Lindsey A. Barner

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OBJECTIVE

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

EDUCATION AND TRAINING

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

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 Optics* (in revision).

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 preparation).

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 press).

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).

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

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 2015
2015 Next Generation X-Ray Optics
Goddard Space Flight Center, Greenbelt, MD

SERVICE

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