Jakub Czuchnowski, PhD

Assistant Scientist and Hibbitt Imaging Scientist

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EDUCATION

2016 – 2021	**Ph.D./Dr. rer. nat. (*Summa cum laude*) – Cell Biology and Biophysics Unit** EMBL International PhD Program jointly with University of Heidelberg, Germany
2014 – 2016	**M.Sc. – Molecular Biotechnology** awarded by Jagiellonian University, Poland for research performed at UT Southwestern Medical Center, TX, USA
2011 – 2014	**B.Sc. – Biotechnology** Jagiellonian University, Poland

PROFESSIONAL POSITIONS

2026 – present	**Hibbitt Imaging Scientist** Marine Biological Laboratory, MA, USA
2026 – present	**Assistant Scientist - Josephine Bay Paul Center** Marine Biological Laboratory, MA, USA
2023 – 2026	**Postdoc – Biomedical Engineering** Boston University, MA, USA
2022 – 2023	**Postdoc – Chemistry and Chemical Biology** Harvard University, MA, USA
2021 – 2022	**Bridging postdoc – Cell Biology and Biophysics Unit** EMBL Heidelberg, Germany
2016 – 2021	**PhD Candidate – Cell Biology and Biophysics Unit** EMBL Heidelberg jointly with University of Heidelberg, Germany
2015 – 2016	**Visiting Student – Department of Biophysics** UT Southwestern Medical Center, TX, USA
2013	**Amgen Scholar – Department of Microbiology, Tumor and Cell Biology** Karolinska Institute, Sweden

RESEARCH INTERESTS

Advanced imaging, multi-modal microscopy, computational imaging, neurobiology, fast volumetric microscopy, label-free microscopy, photoacoustic tomography

PUBLICATIONS (CORRESPONDING AUTHOR*, FIRST AUTHOR)

J. Czuchnowski*, J. Mertz "Reducing ringing artifacts in Wiener deconvolution using implicit physical priors" *ArXiv (2026): 2609.26320*

J. Czuchnowski*, J. Mertz "Implications of temporal sampling in voltage imaging microscopy" *ArXiv (2026): 2601.20236*

J. Czuchnowski*, C. Li, H. Ni, B. Weissbourd, J. Mertz "Versatile 3D space-variant modal deconvolution with measurement-free point spread functions models" *Optics Express 34.16 (2026): 29928-29941*

J. Czuchnowski*, R. Prevedel* "Interrogation trajectory optimisation for Fabry-Perot based photoacoustic tomography" *Journal of Physics: Photonics 8 (2026): 015075*

E. Sitarska, S. Dias Almeida, M. Sandvold Beckwith, J. Stopp, **J. Czuchnowski**, M. Siggel, R. Roessner, A. Tschanz, C. Ejsing, Y. Schwab, J. Kosinski, M. Sixt, A. Kreshuk, A. Erzberger, A. Diz-Muñoz*. "Sensing their plasma membrane curvature allows migrating cells to circumvent obstacles" *Nature Communications 14.1 (2023): 5644.*

J. Czuchnowski* and R. Prevedel*. "Comparing free-space and fibre-coupled detectors for Fabry-Pérot based all-optical photoacoustic tomography" *Journal of Biomedical Optics 27.4 (2022): 046001.*

J. Czuchnowski* and R. Prevedel*. "Zernike mode rescaling extends capabilities of adaptive optics for microscopy" *Optics Continuum 1.12 (2022): 2600-2606.*

J. Czuchnowski* and R. Prevedel*. "Transfer function asymmetry in Fabry-Pérot based optical pressure sensors" *Optics Letters 47.23 (2022): 6089-6092.*

J. Czuchnowski* and R. Prevedel*. "Cross-compensation of Zernike aberrations in Gaussian beam optics" *Optics Letters 46.14* (2021): 3480-3483.

J. Czuchnowski and R. Prevedel*. "Adaptive optics enhanced sensitivity in Fabry-Pérot based photoacoustic tomography." *Photoacoustics* 23 (2021): 100276.

J. Czuchnowski and R. Prevedel*. "Improving the sensitivity of planar Fabry-Pérot cavities via adaptive optics and mode filtering." *Advanced Optical Materials* 9.4 (2020): 2001337.

J. Czuchnowski and R. Prevedel. 2019. "Photoacoustics: seeing with sound." Science In School, Issue 4

SELECTED CONFERENCES

SPIE Photonics West 2026 - Computational Optical Imaging and Artificial Intelligence in Biomedical Sciences III 2026
Best Presentation Award: Modal deconvolution approaches for fast volumetric imaging
San Francisco, CA, USA

Seeing is Believing – Imaging the Molecular Processes of Life 2021
Presentation: All-optical photoacoustic tomography for deep tissue imaging
EMBL, Heidelberg, Germany

OSA ECBO 2021 2021
Presentation: Improving the sensitivity of Fabry-Pérot pressure sensors for photoacoustic imaging
Online conference

SPIE Photonics West 2021 - Photons Plus Ultrasound: Imaging and Sensing 2021 2021
Presentation: Improving the sensitivity of Fabry-Pérot pressure sensors for photoacoustic imaging
Conference Proceeding: Photons Plus Ultrasound: Imaging and Sensing 2021 11642, 116421T
Online conference

Seeing is Believing – Imaging the Molecular Processes of Life 2019
Poster: All-optical photoacoustic tomography for deep tissue imaging
EMBL, Heidelberg, Germany

14th annual meeting of the European society for molecular imaging (EMIM) 2019
Poster: Longitudinal studies of mouse mammary gland tumor models using photoacoustics
Glasgow, United Kingdom

Second Summer School in Molecular Biophysics and Systems Biology Conference 2014
Best Presentation Award: Development of optical microscopy into a structural biology technique
Academy and University Center Nove Hrady, Nove Hrady, Czech Republic

COURSES TAKEN

Machine Learning for Image Analysis 2018
Corbel, EMBL, German Bioimaging and Neubias, Heidelberg, Germany

Machine Learning in R 2018
EMBL, Heidelberg, Germany

EXCITE Zurich Summer School on Biomedical Imaging 2017
Exam passed with the highest grade of 6 (excellent)
ETH Zurich and University of Zurich, Zurich, Switzerland

Course on Laboratory Animal Handling 2017
EMBL, Heidelberg, Germany

TEACHING

Writing an article aimed at informing teachers of emerging trends in science 2019
Science In School – The European journal for science teachers

Lecture on advanced imaging modalities 2019
EMBL Summer School for Undergraduate - Talents teach Talents

Organization of the Basic Teaching Module (BTM) during the EMBL Predoc course 2017
Organized a 3 day course during which selected PhD students teach computational and practical skills to approximately 50 new PhD students coming from 12 different countries.

Lecture and practical on image analysis using ImageJ scripting 2017
Basic Teaching Module

MENTORING

Nathan Berube 2024
Summer student mentoring (as part of the Research Experiences for Undergraduates (REU) program)

Momoko Kawarabata 2019
Master Thesis mentoring