



**University  
of Victoria**

Centre for  
Advanced  
Materials &  
Related  
Technology

# CAMTEC SEMINAR

- TITLE:** *Enabling optical elements for emerging science and technologies*
- SPEAKER:** **Dr. Wei-Chuan Shih**  
University of Houston
- DATE:** Friday, March 16, 2018
- TIME:** 11:00 am
- LOCATION:** EOW 230

## **Abstract:**

I will discuss our development of enabling optical elements including plasmonic nanostructures, neural stimulator and recorder, and inkjet-printed lenses. First, I will introduce a highly porous yet monolithic plasmonic meta-surface that features intense and high-density field localization, large surface area, and high structural integrity and reproducibility. The fabrication process of this meta-surface is of low-cost, highly scalable, and can be implemented on various substrates. Surface plasmons (SP) are the primary driver for localized surface plasmon resonance (LSPR) and surface-enhanced spectroscopy such as surface-enhanced Raman spectroscopy (SERS), fluorescence, and absorption techniques. These enhanced light-matter interactions have enabled new sensing, imaging, and photothermal applications. Second, I will touch base on a neural probe for optical stimulation and spike recording fabricated by ion-beam lithography and laser micromachining. Third, I will show an “inkjet printing” process for making polymer lenses in an additive fashion without molding or grinding. I will discuss one interesting application by using these lenses as “stickers” to turn a smartphone camera into a high performance microscope operating in bright-field, dark-field, and fluorescence modes. Such an imaging platform has found numerous applications in molecular sensing, STEM education, and citizen science.

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