



The Chinese University of Hong Kong

Department of Biomedical Engineering



Time: 10:00 am, 17 December 2018 (Monday)

Venue: Room 513 William M W Mong Engineering Building

## 2D nanomaterials enhanced surface plasmon resonance for sensing applications



**Professor Shuwen ZENG**

**French National Centre for Scientific Research (CNRS),  
France**

### **Abstract**

Surface plasmon resonance sensors are commonly used an effective tool for real-time monitoring biomolecular interactions. The sensing mechanism is based on the evanescent field perturbation at the metallic sensing substrate induced by the binding of chemical and biological molecules. Molecular binding interactions could be measured from the signal of reflected light, under the condition that the surface plasmon resonance is excited by the incident light. In this talk, I will present the use of hybrid 2D nanomaterials-based metasurface nanostructure as an enhanced sensing substrate. The thickness of the plasmonic sensing substrate is tuned in an atomic scale and optimized to improve the sensing capability. Here, both a sharp phase signal change and phase-related Goos-Hänchen signal shift were achieved due to the strong resonance at the surface of the sensing film. The enhanced plasmonic sensitivities of 2D nanostructures were systematically investigated. It is worth noting that the tunability of atomic layer led to the sensing substrate optimized with a narrow scale  $< 1$  nm. Through a precise engineering of the metasurface substrates, 3 orders of magnitude improvement of the sensitivity were demonstrated compared to the one with pure gold sensing substrate. This hybrid 2D nanomaterial-based metasurfaces would provide a good opportunity for developing portable theranostic devices in clinical applications.

### **Biography**

Professor Shuwen ZENG is currently the group leader for plasmonic sensing division of Photonics department and also an EU Marie Skłodowska-Curie Individual Fellow at XLIM Research Institute, UMR 7252 CNRS/University of Limoges, France. She earned her Ph.D. from the School of Electrical and Electronic Engineering at Nanyang Technological University, followed by three years of postdoctoral research at CNRS-International-NTU-THALES Research Alliance (CINTRA)/UMI 3288, Singapore. Her main research interests focus on engineering plasmonic nanostructures-based ultrasensitive chemical and biological sensors

**\*\*\* ALL ARE WELCOME \*\*\***

*For enquiries, please contact Ms. Joyce Chan, Department of Biomedical Engineering at 3943 8278*