

## Seminar Announcement

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Monday, April 18, 2016  
Green Hall, Room 0120  
10:10 AM

### Monolithic MEMS + Photonic Systems

**Abstract:** 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, I 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. I will discuss classical applications enabled by this hybrid platform such as multi-GHz Acousto-Optic Modulators (AOM) and Opto-Acoustic Oscillators. I will conclude my talk by providing a glimpse of how we are leveraging our mastery of micromachining and MEMS to achieve coherent transduction between spin-defects, phonons and photons.

**Bio:** Sunil received the B.S. and Ph.D. degrees from Berkeley in EECS in 1998 and 2004 respectively. In April 2015, he joined the department of Electrical and Computer Engineering at Purdue University as an Associate Professor. Sunil received the NSF CAREER Award in 2007, the DARPA Young Faculty Award in 2008 and the IEEE Ultrasonics Society's Young Investigator Award in 2014. His students have received Best Paper Awards at IEEE Photonics 2012, Ultrasonics 2009 and IEDM 2007. Sunil was a co-founder of Silicon Clocks, which was acquired by Silicon Labs in April 2010. Before joining Purdue, Sunil was an associate professor at Cornell for 10 years.