Jae-Hyun Ryou, Ph.D.

Mechanical Engineering, Engineering Bldg. 1, MC-H4006
University of Houston, Houston, TX 77204-4006, USA
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EDUCATION

Ph.D. ***Materials Science and Engineering, The University of Texas at Austin***, 2001
Area Solid-State Electronic Materials (Advisor: Dr. Russell D. Dupuis)
Thesis III-phosphide self-assembled semiconductor quantum dots grown by metalorganic chemical vapor deposition

M.S. ***Metallurgical Engineering, Yonsei University***, Seoul, Korea, 1995
Area Solid Phase Transformations (Advisor: Dr. Chong Sool Choi)
Thesis Effect of deformation degree on damping capacity and hardness of an austenitic stainless steel

B.S. ***Metallurgical Engineering, Yonsei University***, Seoul, Korea, 1993

PROFESSIONAL EXPERIENCES

University of Houston, Houston, TX Sep. 2012–present
Assistant Professor
Department of Mechanical Engineering (ME), Cullen College of Engineering
- Responsible for the *development of photonic and electronic materials and devices*, including light-emitting diodes (LEDs) and photovoltaic solar cells (PV-SCs), based on III-N and III-AsPSb compound semiconductors.

Georgia Institute of Technology, Atlanta, GA Sep. 2010–present
Adjunct Professor
School of Electrical and Computer Engineering (ECE), College of Engineering

Georgia Institute of Technology, Atlanta, GA Jul. 2012–Aug. 2012
Principal Research Engineer
Center for Compound Semiconductors (CCS), Institute for Electronics and Nanotechnology (IEN)

Georgia Institute of Technology, Atlanta, GA Jul. 2007–Jun. 2012
Senior Research Engineer
CCS, IEN

Georgia Institute of Technology, Atlanta, GA Aug. 2003–Jun. 2007
Research Engineer II
CCS, IEN
- Principal investigator (P.I.) or co-P.I of projects for the development of laser diodes (LDs), nano-lasers, LEDs, light-emitting transistor (LETs), transistor lasers (TLs), avalanche photodiodes (APDs), type-II superlattice photodiodes (T2SL-PDs), heterojunction bipolar transistors (HBTs), heterostructure field-effect transistors (HFETs), and Schottky diodes.

- Responsible for the development of photonic and electronic materials and devices, including LDs, nano-lasers, quantum-cascade lasers (QCLs), LEDs, LETs, TLs, photodetectors (PDs), HBTs, HFETs, and rectifiers based on III-N and III-AsPSb compound semiconductors.

Honeywell International, Plymouth, MN Aug. 2001–Jul. 2003
Research Scientist III
Research and Development, Honeywell VCSEL Optical Products (Honeywell VCSEL) and Honeywell Technology Center (HTC)
- Project leader (P.L.) of commercial 650 nm red vertical-cavity surface-emitting laser (VCSEL) development.
- Responsible for epitaxial structure design, growth, device fabrication, and materials characterization of VCSELs in R&D.

University of Texas at Austin, Austin, TX Jun. 1997–Aug. 2001
Graduate Research Assistant
Microelectronics Research Center, Department of Electrical and Computer Engineering (ECE)
- Responsible for epitaxial structure design, growth, and materials characterization for the development of novel optoelectronic devices including quantum-dot and quantum-well LDs based on III-AsPSb compound semiconductors.

Yonsei University, Seoul, Korea Sep. 1993–Aug. 1994
Graduate Teaching Assistant
Department of Metallurgical Engineering
- Teaching Metallurgical Engineering Lab for undergraduate students and mentoring of undergraduate research thesis.

ACADEMIC HONORS AND ACTIVITIES

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
Granted for 3 years (Sep. 1996–Aug. 1999)

POSCO Research Paper Award Jan. 1995
For identifying correlation between microstructure and damping behavior of alloys

Daewoo Engineering Fellowship Mar. 1994
Granted for 1 year (Mar. 1994–Feb. 1995)

University Academic Excellence Award Jul. 1991, Dec. 1991, Jul. 1992
Yonsei University, Seoul, Korea

PROFESSIONAL ACTIVITIES/SERVICE

Editor of Books and Journals

- Associate Editor: *Optics Express*, Optical Society of America (OSA), Nov. 2010–Nov. 2013.

- Guest Editor: *Energy Express*, Focus Issue: Optics in LEDs for Lighting, OSA, Jul. 2011.

Technical Conference Committee

- Publication Committee, *ISGN-2014 (5th International Symposium on Growth of III-Nitrides)*, Atlanta, Georgia, 2014.

Session Chair

- III/V Nitride and Other Wide Bandgap Semiconductors - Session II, *ACCGE-18* and *OMVPE-15 (18th American Conference on Crystal Growth and Epitaxy* and *15th US Biennial Workshop on Organometallic Vapor Phase Epitaxy)*, Monterey, California, Jul.-Aug. 2011.
- Session GG: III-Nitrides: Non-Polar and Semi-Polar Devices, *EMC 2011 (53rd Electronic Materials Conference)*, Santa Barbara, California, Jun. 2011.
- Session JJ: Nonpolar-Semipolar III-Ns, *EMC 2010 (52nd Electronic Materials Conference)*, Notre Dame, Indiana, Jun. 2010.
- Session F: Group III Nitride Photodetectors and Photonic Lattices, *EMC 2008 (50th Electronic Materials Conference)*, Santa Barbara, California, Jun. 2008.
- Session B: Microwave Devices, *ICNS-7 (7th International Conference on Nitride Semiconductors)*, Las Vegas, Nevada, Sep. 2007.
- Session Q: III-Nitride MOCVD Growth, *EMC 2006 (48th Electronic Materials Conference)*, University Park, Pennsylvania, Jun. 2006.

Reviewer of Technical Journals

- *Applied Optics*, Optical Society of America (OSA)
- *Applied Physics A - Materials Science & Processing*, Springer
- *Applied Physics B - Lasers and Optics*, Springer
- *Applied Physics Express*, The Japan Society of Applied Physics (JSAP)
- *Applied Physics Letters*, American Institute of Physics (AIP)
- *Applied Surface Science*, Elsevier
- *Current Applied Physics*, Elsevier
- *Crystal Growth & Design*, American Chemical Society (ACS)
- *Electrochemical and Solid-State Letters*, Electrochemical Society (ECS)
- *IEEE Journal of Quantum Electronics*, Institute of Electrical and Electronics Engineers (IEEE)
- *IEEE Photonics Technology Letters*, IEEE
- *IEEE Transactions on Electron Devices*, IEEE
- *Journal of Alloys and Compounds*, Elsevier
- *Journal of Applied Physics*, AIP
- *Journal of Crystal Growth*, Elsevier
- *Journal of the Electrochemical Society*, ECS
- *Journal of Electronic Materials*, The Minerals, Metals & Materials Society (TMS)/IEEE
- *Journal of Vacuum Science and Technology B - Microelectronics and Nanometer Structures: Processing, Measurement, and Phenomena*, The American Vacuum Society (AVS)
- *Micro & Nano Letters*, Institution of Engineering and Technology (IET)

- *Nanoscale*, Royal Society of Chemistry (RSC)
- *Nanotechnology*, Institute of Physics (IOP)
- *Optics Express*, OSA
- *Optics and Laser Technology*, Elsevier
- *Optics Letters*, OSA
- *Solid State Electronics*, Elsevier
- *Physica Status Solidi (a) - Applications and Materials Science*, Wiley
- *Physica Status Solidi (c) - Current Topics in Solid State Physics*, Wiley

Consultation

- BioWarn LLC., Semiconductor fabrication process control for bio-sensing applications, May 2008.

TEACHING/INSTRUCTIONAL DEVELOPMENT

Undergraduate Courses Developed/Taught

- University of Houston, MECE2236/CIVE2330-02 "Mechanics I – Statics" (2012 Fall Semester).

Graduate Courses Developed/Taught

- University of Houston, MECE5397 "Semiconductor Materials and Photonic and Electronic Devices" (2013 Spring Semester).
- Georgia Institute of Technology, Guest lecturer for III-nitride photonics devices in ECE6542 "Optoelectronics Packaging and Systems" (Prof. G. K. Chang, 2012 Spring Semester).
- Georgia Institute of Technology, Guest lecturer for III-nitride materials in ECE8853a "Special Topics: III-N Semiconductor Technologies" (Prof. R. D. Dupuis, 2012 Spring Semester).
- Georgia Institute of Technology, Guest lecturer for semiconductor diode lasers and vertical-cavity surface-emitting lasers (VCSELs) in ECE6542 "Optoelectronics Packaging and Systems" (Prof. G. K. Chang, 2005 Spring Semester, 2006 Spring Semester, 2007 Spring Semester).
- Georgia Institute of Technology, Guest lecturer for III-V compound semiconductor materials and devices in ECE6451 "Introduction to the Theory of Microelectronics" (Prof. S.-C. Shen, 2007 fall semester).

STUDENT DEVELOPMENT

Undergraduate Students Advised

- Esther Kim (Georgia Tech, undergraduate research assistant), 2010–2011.
- Carson A. Wick (Georgia Tech, PURA (presidential undergraduate research award) program), 2007.
- Young Lee (Georgia Tech, undergraduate research assistant), 2007

Graduate Students Advised

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Post-Doctoral Fellows Advised

- Dr. Hee Jin Kim (Georgia Tech), 2010–2011.

R&D PROJECTS AND GRANTS (AS P.I. OR CO-P.I.)

Principal Investigator (P.I.)

1. Epitaxial structure development for III-nitride-based Schottky junction power devices (P.I., 2008–2009, Georgia Tech, Alpha and Omega Semiconductors).
2. Advanced HFET devices and circuits for high-performance, high-reliability RF devices (P.I., 2004–2005, Georgia Tech, DARPA, subcontract from Magellus Corp.).
3. Development of commercial 650nm red VCSEL (P.I., 2001–2003, Honeywell Technology Center).

Co-Principal Investigator (Co-P.I.)

4. Investigation of III-N LEDs grown on high-quality low-cost III-N substrates for solid-state lighting, (co-P.I., Georgia Tech, submitted to DOE, National Energy Technology Laboratory (NETL) in Nov. 2011, subcontract from MEMC Electronic Materials Inc.).
5. Advanced Middle-UV coherent optical sources (co-P.I., 2010–2012, Georgia Tech, CMUVT program, DARPA).
6. Fundamental study of defect reduction in type-II superlattice materials (co-P.I., 2010–2012, Georgia Tech, ARO MURI).
7. Collaborative Research: Nanobeam lasers (co-P.I., 2010–2012, Georgia Tech, NSF-EPDT/ECCS).
8. Growth and development of high performance UV imaging focal plane arrays (co-P.I., 2010–2014, Georgia Tech, DARPA SBIR, subcontract from Magnolia Optical Technologies).
9. Development of nitride electronic next generation technology (co-P.I., 2010–2012, Georgia Tech, NeXT program, DARPA, subcontract from HRL).
10. E-mode III-nitride high-voltage transistor development (co-P.I., 2009–2012, Georgia Tech, Intersil Corporation).
11. Development of high-voltage GaN-based DC-DC converter for radio isotope micro-power sources (co-P.I., 2009-2010, Georgia Tech, RIMS program, DARPA, subcontract from Trace Photonics).
12. MOCVD growth of advanced III-N HFETs on bulk GaN substrates (co-P.I., 2009–2010, Georgia Tech, AFRL, subcontract from Kyma Technologies).
13. Fundamental studies and development of III-N visible light emitting diodes for high-power solid-state lighting applications (co-P.I., 2008-2011, Georgia Tech, National Energy Technology Laboratory (NETL), Solid State Lighting Core Technologies, DoE).
14. Novel high-performance III-N HBTs for next-generation energy-efficiency systems (co-P.I., 2007–2011, Georgia Tech, NSF-EPDT/ECCS).
15. Development of high-efficiency InGaN-based green lasers (co-P.I., 2007–2010, Georgia Tech, VIGIL program, DARPA).
16. Development of advanced deep-UV Geiger-mode avalanche photodiodes arrays for critical sensing applications (co-P.I., 2006–2008, Georgia Tech, DUVAP program, DARPA).

RESEARCH ACTIVITY HIGHLIGHTS

- III-V semiconductor-based multijunction solar cells (Georgia Tech, collaboration with ASU (Ponce)).

- ✓ Development of new-concept multi-junction III-V semiconductor solar cells.

- Graphene-based transparent conductive electrode in III-V semiconductor-based photonic devices including LEDs and solar cells (Georgia Tech, collaboration with Georgia Tech Physics (Jiang)).
  - ✓ Development of graphene-metal composite transparent electrodes via graphene transfer and epitaxial growth techniques.
- III-V semiconductor-based nanophotonic devices employing photonic lattices (Georgia Tech, collaboration with Harvard (Loncar)).
  - ✓ Design and growth of epitaxial and device structures for nanophotonic devices.
- III-V InAlGaAs semiconductor-based quantum cascade lasers (Georgia Tech, collaboration with Harvard (Capasso) and EOS Photonics (Pflügl)).
  - ✓ Growth of epitaxial and device structures for QCLs.
- III-N electronic devices including HBTs, HFETs, rectifiers, and Schottky diodes (Georgia Tech, funded by NSF, DARPA, AFRL, NASA, Alpha and Omega Semiconductors, and Intersil, collaboration with Georgia Tech ECE (Shen, Yoder), Kyma Technologies (Hanser), HRL).
  - ✓ Principal investigator (P.I. or co-P.I) for the material development of HFETs, HBTs, rectifiers for high-frequency, high-power, and high-temperature operation.
- III-N photonic devices including UV and visible LEDs, green LDs, and UV photodetectors (Georgia Tech, funded by DoE and DARPA, collaboration with Georgia Tech ECE (Shen, Yoder), ASU (Ponce)).
  - ✓ Principal investigator (co-P.I.) for the material and device development of avalanche photodiodes, visible LEDs, and green LDs.
  - ✓ LED, LD, and photodetectors epitaxial structure/device design, epitaxial growth, material characterization, device fabrication, and chip-level device testing.
- Nanohetrostructure integration of ZnO nanorod and III-N (Georgia Tech, collaboration with Georgia Tech MSE (Wang)).
  - ✓ Growth of III-N structure and the characterization and fabrication of active nano-heterostructures.
- III-AsPSb electronic and photonic materials development for LDs, LETs (light-emitting transistors), type-II superlattice photodiodes (T2SL-PDs), and HBTs (Georgia Tech, funded by NSF, ARO, and DARPA, collaboration with UIUC (Chuang, Feng, Holonyak)).
  - ✓ Epitaxial structure/device design, MOCVD growth, and material characterization.
- Visible spectral region red VCSELs (Honeywell).
  - ✓ Project leader (P.L.) for the development of 650nm red VCSEL.
  - ✓ 650nm VCSEL development for sensing and bio-cytometer applications.
- 780nm and 1550nm single-mode IR VCSELs (Honeywell).
  - ✓ 780nm 1550nm VCSEL structure design, epitaxial growth, and material characterization.
- Wide bandgap III-phosphide self-assembled quantum dot nanostructures (UT-Austin, funded by NSF-DMR, collaboration with UIUC, Harvard, UVA (Holonyak, Narayanamurti, Hall)).
  - ✓ Growth and characterization of III-phosphide quantum dot nanostructures.
  - ✓ Development of visible semiconductor lasers based on InP quantum dots and QD-coupled-to-QW-heterostructures.
- GaAsSb/GaAs optical communication lasers at 1.3μm (UT-Austin; funded by NSF-ECS, collaboration with Agilent Technology (Kish)).
  - ✓ Design and growth of epitaxial structure of laser diodes containing strained GaAsSb QWs.
- Universal compliant substrate study using InP twist direct-wafer bonding (UT-Austin).
  - ✓ InP based compliant substrate using twist direct wafer bonding and the growth of strained ternary InGaAs layer on InP compliant substrate for 1.3 and 1.55 μm emitter.

PROFESSIONAL ASSOCIATIONS

- Senior Member of IEEE (The Institute of Electrical and Electronics Engineers)
  - ✓ Photonics Society (PS) and Electron Devices Society (EDS)
- Senior Member of OSA (Optical Society of America)
- Member of MRS (Materials Research Society)

PATENTS/INVENTION DISCLOSURES

Invented or co-invented 8 granted US patents and have 7 invention disclosures in process.

Invention Disclosures Filed

1. **Jae-Hyun Ryou**, Hee Jin Kim, Suk Choi, Russell D. Dupuis, and Zachary Lochner, "InAlGaN/GaN heterojunction bipolar transistors and making of the same," (filed to Georgia Tech Office of Technology Licensing (OTL) in Nov. 2010; Invention Disclosure ID #5478).
2. Yong Huang, **Jae-Hyun Ryou**, and Russell D. Dupuis, "Strain-engineered superlattice structures and photonic devices in infrared wavelengths and methods of making the same," (filed to Georgia Tech OTL in Nov. 2010; Invention Disclosure ID #5477).
3. **Jae-Hyun Ryou**, Shyh-Chiang Shen, Hee Jin Kim, Zachary Lochner, Tsung-Ting Kao, Suk Choi, and Russell D. Dupuis, "Strain engineered InAlN-based field effect transistors and methods of making the same," (filed to Georgia Tech OTL in Oct. 2010; Invention Disclosure ID #5451).
4. **Jae-Hyun Ryou**, Hee Jin Kim, Suk Choi, Seong-Soo Kim, and Russell D. Dupuis, "High-brightness high-power light-emitting diodes with strain-engineered carrier confinement layers and making of the same," (filed to Georgia Tech OTL in Apr. 2010; Invention Disclosure ID #5256).
5. Seong-Soo Kim, **Jae-Hyun Ryou**, and Russell D. Dupuis, "Transparent electrode for optoelectronic devices using graphene and metal and method of making the same," (filed to Georgia Tech OTL in Sep. 2009; Invention Disclosure ID #5009).
6. **Jae-Hyun Ryou**, Suk Choi, Hee Jin Kim, Russell D. Dupuis, and Zachary Lochner, "Enhancement- and depletion-mode heterostructure field-effect transistors using InAlN/GaN heterostructures and making of the same," (filed to Georgia Tech OTL in Sep. 2009; Invention Disclosure ID #5008).
7. **Jae-Hyun Ryou** and Russell D. Dupuis, "High efficiency multijunction solar cells and method of making same," (filed to Georgia Tech OTL in Aug. 2009; Invention Disclosure ID #4866).

Patents Granted

8. Daniel Guidotti, Gee-Kung Chang, **Jae-Hyun Ryou**, and Russell D. Dupuis, "Edge viewing photo detector and method of making same," US Patent **7482667** (Jan. 27, 2009).
9. Tzu-Yu Wang, Hoki Kwon, **Jae-Hyun Ryou**, Gyoungwon Park, and Jin K. Kim "InP-based long wavelength VCSEL," US Patent **7433381** (Oct. 7, 2008).
10. Tzu-Yu Wang, Jin K. Kim, Hoki Kwon, Gyoungwon Park, and **Jae-Hyun Ryou**, "Carrier bonded 1550nm VCSEL with InP substrate removal," US Patent **7286584** (Oct. 23, 2007).
11. **Jae-Hyun Ryou** and Gyoungwon Park, "Dielectric VCSEL gain guide," US Patent **7277461** (Oct. 2, 2007).
12. **Jae-Hyun Ryou**, "Pseudomorphic layer in tunnel junction," US Patent **7136406** (Nov. 14, 2006).

13. **Jae-Hyun Ryou**, Michael D. Ringle, and Yue Liu, "VCSEL having thermal management," US Patent **7075962** (Jul. 11, 2006).
14. **Jae-Hyun Ryou**, Tzu-Yu Wang, Jin K. Kim, Gyoungwon Park, and Hoki Kwon, "Enhanced lateral oxidation," US Patent **7054345** (May 30, 2006).
15. Ying-Lan Chang, Scott W. Corzine, Russell D. Dupuis, Min Soo Noh, **Jae-Hyun Ryou**, Michael R. T. Tan, and Ashish Tandon, "Long-wavelength photonic devices with GaAsSb quantum-well layers," US Patent **6711195** (Mar. 23, 2004).

INVITED SEMINAR PRESENTATIONS

1. **University of Houston**, Houston, Texas, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technology and next-generation green technology," Jun. 2012.
2. **Applied Materials Inc.**, Santa Clara, California, "Photonic and electronic materials and devices based upon III-nitride compound semiconductors grown by metalorganic chemical vapor deposition: light emitters and transistors," Aug. 2011.
3. **Auburn University**, Department of Physics, Auburn, Alabama, "Physics Colloquium: Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Mar. 2011.
4. **Seoul National University**, Graduate School of Convergence Science and Technology, Suwon, Korea, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Jun. 2010.
5. **Samsung Advance Institute of Technology**, Giheung, Korea, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Jun. 2010.
6. **LG Innotek**, Seoul, Korea, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Jun. 2010.
7. **Gwangju Institute of Science and Technology**, Gwangju, Korea, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Jun. 2010.
8. **Georgia Institute of Technology**, School of Electrical and Computer Engineering, Atlanta, Georgia, "Photonic and electronic materials and devices based upon III-V compound semiconductors: Critical elements for current information technologies and next-generation green technologies," Nov. 2009.
9. **Samsung Electro-mechanics**, Suwon, Korea, "Photonic and electronic materials and devices based on III-V compound semiconductors," Jun. 2006.
10. **Epivalley Inc.**, Gwangju, Korea, "Photonic and electronic materials and devices based on III-V compound semiconductors," Jun. 2006.
11. **Samsung Advanced Institute of Technologies**, Giheung, Korea, "Photonic and electronic materials and devices based on III-V Compound semiconductors," Jun. 2006.
12. **LG Institute of Electronics**, Seoul, Korea, "Photonic and electronic materials and devices based on III-V compound semiconductors," Jun. 2006.

13. **Georgia Institute of Technology**, Packaging Research Center (PRC), Atlanta, Georgia, "III-V compound semiconductor based advanced light emitters for optical interconnect systems, etc.," Oct. 2004.

PUBLICATIONS (SUMMARY)

Authored or coauthored

- ***4 book chapters of books***
- ***>120 technical published and accepted papers in refereed journals***
- ***>200 contributed and invited conference proceeding papers and presentations***

PUBLICATIONS (BOOKS AND BOOK CHAPTERS)

1. **Jae-Hyun Ryou**, "Chapter 3. GaN and LEDs on sapphire substrates," *Nitride semiconductor LEDs: materials, performance and applications*, J. J Huang, H.-C. Kuo, and S.-C. Shen Ed., Woodhead Publishing, Cambridge, U.K. (manuscript in preparation).
2. Shyh-Chiang Shen, **Jae-Hyun Ryou**, and Russell D. Dupuis, "GaN/InGaN heterojunction bipolar transistors using a direct-growth technology," *Nano-Semiconductors: Devices and Technology*," K. Iniewski Ed., CRC Press, New York, New York, U.S.A. (2011) (ISBN 978-1439848357).
3. **Jae-Hyun Ryou**, Ravi Kanjolila, and Russell D. Dupuis, "Chapter 6. CVD of III-V compound semiconductors," *Chemical Vapour Deposition: Precursors, Processes, and Applications*, A. Jones and M. L. Hitchman Ed., RSC (Royal Society of Chemistry) Publishing, Cambridge, U.K. (2009) (ISBN 978-0854044658).
4. **Jae-Hyun Ryou**, Shyh-Chiang Shen, and Russell D. Dupuis, "Chapter 10. Ultraviolet photodetectors based on III-nitride semiconductors," *Advanced Semiconductor Materials and Devices Research - SiC and III-Nitrides*, H. Cha Ed., Research Signpost, India (2009) (ISBN 978-8178953717).

PUBLICATIONS (REFEREED JOURNALS)

**** Corresponding author***

Submitted

1. J. Kim Z. Lochner, M.-H. Ji, R. Gong, S. Choi, H. J. Kim, J. S. Kim, R. D. Dupuis, A. M. Fischer, R. Juday, Y. Huang, T. Li, J. Y. Huang, F. A. Ponce, and **J.-H. Ryou***, "Effect of growth chamber conditions and underlying layers on unintentional incorporation of gallium in InAlN layer," *J. Cryst. Growth* (submitted for publication in Oct. 2012).
2. S. Choi, H. J. Kim, Z. Lochner, J. Kim, R. D. Dupuis, A. M. Fischer, R. Juday, Y. Huang, T. Li, J. Y. Huang, F. A. Ponce, and **J.-H. Ryou***, "Origins of unintentional incorporation of gallium into AlInN layers grown by metalorganic chemical vapor deposition," *J. Appl. Phys.* (submitted for publication in Oct. 2012).

3. S. Kim, **J.-H. Ryou**, R. D. Dupuis, K.-S. Ahn, H. Kim, "Electrical characteristics of Pt Schottky contacts on AlInN:Mg/GaN heterostructures," *Current Appl. Phys.* (submitted for publication in Oct. 2012).
4. S. Kim, **J.-H. Ryou**, R. D. Dupuis, K.-S. Ahn, H. Kim, "Electrical characteristics of Ti/Al contacts on AlInN:Mg/GaN heterostructures," *Jpn. J. Appl. Phys.* (submitted for publication in Oct. 2012).
5. Z. Lochner, X. Li, T.-T. Kao, Md. M. Sattar, H. J. Kim, S.-C. Shen, P. D. Yoder, **J.-H. Ryou**, R. D. Dupuis, A. M. Fischer, and F. A. Ponce, "Photo-pumped deep ultraviolet lasers at 257 nm from AlGaN/AlN heterostructure on AlN substrate," *Appl. Phys. Express* (submitted for publication in Sep. 2012).
6. Md. M. Satter, Z. Lochner, **J.-H. Ryou**, S.-C. Shen, R. D. Dupuis, and P. D. Yoder, "AlGaN-based multiple quantum well deep ultraviolet lateral current injection laser diodes on AlN substrates using regrown ohmic contacts," *IEEE Photon. Technol. Lett.* (submitted for publication in Sep. 2012).
7. T. Li, Q. Y. Wei, A. M. Fischer, Y. Huang, F. A. Ponce, J. P. Liu, Z. Lochner, **J.-H. Ryou**, and R. D. Dupuis, "The effect of InGaN underlayers on the electronic and optical properties of visible InGaN/GaN quantum wells," *Appl. Phys. Lett.* (submitted for publication in Sep. 2012).
8. J. Kim, M.-H. Ji, Z. Lochner, S. Choi, J. P. Liu, Md. M. Satter, P. D. Yoder, **J.-H. Ryou***, R. D. Dupuis, R. Juday, A. M. Fischer, and F. A. Ponce, "Role of p-$In_xGa_{1-x}N$ layer in enhancing hole transport and distribution in InGaN/GaN multiple quantum wells of visible III-nitride light-emitting diodes," *IEEE Photon. Technol. Lett.* (submitted for publication in Jul. 2012).
9. D. W. Park, H. M. Oh, C.-R. Lee, J. S. Kim, Y. H. Kim, S. K. Noh, S. J. Lee, J.-Y. Leem, M. S. Jeong, **J.-H. Ryou**, and R. D. Dupuis, "Self-catalyzed GaAs nanowires without Ga droplets formed on Si (111)," *Appl. Phys. Express* (submitted for publication in May 2012).
10. D. Zuo, B. Kesler, S.-L. Chuang, Y. Huang, **J.-H. Ryou**, and R. D. Dupuis, "Demonstration of InAs/GaSb type-II superlattice photodiodes grown on InAs substrates via metalorganic chemical vapor deposition," *Opt. Lett.* (submitted for publication in Oct. 2011).

Accepted

11. J. Hwang, K. Lee, H. Lee, J. S. Kim, C.-R. Lee, I.-H. Lee, K. Lee, J. H. Lee, J.-Y. Leem, J. S. Kim, **J.-H. Ryou**, and R. D. Dupuis, "Manipulation on the optical properties of InGaN/GaN light emitting diodes by adopting InN layer," *J. Cryst. Growth* (accepted for publication in Sep. 2012).

Published

12. S. Choi, M.-H. Ji, J. Kim, H. J. Kim, Md. M. Satter, **J.-H. Ryou***, P. D. Yoder, R. D. Dupuis, A. M. Fischer, and F. A. Ponce, "Efficiency droop due to electron spill-over and limited hole transport in III-nitride visible light-emitting diodes employing lattice-matched InAlN electron blocking layers," *Appl. Phys. Lett.* **101** (16), 161110-1–5 (2012).
13. S. Kim, H. J. Kim, S. Choi, Z. Lochner, **J.-H. Ryou**, R. D. Dupuis, and H. Kim, "Carrier transport properties of Mg-doped InAlN films," *Electron. Lett.* **48** (20), 1306–1308 (2012).
14. T. S. Mansuripur, S. Menzel, R. Blanchard, L. Diehl, C. Pflügl, Y. Huang, **J.-H. Ryou**, R. D. Dupuis, M. Loncar, and F. Capasso, "Widely tunable mid-infrared quantum cascade lasers using sampled grating reflectors," *Opt. Express* **20** (21), 23339–23348 (2012).
15. Md. M. Satter, Z. Lochner, **J.-H. Ryou**, S.-C. Shen, R. D. Dupuis, and P. D. Yoder, "Polarization matching in AlGaN-based multiple quantum well deep ultraviolet laser diodes on AlN substrates using quaternary AlInGaN barriers," *J. Lightwave Technol.* **30** (18), 3017–3025 (2012).
16. Md. M. Satter, H. J. Kim, Z. Lochner, **J.-H. Ryou**, S.-C. Shen, R. D. Dupuis, and P. D. Yoder, "Design and analysis of 250nm AlInN laser diodes on AlN substrates using tapered electron blocking layers," *IEEE J. Quantum Electron.* **48** (5), 703–711 (2012).

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