

**Title: Novel Device Architectures for High Efficiency Organic Solar Cells**

**Speaker:**

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**Date:** Monday, 6 December 2010

**Time:** 10:00 am

**Venue:** Room 603, Chow Yei Ching Building

**Abstract:**

Polymer-based single heterojunction solar cells with power conversion efficiency (PCE) of ~8% were achieved recently. It is anticipated that 10% PCE will be achievable in the very near future through chemical synthesis, device engineering and optimization, which is close to theoretical prediction of 11%. After a brief overview of the breakthrough in high efficiency organic solar cells, this talk will address some recent progresses made in multi-junction polymer solar cells with a variety of device architectures including tandem organic solar cells. The tandem cells consist of polymers having different bandgaps, high optical absorption in broad spectral region, less potential loss in terms of open circuit voltage, facile processibility, and efficiency add-up of individual sub-cells. Multi-junction organic solar cells with PCE over 6% have been obtained reproducibly via controlling morphology of photoactive layers, engineering interfaces and matching photocurrent in tandem solar cells. Challenges and limitations tandem organic solar cells face today, possible solutions and novel device concepts to these challenges will be also discussed.

**Biography of the speaker:**

Dr. Ziruo Hong is currently leading the organic photovoltaic research in Advanced Organic Electronics Research Center, the Faculty of Engineering, Yamagata University, Japan. Dr. Hong obtained his PhD degree in Condensed Matter Physics from Changchun Institute of Optics, Fine mechanics and Physics, Chinese Academy of

Sciences, in 2001. After that, he has been actively working in the field of organic electroluminescence and organic photovoltaics at City University of Hong Kong, Singapore Institute of Manufacturing Technology, Technological University of Dresden. Before joining Yamagata University in 2010, he was working as a postdoctoral fellow in Prof. Yang Yang's group at UCLA, developing high efficiency organic solar cells. Currently his research is focused on solution-processed organic solar cells. He has authored and co-authored more than 70 research papers, with an h-index of 22.

**Organizer:** Dr. W.C.H. Choy