

Zack Phillips, PhD

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Overview	Full-stack optical sensing engineer and manager, currently a core architect of insitro's ML-enabled drug discovered platform. Ex-Apple R&D Engineer, XDG. Deep-tech microscopy start-up Co-founder.	
Professional Experience	Computational Microscopy Group, insitro South San Francisco, California	
	<i>Associate Director, Computational Microscopy</i>	September 2023 - Present
	<i>Staff Automation Engineer, Microscopy</i>	March 2023 - September 2023
	<i>Senior ML Optical Engineer</i>	November 2021 - March 2023
	- Platform architect and full-stack engineer of insitro's ML-enabled drug discovery platform	
	Exploratory Design Group (XDG), Apple Cupertino, California	
	<i>Photonics Engineer</i>	July 2019 - October 2021
	- Full-stack optical sensing IC and tech lead of interdisciplinary R&D effort in Biophotonics Group	
	Waller Lab, University of California, Berkeley Berkeley, California	
	<i>Graduate Student Researcher (PI: Laura Waller)</i>	July 2014 - May 2019
Education	- Developed and published methods for multi-modal and high-throughput optical microscopy	
	- Spun out hardware development efforts into a commercially successful company (SCI Microscopy)	
	SCI Microscopy Berkeley, California	
	<i>CEO and Co-founder (with Laura Waller) - website</i>	January 2017 - Present
	- Spin-off company focused on developing illuminators for computational microscopy	
	- Designed and delivered over 40+ LED arrays to customers across 7+ countries	
	DISP Lab, Duke University Durham, North Carolina	
	<i>Associate in Research (PI: David Brady)</i>	May 2013 - May 2014
	- R&D engineer for AWARE Gigapixel camera; Work featured in NPR's All Things Considered	
	University of California, Berkeley Berkeley, California	
Tools and Expertise	<i>Ph.D., Applied Science and Technology. GPA 3.6</i>	June 2014 - May 2019
	- Dissertation: Quantitative Microscopy Using Coded Illumination	
	- Research Advisor: Laura Waller	
	University of California, Berkeley Berkeley, California	
	<i>M.S., Applied Science and Technology. GPA 3.6</i>	June 2014 - December 2016
	- Thesis: Coded Illumination Techniques for Phase Imaging and Motion Blur	
	- Research Advisor: Laura Waller	
	University of North Carolina, Chapel Hill Chapel Hill, North Carolina	
	<i>B.S. with Highest Honors, Applied Science and Engineering. GPA 3.7</i>	August 2009 - May 2013
	- Research Advisor: Amy L. Oldenburg	
Awards and Affiliations	Team-Building and Leadership, Computational Imaging, Python (Development and Technical Leadership), Optical Engineering, Vendor Management, CAD (NX / Fusion360 / SolidWorks), Design for Manufacture, PCB Design (KiCad), MATLAB , FRED Optical Design	
	AS&T Excellence in Research Award UC Berkeley	2019
	Qinf PhD Fellowship Recipient Qualcomm inc.	2016
	Eagle Scout Boy Scouts of America	2008

References available upon request - please email zack@zackphillips.com

- Publications**
- Z.F. Phillips**, S. Dean, B. Recht, and L. Waller (*In Preparation*). *High-throughput optical microscopy using multi-frame motion deblurring*.
- H. Pinkard, **Z.F. Phillips**, A. Babakhani, D.A. Fletcher and L. Waller 1 January 2019. *Single-shot autofocus microscopy using deep learning*. BioRxiv, 587485. (doi)
- M. Chen, **Z.F. Phillips** and L. Waller 10 December 2018. *Quantitative differential phase contrast (DPC) microscopy with computational aberration correction*. Optics Express 26 (25), 32888-32899. (doi)
- M. Kellman, M. Chen, **Z.F. Phillips**, M. Lustig and L. Waller 1 December 2018. *Motion-resolved quantitative phase imaging*. Biomedical optics express 9 (11), 5456-5466. (doi)
- R. Eckert, **Z.F. Phillips**, and L. Waller. (1 July 2018). *Efficient illumination angle self-calibration in Fourier ptychography*. Applied Optics 57(19): 5434-5442. (doi)
- Z.F. Phillips**, M. Chen and L. Waller (13 May 2015). *Single-shot quantitative phase microscopy with color-multiplexed differential phase contrast (cDPC)*. PLoS ONE 12(2): e0171228. (doi)
- P. Llull, L. Bange, **Z.F. Phillips**, K. Davis, D. L. Marks, D.J. Brady (20 December 2015) *Characterization of the AWARE 40 wide-field-of-view visible imager*. Optica 2 (12), 1086-1089. (doi)
- Z.F. Phillips**, M.V. D'Ambrosio, L. Tian, J. Rulison, H.S. Patel, N. Sadras, A. Gande, N. Switz, D.A. Fletcher and L. Waller (13 May 2015). *Multi-Contrast Imaging and Digital Refocusing on a Mobile Microscope with a Domed LED Array*. PLoS ONE 10(5): e0124938. (doi)
- D.L. Marks, P.R. Llull, **Z.F. Phillips et.al.** (2014). *Characterization of the AWARE 10 two gigapixel wide FOV visible imager*. Applied Optics 53(14) C54-C63. (doi)
- R.K. Chhetri, **Z.F. Phillips**, M.A. Troester, A.L. Oldenburg (2012). *Longitudinal study of mammary epithelial and fibroblast co-cultures using optical coherence tomography reveals morphological hallmarks of premalignancy*. PLoS ONE 7(11) e49148 (doi)
- Conference Proceedings**
- Z.F. Phillips**, S. Dean, B. Recht, and L. Waller (15 April 2019) *High-Throughput Fluorescence Microscopy Using Motion Deblurring*. Focus on Microscopy 2019.
- S. Dean, **Z. Phillips**, L. Waller and B. Recht (25 June 2018). *Optimal Path and Illumination Design for Multiframe Motion Deblurring*. Imaging Systems and Applications, ITu2B.
- Z.F. Phillips**, S. Dean, B. Recht, and L. Waller (27 March. 2018) *Multi-Frame Motion Imaging For Optical Microscopy*. Focus on Microscopy 2018.
- L. Waller, **Z.F. Phillips**, M. Chen, R. Eckert, L.H. Yeh, L. Waller (7 Nov. 2017) *Algorithmic Self-Calibration in Computational Imaging*. SIAM Data Driven Approaches in Imaging Science 2017.
- Z.F. Phillips**, R. Eckert, L. Waller (7 June. 2017) *Quasi-Dome: A Self-Calibrated High-NA LED Illuminator for Fourier Ptychography*. OSA Imaging Systems and Applications, Paper IW4E.5.
- Z.F. Phillips**, M. Chen, L. Waller (7 April. 2017) *Quantitative Differential Phase Contrast Imaging with Pupil Recovery*. OSA Bio-Optics, Design and Application, Paper JTu5A.2.
- Z.F. Phillips**, M. Chen, L. Waller (7 July. 2016) *Single-Shot Quantitative Phase and Amplitude Retrieval Using Color-Multiplexed Differential Phase Contrast Microscopy*. OSA Computational Optical Sensing and Imaging, Paper CT1D.4.

Z.F. Phillips, M. Chen, L. Waller (7 April. 2016) *Amplitude and Phase Recovery from Motion Blur Deconvolution*. SPIE DCS Computational Imaging, Paper 9870-17.

G. Gunjala, **Z.F. Phillips**, L. Waller (7 April. 2016) *Optimal LED illuminator design for Fourier ptychographic microscopy* SPIE DCS Computational Imaging, Paper 9870-13.

Z.F. Phillips, G. Gunjala, P. Varma, J. Zhong, L. Waller (7 June. 2015) *Design of a Domed LED Illuminator for High-Angle Computational Illumination*. OSA Imaging Systems, Paper [FTu2F.5](#).

Z.F. Phillips, M.V. D'Ambrosio, L. Tian, J. Rulison, H.S. Patel, N. Sadras, A. Gande, N. Switz, D.A. Fletcher, L. Waller (12 April. 2015) *Computational CellScope: Multi-Contrast Imaging on a Smartphone-Based Microscope Using a Domed Programmable LED Array*. OSA Bio-Optics: Design and Application, Paper [BM3A.7](#).

Z.F. Phillips, Chhetri, R.K., Cooper, J., Troester, M.A., Oldenburg, A.L. (2 feb. 2013) *Fractals and fluctuations: spatial and temporal correlations in optical coherence tomography of human breast cancer models*. Dynamics and Fluctuations in Biomedical Photonics X (SPIE Photonics West), Paper 8580-2.

D.L. Marks, J.G. Anderson, **Z.F. Phillips**, S.T. McCain, D.J. Brady (19 oct. 2014) *Gigapixel Whole-Body Microscopy*. Frontiers in Optics, Paper FTu2F.5.

D.L. Marks, **Z.F. Phillips**, S.D. Feller, D.J. Brady (22 June. 2014) *Multiscale Camera Objective with sub 2 Arcsec Resolution, 36 degree Field-of-View* Computational Optical Sensing and Imaging, Paper CTh1C.3.