

## CBC SEMINAR ANNOUNCEMENT



**Dr Lee Hiang Kwee**

**Nanyang Technological University, Singapore / Stanford University, California**  
**Functionalizing Material Interfaces for Enhanced Analyte Detections and Gas-based Applications**

By combining different materials into a composite ensemble, the functionalities of individual components can be effectively integrated to design application-specific properties. This synergism offers a plethora of opportunities for the development of next-generation hybrid materials to address persistent limitations in real-world applications (such as in sensing and catalysis) that cannot be otherwise easily solved using a single-component material. In this talk, I will discuss on how we can create multifunctional hybrid platforms at liquid-liquid, solid-solid and solid-liquid interfaces to enhance analyte detections and gas-based applications. I will first demonstrate the use of particle-assembled microdroplets for the ultratrace and multiplex detection of analytes across a liquid-liquid interface at the molecular level. Next, I will discuss on creating a functional nano-interface between a solid surface and a metal-organic framework (MOF) to drive gas molecules into a pseudo high-pressure microenvironment directly at the point-of-use. This phenomenon notably enables efficient gas-based detection and reaction even at ambient conditions. Finally, I will introduce a designed solid-liquid interface for the low-cost and mobile detection of spectroscopically-silent heavy metal ions down to part-per-trillion levels.

### *Biography*

Hiang Kwee Lee received his Ph.D. degree in chemistry and biological chemistry from Nanyang Technological University (NTU) in 2018, with his thesis mainly focusing on creating particle-assembled microdroplets as multifunctional miniature sensors and reactors. In the same year, he was awarded the International Postdoctoral Fellowship under MOE START scheme to support his overseas post-doctoral studies. He is currently both a research fellow at NTU and a visiting scholar at Stanford University working on environmental topics.

**Date:** 5th February 2020 (Wednesday)  
**Time:** 10.30am to 12.00pm  
**Venue:** SPMS Research & Graduate Studies  
Conference Room  
**Host:** Associate Professor Ling Xing Yi