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## Short Course SC002

### The Progress of Organic Solar Cells

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Tuition Fee: (USD 150)

#### Course Objective:

Photovoltaic technology has been attracting tremendous attention and under a rapid growth recently for the need of green energy sources. Organic solar cells with a number of interesting features have been considered as a potential candidate in the field of photovoltaics. The interesting features include environment friendly, low cost, low production energy consumption, mechanically flexible, compatible to a lot of substrate, etc. In this short course, a review of the organic solar cells from materials, device structure and physics, and light trapping schemes for light harvesting will be delivered.

#### Who Should Attend:

The course is designed for engineers and researchers who would like to expand the knowledge in organic solar cells.

#### Course Outline:

##### I. Introduction of Organic Materials

- Different types of organic materials how can organic materials function as semiconductor
- A brief review of organic materials used for organic solar cells.

##### II. Introduction of Organic Solar Cells

- Solar cells and photodiodes
- Single layer devices
- Heterojunction devices
- Blend-based devices

##### III. Electrical and Optical Properties of Organic Solar Cells

- light absorption and photocarrier generation
- carrier mobility
- carrier transport / conduction
- carrier extraction

##### IV. Light trapping schemes

- non-metal based light trapping schemes
- metal based light trapping schemes

#### Instructor(s) Biography:

Wallace C. H. Choy received his PhD Degree in Electronic Engineering from the University of Surrey, UK in 1999. His work at Surrey was supported by the Croucher Foundation Scholarship. He then joined National Research Council of Canada as a member of research staff to work on optical device structures of polarization independent optical amplifiers and modulators. He joined Fujitsu at San Jose, US in 2001 to develop real-time wavelength tunable lasers and optical transmitter modules. He is now an associate professor of Department of Electrical and Electronic Engineering, the University of Hong Kong (HKU). His current research interests are concerned with organic optoelectronic devices, plasmonic structures and nano-material devices, and optical and electrical properties of organics, metal nanomaterials and metal oxides. Dr. Choy has published over 120 internationally peer-reviewed journal papers, contributed to one book and five book chapters, as well as US and China patents. His work has been cited by 2672 times, H-index; 26 as on 5 May 2014. Details of publication can be found in

<http://scholar.google.com.hk/citations?user=GEJf9dAAAAAJ>.

He was the recipient of the Sir Edward Youde Memorial Fellowship, the Croucher Foundation Fellowship, and the Outstanding Achievement Award from National Research Council of Canada and HKU Research Output Prize. He has served as associate editor/ guest editor/ member of editor board of a number journal such as IEEE Photonics Journals, OSA Journal of Photonic Research, Journal of Optical Quantum Electronics on Numerical Simulation of Optoelectronic Devices and International Journal of Optics. He has delivered a number of invited talks and served as a committee member in internationally industrial and academic conferences organized by various organizations such as IEEE, OSA and Plastic Electronics Foundation. He is now a senior member of IEEE.

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