

## SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
COLLEGE OF DESIGN AND ENGINEERING  
Website: <https://cde.nus.edu.sg/ece>

**Area: Microelectronic Technologies and Devices**

**Host: Prof. Hong Minghui**

<b>TOPIC</b>	:	<b>Sub-50 nm Optical Imaging in Ambient Air with 10× Objective Lens Enabled by Hyper-hemi-microsphere</b>
<b>SPEAKER</b>	:	<b>Mr. Wu Guangxing Graduate Student, ECE Dept, NUS</b>
<b>DATE</b>	:	<b>Thursday, 21 April 2022</b>
<b>TIME</b>	:	<b>5.00PM to 6.00PM</b>
<b>WEBINAR</b>	:	<b>Join Zoom Meeting</b> <a href="https://nus-sg.zoom.us/j/81874273742?pwd=cmRuV2VteHVWclpPZDJ0QUhkYUJDdz09">https://nus-sg.zoom.us/j/81874273742?pwd=cmRuV2VteHVWclpPZDJ0QUhkYUJDdz09</a> <b>Meeting ID: 818 7427 3742</b> <b>Passcode: 315661</b>

### ABSTRACT

Optical microsphere nanoscope has been widely studied due to its outstanding resolving power, low cost, and label-free characteristics. However, its resolution in air is restricted by the magnification and refractive index of microsphere. In this work, high refractive index hyper-hemi-microspheres with tunable magnification are proposed to improve the imaging resolution of virtual imaging. The hyper-hemi-microsphere is fabricated by focusing ion beam in a top-down manner, which accurately tailors the thickness of the hyper-hemi-microsphere with a smooth surface. Since this method is suitable for microspheres made of any material, high refractive index hyper-hemi-microspheres ( $n=2.34$ ) are manufactured and demonstrated with better imaging resolution than common microsphere. Benefiting from the large magnification and high numerical aperture, sub-50nm features in a CPU chip are discerned by a hyper-hemi-microsphere with a 10× objective lens in ambient air. High refractive index hyper-hemi-microsphere nanoscope opens possibilities for easy, fast, and low-cost inspection in the entire pipeline chain of ICs' design, manufacture, and handling defects.

### BIOGRAPHY

Wu Guangxing is currently working towards his Ph.D. degree in the Electrical and Computer Engineering Department at the National University of Singapore. His current research interest focuses on improving performances of microsphere nanoscope and extending its application region.

<https://cde.nus.edu.sg/ece/highlights/events/>