

PHOTONICS SEMINAR

Dr. Aydogan Ozcan

Democratization of Next-Generation Imaging, Diagnostics and Measurement Tools through Computational Photonics

Faculty Host: Dr. Selim Unlu

December 15, 2014

2-3 p.m.

Room 901

Photonics Center

8 Saint Mary's Street

*Refreshments will
be served!*



Dr. Ozcan's research focuses on the use of computation/algorithms to create new optical microscopy, sensing, and diagnostic techniques, significantly improving existing tools for probing micro- and nano-objects while also simplifying the designs of these analysis tools. In this presentation, Dr. Ozcan will introduce a new set of computational microscopes which use lens-free on-chip imaging to replace traditional lenses with holographic reconstruction algorithms. Basically, 3D images of specimens are reconstructed from their "shadows" providing considerably improved field-of-view (FOV) and depth-of-field, thus enabling large sample volumes to be rapidly imaged, even at nanoscale. These new computational microscopes routinely generate >1–2 billion pixels (giga-pixels), where even single viruses can be detected with a FOV that is >100 fold wider than other techniques. At the heart of this leapfrog performance lie self-assembled liquid nano-lenses that are computationally imaged on a chip.

Dr. Ozcan is the Chancellor's Professor at UCLA and an HHMI Professor with the Howard Hughes Medical Institute, leading the Bio- and Nano-Photonics Laboratory at UCLA School of Engineering. He is also the Associate Director of the California NanoSystems Institute (CNSI). Dr. Ozcan holds 27 issued patents (all of which are licensed) and >20 pending patent applications and is also the author of one book and the co-author of more than 350 peer reviewed research articles in major scientific journals and conferences. Dr. Ozcan is a Fellow of SPIE and OSA, and has received major awards including the Presidential Early Career Award for Scientists and Engineers (PECASE), SPIE Biophotonics Technology Innovator Award, SPIE Early Career Achievement Award, ARO Young Investigator Award, NSF CAREER Award, NIH Director's New Innovator Award, ONR Young Investigator Award, IEEE Photonics Society Young Investigator Award and MIT's TR35 Award for his seminal contributions to near-field and on-chip imaging, and telemedicine based diagnostics.



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