



## Department of Chemical Engineering presents

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Goergen Hall 101 @ 3:25pm

### "Optical sensing on multiple scales"

In this talk we are going to discuss optical sensors we are currently working on in the Innovative Biomedical Instruments and Systems (IBIS) Laboratory. At first, we will cover mobile phone based system analyzing microliter-scale biological samples. One of the most important applications of this system is detection of dangerous pregnancy complications while there is still time to save a mother and a baby. This project, called Hemolix, gained significant visibility after being a finalist of XPrize Challenge and recent presentation in Congress. This will be followed by a second project focused on sensing on multi-cellular level using thermo-plasmonics. Unusual 3-dimensional cell manipulation and analysis are theoretically optimized and experimentally demonstrated. Finally, we will discuss the first in-vivo single cell endoscope that can collect information with an individual cell organelle resolution. This project required development of a new fabrication approach, detailed theoretical optimization of light delivery and collection, and numerous experiments with a variety of biological objects.