Zach Marin

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Academic Qualifications	**Yale University**	New Haven, CT

Yale University
Doctor of Philosophy, Biomedical Engineering, May 2022 (expected).
Advisors: Joerg Bewersdorf and David Baddeley.
Thesis: Quantifying endoplasmic reticulum dynamics using super-resolution microscopy.

University of Maine   Orono, ME
Master of Arts, Mathematics, May 2017. Advisor: Andre Khalil. Thesis: Wavelet-based particle tracking in unreconstructed, off-axis holograms.
Bachelor of Science, Bioengineering, *summa cum laude*, May 2015.
Bachelor of Arts, Mathematics, *summa cum laude*, May 2015.

McGill University   Montreal, QC
Biology major, September 2009 – January 2010.

Work Experience

Maritime Applied Physics Corporation   Brunswick, ME
Managed interstate multi-platform computer network and information service technologies for 80 employees. Created inventory database to integrate financial and engineering sides of the business. Designed cost-effective in-house g-force monitor using commercial off-the-shelf technology. Co-designed and programmed real-time seawater quality monitoring system. Programmed network connectivity module for wave prediction system. Programmed data-loggers for in-house testing. January 2011 – August 2012 and July – August 2013.

Awards & Honors

Chase Distinguished Research Assistantship (2016). Interdisciplinary Teaching Assistantship in Biology (2015). Presidential Scholar (2015). Tau Beta Pi (2014). Dean's List (2012-2015).

Leadership

Yale Graduate Student Assembly, Representative (2017-Present) and Service Committee Co-Chair (2018-2019).

Technical Skills

Fluent in Python, C, Tcl, MATLAB, LabView. Proficient with C++, OpenCL, OpenGL, CUDA, Java, R. Image processing and data analysis algorithm development. Optical system design and development, specializing in quantitative phase imaging and single-molecule localization microscopes. Systems integration of electronics, optics, and control and analysis software. Basic wet lab techniques.

Teaching Experience

Lab Leader, Physiological Systems Lab, Yale (Fall 2018, Fall 2019, Fall 2020).
Mathematics Tutor, International Study Center, University of Maine (2015-2016).
Teaching Assistant, Biology of Organisms, University of Maine (Spring 2015).
Teaching Assistant, Basic Biology, University of Maine (Fall 2015).

Publications

Marin Z, Baddeley D (2020). Nanoscale membrane topology from SMLM data. *In preparation.*

Marin Z, Graff M, Barentine AES, Soeller C, Chung KKH, Fuentes LA, Baddeley D (2020). PYMEVisualize: an open-source tool for exploring 3D super-resolution data. *In revision.*

Marin Z, Wallace JK, Nadeau J, Khalil A (2017). Wavelet-based tracking of bacteria in unreconstructed off-axis holograms. *Methods*. 136:60. doi:10.1016/j.ymeth.2017.09.003

Marin Z, Batchelder KA, Toner B, Guimond L, Gerasimova-Chechkina E, Harrow A, Arneodo A, and Khalil A (2017) Mammographic evidence of microenvironment changes in tumorous breasts. *Medical Physics*. 44:4. doi:10.1002/mp.12120

Talks   Gerasimova-Chechkina E, Toner B, Marin Z, Audit B, Roux SG, Argoul F, Khalil A, Gileva O, Naimark O, and Arneodo A (2016) Comparative Multifractal Analysis of Dynamic Infrared Thermograms and X-Ray Mammograms Enlightens Changes in the Environment of Malignant Tumors. *Frontiers in Physiol*ogy. 7:336. doi:10.3389/fphys.2016.00336

Plourde SM, Marin Z, Smith ZR, Toner BC, Batchelder KA, and Khalil A (2016) Computational Growth Model of Breast Microcalcification Clusters in Simulated Mammographic Environments. *Computers in Biology and Medicine*. 76:7. doi:10.1016/j.compbiomed.2016.06.020

Characterization of Chromosome Territory Morphology and Intermingling in Mouse Nuclei. *UMaine Student Research Symposium.* Bangor, ME, USA. 2016.

Conference   Marin Z, Graff M, Bewersdorf J, Baddeley D (2019). Extracting organelle
Presentations membrane topology from super-resolution microscopy data. *EMBO | EMBL*
& Proceedings *Symposium: Seeing is Believing - Imaging the Molecular Processes of Life.* Heidelberg, DE. Poster session.

Marin Z, Graff M, Bewersdorf J, Baddeley D (2019). Visualization of endoplasmic reticulum membrane topology based on super-resolution microscopy data. *BPS Thematic Meeting: Quantitative Aspects of Membrane Fusion and Fission.* Padova, IT. Poster session.

Marin Z, Rollins BD, Chung KKH, Grace M, Sun M, Bewersdorf J, Baddeley D (2019). Simulation of single molecule switching nanoscopy using model-free kinetics. *Auckland Bioengineering Institute Research Forum*. Auckland, NZ. Poster session.

Marin Z, Rollins BD, Chung KKH, Grace M, Sun M, Baddeley D, Bewersdorf J (2018). Simulation of single molecule switching nanoscopy using model-free kinetics. *Labeling and Nanoscopy*. Heidelberg, DE. Poster session.

Marin Z, Khalil A (2017). Wavelet-based particle tracking in unreconstructed, off-axis holograms. *44th Maine Biological and Medical Sciences Symposium*. Bar Harbor, ME, USA. Poster session.

Gerasimova-Chechkina E, Toner B, Marin Z, Audit B, Roux SG, Argoul F, Khalil A, Gileva O, Naimark O, and Arneodo A (2016). Combining multifractal analyses of digital mammograms and infrared thermograms to assist in early breast cancer diagnosis. *AIP Conference Proceedings*. 1760. doi:10.1063/1.4960237