MONASH University

Monash Centre for Electron Microscopy

Seminar

Seeing Trapped Light at the Nanoscale

31 **Tuesday, 27 July 2021**

1.30 – 2.30 pm (AEST)

ZOOM – Register in advance for this meeting:

https://monash.zoom.us/j/88011666012?pwd=NVVpeVlmZFdNTE1QV0tPeFNPZTA4dz09

Passcode: 111111

Associate Professor Michel Bosman holds a joint position at the Institute of Materials Research and Engineering (IMRE, A*STAR) in Singapore.

Abstract

There is a great difference in appearance between a smooth surface and a fine-textured surface. This difference becomes even more striking when we fabricate surfaces with features that are much smaller than the wavelength of light. Nanopatterned surfaces can be designed to absorb specific energy bands, have polarization-dependent colour, or it may be able to trap light. These properties can be engineered by controlling one or more resonant modes, such as Mie resonances, surface plasmon resonances and bound states in-the-continuum.
In this presentation, it will be shown that electron microscopes can be a unique and useful tool to measure optical properties at the nanometer length scale. It will be shown that monochromated STEM-EELS can be used to measure femtosecond electron dynamics in plasmons, with nanometer spatial precision! By combining EELS and STEM-cathodoluminescence measurements, it is also possible to visualize light that is trapped on surfaces. From these non-radiative, so-called bound-states-in-the-continuum, we can now even directly measure the coherent interaction length.

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The Presenter

Michel Bosman is an Associate Professor at the School of Materials Science and Engineering at the National University of Singapore. He also holds a joint position at the Institute of Materials Research and Engineering (IMRE, A*STAR) in Singapore.

His research focuses on visualizing materials at the atomic scale using aberration-corrected scanning TEM (STEM), and on light spectroscopy at the nanometer length scale with monochromated electron energy loss spectroscopy (EELS) and STEM-cathodoluminescence.

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