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# Curriculum Vitae of Debdeep Jena

## Contact Information

326 Bard Hall  
Department of Electrical and Computer Engineering  
Department of Materials Science and Engineering  
Cornell University  
Ithaca, NY 14853 USA  
Email: djena@cornell.edu

## Personal Data

Born: 26 November 1976  
Status: United States Citizen  
Spouse: Grace (Huili) Xing  
Child: Rohan Xing Jena

## Summary

Dr. Jena is a Professor of Electrical and Computer Engineering and Materials Science and Engineering at Cornell University. He joined Cornell in 2015 from the faculty at Notre Dame where he was since August 2003, shortly after earning the Ph.D. in Electrical and Computer Engineering from the University of California, Santa Barbara (UCSB). During his research career, he has received the International MBE Young Scientist award in 2014, the IBM faculty award in 2012, the ISCS Young Scientist award in 2012, the most valuable contribution awards at the Workshop for Compound Semiconductor Materials and Devices (WOCSEMMAD) in 2014, 2010 and 2008, the National Science Foundation (NSF) Career Award in 2006, a best student paper award at the Electronic Materials Conference in 2002, and a young author best paper award from the International Union of Pure and Applied Physics (IUPAP) in 2000.

Jena's research and teaching interests are in the area of electronic materials and devices. His research projects involve the epitaxial growth, design, and fabrication of semiconductor electronic and photonic devices. The device work is built upon fundamental experimental and theoretical studies of the quantum phenomena of charge, heat, & spin transport in III-V semiconductor heterostructures, and nanomaterials such as 2D layered semiconductors, nanowires, nanotubes, and graphene. He is the author or co-author on over 150 journal articles, several book chapters and review articles, and has edited one book, for which he has contributed two book chapters. He currently advises ten graduate students. Thirteen students have obtained their Ph.D. degrees and four students have obtained their M.S. degrees under his supervision. Since Fall 2003, the research efforts in his group have been supported by over \$60M in collaborative research funding, with Jena serving as principal investigator on over \$11M.

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## Professional Preparation

- 2003      **University of California**, Santa Barbara, CA  
Ph.D. in Electrical and Computer Engineering  
*Thesis:* “Polarization Induced Electron Populations in III-V Nitride Semiconductors: Growth, Transport, and Device Applications”  
Committee: Profs. U. Mishra (Director), H. Kroemer, A. Gossard, and J. Speck.
- 1998      **Indian Institute of Technology (IIT)**, Kanpur, India  
B.S. with major in Electrical Engineering and minor in Physics (Solid State)  
*Thesis:* “Pipelined CMOS analog to digital convertors”

## Distinctions, Honors, & Awards

- 2014      Richard E. Lunquist Sesquicentennial Faculty Fellow, Cornell University
- 2014      Young Scientist Award, International conference on Molecular Beam Epitaxy (ICMBE), 2014.
- 2014      Most Valuable Contribution, WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices)
- 2013      Advisor of PhD student Ms. Faiza Faria, winner of the poster award for ICNS 2013
- 2012      Young Scientist Award from ISCS (International Symposium of Compound Semiconductors)
- 2012      IBM Faculty award
- 2010      Most Valuable Contribution, WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices)
- 2010      Joyce award for excellence in undergraduate teaching
- 2009      Advisor of PhD student John Simon, winner of the best student paper for EMC 2009
- 2008      Most Valuable Contribution, WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices)
- 2006      National Science Foundation (NSF) CAREER Award
- 2002      Best student paper award at the Electronic Materials Conference (EMC) 2002, Santa Barbara, CA
- 2000      Young author best paper award from International Union of Pure and Applied Physics (IUPAP) for International Conference on Physics of Semiconductors (ICPS) 2000, Osaka, Japan
- 1997      Visiting Students Research Program (VSRP) Fellowship from Tata Institute of Fundamental Research (TIFR), India
- 1994      Scholarship for academic excellence all four years (1994-1998) of undergraduate studies from Coal India Limited, India

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## Professional Experience

### *Academic Appointments*

- 2015 - **Cornell University**, Ithaca, NY  
Department of Electrical and Computer Engineering  
Department of Materials Science and Engineering  
*Title:* Richard E. Lunquist Sesquicentennial Faculty Fellow
- 2013- **University of Notre Dame**, Notre Dame, IN  
Department of Electrical Engineering  
*Title:* Professor
- 2012 (Fall) **University of California**, Santa Barbara, CA  
Department of Electrical and Computer Engineering  
*Title:* Visiting Associate Professor
- 2009-2013 **University of Notre Dame**, Notre Dame, IN  
Department of Electrical Engineering  
*Title:* Associate Professor
- 2003-2009 **University of Notre Dame**, Notre Dame, IN  
Department of Electrical Engineering  
*Title:* Assistant Professor
- 1998-2003 **University of California**, Santa Barbara, CA  
Department of Electrical and Computer Engineering  
*Title:* Research Assistant

### *Industrial Activities*

- 2014 **Qorvo/Triquint Semiconductors**, Richardson, TX  
*Task:* Development of GaN power electronics.
- 2014 **United Technologies Research Center**, UTRC CT  
*Task:* Development of GaN power electronics.
- 2014 **Agnitron**, MN  
*Task:* Development of GaN power transistors.
- 2011-2014 **Samsung**, Samsung Advanced Institute of Technology, Seoul, Korea  
*Task:* Charge transport and device applications of 2D crystals for Thin Film Transistors.

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- 2011-2014 **Teledyne**, Thousand Oaks, CA  
*Task:* Design, fabrication, and demonstration of high-voltage high-speed III-V Nitride GaN HEMTs for microscale power conversion
- 2011-2014 **Kopin Corporation**, Westboro, MA  
*Task:* Design, fabrication, and demonstration of GaN HEMTs
- 2010-2012 **Nitek**, Irmo, SC  
*Task:* Design, fabrication, and demonstration of III-V Nitride UV LEDs using polarization-induced p-type doping
- 2009-2014 **Triquint Semiconductors**, Richardson, TX  
*Task:* Design, fabrication, and demonstration of ultrafast III-V Nitride HEMT technology
- 2009-2010 **Illinois Applied Research**, Chiacgo, IL  
*Task:* Molecular Beam Epitaxy (MBE) Growth of InGaN for photovoltaic applications
- 2006-2007 **Dot Metrics**, Raleigh, NC  
*Task:* Molecular Beam Epitaxy (MBE) Growth of GaN on Quantum-Dot Samples for LED applications
- 2006-2007 **System Creations**, Metairie, LA  
*Task:* MBE Growth of InN/GaN heterojunctions for Solar Cell applications
- 2008 **4Wave Incorporated**, Sterling, VA  
*Task:* Characterization of Plasma-Deposited GaN and AlGaIn thin films
- 2007 **Traycer Diagnostic Systems**, Columbus, OH  
*Task:* MBE growth of AlN/GaN Heterostructures for enabling terahertz imaging of biological species

## Professional Activities

- Editor: International Conference on Nitride Semiconductors (ICNS) 2007, Conference Proceedings Editor.  
Special Issue of the Journal of Electronic Materials on Wide Bandgap Semiconductors (vol. 36, issue 4, 2007), Associate Editor.

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Program Committee Chair or Co-Chair:

2015 Device Research Conference (IEEE DRC).  
2013 10th Topical Workshop on Heterostructure Microelectronics (TWHM).  
2011 9th Topical Workshop on Heterostructure Microelectronics (TWHM).  
2011 WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices).

Program Committee Member:

2015 Device Research Conference (IEEE DRC).  
2014 Device Research Conference (IEEE DRC).  
2014 International Conference on Molecular Beam Epitaxy (ICMBE).  
2014 MRS Symposium Fall Meeting.  
2014 Lester Eastman Conference on high-performance devices (LEC).  
2013 International Conference on Nitride Semiconductors (ICNS).  
2013 Device Research Conference (IEEE DRC).  
2012 Device Research Conference (IEEE DRC).  
2013 Electronic Materials Conference.  
2012 Electronic Materials Conference.  
2012 International MBE (Molecular Beam Epitaxy) Conference.  
2011 International Conference on Nitride Semiconductors (ICNS).  
2009-2015 WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices) for the period.  
2011 Electronic Materials Conference.  
2010 Electronic Materials Conference.  
2010 International Workshop on Nitrides (IWN).  
2009 Electronic Materials Conference.  
2008 Electronic Materials Conference.  
2007 International Conference on Nitride Semiconductors (ICNS).  
2007 Electronic Materials Conference.  
2006 Electronic Materials Conference.

Session Organizer and/or Chair:

2014 MRS Symposium Fall Meeting: 2D Crystal Materials and Devices.  
2013 American Physical Society (APS) March meeting.  
2006-2008 Electronic Materials Conference.  
2007 International Conference on Nitride Semiconductors (ICNS).  
2006 Device Research Conference (DRC).  
2005 International Conference on Hot Carriers in Semiconductors (HCIS).

Reviewer: *Science*  
*Nature Journals*

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*Physical Review Letters*  
*Physical Review B*  
*Nano Letters*  
*Applied Physics Letters*  
*Journal of Applied Physics*  
*Superlattices and Microstructures*  
*IEEE Electron Device Letters*  
*IEEE Transactions on Electron Devices*  
*Solid State Electronics*  
*MRS Bulletins*  
*Journal of Electronic Materials*  
*Journal of Luminescence*  
*Journal of Physical Chemistry*  
*Journal of Computational Electronics*  
*Physica Status Solidi*

Funding Proposal Reviewer & Panelist:

National Science Foundation (NSF)  
Department of Energy (DOE) National Energy Technology Laboratory (NETL)  
Civilian Research and Development Foundation (CRDF)  
MIT Deshpande Center Innovation Awards  
Ohio State Institute for Materials Research (IMR) Grants  
European Science Foundation (ESF)  
Swiss National Foundation (SNF)

Member: Institute of Electrical and Electronic Engineers (IEEE)  
American Physical Society (APS)  
Materials Research Society (MRS)  
American Association for the Advancement of Science (AAAS)

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## Patents Issued

3. *Methods and apparatus for THz wave amplitude modulation.*  
Berardi Sensale-Rodriguez, Rusen Yan, Tian Fang, Michelle Kelly, Debdeep Jena, Lei Liu and Huili (Grace) Xing  
**Issued** on September 16, 2014, **US Patent Number 8,836,446.**
2. *Compositionally graded heterojunction semiconductor device and method for making the same.*  
John Simon, Huili Xing and Debdeep Jena  
**Issued** on September 16, 2014, **US Patent Number 8,835,998.**
1. *Polarization-Doped Field-Effect Transistors (POLFETs) and Materials and Methods for making the same.*  
Debdeep Jena, Siddharth Rajan, Huili Xing and Umesh Mishra  
**Issued** on April 28, 2009, **US Patent Number 7,525,130.**

## Patents Pending

7. *GaN PolarMOS.*  
Huili (Grace) Xing, Debdeep Jena, Kazuki Nomoto, Bo Song, and Mingda Zhu  
Pending, US Patent filed in 2013.
6. *GaN vertical power devices.*  
Kazuki Nomoto, Debdeep Jena, and Huili (Grace) Xing  
Pending, US Patent filed in 2013.
5. *THz detector array utilizing electro-absorption modulators.*  
Berardi Sensale-Rodriguez, Rusen Yan, Debdeep Jena, Lei Liu and Huili (Grace) Xing  
Pending, US Patent filed in 2013.
4. *Ultrathin body Nitride-on-Insulator Quantum Well Field Effect Transistors with Regrown Ohmic Contacts.*  
Guowang Li, Huili Xing and Debdeep Jena  
Pending, US Patent filed in 2012.
3. *Growth interruption technology for obtaining high mobility two-dimensional electron gases in nitride heterostructures with high Al composition AlGaN barriers.*  
Guowang Li, Yu Cao, Huili Xing and Debdeep Jena  
Pending, US Patent filed in 2010.
2. *Threshold voltage control in wide-bandgap transistors by work function engineering.*  
Guowang Li, Yu Cao, Ronghua Wang, Tom Zimmermann, Huili Xing and Debdeep Jena

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Pending, US Patent filed in 2010.

1. *Heterostructure Based Low-Leakage Buffer Transistors.*  
Yu Cao, Tom Zimmermann, Huili Xing and Debdeep Jena  
Pending, US Patent Filed in 2009.



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## Invited Talks

83. *New features in doping, contacts, transport, and device physics of 2D crystal semiconductors*  
SEMATECH workshop on Materials and Technologies for Beyond CMOS, San Francisco (2014).
82. *Electro-thermal properties of Gallium Oxide*  
Special oxide workshop, Air Force Research Laboratory, Dayton (2014).
81. *Electron device potential of 2D crystal semiconductors*  
ECS Symposium, Cancun, Mexico (2014).
80. *Exploiting polarization in semiconductor heterostructures for steep switching transistors*  
Intel, Portland OR (2014).
79. *Eastman's 2nd gen legacy: nitride, oxide, and 2D crystal materials and devices*  
Lester Eastman Conference (LEC), Cornell University, Ithaca NY (2014).
78. *Using polarization for novel nitride devices*  
International Workshop on Nitrides (IWN), Wroclaw, Poland (2014).
77. *Two-dimensional semiconductor beyond graphene*  
International Conference on the Physics of Semiconductors (ICPS), Austin, (2014).
76. *2D crystal semiconductor materials and devices: opportunities and challenges*  
Walter Schottky Institute, Munich, Germany (2014).
75. *Electron scattering, mobilities, and tunneling transport in 2D crystal materials for device applications*  
CMOS emerging technologies (CMOSET), Grenoble, France (2014).
74. *Low power devices*  
Workshop on Compound Semiconductor Devices and Integrated Circuits (WOCSDICE), Delphi, Greece (2014).
73. *Nanoelectronic materials and devices: Current advances and future perspectives*  
Taiwan Semiconductor Manufacturing Corporation (TSMC), Tshinchu, Taiwan (2014).
72. *Opportunities for RF electronics with 2D crystal semiconductors*  
IEEE MTT-S International Microwave Symposium, Tampa (2014).
71. *Electron transport in 2D crystal semiconductors and their device applications*  
IEEE Silicon Nanoelectronics Workshop 2014, Hawaii (2014).

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70. *Electronic devices enabled by graphene*  
Graphene Week 2014, Gothenburg, Sweden (2014).
  69. *Electron transport in graphene based 2D crystals for novel electronic devices*  
Graphene 2014, Toulouse, France (2014).
  68. *Nanoelectronic materials and devices at the crossroads: Recent advances and future perspectives*  
Chinese Academy of Science, Beijing, China (2014).
  67. *Nanoelectronic materials and devices at the crossroads: Recent advances and future perspectives*  
Physics Department Seminar, Peking University, China (2014).
  66. *FETs with 2D crystals for logic: scaling extender, or harbinger of new functionalities?*  
Data-abundant system technology, Stanford University (2014).
  65. *New results on III-Nitride physics and devices using MBE heterostructures*  
SSLEC Seminar, University of California at Santa Barbara (2014).
  64. *2D crystal semiconductor physics of novel device applications: Challenges and opportunities*  
Condensed Matter Physics and Material Science Seminar, Tata Institute of Fundamental Research (TIFR) Mumbai, India (2014).
  63. *Physics and applications of 2D crystal semiconductors; graphene and transition metal dichalcogenides*  
Condensed Matter Seminar, Physics Department, University of Notre Dame (2014).
  62. *Novel logic devices based on 2D crystal semiconductors: Opportunities and challenges*  
International Electron Devices Meeting (IEDM), Washington DC (2013).
  61. *SymFET: A novel graphene-insulator-graphene tunneling device*  
Semiconductor Interfaces Specialists Conference (SISC), Washington DC (2013).
  60. *III-Nitride Heterostructure Electronic and Optical Devices*  
Universidad de Chile, Santiago, Chile (2013).
  59. *New electronic devices exploiting nanocarbon crystals: Proposals & Experimental Progress*  
JSAP/MRS Joint Symposium, Kyoto, Japan (2013).
  58. *Recent progress in III-Nitride Heterostructure and 2D crystal devices*  
Naval Research Laboratory, Washington, DC (2013).
  57. *Novel 2D crystal tunneling devices*

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- CMOS Emerging Technologies Research, Whistler, Canada (2013).
56. *Charge transport properties and device applications of novel 2D crystals*  
Short Course, Device Research Conference (DRC), Notre Dame, IN (2013).
  55. *Prospects for 2D crystal semiconductor devices*  
International Symposium of Compound Semiconductors (ISCS), Kobe, Japan (2013).
  54. *2D crystal semiconductor materials and devices*  
International Materials Week, The Ohio State University, OH (2013).
  53. *Novel 2D crystal semiconductor devices*  
SPIE Conference, Baltimore, MD (2013).
  52. *Challenges and prospects for 2D crystal semiconductor devices*  
Beyond Graphene workshop, Penn State University, PA (2013).
  51. *III-Nitride Transistors and LEDs on AlN substrates*  
Global Conference on Excellence in Engineering (GCOE), Kyoto University, Japan (2013).
  50. *Polarization-Engineered High-Performance III-Nitride Transistors and LEDs*  
University of Michigan, Ann Arbor, MI (2013).
  49. *Transistors and Quantum-Dot LEDs on AlN substrates*  
HETECH, Barcelona, Spain (2012).
  48. *Opportunities and Reliability Challenges in 2D Crystal Electronics*  
ESREF, Cagliari, Italy (2012).
  47. *2D Crystal based Electronic Devices*  
AVS annual meeting, Tampa, FL (2012).
  46. *Tunneling Transistors with 2D Crystals*  
SRC NRI eWorkshop (2012).
  45. *Novel Heterostructures for GaN Power Electronic Devices*  
Sandia National Laboratories, Sandia, NM (2012).
  44. *Graphene Nanoribbon Electronics and the promise of 2D Crystals*  
CNSI seminar, UC Santa Barbara, CA (2012).
  43. *The promise of 2D Crystal Semiconductor Electronics*  
NSF/AFOSR 2D Crystals workshop, Arlington, VA (2012).

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42. *Wafer-Scale Graphene Nanoribbon Electronics*  
ECS meeting, Seattle (2012).
  41. *Wafer-scale graphene nanoribbon technology*  
China Semiconductor Technology International Conference (CSTIC), Shanghai (2012).
  40. *Exploiting symmetry in electronic and optical devices*  
University of Minnesota, CEMS (2012).
  39. *Nitride semiconductors and 2D crystals*  
Purdue University, Birck Center (2012).
  38. *Using Polarization in III-Nitride Optoelectronic Devices: Not always an Enemy*  
KAUST-NSF Workshop on Solid State Lighting, KAUST, KSA (2012).
  37. *2D Crystals for Next Generation Electronic Switches.*  
National Nanofabrication Infrastructure Network (NNIN) workshop, UCSB, CA (2012).
  36. *Graphene and 2D crystals: Physics and Device Applications.*  
University of California, Berkeley, CA (2011).
  35. *III-Nitride semiconductor heterostructure epitaxy and device applications.*  
Army Research Laboratory, Adelphi, MD (2011).
  34. *Short course on: Polarization physics and device applications in III-Nitride Heterostructures.*  
Jaszowiec School, Krynica, Poland (2011).
  33. *Graphene Nanostructures for Digital Applications.*  
GOMACTech, Orlando, FL (2011).
  32. *Polarization Physics and Novel device applications in wide-bandgap III-V nitrides.*  
Peking University, Beijing, China (2010).
  31. *Wide and zero-bandgap materials and devices.*  
Indian Institute of Technology (IIT), Chennai, India (2010).
  30. *Polarization-Engineered Applications in III-Nitride Devices: Tunneling and Doping.*  
International Workshop on Nitride Semiconductors (IWN), Tampa, FL (2010).
  29. *Polarization induced tunneling and doping in nitride semiconductor devices.*  
International Conference on Molecular Beam Epitaxy (ICMBE), Berlin, Germany (2010).
  28. *Graphene Physics and Device Applications.*  
The Ohio State University, Columbus, OH (March, 2010).

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27. *Novel Polarization-Engineered Devices with III-V Nitride Semiconductors.*  
Purdue University, West Lafayette, IN (January 2010).
  26. *2-D Crystals.*  
Naval Research Laboratory, Washington, D.C. (January 2010).
  25. *Graphene based Electronics.*  
International Workshop on Physics of Semiconductor Devices (IWPSD), New Delhi, India (December 2009).
  24. *Graphene Electronics: Fundamentals to Applications.*  
Heterostructure Technologies Workshop (HETECH), Ulm, Germany (Nov 2009).
  23. *Polarization-engineering for Gallium Nitride Devices.*  
Walter Schottky Institute (WSI) Munich, Germany (October 2009).
  22. *The role of phonons on electron transport in GaN devices.*  
International Conference on Nitride Semiconductors (ICNS), Jeju, South Korea (October 2009).
  21. *Graphene Transistors.*  
Technical Workshop on Heterostructure Microelectronics (TWHM), Nagano, Japan (August 2009).
  20. *Graphene Electronics.*  
Army Research Laboratory (ARL), Baltimore, MD (August 2009).
  19. *Nitride Nanowires by Molecular Beam Epitaxy.*  
Paul Drude Institute (PDI) workshop on nanowires, Berlin, Germany (March 2009).
  18. *Adventures across bandgaps: Bandgap Engineering and Device Applications of wide-bandgap III-V Nitrides to zero-bandgap Graphene.*  
Cornell University, Ithaca, NY (September 2007).
  17. *Polarization engineering in III-V Nitrides and prospects for multifunctional devices.*  
United Technologies Research Center (UTRC), East Hartford, Connecticut (Aug 2007).
  16. *Graphene-based mm-wave Transistors: New ideas and paradigms.*  
DARPA Carbon Electronics workshop (April 2007).
  15. *Phonon cavities and engineering of electron-phonon interactions in semiconductor heterostructures.*  
Photonics West, San Jose, CA (January, 2007).

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14. *Phonon-Engineered III-V Nitride High-electron Mobility Transistors.*  
Advanced Heterostructures Workshop, Big Island, Hawaii (Dec 12-15, 2006).
  13. *Phonon Engineering in Transistors.*  
DARPA Technologies for Heat Removal in Electronics at the Device Scale (THREADS) workshop, Santa Barbara, CA (Dec 2006).
  12. *MBE growth and polarization-doping in III-V Nitride Heterostructures: Applications to HBTs and ultrafast HEMTs.*  
General Electric Corporate Research and Development (CRD) Niskayuna, New York (August 2006).
  11. *Semiconductor Nanowires: Transport and Optical properties, and applications in large-area flexible Transistors and Photodetectors.*  
University of California Santa Barbara, CA (March 2006).
  10. *Compositionally graded polar semiconductors and ferroelectrics: Analogies and new multi-functional device possibilities..*  
International Workshop on Multifunctional Materials III, San Carlos de Bariloche, Argentina (March 5, 2006).
  9. *The Hot-Phonon Effect in III-V Nitride Heterostructures: Impact on ultrafast transistors and epitaxial solutions.*  
DARPA Nanoscale Optical Phonon Engineering workshop, Washington, D.C. (Dec 2005).
  8. *MBE growth of polarization-doped III-V nitride p-n junctions.*  
ONR Electronic Materials Review, New Jersey (August 15, 2005).
  7. *Polarization Engineered III-V Nitride Heterostructures: Growth, Transport, and Device applications.*  
University of Illinois, Chicago (April 14, 2005).
  6. *Graded alloy heterojunctions: A possible solution for the hot-phonon effect?*  
Workshop on Surface and Interface Electronics (ONR/Iowa), Palm Springs (April 13, 2005).
  5. *Compositionally graded polar semiconductors: doping and high-field transport.*  
Arizona State University, Tempe (March 11, 2005).
  4. *Polarization engineering in III-V Nitride Heterostructures.*  
SUNY Buffalo (March 4, 2005).
  3. *Distributed Polarization Effects.*  
ONR Electronic Materials Review, Monterey (August 3, 2004).

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2. *Electron Transport in AlGaN/GaN Heterostructures.*  
Naval Research Laboratory, Washington D.C. (August 20, 2003).
  1. *Polarization-Induced Electron Populations in Nitride Heterostructures: Physics and Device Applications.*  
University of Notre Dame, Notre Dame, IN (March 10, 2003).

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## Publication list of Prof. Debdeep Jena (djena@cornell.edu)

Electronic copies are available upon request. The most recent list is available at:  
<http://djena.engineering.cornell.edu/publications.htm>.

*Books, Monographs, and Book Chapters (6):*

- 7) **Book Chapter**  
*Epitaxy of GaN on Silicon*  
Yu Cao, Oleg Laboutin, Wayne Johnson, Satyaki Ganguly, Huili (Grace) Xing, and Debdeep Jena  
Thin Films on Silicon: Electronic and Photonic Applications (ed: Vijay Narayanan, IBM),  
In press, 2015.
- 6) **Book Chapter**  
*Graphene and 2D Crystal Tunnel Transistors*  
Qin Zhang, Pei Zhao, Nan Ma, Grace (Huili) Xing, and Debdeep Jena  
CMOS and Beyond (Ed: Tsu Jae King), Cambridge University Press, 2014.
- 5) **Book Chapter**  
*Nitride LEDs based on quantum wells and quantum dots*  
J. Verma, A. Verma, V. Protasenko, S. M. Islam, and D. Jena  
Book on Nitride Semiconductor Light Emitting Diodes (LEDs), Woodhead Publishers,  
2012.
- 4) **Book Chapter**  
*Graphene*  
Debdeep Jena  
Springer Encyclopedia on Nanotechnology, 2012.
- 3) **Book Chapter**  
*Graphene transistors*  
Kristof Tahy, Tian Fang, Pei Zhao, Aniruddha Konar, Chuanxin Lian, Huili Xing,  
Michelle Kelly and Debdeep Jena  
InTech Web (2010), ISBN: 0387368310
- 2) **Monograph**  
*Studies of MBE-Grown Single and Multiple AlN/GaN Heterojunctions*  
Cao Yu and Debdeep Jena  
VDM Verlag (2008), ISBN: 3836475944
- 1) **Book**  
*Polarization Effects in Semiconductors: From ab-initio Theory to Device Applications*  
Springer, Berlin (2007), ISBN: 0387368310  
Editor, jointly with C. Wood, contributed 2 chapters.



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**Journal Articles** (>150) Publications in Science, Nature Journals, PRL, PRX, PRB, Nano Lett, IEEE Proceedings, EDL, TED, APL, JAP, etc... :

160. Z. Guo et al.  
*Anisotropic Thermal Conductivity in Single-Crystal  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>.*  
Applied Physics Letters, **accepted**, to appear, (2015).
159. M. Zhu et al.  
*1.9 kV AlGaN/GaN lateral Schottky barrier diodes on Silicon.*  
IEEE Electron Device Letters, **accepted**, to appear, (2015).
158. M. Li et al.  
*2-dimensional heterojunction interlayer tunneling FETs (Thin-TFETs).*  
IEEE Journal of Electron Devices Society, **accepted**, to appear, (2015).
157. M. Qi et al.  
*Dual optical marker Raman characterization of strained GaN channels on AlN using AlN/GaN/AlN quantum wells and <sup>15</sup>N isotopes.*  
Appl. Phys. Lett., **106**, 041906, (2015).
156. N. Ma and D. Jena  
*Carrier statistics and quantum capacitance effects on mobility extraction in 2D crystal FETs.*  
2D Materials, **2**, 015003, (2015).
155. S. Fathipour et al.  
*Synthesized multi wall MoS<sub>2</sub> nanotube and nanoribbon FETs.*  
Appl. Phys. Lett., **106**, 022114, (2015).
154. W. S. Hwang et al.  
*Graphene Nanoribbon FETs on wafer-scale epitaxial graphene on SiC substrates.*  
APL Materials, **3**, 011101, (2015).
153. D. Jena et al.  
*2D Crystal Semiconductors: Intimate Contacts.*  
Nature Materials, **13**, 1076, (2014).
152. S. Fathipour et al.  
*Exfoliated MoTe<sub>2</sub> field-effect transistors.*  
Applied Physics Letters, **105**, 192101, (2014).
151. A. Verma et al.  
*Au-gated SrTiO<sub>3</sub> field-effect transistors with large electron concentration and current modulation.*  
Applied Physics Letters, **105**, 113512, (2014).

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150. S. H. Lee et al.  
*Strain sensitivity in the nitrogen 1s NEXAFS spectra of gallium nitride.*  
Applied Surface Science, **316**, 232, (2014).
149. Y. Yue et al.  
*Faceted sidewall etching of n-GaN on sapphire by photoelectrochemical wet processing.*  
Journal of Vacuum Science and Technology B, **32**, 061201, (2014).
148. S. H. Lee et al.  
*High-performance photocurrent generation from 2D WS<sub>2</sub> FETs.*  
Applied Physics Letters, **104**, 193113, (2014).
147. Q. Yan et al.  
*First-principles study of high-field related behavior of group-III nitrides.*  
Physical Review B, Rapid Communication, **90**, 121201, (2014).
146. S. Ganguly et al.  
*Plasma-MBE growth conditions of AlGaIn/GaN HEMTs on Silicon and their device characteristics with epitaxially regrown ohmic contacts.*  
Appl. Phys. Exp., **7**, 105501, (2014).
145. Q. Zhang et al.  
*Optimum band gap and supply voltage in tunnel FETs.*  
IEEE Trans. Electron Dev., **61**, 2719, (2014).
144. A. Verma et al.  
*Intrinsic Mobility Limiting Mechanisms in Strontium Titanate.*  
Physical Review Letters, **112**, 216601, (2014).
143. N. Ma and D. Jena  
*Charge Scattering and Mobility in Atomically Thin Semiconductors.*  
Physical Review X, **4**, 011043, (2014).
142. W.-S. Hwang et al.  
*High-Voltage Field-Effect Transistors with Wide-Bandgap Ga<sub>2</sub>O<sub>3</sub> Nanomembranes.*  
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*A High-Mobility Window for Two-Dimensional Electron Gases at Ultrathin AlN/GaN Heterojunctions.*  
Applied Physics Letters, **90** 182112 (2007).
  23. X. Mu, Y. J. Ding, K. Wang, D. Jena, and Y. B. Zotova,  
*Resonant Terahertz generation from InN thin films.*  
Optics Letters, **32** 1432 (2007).

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22. R. Zhou, H.-C. Chang, V. Protasenko, M. Kuno, A. Singh, D. Jena, and H. Xing  
*Polarization anisotropy, frequency dependent emission, and transport properties of dielectrically aligned CdSe nanowire arrays.*  
Journal of Applied Physics, **101** 073704 (2007).
  21. D. Jena and A. Konar  
*Enhancement of carrier mobility in semiconductor nanostructures by dielectric engineering.*  
Physical Review Letters, **98**, 136805, (2007).
  20. M. Gao, S. Bradley, Y. Cao, D. Jena, Y. Lin, S. Ringel, H. Hwang, W. Schaff, and L. Brillson  
*Compositional modulation and optical emission in AlGaIn epitaxial films.*  
Journal of Applied Physics, **100** 103512 (2006).
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*Hot Phonons in Si-Doped GaN.*  
Applied Physics Letters, **89** 202117 (2006).
  18. K. Wang, Y. Cao, J. Simon, J. Zhang, A. Mintairov, J. Merz, D. Hall, T. Kosel, and D. Jena  
*Effect of dislocation scattering on the transport properties of InN grown on GaN substrate by Molecular Beam Epitaxy.*  
Applied Physics Letters, **89** 162110 (2006).
  17. J. Simon, K. Wang, H. Xing, S. Rajan, and D. Jena  
*Carrier transport and confinement in polarization-induced 3D electron slabs: Importance of alloy scattering in AlGaIn.*  
Applied Physics Letters, **88** 042109 (2006).
  16. K. Wang, J. Simon, N. Goel, and D. Jena  
*Optical study of hot electron transport in GaN: Signatures of the hot-phonon effect.*  
Applied Physics Letters, **88** 022103-022105 (2006).
  15. S. Rajan, S. DenBaars, U. K. Mishra, H. Xing, and D. Jena  
*Electron mobility in graded AlGaIn alloys.*  
Applied Physics Letters, **88** 042103-042105 (2006).
  14. A. Khandelwal, D. Jena, J. Grebinski, K. Richter, and M. Kuno  
*Ultrathin CdSe Nanowire FETs and their Optical Properties.*  
Journal of Electronic Materials, **35** 170-173 (2006).
  13. D. Jena  
*Conduction electron spin relaxation due to dislocation scattering in III-V semiconductors.*  
Physical Review B **70** 245203-(1-8) (2004).

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12. W. Zhao and D. Jena  
*Dipole scattering in highly polar semiconductor alloys.*  
Journal of Applied Physics **96** 2095-2101, (2004).
  11. S. Rajan, H. Xing, S. DenBaars, U. K. Mishra, and D. Jena  
*AlGaIn/GaN polarization-doped field-effect transistor for microwave power applications.*  
Applied Physics Letters **84**, 1591-1593 (2004).
  10. D. Jena, S. Heikman, J. S. Speck, U. K. Mishra, A. Link, and O. Ambacher  
*Magnetotransport measurement of effective mass, quantum scattering time, and alloy scattering potential of polarization-doped 3D electron slabs in graded AlGaIn.*  
Physica Status Solidi (c), **0**, 2339-2343 (2003).
  9. D. Jena, A. Link, S. Heikman, S. Keller, S. DenBaars, J. Speck, A. Gossard, and U. K. Mishra  
*Magnetotransport properties of a polarization doped three-dimensional electron slab.*  
Physical Review B, **67**, 153306-(1-4) (2003).
  8. H. Xing, D. Jena, M. J. W. Rodwell, and U. K. Mishra  
*Explanation of anomalously high current gain ( $\beta$ ) observed in GaN based bipolar transistors.*  
IEEE Electron Device Letters **24** 4-6 (2003).
  7. D. Jena and U. K. Mishra  
*Quantum and classical scattering times due to charged dislocations in an impure electron gas.*  
Physical Review B, **66** 241307-(1-4)(Rapid Communications) (2002).
  6. D. Jena, S. Heikman, D. Green, D. Buttari, R. Coffie, H. Xing, S. Keller, S. DenBaars, J. Speck, and U. K. Mishra  
*Realization of wide electron slabs by polarization bulk doping in graded III-V nitride semiconductor alloys.*  
Applied Physics Letters, **81** 4395-4397 (2002).
  5. A. Jimenez, D. Buttari, D. Jena, R. Coffie, S. Heikman, N. Q. Zhang, L. Shen, E. Calleja, E. Munoz, J. Speck, and U.K. Mishra  
*Effect of p-doped overlayer thickness on RF-dispersion on GaN junction FETs.*  
IEEE Electron Device Letters, **23** 306-308 (2002).
  4. D. Jena and U. K. Mishra  
*Effect of scattering by strain fields surrounding edge dislocations on electron transport in two-dimensional electron gases.*  
Applied Physics Letters, **80** 64-66 (2002).
  3. D. Jena, I. Smorchkova, A. Gossard, and U. K. Mishra



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*Electron transport in III-V nitride two-dimensional electron gases.*  
Physica Status Solidi B, **228** 617 -619 (2001).

2. D. Jena, A. Gossard and U. K. Mishra  
*Dipole scattering in polarization induced 2DEGs.*  
Journal of Applied Physics, **88** 4734-4738 (2000).
1. D. Jena, A. Gossard and U. K. Mishra  
*Dislocation scattering in a two-dimensional electron gas.*  
Applied Physics Letters, **76** 1707-1709 (2000).

*Unrefereed publications:*

1. D. Jena, Y. Smorchkova, C. Elsass, A. C. Gossard, and U. K. Mishra  
*Electron transport and intrinsic mobility limits in two-dimensional electron gases of III-V nitride heterostructures.*  
Condensed Matter Archives, (cond/mat) 0103461 (9 text + 8 Figures).

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## *Conference Presentations & Publications*

The research work from my group is regularly presented at the following scientific conferences and workshops:

- International Electron Devices Meetings (IEDM)
- Device Research Conference (DRC)
- Electronic Materials Conference (EMC)
- International Conference on Physics of Semiconductors (ICPS)
- International Conference on Molecular Beam Epitaxy (MBE)
- International Conference on Nitride Semiconductors (ICNS)
- International Workshop on Nitrides (IWN)
- International Symposium on Compound Semiconductors (ISCS)
- American Physical Society (APS) March Meetings
- Workshop on Compound Semiconductor Materials and Devices (WOCSEMMAD)
- Technical Workshop on Heterostructure Microelectronics (TWHM)

*A complete conference presentations list is available upon request, and is not listed here separately.*

Graduate students and postdoctoral scholars from my group present their work and are active participants in these conferences. In addition to serving on the program committees of a few of these conferences, I have offered short courses and tutorials in emerging areas of research.

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## Research funding

### *Active Grants*

38. National Science Foundation (NSF)  
EFRI 2-DARE: Monolayer Heterostructures: Epitaxy to Beyond CMOS Devices  
\$1,999,997, 11/2014 - 10/2018 (with PI H. Xing, Morten Eskildsen, Tengfei Luo, and Libai Huang)
37. Radiation-hard multi-channel AlN/GaN HEMTs for high-efficiency X- and Ka-band power amplifiers: Phase I (NASA STTR)  
Sub-contract from Agnitron Technology Inc.  
Co-PI with PI Prof. Xing  
\$40,000, 06/2014 - 12/2014
36. ARPA-E SWITCHES program: PolarJFET for high-voltage switching  
Co-PI with PI Prof. Xing, Triquint, United Technologies, and IQE  
\$2.4M, 01/2014 - 03/2017
35. ARPA-E SWITCHES program: Bulk GaN for Power Switching  
Subcontract from SixPoint Materials, with Prof. Xing  
\$585K, 01/2014 - 03/2017
34. Semiconductor Research Corporation (SRC) and DARPA  
Co-PI and Theme Leader for Center for Low-Energy Systems Technology (LEAST), part of StarNET  
\$30M, 01/2013 - 01/2018
33. International Business Machines (IBM)  
IBM Faculty Award  
\$40,000, 10/2012 - 9/2016
32. National Science Foundation (NSF)  
2D Crystal Materials and Devices  
\$360,000, 10/2012 - 9/2015 (with H. Xing)
31. Office of Naval Research (ONR-MURI)  
Extreme Electron Concentration Materials and Devices (EXEDE)  
\$750,000, 10/2012 - 9/2017 (with S. Stemmer from UCSB and other Co-PIs)
30. Air Force Office of Scientific Research  
2D Crystals for GHz-THz electronics  
\$600,000, 10/2012 - 9/2015
29. Office of Naval Research (ONR - MURI)

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III-Nitride Devices and Architectures for Terahertz Electronics (DATE)  
\$6,288,908, 6/2011 - 5/2016, (with P. Fay and H. Xing from Notre Dame, and PIs from Ohio State, Wright, and John Hopkins.)

*Past Grants*

28. DARPA Microscale Power Conversion (MPC)  
GaN high-speed and high voltage switches and circuits for power conversion  
\$700,000, 10/2011 - 9/2014 (with H. Xing and P. Fay, subcontract from Teledyne)
27. DARPA Nitride Next Generation Technology (NEXT)  
Ultrafast III-V Nitride High Electron Mobility Transistors  
\$3,364,000, 10/2009 - 4/2014, (with H. Xing, P. Fay and G. Snider)
26. Air Force Office of Scientific Research: DoD DURIP  
Complex Oxide Heterostructures by Chemical Beam Epitaxy  
\$400,000, 10/2012 - 9/2013
25. Samsung Global Research Office (GRO) Projects  
Charge transport and device applications of 2D crystals for Thin Film Transistors  
\$300,000, 10/2011 - 9/2013 (with C. Van-de-Walle from UCSB)
24. DARPA Compact Mid-UltraViolet Technologies (CMUVT)  
Deep-UV Optoelectronic Devices  
\$375,000, 9/2010 - 3/2013 (with H. Xing)
23. Air Force Office of Scientific Research  
Stacked Quantum Wire (SQWIRE) Nitride High Electron Mobility Transistors  
\$300,000, 3/2009 - 2/2012, (with H. Xing)
22. Semiconductor Research Corporation, Nanoelectronics Research Initiative (SRC NRI)  
Midwest Institute for Nanoelectronics Discovery (MIND) Phase 1.5  
\$2,200,986, 1/2011 - 12/2012, (with A. Seabaugh, P. Fay, T. Kosel, H. Xing, W. Porod, M. Neimer, S. Hu)
21. National Science Foundation  
CAREER: Dielectric Engineering of Quantum Wire Solids: Fundamentals to Applications  
\$579,996, 4/2007 - 3/2012
20. National Science Foundation  
III-V Nitride Nanowire Optoelectronic Devices  
\$299,997, 7/2009 - 6/2012, (with H. Xing and V. Protasenko)

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19. Office of Naval Research  
Nitride Terahertz Electronics  
\$150,000, 3/2009 - 2/2012, (with H. Xing)
  18. Semiconductor Research Corporation, Nanoelectronics Research Initiative (SRC NRI)  
Midwest Institute for Nanoelectronics Discovery (MIND) Phase 1  
\$3,100,000, 4/2008 - 3/2011, (with A. Seabaugh, P. Fay, T. Kosel, H. Xing, W. Porod, M. Neimer, S. Hu)
  17. PI, National Science Foundation  
Evaluation of Graphene Nanoribbons for Lateral Bandgap Engineered Devices  
\$299,999, 6/2008 - 5/2011, (with H. Xing)
  16. Co-PI, Defense Advanced Research Projects Agency  
Ultrascaled AlN/GaN HEMT technology for mm-wave RF Applications  
\$260,000, 6/2008 - 5/2009 (with H. Xing)
  15. Subcontract from Traycer Diagnostics, Air Force Office of Scientific Research (STTR)  
STTR: Terahertz Technology with III-V Nitride Heterostructures  
\$35,700, 9/2008 - 3/2009
  14. PI, AFOSR, (with Illinois Applied Research)  
Nitride Photovoltaics  
\$33,000, 5/2009 - 10/2009
  13. PI, Office of Naval Research  
Graded Polarization-induced Base Heterostructure Bipolar Transistors (HBTs)  
\$280,204, 10/2007 - 9/2009
  12. PI, Air Force Office of Scientific Research Defense University Research Instrumentation Program  
DURIP: Transport Characterization System for Nanoscale and Multifunctional Materials and Devices  
\$336,507 (\$280,000 + \$56,507 cost share), 4/2008 - 4/2009, (with H. Xing)
  11. Co-PI, Raytheon  
Phonon-engineering in Nitride HEMTs  
\$50,000, 10/2007 - 9/2008, (with J. Khurgin (JHU) & Y. Ding (Lehigh))
  10. Subcontract from 4Wave Inc.  
Diodes Fabricated by Biased Target deposition  
\$30,150, 4/2008 - 11/2008
  9. PI, Office of Naval Research  
Center for Engineering of Oxide/Nitride Structures (EONS)

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- \$1,146,000, 10/2007 - 9/2008, (with A. Seabaugh, J. Merz & H. Xing)
8. PI, Office of Naval Research  
Nanowire-based polarization-sensitive multi-spectral photodetectors  
\$150,000, 5/2006 - 5/2009 (with M. Kuno)
  7. Co-PI, Defense Advanced Research Projects Agency  
Phonon Engineering in Nitride Heterostructures for Ultrafast Transistors  
\$95,000, 12/2006 - 11/2007, (with J. Khurgin (JHU) and Y. Ding (Lehigh))
  6. Subcontract from System Creations, Air Force Office of Scientific Research (STTR)  
STTR: III-V Nitride based Photovoltaics  
\$35,808, 9/2006 - 2/2007
  5. Co-PI, National Science Foundation, Major Research Instrumentation (MRI)  
MRI: Acquisition of Ultrafast Spectroscopy Instrumentation for Materials Science and Education  
\$291,658, 9/2006 - 8/2008 (with J. Merz, A. Mintairov, H. Xing)
  4. Co-PI, National Science Foundation, Nanoscale Exploratory Research (NER)  
NER: Modulation-doped Colloidal Quantum Dots and Solution-based Nanowires  
\$98,129, 9/2006 - 8/2007 (with M. Kuno)
  3. PI, Army Research Office Defense University Research Instrumentation Program  
DURIP: High-Resolution X-ray diffraction system for nanoscale material characterization  
\$230,305 (\$207,275 + \$23,030 cost share), 5/2005 - 4/2006
  2. PI, Office of Naval Research Defense University Research Instrumentation Program  
DURIP: Molecular Beam Epitaxial system for growth of III-V Nitride Semiconductors  
\$675,000 (\$500,000 + \$150,000 cost share), 5/2004 - 4/2005 (with Dr. J. L. Merz as the co-P.I.)
  1. PI, Office of Naval Research  
Distributed Polarization doping for p-type III-V Nitrides  
\$270,000, 10/2003 - 9/2006

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## **Current Research Assistants**

### *Associated Research Assistant Professors*

Dr. Vladimir Protasenko (Jointly with H. Xing)

### *Post-Doctoral Scholars*

Dr. (Ms) Nan Ma

Dr. Arvind Ajoy

### *Graduate Students*

Mr. Raj Jana (Ph.D., expected May 2015)

Mr. Moudud Islam (Ph.D., expected May 2016)

Mr. Meng Qi (Ph.D., expected May 2016)

Mr. Kasra Pourang (Ph.D., expected May 2017)

Mr. Alexander Chaney (Ph.D., expected May 2018)

Mr. Brian Schutter (Ph.D., expected May 2018)

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## Past Research Assistants

### *Post-Doctoral Scholars*

Prof. Wan Sik Hwang  
Currently Assistant Professor at The Korea Aerospace University

Dr. Prem Kandasamy (Jointly with H. Xing)  
Currently at IMEC, Belgium

Dr. Aniruddha Konar (Ph. D. in Physics, Sept 2011)  
Currently at IBM, Bangalore

Dr. Chuanxin Lian (Jointly with H. Xing)  
Currently at Global Semiconductors

Dr. Qingling Hang  
Currently at Vegawave, Chicago

Dr. Ms. Xiangning Luo  
Currently at Vegawave, Chicago

Dr. Tom Zimmermann (Jointly with H. Xing)  
Currently at Fraunhofer Institut, Germany

Dr. Rui Wang  
Currently at LumiLeds, Santa Clara

Dr. Ms. Niti Goel  
Currently at Intel

### *Graduate Students*

Dr. Ms. Faiza Faria (Ph.D., May 2015)

Dr. Amit Verma (Ph.D., May 2015)

Mr. Xiaodong Yan (M.S., May 2014)

Dr. Guowang Li (Ph.D., August 2014)  
Currently at Google

Mr. Joe Loof (M. S., student December 2014)



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Dr. Pei Zhao (Ph.D., September 2014)  
Currently at GlobalFoundries

Dr. Satyaki Ganguly (Ph.D., July 2014)  
Currently at Intel

Dr. Jai Verma (Ph.D., June 2013)  
Currently at Intel

Dr. Jorge-Ferrer Perez (co-advisor, Ph.D., June 2012)  
Currently at the Mexican Space Agency

Dr. Kristof Tahy (Ph.D. May 2012)  
Currently at Intel, OR

Dr. Tian Fang (Co-advised with H. Xing, Ph.D., March 2012)  
Currently at First Solar, OH

Dr. Aniruddha Konar (Ph. D. in Physics, Sept 2011)  
Currently at IBM, Bangalore

Dr. Yu Cao (M. S. 2007, Ph.D. Sept 2010)  
Currently at Kopin Corporation, MA

Dr. Kevin Goodman (Ph.D., May 2010)  
Currently at Intel, AZ

Dr. John Simon (M. S. 2005, Ph.D. May 2009)  
Currently at NREL, Golden, CO

Dr. Williams Munoz (co-advisor, Ph.D. 2009 from Notre Dame)  
Currently Assistant Professor at the University of Chile, Santiago

Dr. Albert (Kejia) Wang (M. S. 2006, Ph.D. September 2008)  
Currently at Global Foundries

Dr. Siddharth Rajan (co-advisor, Ph.D. Sept 2006 from UCSB)  
Currently Associate Professor at the Ohio State University

Mr. Amol Singh (M.S., Spring 2010)  
Currently at University of South Carolina

Mr. Anubhav Khandelwal (M. S. 2005)

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Currently with SanDisk, Mountain View, CA

*Undergraduate Students*

Ms. Runjie (Lily) Xu (B. S. expected May 2014 from Tsinghua University)  
Applying for Ph.D. programs

Mr. Andrew Setter (B. S. May 2012)  
Currently at Rolls Royce

Mr. David Shilling (B. S. May 2010)  
Currently at GE + graduate school

Mr. William Carlson (B. S. May 2010)

Mr. Jeff Wolanin (B. S. May 2009)

Mr. Daniel Barrett (Pursuing Ph.D. at Purdue University)  
Research student in summer 2007 & summer 2008

Mr. Andrew Barthel (B. S. 2005)  
Ph.D. at Yale University

Ms. Pranati Bansal (B. S. 2005)  
Currently with Accenture, New York

Ms. Nicole Rogers (B. S. 2005)  
Currently with Air Force, Atlanta

*High School Teachers*

Mr. Ian Lightcap (Clay High School, South Bend, IN)  
Summer 2005, Co-advised with H. Xing  
Research Experience for Teachers (RET) program  
Project: Nanoscale imaging of Semiconductors

Ms. Kimberly Bergeron (Washington High School, South Bend, IN)  
Summer 2008  
Research Experience for Teachers (RET) program  
Project: Graphene for Nanoelectronics

Mr. Paul Montbriand (Penn High School, Mishawaka, IN)

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Summer 2010  
Research Experience for Teachers (RET) program  
Project: GaN nanowires

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## **Courses Taught**

*2015 - ... at Cornell University*

ECE 4070 / MSE 5470 - Physics of Semiconductors and Nanostructures  
Spring 2015

*2003 - 2014 at the University of Notre Dame*

EE 80687 - Advanced Quantum Mechanics  
Fall 2014, Fall 2013

EE 80656 - Advanced Semiconductor Physics  
Spring 2014, Spring 2013, Fall 2006, Fall 2004

ECE 594F - Electron Transport in Semiconductors  
Fall 2012 (Taught at UC Santa Barbara during sabbatical)

EE 30358 - Electromagnetic Fields and Waves - II  
Spring 2012, Spring 2011, Spring 2010

EE 80656 - Wide Bandgap Device Physics  
Fall 2011, Fall 2010, Fall 2009

EE 60566 - Solid State Devices  
Spring 2009, Spring 2008, Spring 2007, Spring 2006, Spring 2005, Spring 2004

EE 30348 - Electromagnetic Fields and Waves - I  
Fall 2008, Fall 2007, Fall 2006, Fall 2005

ESTS 40403 - Nanotechnology: Opportunities and Challenges  
Guest Lecturer, Spring 2006

EE 60698 - Epitaxial Nanostructures  
Fall 2003

## **Courses developed**

EE 80656 - Wide Bandgap Device Physics / Advanced Semiconductor Physics

EE 80687 - Advanced Quantum Mechanics

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EE 60698 - Epitaxial Nanostructures

## **Courses organized**

EE 63502 - Solid State Seminar (Spring 2010, Spring 2008, Spring 2005)

## **University Service**

*College of Engineering & College of Science*

Executive Committee (2010 - now) of the Strategic Research Initiative (SRI), Notre Dame Nano (NDNano) team

Novel Materials Pillar Leader (2010 - now) of the Strategic Research Initiative (SRI), Notre Dame Nano (NDNano) team

SPIE Student Division Advisor (2006 - 2014)

Steering Committee (2008 - 2012) of the Strategic Research Initiative (SRI), Advanced Diagnostics & Therapeutics (AD & T) team

*Department of Electrical Engineering*

Faculty Recruitment Committee (2014)

Graduate Admissions Committee (2004, 2005, 2007, 2008)

Graduate Committee (2005, 2006, 2007, 2008, 2009)

Undergraduate Committee (2006 - 2008)