# Zack Phillips

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## Professional Experience

**Advanced Imaging Methods Group, Insitro** | South San Francisco, California

*Assiciate Director, Microscopy Systems* — September 2023 - Present

*Staff Automation Engineer, Microscopy* — March 2023 - August 2023

*Senior ML Optical Engineer* — November 2021 - March 2023

- Led Advanced Imaging Modalities group; ML-enabled microscopy for drug discovery
- Member of imaging platform, responsible for developing and scaling microscopy platform

**Exploratory Design Group (XDG), Apple** | Cupertino, California

*Photonics Engineer* — July 2019 - October 2021

- Project lead for interdisciplinary R&D effort within Biophotonics group
- Delivered monthly progress updates to Apple Fellow (VP) and team

**Waller Lab, University of California, Berkeley** | Berkeley, California

*Graduate Student Researcher (PI: Laura Waller)* — July 2014 - May 2019

- Developed methods for phase retrieval, super-resolution, and high-throughput optical microscopy
- Cultivated duel expertise in GPU computation (inverse problems) and optical hardware
- Mentored 11 undergraduates for summer and semester projects

**SCI Microscopy** | Berkeley, California

*CEO and Co-founder (with Laura Waller) - website* — Jan 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, NC

*Associate in Research (PI: David Brady)* — May 2013 - May 2014

- R&D engineer for AWARE Gigapixel camera; Work featured in NPR's *All Things Considered*

## Education

**University of California, Berkeley**

*Ph.D., Applied Science and Technology* — 2014 - 2019

- Dissertation: Quantitative Microscopy Using Coded Illumination
- Research Advisor: Laura Waller

**University of California, Berkeley**

*M.S., Applied Science and Technology* — 2014 - 2016

- Thesis: Coded Illumination Techniques for Phase Imaging and Motion Blur
- Research Advisor: Laura Waller

**University of North Carolina, Chapel Hill**

*B.S. with Highest Honors, Applied Science and Engineering* — 2009 - 2013

- Research Advisor: Amy L. Oldenburg

## Tools and Expertise

Python (various contexts), CAD (NX / Fusion360 / SolidWorks), Machining and 3D printing, PCB Design (KiCad), MATLAB, FRED Optical Design, Keynote / slides.com, Vendor Engagement

## Awards and Affiliations

**AS&T Excellence in Research Award** | UC Berkeley — 2019

**Qinf PhD Fellowship Recipient** | Qualcomm inc. — 2016 - 2017

**Eagle Scout** | Boy Scouts of America — 2008

*Referances 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 1December 2018. *Motion-resolved quantitative phase imaging*. Biomedical optics express 9 (11), 5456-5466. (doi)

R. Eckert, **Z.F. Phullips**, 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.