**Lindsey A. Erion Barner, Ph.D.**  
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**OBJECTIVE**

To develop imaging technology and data analysis tools to advance technology and human health.

**EDUCATION AND TRAINING**

**Doctor of Philosophy, University of Washington**  Aug 2017 – June 2022Mechanical Engineering

Molecular Biophotonics Laboratory (PI: Dr. Jonathan Liu)  
Dissertation: Multi-resolution open-top light-sheet microscopy enables 3D pathology of lymph nodes for breast cancer staging

**Master of Science, University of Washington** 2020Mechanical Engineering (GPA 3.84/4.00)

**Bachelor of Science, Messiah University** 2013 – 2017  
Mechanical Engineering (GPA 3.98/4.00)  
Physics minor

Diagnostics for Viral Diseases Research Group (PI: Dr. Matthew Farrar)  
Thesis: A low-cost dynamic light scattering system for detection of viral aggregates

Kryemadhi Research Group (PI: Dr. Abaz Kryemadhi)  
Compact particle detector development for dark matter searches

**RESEARCH EXPERIENCE**

**Scientist I, Nanostring Technologies, Inc.** June 2022 – Nov 2022 (position downsized)  
Developed light sheet microscope for 3D imaging of CosMx RNA and protein analytes in thick tissue  
PI: Dr. Yi Cui

**Research Assistant, University of Washington** Aug 2017 – June 2022Developed multi-resolution open-top light-sheet microscopy for 3D pathology of clinical specimens  
Implemented deep learning techniques for AI-assisted 3D pathology diagnostic workflows   
PI: Dr. Jonathan Liu

**HONORS AND AWARDS**

National Science Foundation GRFP fellowship 2018 – 2021  
Seattle ARCS Foundation ARCS Foundation scholarship 2018 – 2021  
University of Washington Purvis Endowed Fellowship 2018 – 2019  
University of Washington Mamidala Endowed Fellowship 2018 – 2019  
ASME IMECE Poster award 2019

**PUBLICATIONS**

**L.A. Barner,** A.K. Glaser, H. Huang, L.D. True, and J.T.C. Liu, “Multi-resolution open-top light-sheet microscopy to enable efficient 3D pathology workflows,” Biomed. Opt. Exp. 11, 6605 (2020).

**L.A. Barner,** A.K. Glaser, L.D. True, N.P. Reder, and J.T.C. Liu, "Solid immersion meniscus lens (SIMlens) for open-top light-sheet microscopy," Opt. Lett. 44, 4451 (2019).

**L.A. Barner,** A.K. Glaser, E.A. Susaki, S.M. Dintzis, and J.T.C. Liu, “Multi-resolution non-destructive 3D pathology of whole lymph nodes for breast cancer staging,” Journal of Biomedical Optics27, 036501 (2022).

**L.A. Barner\*,** G. Gao\*, D.M. Reddi, L. Lan, W. Burke, W.M. Grady, and J.T.C. Liu, “Enhanced detection of neoplasia in esophageal biopsies via non-destructive 3D pathology with deep learning triage” (in preparation). \*equal contribution

D.M. Reddi, **L.A. Barner,** W. Burke, W.M. Grady, and J.T.C. Liu, “Non-destructive 3D pathology image atlas of Barrett esophagus with open-top light-sheet microscopy,” Arch. Path. Lab Med (in press).

A.K. Glaser, K.W. Bishop, **L.A. Barner,** R.B. Serafin, and J.T.C. Liu, “A hybrid open-top light-sheet microscope for multi-scale imaging of cleared tissues,” Nature Methods19, 613 (2022).

W. Xie, N.P. Reder, C. Koyuncu, P. Leo, S. Hawley, H. Huang, C. Mao, N. Postupna, S. Kang, R. Serafin, G. Gao, Q. Han, K.W. Bishop, **L.A. Barner,** P. Fu, J.L. Wright, C.D. Keene, J.C. Vaughan, A. Janowczyk, A.K. Glaser, A. Madabhushi, and J.T.C. Liu, "Prostate cancer risk stratification via non-destructive 3D pathology with deep learning-assisted gland analysis," Cancer Research 82, 334 (2022).

L. Horowitz, A. Rodriguez, A. Au-Yeung, K.W. Bishop, **L.A. Barner,** G. Mishra, A. Raman, P. Delgado, J.T.C. Liu, T. Gujral, M. Mehrabi, M. Yang, R. Pierce, and A. Folch, “Microdissected cuboids for microfluidic drug testing of intact tissues,” Lab on Chip (2020).

A.K. Glaser, N.P. Reder, Y. Chen, C. Yin, L. Wei, S. Kang, **L.A. Barner,** W. Xie, E.F. McCarty, C. Mao, A.R. Halpern, C.R. Stoltzfus, J.S. Daniels, M.Y. Gerner, P.R. Nicovich, J.C. Vaughan, L.D. True, and J.T.C. Liu, "Multi-immersion open-top light-sheet microscope for high-throughput imaging of cleared tissues," Nature Communications 10, 2781 (2019).

A.K. Glaser, Y. Chen, C. Yin, L. Wei, **L.A. Barner,** N.P. Reder, and J.T.C. Liu, "Multidirectional digital scanned light-sheet microscopy enables uniform fluorescence excitation and contrast-enhanced imaging," Scientific Reports 8, 13878 (2018).

A. Kryemadhi, **L.A. Barner,** A. Grove, J. Mohler, A. Roth, “A LYSO crystal array readout by silicon photomultipliers as compact detector for space applications,” Nuclear Instruments and Methods in Physics Research (2018).

A. Kryemadhi, **L.A. Barner,** A. Grove, J. Mohler, C. Sisson, A. Roth, “Performance of LYSO and CeBr3 crystal readout by silicon photomultiplier arrays as compact detectors for space based applications,” Journal of Instrumentation 12 (02), C02013 (2017).

**PRESENTATIONS**

**L.A. Barner,** A.K. Glaser, H. Huang, J.T.C. Liu, “Solid immersion lens (SIMlens) enables multi-resolution open-top light-sheet microscopy,” SPIE Photonics West 11649- 13 (2021). Oral presentation.

**L.A. Barner,** A.K. Glaser, J.T.C. Liu, “Multi-resolution open-top light-sheet microscopy enabled by a solid immersion meniscus lens (SIMlens),” Biophotonics Congress: Biomedical Optics (2020). Oral presentation.

**L.A. Barner,** A.K. Glaser, J.T.C. Liu, “Multi-resolution open-top light-sheet (OTLS) microscopy for rapid 3D pathology,” ASME IMECE 13009 (2019). Poster presentation, award winner.

**L.A. Barner,** A. Grove, J. Mohler, C. Sisson, A. Roth, “Development of compact particle detectors for space-based instruments,” APS April meeting E2.003 (2017). Oral presentation.

J.R. Wilson, **L.A. Barner,** A.E. Vladar, K. Klein, “Characterization of helium-ion machined fluidic structures”, poster presentation at EIPBN (2018). Poster presentation.

**PATENTS**

J.T.C. Liu, **L.A. Barner,** A.K. Glaser, “Apparatuses, systems and methods for solid immersion meniscus lenses,” WO2020150239A1 (2019).

**INDUSTRY EXPERIENCE**

**Johns Hopkins University Applied Physics Laboratory (JHUAPL)** Summer 2017  
LIDAR systems and interferometry, Imaging Systems Group (Supervisor: Austin Cox)  
Laurel, MD

**National Institute of Standards and Technology (NIST)** Summer 2016  
Helium ion-machined fluidic structures for nanofluidic devices (PI: Dr. Kate Klein)   
Gaithersburg, MD

**National Aeronautics and Space Administration (NASA)**  Summer 20152015 Next Generation X-Ray Optics  
Goddard Space Flight Center, Greenbelt, MD

**SKILLS**

**Programming languages** – Python, PyTorch, CUDA, MATLAB, LabVIEW  
**Software** – ZEMAX, SolidWorks, Imaris, BigStitcher, KeyShot, LATEX  
**Hardware –** Light-sheet microscopy development (sCMOS, dual-axis galvanometer, spatial light modulator), GPU acceleration, helium-ion microscopy, electron microscopy   
**Wet Lab –** Fixed tissue and antibody labeling, tissue clearing

**SERVICE**

Graduate Society of Women Engineers Academics Chair 2020 – 2022  
UW Mechanical Engineering Biomedical Imaging Cluster Hire Committee 2020 – 2021  
UW Mechanical Engineering Graduate Student Association (VP) 2018 – 2019  
Biophotonics seminar organizer 2018 – 2019  
Graduate student mentor 2018 – 2020