JAE-HYUN RYOU

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Education:

B.S.	Yonsei University, Korea	1988 - 1993
M.S.	Yonsei University, Korea	1993 -1995
Ph.D.	University of Texas at Austin PhD Advisor: Russell D. Dupuis	1996 - 2001

Employment History:

Assistant Professor, University of Houston	2012 - present
Principal Research Engineer, Georgia Institute of Technology	2003 - 2012
Research Scientist, Honeywell Technology Center	2001 - 2003

Honors and Awards:

- Teaching Excellence Award, College of Engineering, University of Houston — May 2017
- OSA (Optical Society of America) Senior Member — May 2011
- Roger P. Webb Georgia Tech ECE Research Spotlight Award — Apr. 2011
- IEEE (Institute of Electrical and Electronics Engineers) Senior Member — Feb. 2008
- Korean Government Overseas Scholarship — Oct. 1995
- POSCO Research Paper Award — Jan. 1995
- Daewoo Engineering Fellowship — Mar. 1994

Recent Research Highlights:

- Ryou has developed new novel-concept material structures and photonic/electronic devices based on III-V semiconductors through fundamental research on modeling/design, material, and devices, especially focusing on energy applications. The materials and devices demonstrated include light-emitting diodes (LEDs), laser diodes (LDs), heterostructure field-effect transistors (HFETs), heterojunction bipolar transistors (HBTs), solar cells (SCs), light-emitting transistors (LETs), and photodiodes (PDs).

Lab Facilities / Expertise:

- Technology computer-aided design (TCAD) to develop new-concept optimized device structures
- Physical vapor deposition (PVD)
- Epitaxial growth by metalorganic chemical vapor deposition (MOCVD)
- Device fabrication including, photolithography, thin-film deposition by e-beam evaporation, sputtering, plasma-enhanced chemical vapor deposition (PECVD), etching by reactive-ion etching (RIE), inductively-coupled plasma reactive-ion etching (ICP-RIE)
- Materials characterization of structural, optical, electrical properties using, X-ray diffraction (XRD), scanning electron microscopy (SEM), Nomarski, photoluminescence (PL), cathodoluminescence (CL), Hall measurement, etc.
- Device characterizations including I-V, C-V, quantum efficiency (QE) measurement, etc.

Five Selected Publications:

1. K. J. Son, T. K. Kim, Y.-J. Cha, S. K. Oh, S.-J. You, J.-H. Ryou, and J. S. Kwak, "Impact of electron flux on plasma damage-free sputtering of ultrathin indium-tin-oxide contact layer on p-GaN for InGaN/GaN light-emitting diodes," *Adv. Sci.* 5 (2), 1700637-1–10 (2018).
2. W. Lee, S. Muhammad, T. Kim, H. Kim, E. Lee, M. Jeong, S. Son, J.-H. Ryou, and W. S. Yoon, "New insight into Ni-rich layered structure for next-generation Li rechargeable batteries," *Adv. Energy Mater*. 8 (4), 1701788-1–12

(2018).

3. Y.-J. Yu, K. S. Kim, J. Nam, S.R. Kwon, H. Byun, K. Lee, J.-H. Ryou, R. D. Dupuis, J. Kim, G. Ahn, S. Ryu, M.-Y. Ryu, and J. S. Kim, "Temperature-dependent resonance energy transfer from semiconductor quantum wells to graphene," *Nano Lett.* 15 (2), 896–902 (2015).
4. (Invited paper) J.-H. Ryou*, P. D. Yoder, J. P. Liu, Z. Lochner, H. Kim, S. Choi, H. J. Kim, and R. D. Dupuis, "Control of quantum confined Stark effect in InGaN-based quantum wells," *IEEE J. Select. Topic. Quantum Electron*. 15 (4), 1080–1091 (2009).
5. X. Wang, J. Song, P. Li, J.-H. Ryou, R. D. Dupuis, C. J. Summers, and Z. L. Wang, "Growth of uniformly aligned ZnO nanowire heterojunction arrays on GaN, AlN, and Al0.5Ga0.5N substrates," *J. Am. Chem. Soc.* 127 (21), 7920–7923 (2005).