

Jeong Ho You

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EDUCATION

- UNIVERSITY OF ILLINOIS** Urbana, IL
Ph.D., Department of Mechanical Science & Engineering, Oct. 2007
Thesis: *Effect of nanoscale defects on electrical and optical properties in III-V semiconductors*
Advisor: Prof. Harley Johnson
- UNIVERSITY OF TEXAS** Austin, TX
M.S., Department of Mechanical Engineering, Aug. 2002
Thesis: *Sound diffraction by jagged edge noise barriers*
Advisors: Prof. David Blackstock, Dr. Wayne Wright, and Dr. Penelope Menounou
- CHUNGANG UNIVERSITY** Seoul, Korea
B.Eng., Mechanical Design & Production Engineering, Feb. 1999

APPOINTMENTS

- 09/07 – present **POSTDOCTORAL SCHOLAR, CALIFORNIA INSTITUTE OF TECHNOLOGY** Pasadena, CA
Supervised by Prof. Kaushik Bhattacharya
- *Atomic-based Effective Hamiltonian*
Effective Hamiltonian, which provides connections between atomistic or molecular behaviors and continuum models in large scale, is developed. Microscopic knowledge of material behaviors is studied with Density Functional Theory (DFT) and Monte Carlo simulations are performed to explain the macroscopic abnormal behaviors near morphotropic phase boundary in chemically disordered ferroelectric materials.
- 09/02 – 07/07 **GRADUATE RESEARCH ASSISTANT, UNIVERSITY OF ILLINOIS** Urbana, IL
Supervised by Prof. Harley Johnson
- *Electron scattering due to edge dislocations in epitaxial electronic materials*
Effects of dislocations on electron mobility have been studied numerically in epitaxial gallium nitride (GaN). Charge distributions along an edge dislocation have been obtained by DFT. Quantum mechanical behaviors of electrons have been coupled with mechanical strain and electrostatic charges in dislocations.
 - *Effects of threading edge and screw dislocations on optical properties in wurtzite gallium nitride (GaN) and zinc blende gallium arsenide (GaAs)*
Optical emission/absorption efficiencies have been calculated with the presence of edge and screw dislocations in complex crystalline materials. Spatial inhomogeneity of dislocation strain fields and electrostatic charges have been included through a multiband $\mathbf{k}\cdot\mathbf{p}$ Hamiltonian by solving the Schrödinger equation in real space finite element formulation.
 - *Optical properties of Nitrogen-ion-implanted ellipsoidal GaAsN quantum dots*
Effects of misfit strain and band structure mismatch on quantum confinements in embedded ellipsoidal quantum dots have been studied numerically.
- 2006 – 2007 **GRADUATE TEACHING ASSISTANT, UNIVERSITY OF ILLINOIS** Urbana, IL
Engineering Materials Laboratory
Mechanical Design
- 09/00 – 06/02 **GRADUATE RESEARCH ASSISTANT, UNIVERSITY OF TEXAS** Austin, TX
Supervised by Prof. David Blackstock, Dr. Wayne Wright, and Dr. Penelope Menounou
- *Noise reduction by jagged edge noise barriers*
Experimental and numerical investigations have been conducted to study effects of jagged-top-edge noise barriers. It has been found that an optimum-designed jagged edge noise barrier causes a substantial degradation of a diffracted signal: about 70% reduction compared with the conventional straight-top-edge in sound pressure peaks.

PUBLICATIONS

- Jeong Ho You and K. Bhattacharya, "Ferroelectric phase transitions near Morphotropic phase boundary in disordered perovskite compounds: Atomic-based continuous energy landscape representation," in preparation (2008).
- Jeong Ho You and H. T. Johnson, "Defect states in photoluminescence induced by edge dislocations in n-type GaN," in preparation (2008).
- Jeong Ho You and H. T. Johnson, "Photoluminescence intensity reduction due to edge dislocations in III-V semiconductors," Phys. Rev. B, submitted (2008).
- Jeong Ho You and H. T. Johnson, "Effect of dislocations on electrical and optical properties in III-V semiconductors," in press, Solid State Physics **61** (2008). [**invited, review article**] (**Impact factor: 9.5**)
- Jeong Ho You, Jun-Qiang Lu, and H. T. Johnson, "Electrostatic model of an edge dislocation in a complex crystalline material," Mathematics and Mechanics of Solids, **13**, 267-291 (2008). [**invited**]
- Jeong Ho You and H. T. Johnson, "Effects of threading edge dislocations on the photoluminescence spectrum in n-type Wurtzite GaN," Phys. Rev. B, **76**, 115336 (2007). (**Impact factor: 3.107**)
- Jeong Ho You and H. T. Johnson, "Effect of screw dislocation density on optical properties in n-type wurtzite GaN," J. Appl. Phys. **101**, 023516 (2007). (**Impact factor: 2.316**)
- Jeong Ho You, Jun-Qiang Lu, and H. T. Johnson, "Electron scattering due to threading edge dislocations in n-type wurtzite GaN," J. Appl. Phys. **99**, 033706 (2006). (**Impact factor: 2.316**)
- Penelope Menounou and Jeong Ho You, "Design of a jagged-edge barrier: numerical and experimental study," Noise Control Engineering Journal **52**(5), 210 (2004): **awarded, INCE outstanding paper.**
- Penelope Menounou and Jeong Ho You, "Experimental study of the diffracted sound field around jagged edge noise barriers," J. Acoust. Soc. Am. **116**, 2843 (2004). (**Impact factor: 1.433**)

CONFERENCE PRESENTATIONS

- Jeong Ho You and H. T. Johnson, "Effects of Dislocations on Photoluminescence in GaN and GaAs," 67th Physical Electronics Conference, Urbana, IL, June, 2007 (oral presentation).
- Jeong Ho You and H. T. Johnson, "Effects of Dislocations on Photoluminescence in GaN and GaAs," 14th Semiconducting and Insulating Materials Conference (SIMC), Fayetteville, AR, May, 2007 (oral presentation).
- Jeong Ho You and H. T. Johnson, "Computational Model for the Effects of Dislocations on Band edge Photoluminescence Reduction and Yellow Luminescence in GaN," MRS Spring meeting, San Francisco, CA, April, 2007 (poster).
- Jeong Ho You and H. T. Johnson, "Effect of Edge and Screw Dislocations on Photoluminescence in Wurtzite GaN," MRS Fall meeting, Boston, MA, November, 2006 (oral presentation).
- Jeong Ho You and H. T. Johnson, "Effect of edge and open-core screw dislocations on optical properties in Wurtzite GaN," APS March meeting, Baltimore, MD, March, 2006 (oral presentation).

- Jeong Ho You, Jun-Qiang Lu, and H. T. Johnson, “Electron scattering due to threading edge dislocations in n-type wurtzite GaN,” MRS Fall meeting, Boston, MA, December, 2005 (oral presentation).
- Jeong Ho You and H. T. Johnson, “Electron scattering due to $[V_{Ga}-O_N]^{2-}$ threading edge dislocations in epitaxial GaN,” MRS Fall meeting, Boston, MA, November, 2004 (poster).
- Jeong Ho You and Penelope Menounou, “Sound diffraction by jagged edge noise barriers,” Acoustical Society of America Conference (143rd meeting), Pittsburg, Pennsylvania, June, 2002 (oral presentation).
- Jeong Ho You, Penelope Menounou, Wayne M. Wright, “Directivity of the diffracted field around a half plane,” Acoustical Society of America Conference (142nd meeting), Ft. Lauderdale, Florida December, 2001 (oral presentation).

RESEARCH AREAS

- Computational nanomechanics
- Solid mechanics & quantum mechanics coupling systems
- Density Functional Theory
- Atomic-based continuum modeling
- Defect analysis in nanoelectronic and optoelectronic systems
- Phase transitions and Morphotropic phase boundary in disordered ferroelectrics/multiferroics
- Design of materials and nanostructures for energy conversion

HONORS AND AWARDS

- INCE award for paper in NCEJ: Outstanding Paper on Cost-Effective Noise Control Treatments published in Noise Control Engineering Journal, 2007.
- Summer tuition fellowship, University of Texas-Austin, 2000
- Primary and Secondary scholarships, ChungAng University, 1994 and 1995.

MEMBERSHIPS AND ACTIVITIES

- Reviewer in the Archive of Applied Mechanics
- Materials Research Society
- American Physical Society
- Acoustical Society of America