

IBS CINAP Seminar

November 22, 2018, 10:30AM

Room 86120 (N Center), Sungkyunkwan University, Suwon

Frontier Research on Fullerene and Carbon Nanotube Applications to Thin-film Solar Cells

Il Jeon

Graduate School of Engineering, University of Tokyo

Global warming and recent energy crisis have prompted the society to look towards pollution-free and infinite renewable energy sources. As a result, there has been remarkable progress in photovoltaic research. The photovoltaics include conventional silicon solar cells and thin-film solar cells, such as organic and perovskite solar cells. My research focuses on the enhancement of their device performance in terms of power conversion efficiency, stability, and flexibility by employing modified carbon allotropes. Being comprised of carbon atoms only, the carbon allotropes, namely carbon nanotube, graphene, and fullerene, manifest different properties depending on their electronic configurations, ranging from conductors to semiconductors. Their earth-abundance and resilient nature mean that they are perfect replacements for the conventional materials which are finite and inflexible. Thus far, I have applied various carbon allotropes to organic solar cells and perovskite solar cells to offer solutions to their intrinsic problems. In this talk, I will introduce some of my past work and discuss a research direction, demonstrating how carbon allotropes are making an impact in the field of solar cells.

Biography

University of Tokyo

Lecturer (Senior Assistant Professor)

Assistant Professor

- Research Theme: Low-Dimensional Materials in Photovoltaics
- Teaching: Molecular Dynamics and Nanotechnology; Engineering-I (Project Based Learning course); Engineering - III (Capstone-inspired GMSI summer camp, Peking university/Tokyo university joint summer camp, GSDM spring camp)
- JST CIAiS initiative (¥10m for 3y), JSPS KAKENHI Start-Up (¥2.6m for 2y)^{17H06609}

Tokyo, Japan

2018 Apr – present

2017 Mar – 2018 Mar

University of Tokyo

JSPS Postdoctoral Fellow (under Prof. S. Maruyama)

- JSPS fellowship^{16F16069} (stipend: ¥8.7m + research aid: ¥3m for 2y)

Tokyo, Japan

2016 Apr – 2017 Feb

University of Tokyo

PhD in Chemistry

- ‘Studies on New Charge Selective and Conductive Interfaces in Organic-Inorganic
- Thin-film Solar Cells’ (Prof. T. Hasegawa and Prof. Y. Matsuo)
- Dean’s Award for the Best Doctoral Student (20.5 credits GPA: 4.0/4.0)

Tokyo, Japan

2013 Apr – 2016 Mar

Oxford University

Masters in Chemistry

- ‘Functionalisation of Polymeric Substrates via Diarylcarbene Synthesis’ (Prof. M. Moloney)

Oxfordshire, UK

2007 Sep – 2008 Jun

Oxford University

Bachelors in Chemistry

Oxfordshire, UK

2004 Sep – 2007 Jun