof. Dr. W. Stefan Hell

- Design and construction of a 4Pi-RESOLFT nanoscope, including optical and acquisition system. Controlling software was also developed.
- System / sample testing and optimization

**Master Student** 2009
Max Planck Institute of Biochemistry, Martinsried/Munich, Germany
Department of Molecular Structural Biology (Prof. Dr. Wolfgang Baumeister)
*Dissertation title:* "Correlative microscopy at liquid nitrogen temperature"
*Advisors:* Dr. Jürgen M. Plitzko, Prof. Dr. Wolfgang Baumeister

- Development and testing of a cryo transfer shuttle (CryoStage$^2$) for the reliable transfer of amorphous frozen-hydrated samples from a fluorescence to an electron microscope for correlative microscopy

- Further development and testing of the software based on scale-invariant feature transform (SIFT) for the correlative microscopy approach

**Undergraduate Researcher** - various research assistant positions 2005 - 2008

- Evaluation of the mechanical properties of actin filaments in combination with different actin binding proteins at the Physics Department of the Technical University of Munich, Germany - Prof Andreas Bausch (2008)
- Study of HEK cells with FLIC-microscopy at the Max Planck Institute of Biochemistry, Martinsried, Germany - Prof Peter Fromherz (2008)
- Analysis of Multi-SANS data (with MIRA) and data of Cytochrom C (with the Neutron Spin Echo RESEDA) at the Research Neutron Source Heinz Maier-Leibnitz (FRM II), Munich, Germany - Dr Robert Georgii and Prof Peter Böni (2007)
- Study of surfaces and DNA with an AFM at the Physics Department of the Technical University of Munich, Germany - Prof Thorsten Hugel (2006)
- Performance evaluation of an animal PET scanner at the university hospital "rechts der Isar" , Munich, Germany - Prof Sibylle Ziegler (2006)
- Data analysis of water levels of the Baltic Sea at the Leibnitz Institute for Baltic Sea Research, Warnemünde, Germany - Dr Torsten Seifert (2005)

## Education

**MicroMasters in Statistics and Data Science** 2020 - 2021
Massachusetts Institute of Technology, Cambridge, MA, USA

**Ph.D. in Physics** 2010 - 2015
Heidelberg University, Heidelberg, Germany

**Diploma in Physics** 2004 - 2009
Technical University of Munich, Munich, Germany

## Honors & Awards

**Helmsley Fellowship**, Helmsley Charitable Trust 2017

**66th Lindau Nobel Laureate Meeting**, Participant 2016

**Excellence Award**, Max Planck Society 2010

**Oskar Karl Forster Scholarship**, Technical University of Munich 2009

**Study Career Scholarship**, Technical University of Munich 2008

## Publications

9. Galbraith J., Aaron J., **Boehm U.**, Chew T.-L. and Galbraith C., *Resolving the 3D Nanoarchitecture of the Actin Cytoskeleton.* Microscopy and Microanalysis, p1 (2020). doi:10.1017/S1431927620016736
8. **Boehm U.**, Hell S.W., Schmidt, R., *4Pi-RESOLFT nanoscopy.* Nature Comm. 7 (10504), p1-8 (2016). doi:10.1038/ncomms10504
7. **Boehm U.**, *4Pi-RESOLFT nanoscopy.* PhD Thesis, Heidelberg University (2016) doi: 10.11588/HEIDOK.00020200
6. **Boehm U.**, Schmidt R., Hell S.W., *Live cell 4pi nanoscopy.* European Biophysics Journal with Biophysics Letters 2015 Jul 1 (Vol. 44, pp. S75-S75). 233 SPRING ST, NEW YORK, NY 10013 USA: SPRINGER.
5. Ullal C.K., Primpke S., Schmidt R., **Boehm, U.**, Egner A., Vana P, Hell S.W., *Flexible Microdomain Specific Staining of Block Copolymers for 3D Optical Nanoscopy.* Macromolecules, 44, p7508–7510 (2011). doi: 10.1021/ma201504f
4. Ullal C., Schmidt R., **Boehm U.**, Primpke S., Vana P, Hell W.S., *STED Microscopy as a Characterization Tool for Three Dimensionally Nanostructured Block Copolymer Thin Films.* APS. 2011 Mar;2011:A43-002.

3. Rigort A., Bäuerlein F.J., Leis A., Gruska M., Hoffmann C., Laugks T., **Boehm U.**, Eibauer M., Gnaegi H., Baumeister W. and Plitzko J.M., *Micromachining tools and correlative approaches for cellular cryo-electron tomography.* J. Struct. Biol. 172, p169–179 (2010). doi: 10.1016/j.jsb.2010.02.011
2. Rigort A., Mathisen C., **Boehm U.**, Leis A., Lich B., Hayles M., Laugks T., Baumeister W. and Plitzko J.M., *Integrative Cryo-Correlative Microscopy Approaches.* Microscopy and Microanalysis. Vol 16(S2), p186–187 (2010). doi: 10.1017/S1431927610058216
1. **Boehm U.**, *Korrelative Mikroskopie bei Flüssigstickstoff-Temperatur.* Diplома Thesis, Technical University of Munich (2010)

## Presentations

**Junior Scientist Workshop on Biological Optical Microscopy** *(invited)*, Janelia Research Campus, Ashburn, United States of America — 2019

**Transcription Seminar** *(invited)*, Albert Einstein College of Medicine New York, United States of America — 2019

**Microscopy Seminar** *(invited)*, Havard Medical School Boston, United States of America — 2019

**Microscopy Lunch Seminar** *(invited)*, UMass Medical School Worcester, United States of America — 2019

**Single Biomolecules Meeting**, Cold Spring Harbor Laboratories Cold Spring Harbor, United States of America — 2018

**NIH Light Microscopy Interest Group Seminar** *(invited)*, Bethesda, United States of America — 2018

**Chan Zuckerberg Initiative Imaging Workshop** *(invited)*, CZ Biohub San Francisco, United States of America — 2017

**Chesapeake Bay Area Single Molecule Biology Meeting**, Baltimore, United States of America — 2017

**Frontiers in Imaging Science Conference**, Ashburn, United States of America — 2017

**Single Molecule Biophysics Conference**, Aspen, United States of America — 2017

**Labeling and Nanoscopy Conference**, Heidelberg, Germany — 2016

**MPIbpc Campus Seminar** *(invited)*, Göttingen, Germany — 2016

**NCI Departmental Seminar** *(invited)*, Bethesda, United States of America — 2016

**Departmental Seminar** *(invited)*, Wyss Institute at Havard University, Boston, United States of America — 2016

**Lunch Talk** *(invited)*, Havard, Cambridge, United States of America — 2016

**Biophysical Society Annual Meeting**, Los Angeles, United States of America — 2016

**Seeing Is Believing Symposium**, Heidelberg, Germany — 2015

**Deutsche Physikerinnen Tagung** *(invited)*, Göttingen, Germany — 2015

**Annual meeting of the European Light Microscopy Initiative (ELMI)**, Sitges, Spain — 2015

**Focus On Microscopy (FOM)**, Göttingen, Germany — 2015

**PROSPECTS. First Plenary Meeting**, Punta Negra, Majorca/Spain — 2010

## Teaching

**Image Analysis with ImageJ/Fiji** (virtual workshop) Co-instructor, Turku Bioscience Centre, Turku, Finland — 2020

**Open Science in Imaging and Microscopy** (breakout session during a workshop) 2019
Lead instructor, Janelia Research Campus, Ashburn, United States of America

**Advanced Imaging Techniques in Biomedical Sciences** (summer intern journal club) 2018
Lead instructor, National Institutes of Health, Bethesda, United States of America

**Introduction to microscopy** (graduate course) 2017
Teaching assistant, University of Massachusetts Medical School, Worcester, United States of America

**Optical Microscopy & Imaging in the Biomedical Sciences** 2017
(summer intern journal club)
Lead instructor, National Institutes of Health, Bethesda, United States of America

**Advanced physics laboratory course for physics students** (undergraduate course) 2011
Teaching assistant, Heidelberg University, Germany

**Experimental Physics III: Optics** (undergraduate course) 2011
Teaching assistant, University of Göttingen, Germany

**Experimental Physics IV: Quantum, atomic and molecular physics** 2010
(undergraduate course), Teaching assistant, University of Göttingen, Germany

**Theoretical Physics I: Theoretical Mechanics** (undergraduate course) 2009
Teaching assistant, Technical University of Munich, Germany

**Theoretical Physics II: Electrodynamics** (undergraduate course) 2008
Teaching assistant, Technical University of Munich, Germany

## Conference Organization

**Combined Janelia / EMBL OIG Seminar Series**, Co-organizer 2020 - present
Ashburn, United States of America

**COVID-19 Optical Interest Group (OIG) Summer Seminar Series**, Co-organizer 2020
Virtual seminar series with external speakers via Zoom during the COVID-19 lockdown
Ashburn, United States of America

**Imaging Africa Microscopy Club**, Webinar support 2020
Ashburn, United States of America

**Frontiers in Imaging Science Conference**, Member of the local support team 2019
Ashburn, United States of America

**Labeling and Nanoscopy Conference 2018**, Website and social media support 2018
Heidelberg, Germany

**Division of International Services (DIS) Immigration Symposium**, Co-organizer 2018
National Institutes of Health, Bethesda, United States of America

**International Opportunities EXPO**, Co-organizer 2018
National Institutes of Health, Bethesda, United States of America

**Division of International Services (DIS) Immigration Symposium**, Co-organizer 2017
National Institutes of Health, Bethesda, United States of America

**I, Scientist Conference**, Co-organizer 2017
Berlin, Germany

**Labeling and Nanoscopy Conference 2016**, Co-organizer 2016
Heidelberg, Germany

**Focus On Microscopy (FOM)**, Social media support 2015 - present

**PhDnet General Meeting**, Co-organizer 2011
Bonn, Germany

## Peer Review

**Angewandte Chemie (International ed.)**, **Biophysical Journal**

## Professional Services

**QUAREP-LiMi**, Chair of the "White Paper" working group — 2020 - present
Freiburg, Germany

**Frontiers in Bioinformatics**, Review Editor for Computational BioImaging — 2020 - present
Lausanne, Switzerland

**CZI Imaging Scientists Round 2**, Grant reviewer — 2020
San Francisco, United States of America

**QUAREP-LiMi**, Vice-chair of the "Image Quality" working group — 2020 - present
Freiburg, Germany

**German BioImaging**, Committee member of the working groups for — 2020 - present
(1) Training and Knowledge Transfer and
(2) Image Data Analysis & Management

**BioImaging North America (BINA)**, Committee member — 2020 - present
of the "Quality Control and Data Management" working group

**Janelia's Optical Interest Group (OIG)**, Co-coordinator — 2020 - present
Ashburn, Virginia, United States of America

**GSO German Scholars Organization e.V.**, Coordinator — 2020 - present
for Local Chapter of German Scientists, Ashburn

**Accelerating Science and Publication in Biology (ASAPbio)**, Ambassador — 2018 - present

**eLife Early-Career Advisory Group**, Ambassador — 2017 - 2019

**NIH Laser Safety Advisory Committee**, Committee member for the NCI — 2018
National Institutes of Health, Bethesda, United States of America

**NIH Visiting Fellows Committee**, Co-chair — 2017 - 2018
National Institutes of Health, Bethesda, United States of America

**NIH Light Microscopy Interest Group**, Co-coordinator — 2016 - present
National Institutes of Health, Bethesda, United States of America

**DPG Arbeitskreis für Changengleichheit**, Board member — 2016 - present
Bad Honnef, Germany

**Lindau Nobel Laureate Meeting**, Freelance writer — 2016 - present
Lindau, Germany

**66th Lindau Nobel Laureate Meeting**, "Women in Science"-correspondent — 2016
Lindau, Germany

**Lise Meitner Gesellschaft e.V.**, Co-founder and board member — 2011
Berlin, Germany

**Max Planck PhDnet**, Steering group 2011 member & deputy spokesperson — 2011
Max Planck Society, Munich, Germany

**PhD/Postdoc Community**, PhD/Postdoc representative — 2011 - 2014
Max Planck Institute for Biophysical Chemistry, Göttingen, Germany

## Certificates & Training

**Fierce Conversations program** — 2020
A 6-week course offered by Howard Hughes Medical Instiute about Feedback, Confrontation, Team, Delegation, Coaching and Accountability.

**LabVIEW Core 2** — 2020
A certificate course offered by National Instruments about the LabVIEW basics.

**LabVIEW Core 1** — 2020
A certificate course offered by National Instruments about the LabVIEW basics.

**HBS Entrepreneurship Essentials** — 2020

Entrepreneurship Essentials is a 4-week, 30-hour online certificate program from Harvard Business School. Entrepreneurship Essentials introduces participants to the entrepreneurial journey from finding an idea to gaining traction in the marketplace to raising capital for a venture. Participants learn an overarching framework - People, Opportunity, Context, Deal - to evaluate opportunities, manage start-ups, and finance ventures.

**HBS Management Essentials** 2019
Management Essentials is an 8-week, 35-hour online certificate program from Harvard Business School. Management Essentials takes a distinctive, hands-on approach to management. Participants in this course learn to identify, understand, design, and shape critical organizational and managerial processes as a means of getting the work done.

**HBS CORe (Credential of Readiness)** 2019
CORe (Credential of Readiness) is a 150-hour certificate program on the fundamentals of business from Harvard Business School. CORe is comprised of three courses - Business Analytics, Economics for Managers, and Financial Accounting - developed by leading Harvard Business School faculty and delivered in an active learning environment based on the HBS signature case-based learning model.

**Scientists Teaching Science** 2018
at the Office of Intramural Training and Education (OITE) at the National Institutes of Health, Bethesda, United States of America (9-week online pedagogy course)

**Research Mentor Training** 2018
at the Office of Intramural Training and Education (OITE) at the National Institutes of Health, Bethesda, United States of America

**Business of Science for Scientists** 2018
by SciPhD at the National Cancer Institute in Shady Grove, United States of America

**Chromatin, Epigenetics and Gene Expression Course** 2018
at the Cold Spring Harbor Laboratory (CSHL) in Cold Spring Harbor, NY, United States of America, Course instructors: Prof Karen Adelman, Dr Luciano Di Croce, Prof Geeta Narlikar, Prof Ali Shilatifard

**Bio Tech 2: Recombinant DNA Methodology** 2017
at the Foundation for Advanced Education in the Sciences at the NIH (FAES), Bethesda, United States of America

**Management Bootcamp for Postdocs** 2017
at the Office of Intramural Training and Education (OITE) at the National Institutes of Health, Bethesda, United States of America

**Ethics in Research Training for Postdocs** 2017
at the Office of Intramural Training and Education (OITE) at the National Institutes of Health, Bethesda, United States of America

**Workplace Dynamic Series** 2016
about Self-Awareness, Conflict & Feedback, Team Skills, Diversity In A Multicultural Society at the Office of Intramural Training and Education (OITE) at the National Institutes of Health, Bethesda, United States of America

## Computer Skills

Languages: Python, MATLAB, Java, LabVIEW, C++, R
Software: Inventor (CAD), Zemax

## Professional Affiliation

American Physical Society, German Physical Society, BioImaging North America (BINA), German BioImaging Society, Network of European BioImage Analyst (NEUBIAS), Quantitative BioImaging Society

| | |
|---|---|
| Languages | German - native language<br>English - fluent, spoken and written<br>French - basic knowledge<br>Swedish - basic knowledge<br>Spanish - basic knowledge |
| References | Available upon request |

*Last updated September 25, 2020.*