



## Photonics Forum

January 25, 2017

11:45 a.m. -  
1:15 p.m.

9th Floor

Room 901

Photonics Center

8 Saint Mary's Street

Lunch will be served!



## Professor Lei Tian, Boston University

### Computational Microscopy: Illumination Coding and Nonlinear Optimization Enables Gigapixel 3D Phase Imaging

Computational imaging is a new frontier of imaging technology that overcomes fundamental limitations of conventional systems by jointly designing optics, devices, signal processing, and algorithms. In this talk, Professor Tian will present recent advancements in computational microscopy based on coded illumination and nonlinear phase retrieval. This method enables wide field-of-view and high-resolution Gigapixel and 3D phase microscopy capability, breaking the limit of space-time-bandwidth product in traditional systems. Experiments demonstrate quantitative dynamic imaging of rare events across multiple scales in both space and time. This computational imaging approach creates significant new capabilities by integrating hardware and computation at the system level. It promises wide applications, with biomedicine, metrology, and inspection.

Lei Tian is an Assistant Professor in the Electrical and Computer Engineering department at Boston University. He received his Ph.D. (2013) and M.S. (2010) from MIT. He was a postdoctoral associate in the EECS department at University of California, Berkeley from 2013-2016. His research focuses on computational imaging and sensing, high-throughput microscopy, phase retrieval and imaging in complex media. Dr. Tian's awards include the 2014 Imaging Systems and Applications Best Paper Award and the 2011 Emil Wolf Outstanding Student Paper Prize, both from the OSA. He serves as a topical editor of *Applied Optics*, and conference chair and program committee member for multiple conferences sponsored by OSA, SPIE, and IEEE.