

## Lindsey A. Barner

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## OBJECTIVE

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To develop imaging technologies and data analysis tools for the advancement of technology and human health.

## EDUCATION AND TRAINING

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**Doctoral candidate, University of Washington** Aug 2017 – June 2022  
Mechanical 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** 2020  
Mechanical 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

## HONORS AND AWARDS

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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

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**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 Optics* (under review).

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* (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 Methods* (in revision).

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 CeBr<sub>3</sub> crystal readout by silicon photomultiplier arrays as compact detectors for space based applications," *Journal of Instrumentation* 12 (02), C02013 (2017).

## PRESENTATIONS

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**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.

**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

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

## SKILLS

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**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

## INDUSTRY EXPERIENCE

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<b>Johns Hopkins University Applied Physics Laboratory (JHUAPL)</b> LIDAR systems and interferometry, Imaging Systems Group (Supervisor: Austin Cox) Laurel, MD	Summer 2017
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<b>National Institute of Standards and Technology (NIST)</b> Helium ion-machined fluidic structures for nanofluidic devices (PI: Dr. Kate Klein) Gaithersburg, MD	Summer 2016
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<b>National Aeronautics and Space Administration (NASA)</b> 2015 Next Generation X-Ray Optics Goddard Space Flight Center, Greenbelt, MD	Summer 2015
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## SERVICE

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Graduate Society of Women Engineers Academics Chair	2020 – present
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