

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

SUMMARY

Physicist, microscope builder & data scientist with a passion for community building/engagement, outreach, and teaching: I have over ten years of experience in building and running advanced light microscopy systems, analyzing microscopy data, and developing image acquisition & analysis workflows. Furthermore, I am highly engaged in community building/engagement, outreach, and teaching activities focusing on community service, women/diversity in science, open science, and microscopy for more than 15 years.

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 light microscopes (iPALM, Lattice Light Sheet Microscope, SiMView Light Sheet Microscope, Aberration Corrected Multifocal Microscope, MOSAIC, FIB-SEM, cryo-SIM, etc.), sample preparation and image analysis
- Support of (inter)national visitors during technical consultations and their imaging sessions at the microscopes of Janelia's Advanced Imaging Center
- Development and implementation of new image and data analysis strategies for users from around the world
- Review of proposal drafts, proposals, and grants submitted to the Advanced Imaging Center
- Design and realization of microscopy and data analysis workshops and conferences

Postdoctoral Research Fellow 2017 - 2018
National Institutes of Health, National Cancer Institute, Bethesda, 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 W. Hell)
Dissertation title: "4Pi-RESOLFT nanoscopy"
Advisor: Prof. Dr. Stefan W. Hell

- Design and construction of a 4Pi-RESOLFT nanoscope, including optical and acquisition system. Acquisition 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 (CryoStage²) 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 Cytochrome 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 / MITx, 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 18. **Boehm U.***, Nelson G.* et al., *QUAREP-LiMi: A community-driven initiative to establish guidelines for quality assessment and reproducibility for instruments and images in light microscopy*. Journal of Microscopy, p1-18 (2021). doi:<https://doi.org/10.1111/jmi.13041>

17. **Boehm U.**, Galbraith C. *Extending the performance capabilities of isoSTED*. Biophysical Journal, p3237-3239 (2021). doi:<https://doi.org/10.1016/j.bpj.2021.07.005>

16. Rigano A., . . . , **Boehm U.** et al., *Micro-Meta App: an interactive software tool to facilitate the collection of microscopy metadata based on community-driven specifications*. bioRxiv, p1-23 (2021). doi:<https://doi.org/10.1101/2021.05.31.446382>

15. **Boehm U.***, Nelson G.* et al., *QUAREP-LiMi: a community endeavor to advance quality assessment and reproducibility in light microscopy*. Nature Methods, p1-4 (2021). doi:<https://doi.org/10.1038/s41592-021-01162-y>

14. Huisman M., Hammer M., Rigano A., **Boehm U.** et al., *A perspective on Microscopy Metadata: data provenance and quality control.* arXiv, p1-15 (2021). doi:<https://arxiv.org/abs/1910.11370>
13. Hammer M., Huisman M., Rigano A., **Boehm U.** et al., *Towards community-driven metadata standards for light microscopy: tiered specifications extending the OME model.* bioRxiv, p1-27 (2021). doi:<https://doi.org/10.1101/2021.04.25.441198>
12. Rigano A., **Boehm U.** et al., *WU-BIMAC/NBOMicroscopyMetadataSpecs: 4DN-BINA-OME (NBO) Microscopy Metadata Specifications.* zenodo, (2021). doi:<https://doi.org/10.5281/zenodo.4710731>
11. **Boehm U.***, Nelson G.* et al., *QUAREP-LiMi: A community-driven initiative to establish guidelines for quality assessment and reproducibility for instruments and images in light microscopy.* arXiv, p1-17 (2021). doi:<https://arxiv.org/abs/2101.09153>
10. Galbraith J., Aaron J., **Boehm U.**, Chew T.-L. and Galbraith C., *Resolving the 3D Nano-architecture of the Actin Cytoskeleton.* Microscopy and Microanalysis, p1 (2020). doi:10.1017/S1431927620016736
9. Brown-Harding H., Cordelieres F., Poujol C., **Boehm U.**, Collinson L., *A 'lockdown post' from facility managers across the world.* FocalPlane, p1 (2020). doi:10.1242/focalplane.1244
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.**, Egnér 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.* Diploma Thesis, Technical University of Munich (2010)

* these authors contributed equally to this work

PEER REVIEW

Angewandte Chemie (International ed.)

Biophysical Journal

Biophysical Reports

Journal of Cell Science

Journal of Microscopy

Review Commons

PRESENTATIONS	Janelia Advisory Committee Meeting	2021
	Better Science through Open Science and Collaborative Teams (<i>invited</i>), Janelia Research Campus, Ashburn, United States of America	
	Junior Scientist Workshop on Biological Optical Microscopy (<i>invited</i>), Janelia Research Campus, Ashburn, United States of America	2019
	Transcription Seminar (<i>invited</i>), Albert Einstein College of Medicine New York, United States of America	2019
	Microscopy Seminar (<i>invited</i>), Harvard Medical School Boston, United States of America	2019
	Microscopy Lunch Seminar (<i>invited</i>), 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 (<i>invited</i>), Bethesda, United States of America	2018
	Chan Zuckerberg Initiative Imaging Workshop (<i>invited</i>), 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 (<i>invited</i>), Göttingen, Germany	2016
	NCI Departmental Seminar (<i>invited</i>), Bethesda, United States of America	2016
	Departmental Seminar (<i>invited</i>), Wyss Institute at Harvard University, Boston, United States of America	2016
	Lunch Talk (<i>invited</i>), Harvard, 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 (<i>invited</i>), 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	Fiji Image Processing and Analysis Workshop (virtual workshop) Co-instructor, Turku Bioscience Centre, Turku, Finland	2021
	NIH FAES Image Processing and Analysis Workshop (virtual workshop) Co-instructor, National Institutes of Health, Bethesda, United States of America	2021
	NIH FAES Super Resolution Workshop (virtual workshop) Co-instructor, Foundation for Advanced Education in the Sciences (FAES) Bethesda, United States of America	2021
	Fiji Macros Programming (virtual workshop) Co-lead instructor, Janelia Research Campus, Ashburn, United States of America	2020

	DECODE for Single Molecule Localization Microscopy (virtual workshop) at the <i>From Image to Knowledge with ImageJ & Friends</i> conference Co-instructor, Janelia Research Campus, Ashburn, United States of America	2020
	NIH FAES Image Processing and Analysis workshop (virtual workshop) Teaching assistant, National Institutes of Health, Bethesda, United States of America	2020
	Open Science in Imaging and Microscopy (breakout session during a workshop) Lead instructor, Janelia Research Campus, Ashburn, United States of America	2019
	Advanced Imaging Techniques in Biomedical Sciences (summer intern journal club) Lead instructor, National Institutes of Health, Bethesda, United States of America	2018
	Introduction to microscopy (graduate course) Teaching assistant, University of Massachusetts Medical School, Worcester, United States of America	2017
	Optical Microscopy & Imaging in the Biomedical Sciences (summer intern journal club) Lead instructor, National Institutes of Health, Bethesda, United States of America	2017
	Advanced physics laboratory course for physics students (undergraduate course) Teaching assistant, Heidelberg University, Germany	2011
	Experimental Physics III: Optics (undergraduate course) Teaching assistant, University of Göttingen, Germany	2011
	Experimental Physics IV: Quantum, atomic and molecular physics (undergraduate course), Teaching assistant, University of Göttingen, Germany	2010
	Theoretical Physics I: Theoretical Mechanics (undergraduate course) Teaching assistant, Technical University of Munich, Germany	2009
	Theoretical Physics II: Electrodynamics (undergraduate course) Teaching assistant, Technical University of Munich, Germany	2008
MENTORING	Janelia Buddy Program for International Scientists Focus: Facilitating the transition of international scientists to Janelia in partnership with Janelia's Human Resource Department Janelia Research Campus, Ashburn, United States of America	2020 - present
	Mentoring of Postbac Students Focus: Navigating a scientific career Janelia Research Campus, Ashburn, United States of America	2020 - present
	Mentoring of PhD, College and Highschool Students Focus: Navigating a scientific career, how to work in an optics laboratory & in-depth support with individual research projects National Institutes of Health, Bethesda, United States of America	2017 - 2018
	Mentoring of PhD students and Master Students Focus: Navigating a scientific career, how to work in an optics laboratory & in-depth support with individual research projects Max Planck Institute for Biophysical Chemistry, Göttingen, Germany	2010 - 2016
CONFERENCE ORGANIZATION	Microscopy Club for North America , Co-organizer Ashburn, United States of America	2021 - present
	OIG-ABG Educational Lectures , Co-organizer Ashburn, United States of America	2021 - present
	OIG-MOIA Seminar Series , Co-organizer	2020 - present

	Ashburn, United States of America	
	Virtual Optical Interest Group (OIG) 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 - 2019
	PhDnet General Meeting , Co-organizer	2011
	Bonn, Germany	
PROFESSIONAL SERVICES	CZI Expanding Global Access to Bioimaging , Grant reviewer	2021
	San Francisco, United States of America	
	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 Challengleichheit, 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	Machine Learning with Python: from Linear Models to Deep Learning	2021
	A 15-week in-depth introduction course by MITx to the field of machine learning, from linear models to deep learning and reinforcement learning, through hands-on Python projects.	
	Data Analysis for Social Scientists	2020
	A 11-week course by MITx to learn methods for harnessing and analyzing data to answer questions of cultural, social, economic, and policy interest.	
	Probability - The Science of Uncertainty and Data	2020
	A 16-week course by MITx to build foundational knowledge of data science with an introduction to probabilistic models, including random processes and the basic elements of statistical inference.	
	Fierce Conversations program	2020
	A 6-week course offered by Howard Hughes Medical Institute 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
- BioTech2: 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, LabVIEW, C++, R
 Software: Inventor (CAD)

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
 English - fluent, spoken and written
 French - basic knowledge
 Swedish - basic knowledge
 Spanish - basic knowledge

REFERENCES Available upon request

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