

# T<sub>C</sub>SUH Bi-Weekly Seminar

Texas Center for Superconductivity at the University of Houston

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Department of Mechanical Engineering and TeSUH



**Tuesday, October 11, 2016**

Room, 102, University of Houston Science Center

12:00 noon – 1:00 p.m.

## **New Functional Semiconductor Materials and Devices**

### **ABSTRACT**

The presentation will cover various topics of flexible photonic and electronic devices based upon semiconductors and their structures for energy applications. The material structures and devices include visible light-emitting diodes (LEDs) for solid-state lighting applications, heterostructure field-effect transistors (HFETs) for high-efficiency high-voltage switching applications, photovoltaic solar cells (PV-SCs) for sustainable energy harvesting, and thin-film transistors (TFTs). New functionality of flexible devices, material-related technical issues, and state-of-the-art device technology will be described.

### **BIOGRAPHY**

Jae-Hyun Ryou received the B.S. and M.S. degrees in metallurgical engineering from Yonsei University, Seoul, Korea, and the Ph.D. degree in materials science and engineering in the area of solid-state materials from the University of Texas at Austin, Austin, TX. Before joining University of Houston, he had several R&D positions in both industry and academia, with Honeywell Technology Center (HTC) and Honeywell VCSEL Optical Products, Plymouth, MN, as a Research Scientist and with the Center for Compound Semiconductors at the Georgia Institute of Technology, Atlanta, as a Principal Research Engineer. With research interests in semiconductor materials, nanostructures, and quantum devices, he has been developing new-concept material structures and devices with improved performance characteristics including, semiconductor laser diodes (LDs), visible and UV light-emitting diodes (LEDs), light-emitting transistors (LETs), transistor lasers (TLs), heterostructure field-effect transistors (HFETs), heterojunction bipolar transistors (HBTs), avalanche photodiodes (APDs), type-II superlattice photodetectors (T2SL-PDs), quantum cascade lasers (QCLs), etc., through materials/device structure modeling/design, epitaxial materials growth by metalorganic chemical vapor deposition, and fabrication process innovations. He has authored or coauthored 4 book chapters of books, ~160 technical journal papers, and more than 260 conference presentations/proceeding papers, and holds 8 U.S. patents. His current research interests include electronic and photonic materials, devices, and nanostructures based on group IV and III-V compound semiconductors with a focus on energy device applications. He is a member of the Materials Research Society (MRS) and a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and the Optical Society of America (OSA) and. He is currently serving as an associate editor of Optics Express (fields of solid-state lighting and photovoltaics) of the OSA.

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