

PHOTONICS SEMINAR

Professor Sunil Bhave

Monolithic MEMS and Photonics Systems

Faculty Host: Professor Ajay Joshi

October 9, 2014

2:00-3:00 p.m.

Room 901

Photonics Center

8 Saint Mary's Street

*Refreshments will
be served!*



Opto-mechanical systems offer one of the most sensitive methods for detecting mechanical motion using shifts in the optical resonance frequency of the opto-mechanical resonator. Presently, these systems are used for measuring mechanical thermal noise displacement or mechanical motion actuated by optical forces. Meanwhile, electrostrictive and piezoelectric actuation and detection are the main transduction schemes used in RF MEMS resonators.

In this talk, Professor Bhave will introduce a method for actuating an opto-mechanical resonator using MEMS transducers and sensing of mechanical motion by using the optical intensity modulation at the output of an opto-mechanical resonator. Professor Bhave will discuss classical applications enabled by this hybrid platform such as multi-GHz Acousto-Optic Modulators (AOM) and Opto-Acoustic Oscillators. He will conclude his talk by providing a glimpse of how he is leveraging his mastery of micromachining and MEMS to achieve coherent transduction between spin-defects, phonons and photons.

Professor Sunil Bhave is an Associate Professor in the School of Electrical and Computer Engineering at Cornell University. He received a B.S. and Ph.D. from University of California at Berkeley in Electrical Engineering and Computer Sciences in 1998 and 2004 respectively. He received the NSF CAREER Award in 2007, the DARPA Young Faculty Award in 2008, and the IEEE Ultrasonics Early Career Award in 2014. His students have received Best Paper Awards at IEDM 2007, Ultrasonics 2009 and IEEE Photonics 2012. Professor Bhave was a co-founder of Silicon Clocks, which was acquired by Silicon Labs in April 2010.