THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

COLLEGE OF PROFESSIONAL AND CONTINUING EDUCATION
專業及持續教育學院

School of Professional Education and Executive Development
專業進修學院

SPEED

# Research Centre for Advanced Design, Materials and Manufacturing Technologies (RCADMM) Research Seminar

## ADVANCED MATERIALS WITH SUPERIOR PROPERTIES: MESOPHASE PITCH, NANOCOMPOSITES & METAMATERIALS

**DATE: 19 March 2021 (Friday)**
**TIME: 2:00 pm – 4:00 pm**
**VENUE: ONLINE (Microsoft Teams)**

*The seminar is fully supported by a grant from the Research Grants Council of the HKSAR, China. (Project No.: UGC/IDS(R)24/19)*

***Registration!***

**Mr Oscar HO**
Vice President, Carbon Materials R&D and Business,
ECO Environmental Investments Ltd., Towngas Group

## Topic

Mesophase Pitch-based Carbon Fibers

## Abstract

Carbon fiber is made from organic polymers with a carbon content of more than 94% (mass fraction). It is the important strategic material, characterized by superior properties, supporting for future industrial development. Carbon fibers are mainly produced by polyacrylonitrile (PAN) and pitch. At present, PAN-based carbon fiber accounts for more than 90% of the global production capacity of carbon fibers and is widely used as a reinforcement fiber for structural components of aircrafts and wind turbine blades. Pitch-based carbon fiber is produced using petroleum or coal pitch as raw materials, which are abundant and has high carbonization yield. Among those, high-performance pitch-based carbon fiber (also known as mesophase pitch-based carbon fiber) has exhibited outstanding tensile modulus and excellent conductivity. It is widely used in aerospace, military weapons, construction engineering, sports equipment, heat dissipation of electronic components and other fields. This seminar mainly introduces the production process, microstructure, performance, and application fields of mesophase pitch-based carbon fiber.

## Dr Kenneth LO

Research Associate, Department of Mechanical Engineering, The Hong Kong Polytechnic University

## Topic

Production of Graphene Nanocomposites with Semiconductors

## Abstract

Nanocomposites have been used to leverage properties that are only exhibited at small dimensional scales. Graphene is a nanomaterial with multiple uses from mechanical strength to electrical properties. But graphene is not a semi-conductor and requires doping to exhibit semi-conducting properties or leverage the properties of connected nanomaterials. However, forming graphene nanocomposites faces numerous issues as graphene does not readily disperse in most solution. This seminar will discuss some common methods used in forming nanocomposites with semiconductors.

## Dr Junot LIANG

Lecturer, School of Professional Education and Executive Development, The Hong Kong Polytechnic University

## Topic

Helicoid acoustic metamaterials: theory, design, and implementation

## Abstract

Acoustic metamaterials developed rapidly in recent decades, enriching the acoustic wave control technology, offering great unique wavefront modulation functionalities in different application scenarios, such as sound focusing, anomalous refraction, and programmable materials. The speaker presents a series of topics about the helicoid acoustic metamaterials in this seminar, which broaden the working frequency band and offer easy-controlled parameters. The helicoid metamaterial remains enormous potential in broadband wave control. The presenter's work paves the way to realize meta-structured sound barriers and absorbers with many advantages over traditional acoustic devices.

*All are welcome!*

**Please scan the QR code for registration**

**For enquiry, please contact Ms Jenny Li at jenny.li@speed-polyu.edu.hk on or before 18 March 2021.**