

## CBC SEMINAR ANNOUNCEMENT



**Professor Shi-Wei Chu**  
**National Taiwan University**

### **Superresolution microscopy without fluorescence**

Optical microscopy has established itself to be an indispensable tool in research fields such as biomedicine and material science. For far-field observation, optical resolution is limited by diffraction, a barrier set by Ernst Abbe more than 100 years ago. During the past two decades, several ground-breaking methods have been demonstrated to surpass the diffraction barrier, revolutionizing the way we access the nano world. However, all previous methods are based on switching or saturation of fluorescence, and are severely limited by switching reversibility and photobleaching. In this seminar, I will present our latest achievement on first superresolution far-field imaging based on scattering, which is a universal optical phenomenon without bleaching. Our principal finding is that plasmon resonance in a nanostructure can be saturated, resulting in saturation of optical scattering. By extracting the saturated part in the focal region, along with optical field centralization due to plasmonic resonance, microscopic resolution is reduced to below 100-nm. Our result expands the horizon of superresolution imaging from fluorescence to scattering. The expected applications range from biomedical imaging, by using metallic particles as contrast agent, to the functional inspection of plasmonic nanostructures, by visualizing plasmon oscillation modes directly with far-field observation. Moreover, all imaging modalities that utilize plasmonic properties, such as apertureless near-field microscopy, will benefit from the saturation effect for further resolution enhancement.

<b>Date:</b>	<b>5<sup>th</sup> April 2012 (Thursday)</b>
<b>Time:</b>	<b>11am – 12:30pm</b>
<b>Venue:</b>	<b>NTU SPMS CBC Building Level 2, Conference Room</b>
<b>Host:</b>	<b>Assoc Professor Xing Bengang</b>