東京大学 THE UNIVERSITY OF TOKYO

GMSI Graduate Program for Mechanical Systems Innovation

CIAiS Research and Education Consortium for Innovation of Advanced Integrated Science

WINGS CFS World-leading Innovative Graduate Study Program Co-designing Future Society

第339回GMSI公開セミナー／第162回CIAiSセミナー／第84回WINGSセミナー

# エネルギー応用に向けたカーボンナノチューブ・二次元半導体の新物性開拓
# Exploring Novel Physical Properties of Single-Walled Carbon Nanotubes and Atomically Thin Semiconductors Toward Energy Applications


## 宮内 雄平
京都大学エネルギー理工学研究所
Yuhei Miyauchi, Institute of Advanced Energy, Kyoto University


**Date: Friday, 10th January, 2020, 13:30-14:30**
**Venue: 31A, 3F Faculty of Engineering Bldg. 2**


**Abstract:**

カーボンナノチューブ、グラフェン、二次元原子層半導体などの低次元ナノ物質の発見以来、これらの物質特有の優れた物性のマクロスケール応用実現が、物質工学における重要課題となっている。本講演では、太陽光や熱エネルギーの有効利用、超軽量高強度省エネルギー材料などのマクロな応用を目指した、構造既知カーボンナノチューブの熱光・機械特性に関する我々の最近の研究成果を紹介する。また、将来の高速低消費エネルギーオプトエレクトロニクス応用に向けた二次元半導体光物性研究の最近の展開についても議論する。

Since the discoveries of low-dimensional nanomaterials such as carbon nanotubes, graphene, and atomically thin two-dimensional semiconductors, realization of macroscopic applications of their excellent intrinsic properties has been an important issue in materials science and engineering field. We will discuss our recent studies on thermo-optical and mechanical properties of structure-defined carbon nanotubes, and how to make the best use of their intrinsic properties in macroscopic applications including solar and thermal energy harvesting and ultra-strong and light-weight structural materials. We will also discuss our recent progress on the studies of photophysics in two dimensional semiconductors for future fast and energy-saving optoelectronics.


**Biography:**

Dr. Yuhei Miyauchi is an associate professor of the Institute of Advanced Energy at Kyoto University. He received his B.Eng. and M.Eng. from the Department of Mechanical Engineering at the University of Tokyo in 2002 and 2003, respectively. He then received Ph.D. in Engineering in 2006 from the University of Tokyo, and studied at Columbia University and Kyoto University as a postdoctoral research fellow of JSPS (SPD) and JST (PRESTO). In 2014, he joined Kyoto University as an associate professor. From 2014 to 2019, he also took part in JST-ERATO Itami Molecular Nanocarbon Project at Nagoya University as a Group Leader. His research interests are in synthesis, optical, thermo-optical, and mechanical properties of nanomaterials, and in the development of their applications; he has published over a hundred journal articles on these topics. He received the MEXT Commendation for Science and Technology, Young Scientists' Prize (2016), Research Award of Optical Science and Technology Research Promotion Foundation (2014), Young Scientist Award of the Physical Society of Japan (2013), and other awards.

主催: 東京大学大学院工学系研究科専攻間横断型教育プログラム 機械システム・イノベーション（GMSI）
最先端融合科学イノベーション教育研究コンソーシアム （CIAiS）
未来社会協創 国際卓越大学院（WINGS CFS）


本件連絡先: 東京大学大学院工学系研究科機械工学専攻 教授 塩見 淳一郎
GMSI事務局 E-mail: office@gmsi.t.u-tokyo.ac.jp Phone: 03-5841-0696