Curriculum Vitae of Huili Grace Xing

(updated in December 2016)

Contact Information

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Summary

Dr. Xing is a Richard Lunquist Sesquicentennial Professor at Cornell University, with a 50/50 joint appointment with the School of Electrical & Computer Engineering and the Department of Materials Science & Engineering. She was with Electrical Engineering at the University of Notre Dame (UND) from 2004 to 2014, after earning her Ph.D. and subsequent one-year postdoctoral experience in Electrical and Computer Engineering from the University of California, Santa Barbara. During her research career, she has received the Young Investigator Program (YIP) Award from the Air Force Office of Scientific Research (AFOSR) in October 2008, the National Science Foundation (NSF) CAREER Award in January 2009, the John Cardinal O'Hara C.S.C. professorship by the University of Notre Dame in 2010, the Young Scientist Award at the International Symposium on Compound Semiconductors (ISCS) in 2014. She is also the advisor to a recipient of the 2013 Eli J. and Helen Shaheen Graduate School Award in Engineering at UND, several best paper awards, including a Best Paper Award at International Workshop on Nitride Semiconductors (IWN) and the Best Student Presentation Award at IRMMW-THz in 2012.

Xing's research and teaching interests are in the area of electronic materials and devices. Her research projects involve growth, fabrication and characterization of semiconductor electronic and optical materials and devices, primarily III-V nitride semiconductors, 2D crystals and tunnel FETs. She is the author or co-author of 170+ journal articles, 80+ conference proceeding papers and 400+ conference presentations, delivered 100+ invited talks and contributed five chapters in five books. Her h-index is 43 with 7000+ citations according to Google Scholar.

She currently advises 9 graduate students, co-advises 3 postdoctoral researchers and 2 research associate, and co-advises a few graduate students. She also worked closely with 3 RAPs at the Electrical Engineering Department, one of whom was promoted to a tenure-track assistant professor at UND in 2011. Eleven students have been awarded Ph.D. degree, and five M.S. degrees have been awarded under her supervision. Since Fall 2004, her research efforts have been supported by about $60M in external research funding, with Xing serving as the leading principle investigator on over $14M.

Professional Preparation

1996 Peking University, Beijing, China
B.S. in Physics, Thesis Advisor: Hongdu Liu
Thesis: Fabrication and Characterization of Bragg Grating on Optical Fiber

1998 Lehigh University, Pennsylvania
M.S. in Material Science, Thesis Advisor: G. Slade Cargill III
Thesis: SEM-Cathodoluminescence Studies of ZnCdSe-Based Quantum Well Structures

2003 University of California, Santa Barbara, CA
Ph.D. in Electrical Engineering, Thesis Advisor: Umesh Mishra
Thesis: Growth, Fabrication and Characterization of GaN Bipolar Transistors

2003 University of California, Santa Barbara
Postdoc in Electrical Engineering, Advisor: Umesh Mishra
Project: AlGaN/GaN High Electron Mobility Transistor For Power Electronics

Honors:

Grace Xing:

2015 Richard E. Lunquist Sesquicentennial Faculty Fellow, Cornell University
2015 Co-author of the Best Paper in Journal of Electronic Materials
2014 Young Scientist Award, International Symposium on Compound Semiconductors (ISCS)
2012 Outstanding Notre Dame Faculty, featured at the UND-BYU football game
2010 John Cardinal O'Hare CSC professorship, University of Notre Dame
2009 CAREER Award, National Science Foundation (NSF)
2008 Young Investigator Program (YIP) Award, Air Force Office of Scientific Research (AFOSR)
1993 Scholarship for Academic Excellence in Undergraduate Studies, Beijing University.

Grace Xing's advisees:

2016 Best Poster Award at the 2nd International Symposium on Devices and Applications of Two-dimensional Materials (Fudan, Shanghai), Advisor to Mingda Oscar Li
2014 NIST Uncertainty Analysis Student Award at Electronic Materials Conference (EMC), Advisor to Rusen Yan
2014 Award for Outstanding Self-Financed Student Abroad from the Education Ministry of China, Advisor to Rusen Yan
2013 Runner up for the Best Student Presentation Award at the IRMMW-THz, Advisor to Rusen Yan
2013 Eli J. and Helen Shaheen Graduate School Award in Engineering (Best Ph.D. Dissertation) from UND, Advisor to Berardi Sensale-Rodriguez
2012 Best Poster Award at TeraNano-3, Advisor to Rusen Yan
2012 Best Student Paper Award at International Workshop on Nitride Semiconductors (IWN),

Advisor to Ronghua Wang

2012 Best Student Presentation Award at the International Conference on Infrared, Millimeter and Terahertz Wave (IRMMW-THz), Advisor to Berardi Sensale-Rodriguez

Professional Experience:

Academic Appointments:

2004/08 University of Notre Dame, Notre Dame, IN
Department of Electrical Engineering
Title: Assistant Professor

2010/08 University of Notre Dame, Notre Dame, IN
Department of Electrical Engineering
Title: John Cardinal O'Hare C.S.C. Associate Professor

2012/08-12 University of California, Santa Barbara, CA
Department of Electrical and Computer Engineering
Title: Visiting Associate Professor

2013/08 University of Notre Dame, Notre Dame, IN
Department of Electrical Engineering
Title: Professor

2014/06-12 Cornell University, Ithaca, NY
School of Electrical and Computer Engineering
Title: Visiting Professor

2014/07 Technical University of Munich, Germany
Department of Electrical, Electronic and Computer Engineering
Title: Visiting Professor

2015/01 Cornell University, Ithaca, NY
School of Electrical and Computer Engineering,
Department of Materials Science & Engineering
Title: Richard E. Lunquist Sesquicentennial Faculty Fellow, Professor

Activities with industry and National Institutes:

2009 Triquint Semiconductors, Richardson, TX
Task: Design, fabrication and characterization of high frequency GaN transistors

2010 Inlustra Technologies Inc., Santa Barbara, CA
Task: Characterization of semi-insulating non-polar GaN

2010 Electro-Optics Technology, Traverse City, MI
Task: Characterization of NIR optical isolators

2011 Kopin Corporation, Westboro, MA
Task: Fabrication and characterization of GaN HEMTs

2011 Nitek, Irmo, SC
Task: Design, fabrication and demonstration of III-V nitride UV LEDs using polarization-induced p-type doping

2011 Teledyne Scientific & Imaging, Thousand Oaks, CA
Task: Design, fabrication and characterization of high-speed GaN power switches

2012 National Institute of Standard and Technology
Task: Internal photoemission of heterostructures
2013 Northrop Grumman Corporation, Baltimore, MD
Task: Development of conformal deposition of metal by ALD
2013 Osram Opto Semiconductors GmbH, Germany
Task: Development of GaN-on-Si devices
2013 Hitachi Cable Ltd., Japan
Task: Development of GaN power transistors
2013 SixPoint Materials, LLC., CA
Task: Development of GaN high voltage Schottky diodes for power switching
2013 United Technology Research Center (UTRC), CT
Task: Development of GaN power transistors
2013 IQE
Task: Development of GaN power transistors
2014 ElementSix
Task: Development of GaN power transistors on diamond
2014 Agnitron, MN
Task: Development of GaN power/RF transistors

Professional activities

Editorial:

Editor of IEEE Electron Device Letters (2015 –)
Guest editor of the Special Issue of IEEE JSTQE on 2D materials/devices (2015 - 2016)
Associate editor of the Journal of Electronic Materials (2012 – 2014)
Special Issue of the Journal of Electronic Materials on Wide Bandgap Semiconductors (2007 – 2013)

Program Committee Member:

European Solid State Device Research and Circuits (ESSDERC), 2016
North American Molecular Beam Epitaxy Conference, 2015
Silicon Nanoelectronics Workshop, 2014, 2015
International Symposium on Compound Semiconductors (ISCS), 2013
IEEE International Electron Device Meeting (IEDM), 2012 - 13
IEEE (Biennial) Lester Eastman Conference 2010, 2012, 2014 (Program Chair), 2016 (General Chair)
IEEE Device Research Conference (DRC), Local Arrangement, 2010.
IEEE (Biennial) International Semiconductor Device Research Symposium (ISDRS), 2009, 2011, 2013
Electronic Materials Conference (EMC), 2010 - 2015
University Government Industry Micro/Nano Symposium (UGIM) 2010

Session Organization/Participation:

Rump Session co-organizer in International Conference on Nitride Semiconductors (ICNS) 2015
Rump Session presenter in DRC 2015
Rump Session presenter in WOCSEMMAND 2015
Session chair in International Symposium on Compound Semiconductor (ISCS), 2009
Organizer and session chair in American Conference on Crystal Growth and Epitaxy (ACCGE), 2009
Session chair in ONR Electronic Materials Review 2007
Organizer and session chair in Electronic Materials Conference (EMC) in 2006-2009

Journal Reviewer:

Applied Physics Letters
ACS Nano
Carbon
IEEE Electron Device Letters
IEEE Transaction of Electron Devices
IEEE Transaction of Nanotechnology
IEEE Journal of Quantum Electronics
International Journal of High Speed Electronics and Systems
Japanese Journal of Applied Physics
Journal of Electronic Materials
Journal of Electrochemical Society
Journal of Physical Chemistry
Journal of Vacuum Science & Technology
Nano Letters
Nature journals
Physica Status Solidi
Optics Express
Science
Solid State Electronics

Funding Proposal Review & Panelist:

National Science Foundation (NSF)
Department of Energy (DOE)
MIT Deshpande Center Innovation Awards
Ohio State Institute for Materials Research (IMR) Grants
Hong Kong Research Grant Council (China)
Notre Dame AD&T Research Seedling

Member:

Institute of Electrical and Electronic Engineers (IEEE)
Material Research Society (MRS)
American Association for the Advancement in Science (AAAS)
American Society for Engineering Education (ASEE)

The Minerals, Metals and Materials Society (TMS)
The Electrochemical Society (ECS)

Other activities:

Board of Visitors for the Army Research Office (ARO) Biennial Review of the Electronic Division (2012)
Ph.D. dissertation international examiner, ETH, Switzerland, 2012
Ph.D. dissertation international examiner, UWA, Australia, 2013

Research Grants (RGs)

Active grants (8, total ~$39.1M and as leading PI ~$7.7M):

RG-32. Office of Naval Research (ONR). III-N devices and architectures for terahertz electronics (DATE). P.I, Cornell Co-PI: Debdeep Jena. Notre Dame (Team P.I. Patrick Fay), Ohio State University (Paul Berger, Siddharth Rajan, John Volakis, Kubilay Sertel), Wright State University (Elliot Brown) and John Hopkins University (Jacob Khurgin). 06/01/2016 - 12/31/2017, $380,000 for Cornell

RG-33. Semiconductor Research Corporation (SRC). *LEAST: Center for low energy systems technology*. Co-PI (PI: Alan Seabaugh, co-PIs at UND: Patrick Fay, Susan Fullerton, Xiaobo Sharon Hu, Debdeep Jena, Michael Niemier, Huili Grace Xing, and other co-PIs outside UND). 01/15/13 - 11/30/17. $30M (~ $1.25M per PI)

RG-34. National Science Fundation (NSF). *MRI: Development of an apertureless near-field scanning optical and magneto-optical Kerr effect microscope for nano-science applications.* P.I. (co-P.I. Vladimir Protasenko). 10/01/2013 - 09/30/2017. $440,000

RG-35. Advanced Research Program Agency - Energy (ARPA-E). Program: Strategies for wide-bandgap inexpensive transistors for controlling high efficiency systems (SWITCHES). *Title: GaN epi-wafers for vertical high-power devices grown by vapor phase epitaxy on low-cost, high-quality ammonothermal GaN substrates*. Subcontract from: SixPoint Materials, LLC. PI (Co-PI: Debdeep Jena). 02/15/14 - 02/14/17. $560,000

RG-36. Advanced Research Program Agency - Energy (ARPA-E) Program: SWITCHES. *Title: PolarJFET: a novel vertical GaN power transistor concept.* PI (Co-PIs: Manyam Pilla at Qorvo, Joe Mantese at UTRC, Wayne Johnson at IQE; Co-PI at Cornell: Debdeep Jena) 03/17/14 - 10/16/17. $3,435,070 ($4.27M including 20% cost share)

RG-37. National Science Foundation (NSF) EFRI-2DARE: Monolayer Heterostructures: Epitaxy to Beyond-CMOS Devices. P.I. (Co-PIs: Debdeep Jena, Libai Huang, Morten Eskildsen, Tengfei Luo). 11/01/2014 - 10/31/2018. $1,999,997

RG-38. National Science Foundation (NSF) DMREF: Collaborator Research - Extreme bandgap semiconductors. co-P.I. (PI: Debdeep Jena), Collaborators: Eric Pop (Stanford), Emmanouil Kioupakis (U. Michigan). 11/01/2015 - 10/31/2018 $840,000

RG-39. Air Force Office of Scientific Research (AFOSR). *Title: Light-Mass-Atom Semiconductor Materials and Devices.* P.I. (Co-PI: Debdeep Jena). 11/1/2016 - 10/31/2021 $1,250,000

Past grants (31, total $24.2M and as leading PI $5.9M):

RG-1. National Science Foundation (NSF) *MRI: Acquisition of Ultrafast Spectroscopy Instrumentation* for Material Research and Education. Co-PI (PI: Jim Merz, 3 co-PIs: Alexander Mintairov and Debdeep Jena). 09/2006 - 08/2008. $291,658. Cost share: $30K (=$7.5K per PI)

RG-2. Office of Naval Research (ONR) *Polarization-doped GaN HBTs.* P.I. 03/2007 - 09/2008. $116,000

RG-3. Office of Naval Research/Defense Advanced Research Projects Agency (ONR/ DARPA) *Ideal channel field effect transistors,* P.I., 08/2007 - 03/2008, $90,000

RG-4. Office of Naval Research (ONR) *Nitride/Oxide multifunction materials: bridging the gap between materials and devices,* Co-P.I. (PI: Debdeep Jena, 3 Co-PIs: Jim Merz and Alan Seabaugh), 11/2007 - 03/2009, $1,146,000

RG-5. University of Notre Dame (Faculty Research Program) *Graphene nanoribbon-based FETs and gated RTTs for integrated high-speed RF devices and circuits,* P.I., 01/2008 - 12/2008, $10,000

RG-6. Air Force Office of Scientific Research (AFOSR) *DURIP: Transport characterization system for electronic, optical & multifunctional materials and devices,* Co-PI (PI: Debdeep Jena), 10/2008 - 09/2009, $280,000

RG-7. Office of Naval Research/Defense Advanced Research Projects Agency (ONR/ DARPA) *Ultrascaled AlN/GaN HEMT technology for mm-wave applications,* P.I. (co-PI: Debdeep Jena), 07/2008 - 07/2010, $260,000

RG-8. Office of Naval Research (ONR) *AlGaAs/GaAs/GaN HBTs by wafer fusions,* P.I. of the subcontract from MURI: MINE-UCSB, 04/2005 - 03/2010, $350,000

RG-9. Nanoelectronic Research Initiative (NRI) *MIND: Midwest Institute of Nanoelectronics Discovery (Phase 1.0)*, Co-PI (PI: Alan Seabaugh, 7 co-PIs: Debdeep Jena, Patrick Fay, Wolfgang Porod, Gary Bernstein, Mike Niemier and Sharon Hu), 04/2008 - 03/2011, $3,100,000

RG-10. National Science Foundation (NSF) *Evaluation of nanoribbons for lateral bandgap engineering*, Co-PI (PI: Debdeep Jena), 05/2008 - 04/2011, $299,999

RG-11. Office of Naval Research (ONR) *Engineering of oxide/nitride semiconductors (EONS)* Co-P.I. (PI: Debdeep Jena, 6 Co-PIs: Jim Merz, Alan Seabaugh, Patrick Fay, Tom Kosel and Doug Hall), 12/10/2008 - 12/31/2010, $1,529,349

RG-12. Inlustra Technologies, Inc. *Characterization of non-polar bulk GaN substrates (DoD STTR*), P.I., 5/3/2010 - 11/3/2010, $30,000

RG-13. Air Force Office of Scientific Research (AFOSR) *Stacked quantum wire AlN/GaN HEMTs,* P.I. (co-PI: Debdeep Jena), 03/2009 - 11/2011, $450,000

RG-14. Air Force Office of Scientific Research (AFOSR), *YIP: Quantum limits of AlN/GaN RF HEMTs,* P.I., 02/15/2009 - 11/30/2011, $450,000, Cost share: total $175K (EE $75K + College $75K for graduate students & EE $2.5K + College $5K + University $17.5K for instrumentation)

RG-15. Defense Advanced Research Projects Agency (DARPA) The Compact Mid-Ultraviolet Technology (CMUVT) program, *AlGaN MQW Mid UV LEDs over sapphire and bulk AlN,* Co-P.I. (P. I. Debdeep Jena), 11/01/2010 - 12/31/2011, Subcontract total $175,000 for Notre Dame, Subcontract from Nitek, Inc. (South Carolina)

RG-16. Office of Naval Research (ONR) *THz power sources based on negative differential resistance in GaN*, P.I. (2 Co-PIs: Debdeep Jena, Alan Seabaugh), 4/1/2009 - 5/31/2012, $260,000

RG-17. National Science Foundation (NSF) *Nanoscale optoelectronics with polarization and bandgap engineered nitride nanowire/silicon heterostructures,* Co-P.I. (P.I. Debdeep Jena and Co-P.I. Vladimir Protasenko), 06/01/2009 - 05/31/2012, $299,997

RG-18. Nanoelectronics Research Initiative (NRI) *MIND: Midwest Institute of Nanoelectronics Discovery (Phase 1.5),* Co-PI (PI: Alan Seabaugh, co-PIs Patrick Fay, Xiaobo Sharon Hu, Debdeep Jena, Michael Niemier, Grace Xing, Mark Wistey, Tom Kosel, Wolfgang Porod) 01/01/11 - 3/31/13, $2,200, 986

RG-19. University of Notre Dame (Faculty Research Program) *A microfluidic approach of terahertz chemical and biological sensing,* Co-P.I. (P.I. Lei Liu, and co-PIs: T. Wang, L. Cheng, P. Fay and C. Chang), 06/2012 - 05/2013, $10,000

RG-20. Air Force Office of Scientific Research (AFOSR) *DURIP: Complex oxide heterostructure physics by chemical beam epitaxy.* Co-P.I. (P.I. Debdeep Jena) 06/15/2012 - 06/14/2013. $400,000

RG-21. National Institute Standard & Technology (NIST) *Internal Photoemission Spectroscopy.* Co-P.I. (P.I. Alan Seabaugh, co-PI: Patrick Fay) 06/1/2012 - 05/31/2013, $59,510

RG-22. National Science Foundation (NSF) *A room temperature portable terahertz camera using zero bias Sb-based heterostructure backward diodes for imaging applications.* Co-P.I. (P.I. Lei Liu and Co-P. I. Patrick Fay) 08/01/2010 - 07/31/2013, $359,281 - (201676 - ND account number)

RG-23. Defense Advanced Research Projects Agency (DARPA) *The Microscale Power Conversion (MPC) Program.* Co-P.I. (P. I. Debdeep Jena, Co-PI: Patrick Fay) 10/01/2011 - 03/31/2014, Subcontract total $700,000 for Notre Dame. Subcontract from Teledyne Scientific & Imaging, Inc.

RG-24. Defense Advanced Research Projects Agency (DARPA) The Nitride Electronic NeXt-Generation Technology (NEXT) program. *Ultrafast RF and mixed-signal electronics with ultra-scaled binary AlN/GaN HEMTs.* P.I. (Co-P.I. Debdeep Jena, Patrick Fay and Gregory Snider). 10/01/2009 - 10/31/2014. $3,290,000 for Notre Dame (total award: $16,188,131) Subcontract from TriQuint Semiconductor (Texas)

RG-25. National Science Foundation (NSF) CAREER: *Graphene and graphene nanoribbon optoelectronic properties and devices*. P.I. 02/01/2009 - 09/30/2015 $400,000. Cost share: total $150K (EE $50K, College $50K and University $50K)

RG-26. Air Force Office of Scientific Research (AFOSR) *2D crystal semiconductors: new materials for GHz-THz devices*. Co-P.I. (P.I. Debdeep Jena) 07/01/2012 - 06/30/2015. $600,000

RG-27. Agnitron Technology, Inc. *Radiation hard multi-channel AlN/GaN HEMT for high efficiency X- and Ka-band power amplifiers: Phase I (NASA STTR)* P.I. (Co-PI: Debdeep Jena) 06/20/2014 - 12/19/2014. $40,000

RG-28. National Science Fundation (NSF) *2D crystal semiconductors: electron transport and device applications*. Co-P.I. (P.I. Debdeep Jena) 08/1/2012 - 07/31/2015, $360,000

RG-29. National Science Foundation (NSF) *Graphene-based electrically reconfigurable THz aperture arrays for imaging applications.* P.I. (co-P.I. Lei Liu) 05/01/2012 - 04/31/2016, $360,000

RG-30. Office of Naval Research (ONR) *III-N devices and architectures for terahertz electronics (DATE)* Co-P.I. (P.I. Patrick Fay, Co-PI: Debdeep Jena), Ohio State University (Paul Berger, Siddharth Rajan, John Volakis, Kubilay Sertel), Wright State University (Elliot Brown)and John Hopkins University (Jacob Khurgin). 06/01/2011 - 05/31/2016 (2015-16 are

the option period) $6,288,908 (total award and $2.5M for Notre Dame)

RG-31. Semiconductor Research Corporation (SRC) *Chemically functionalized graphene as high performance heat spreader.* Co-PI (PI: Tengfei Luo, co-PI: David Go) 11/01/13 - 10/31/16, $300,000

Invited Talks/Workshops/Seminars

[I-105] The **MRS** Fall Meeting, Boston, MA, November 2017
Recent progress on MBE 2D materials and applications (TBD)

[I-104] The International Conference on Nitride Semiconductors **(ICNS)** , Strasbourg, France, July 2017
Resonant tunneling diode: an elusive device in III-nitrides

[I-103] The Compound Semiconductor Week **(CSW)**, Berlin, Germany, May 2017
Thin-TFETs for high efficiency logic electronics

[I-102] The **MRS** Spring Meeting, Symposium on Terahertz Science and Technologies, Phoenix, AZ, April 2017
Recent progress on THz technologies based on 2D electron systems

[I-101] The **MRS** Spring Meeting, Symposium on Materials for Beyond the Roadmap Devices in Logic, Memory and Power, Phoenix, AZ, April 2017
Tunnel FET: lateral or vertical?

[I-100] The Government Microcircuit Applications and Critical Technology Conference (**GOMAC**), Reno, NV, March 2017.
GaN power electronics

[I-99] The **NG Next** 2nd Semiconductors and Devices Workshop, Redondo Beach, CA, January 2017
Recent progress on THz and energy efficient technologies (TBD)

[I-98] **(Keynote)** The KAUST-NSF Research Conference on Interactive Electronics, KAUST, January 2017.
Electronics based on GaN and layered materials

[I-97] **The Chez Pierre seminar**, MIT, Boston, December, 2016.
SnSe and related layered materials

[I-96] The International Electron Device Meeting **(IEDM)**, San Francisco, December, 2016.
Thin-TFET.

[I-95] The **US-EU** workshop on 2D Layered Materials and Devices, Manchester, UK, Oct. 2016.
Layered Heterojunctions for High Performance Electronics

[I-94] The Steep Transistor Workshop 2016, Lausanne, September, 2016.
Thin-TFET.

[I-93] The International Conference on Electronic Materials (**ICEM**), Singapore, July 4-8, 2016.
Approaching the theoretical limit of GaN power devices.

[I-92] The 2nd International Symposium on Physics and Device Applications of Two-Dimensional Materials, Shanghai, June 30, 2016.
Recent progress on 2D materials.

[I-91] The 229th **ECS** annual meeting, San Diego, May 29, 2016.
Recent progress on GaN power devices with BV > 1200 V

[I-90] The IEEE **MTT-S** International Microwave Symposium, San Francisco, May 27, 2016.
Beyond graphene electronic devices and their potential for high-frequency applications.

[I-89] **(Plenary)** The Brainstorming NSF-AFOSR-ARO Workshop on Reproducible Advanced Technologies for Next-Generation Nano/Quantum Devices, April 27, 2016.
Searching for the genetic code for reproducible nano/quantum devices.

[I-88] **(Keynote)** The Pittsburgh Quantum Institute (PQI) annual symposium, April 20, 2016.
Progress to realize Thin-TFET: a 2D material based tunnel transistor

[I-87] The University of South California, March 2016.

[I-86] The **MRS** Spring meeting, Phoenix, March 28, 2016.
MBE growth and properties of 2D crystal heterostructures

[I-85] The **APS** March meeting, Baltimore, March 14-18, 2016.
2D crystal heterostructures and growth by molecular beam epitaxy

[I-84] Vertical GaN Roadmap Workshop, Davis, CA, January 13-14, 2016.
Polarization Doping in Vertical GaN Electronics

[I-83] India Institute of Technology, New Delhi, Dec. 18, 2015.
GaN and 2D semiconductors for future electronics.

[I-82] **The Mercer Lecture Series, RPI**, Dec. 2015.

[I-81] The **AVS** annual meeting, San Jose, Oct. 2015.
Secret ingredients in Thin-TFET: a 2D material based transistor

[I-80] The NSF-Advance Seminar Series, Rochester Institute of Technology, Rochester, Oct. 2015.

[I-79] The Steep Transistors Workshop, Notre Dame, Oct. 2015.
Thin-TFET: a 2D material based transistor

[I-78] The International Conference on Solid State Devices and Materials (**SSDM**) 2015, Sapporo, Japan, Sept. 2015.
THz devices based on 2D electron systems

[I-77] The International Conference on Nitride Semiconductors (**ICNS**) 2015, Beijing, China, Aug. 2015.
Ultimate GaN vertical transistor: PolarMOS

[I-76] The Science and Technology of 2D Materials Workshop, Orlando, August 2015.
Challenges and opportunities in 2D crystals: graphene and beyond

[I-75] The Device Research Conference (**DRC**) 2015, Columbus, Ohio, June 2015.
Unique opportunity to harness polarization in GaN to override the conventional power electronics figure-of-merits

[I-74] The **US-EU** workshop on 2D Layered Materials and Devices, Arlington, VA, April 2015.
Layered Materials for Electronics

[I-73] The **SPIE** DSS15, Baltimore, April 2015.
Challenges and opportunities in 2D crystals: graphene and beyond

[I-72] The **SPIE** DSS15, Baltimore, April 2015.
THz devices based on 2D electron systems

[I-71] Temasek Laboratory, Nanyang Technological University, Singapore, April 2015.

[I-70] IEEE International Microwave Symposium, Shenzhen, March 2015.
2D crystals for wireless communications: challenges and opportunities

[I-69] The China International Scientific & Technological Cooperation Week, Shenzhen, Dec. 2014.
Exploring polarization in GaN for power electronics

[I-68] Nanomodular Materials and Systems by Design (**NMSD**), Washington DC, Oct. 2014.
Modular materials and nanosystems from 2D materials

[I-67] The 18th International Conference on Molecular Beam Epitaxy (**MBE 2014**), Flagstaff,

Sept. 2014.
Challenges and opportunities in MBE growth of 2D crystals

[I-66] Walter Schottky Institute, Technical University Munich, July 2014.

[I-65] IEEE Summer Topicals Meeting, Functional Meta- and Two-Dimensional Materials (FMTM) Symposium, Montreal, Canada, July 2014.
Terahertz electronics enabled by 2D electron systems

[I-64] CMOS emerging technologies Research, Grenoble, France, July 2014.
Tunnel FETs based on III-Vs and 2D crystals

[I-63] Nanjing University, May 2014.

[I-62] SPIE DSS14 Micro-Nanotechnology Sensors, Systems, and Applications Conference and the Passive and Active Millimeter-Wave Imaging Conference, Baltimore, MD, May 2014. (Delivered by B. Sensale-Rodriguez)
Resonant tunneling enhanced plasmonic terahertz devices

[I-61] Graphene and Beyond Workshop: from atoms to applications, Penn State University, April 2014.

[I-60] Cornell University, March 2014

[I-59] Texas Tech University, Feb. 2014
GaN electronics

[I-58] Arizona State University, Jan. 2014

[I-57] University of Wisconsin, Madison, Nov. 2013
GaN, III-Vs and graphene in tomorrow's electronics

[I-56] IEEE International Topical Meeting on Microwave Photonics (MWP13), Alexandra, VA, October 2013. (Delivered by B. Sensale-Rodriguez)
Graphene for reconfigurable THz devices

[I-55] Berkeley Symposium on Energy Efficient Electronics Systems (E3S), CA, October 2013.
Tunnel FETs with tunneling normal to the gate

[I-54] Gezhi Forum, School of Physics, Peking University, Beijing, China, October 2013.
GaN, III-Vs and graphene in tomorrow's electronics

[I-53] Solid State Physics Seminar, School of Physics, Peking University, Beijing, China, October 2013.

THz electronics enabled by 2D electron systems

[I-52] School of Software and Microelectronics, Peking University, Beijing, China, October 2013.
Tunnel FETs
GaN electronics

[I-51] HongKong University of Science and Technology, Oct. 2013
GaN, III-Vs and graphene in tomorrow's electronics

[I-50] SPIE Active Photonics Materials V, San Diego, August 2013.
Graphene THz devices

[I-49] Ohio State University, May 2013.

[I-48] Nanoelectronics Workshop, Porto Alegre, Brazil, April 2013.
Tunnel FETs
GaN electronics

[I-47] Cornell University, April 2013.
GaN, III-Vs and 2D crystals in future electronics

[I-46] Physics and Chemistry of Surfaces and Interfaces (PCSI), Hawaii, January 2013.
Unique optoelectronic properties and applications of Graphene

[I-45] Institute for Terahertz Science and Technology (ITST), Santa Barbara, December 2012.
THz devices built on 2DEGs.

[I-44] The 3rd International Workshop on Terahertz Nanoscience (TeraNano 3), Hawaii, December 2012.
Graphene and semiconductor plasmonics for THz technologies

[I-43] American Vacuum Society (AVS) annual meeting, Tampa, FL, October 2012.
Surfaces and interfaces in vertical tunnel FETs.

[I-42] IWN (International Workshop on Nitride Semiconductors), Hokkaido, October, 2012.
High speed GaN transistors.

[I-41] Tohoku University, Japan, October 2012.

[I-40] **(Keynote)** ESREF (European Symposium on Reliability of Electron Devices, Failure Physics and Analysis), Cagliari, Italy, October 2012.
Ultra-scaled GaN HEMTs and their reliability challenges.

[I-39] IRMMW-THz, Wollongong, Australia, September 2012.

Exceptional tunability of THz reflection in graphene structures.

[I-38] University of Western Australia, Perth, September 2012.

[I-37] University of Minnesota, Minneapolis, September 2012.

[I-36] Kopin, Massachusetts, August 2012.

[I-35] NIST, Gaithersburg, June 2012.

[I-34] Purdue University, May 2012.

[I-33] North Carolina State University, May 2012.

[I-32] University of California, Santa Barbara, April 2012.

[I-31] HRL (Huges Research Laboratory), April 2012.
GaN, graphene and tunnel transistors

[I-30] Fudan University, Shanghai, March 2012.
GaN: The 3rd electronic revolution?

[I-29] CSTIC,(China Semiconductor Technology International Conference), Shanghai, March 2012.
GaN: The 3rd electronic revolution?

[I-28] CSTIC (China Semiconductor Technology International Conference), Shanghai, March 2012.
Tunnel field-effect transistors for low voltage electronics.

[I-27] Nippon Telegraph and Telephone Corporation (NTT), R&D center, Atsugi, Japan, 2011
GaN HEMT, TFETs and graphene THz modulators.

[I-26] The 9th Topical Workshop on Heterostructure Microelectronics (TWHM), Japan, Aug. 2011
GaN HEMTs with ultra-thin AlN barriers.

[I-25] ECS annual meeting, Boston, October, 2011
GaN transistors for power management.

[I-24] The Swiss Federal Institute of Technology Zurich (ETH Zurich), June, 2011
GaN: the 3rd electronic revolution?

[I-23] University of Michigan, May, 2011

GaN transistors.

[I-22] Indian Institute of Technology, Madras, December 2010
GaN transistors.

[I-21] Ohio State University, March, 2010
AlN/GaN HEMTs.

[I-20] The Fifteenth International Workshop on the Physics of Semiconductor Devices (IWPSD), New Delhi, India, December, 2009
Top-down AlN/GaN nanoribbon HFETs.

[I-19] Asia-Pacific Workshop on Widegap Semiconductors (APWS), ZhangJiaJie, China, May 2009
AlN/GaN based HEMTs.

[I-18] Advanced Heterostructure Workshop, Hawaii, 2008
Ultrashallow AlN/GaN heterostructures for HEMTs.

[I-17] International Conference on Compound Semiconductor Manufacturing Technology (CS ManTech), Chicago, April, 2008
Ultrathin AlN/GaN heterostructure based HEMTs.

[I-16] Argonne National Laboratory, April, 2008
Prospects of graphene based electronics.

[I-15] ECS annual meeting, Washington DC, October, 2007
MBE grown ultrashallow AlN/GaN HEMT technology.

[I-14] Advanced Heterostructure Workshop, Hawaii, 2006
Ultrashallow AlN/GaN heterostructures for HEMTs.

[I-13] GE Global Research Center, Schenectady, NY, 2006
The development of GaN-based bipolar transistors.

[I-12] Naval Research Laboratory, Washington DC, 2004
AlGaN/GaN heterojunction bipolar transistors.

[I-11] University of New Mexico, Albuquerque, New Mexico, 2004
GaN-based bipolar transistors.

[I-10] Northwestern University, Chicago, 2004
GaN-based devices and their perspectives.

[I-9] University of Notre Dame, Indiana, 2004
GaN-based devices and their perspectives.

[I-8] Rensselaer Polytechnic Institute, Troy, 2004
GaN-based devices and their perspectives.

[I-7] University of South Carolina, Columbia, 2003
GaN-based devices and their perspectives.

[I-6] University of Notre Dame, Indiana, 2003
GaN-based devices and their perspectives.

[I-5] North Carolina State University, Raleigh, 2003
GaN-based devices and their perspectives.

[I-4] University of Wisconsin, Madison, 2003
GaN-based devices and their perspectives.

[I-3] Compound Semiconductor (CS) Outlook, Dallas, Texas, 2003
The growth of III-V nitrides and its effects on devices.

[I-2] BIPOLAR/BiCMOS Circuits and Technology Meeting, Minneapolis, MN, USA, Sept. 2001
Progress in gallium nitride-based bipolar transistors.

[I-1] Nippon Telegraph and Telephone Corporation (NTT), R&D center, Atsugi, Japan, 2001
AlGaN/GaN heterojunction bipolar transistors with regrown emitter.

Outreach Seminars/Meetings at Cornell

[O-4] Cornell Undergraduate Research Board Dinner Conversation Series, Ithaca, November 2016.

[O-3] CCMR Hot Materials Seminar Series, Ithaca, July 2016.
A almighty semiconductor: GaN.

[O-2] CURIE Field Presentation Series, Ithaca, July 2016.
Materials Science and Engineering.

[O-1] Cornell Undergraduate Research Board Dinner Conversation Series, Ithaca, November 2015.

Publications Summary (details attached in the end of the document)

Patents: 6, pending and issued
Book Chapters and Monographs: 5
Journal Articles (detailed attached in the end): 172 total, in Science, Nature Comm, Proceedings of IEEE, EDL, PRL, Nano Lett, APL etc.
Conference Proceeding papers (detailed attached in the end): 89 (IEDM, DRC, CSMantech, IRMMW-THz, Proc. of SPIE, etc)
Conference Presentations: >400 (235 till Dec. 2013, not recorded afterwards)

Patents (5+1, issued & pending):

P-1 (issued): Polarization-doped field effect transistors (POLFETs) and materials and methods for making the same.
US Patent No. 11/241,804, (2005).
Umesh Mishra, Huili Xing, Debdeep Jena, and Siddarth Rajan

P-2 (issued): Compositionally graded heterojunction semiconductor device and method of making of the same.
US Patent No. 8,835,998, (2014).
John Simon, Huili Xing and Debdeep Jena

P-3 (issued): Low voltage tunnel field-effect transistor (TFET) and the method of making same.
US Patent No. 8,796,733, (2014).
Alan Seabaugh, Patrick Fay, Huili Xing, Yeqing Lu, Guangle Zhou, Mark Wistey and Siyuranga Koswatta

P-4 (issued): Methods and apparatus for terahertz wave amplitude modulation.
US Patent No. 8,836,446, (2014).
Berardi Sensale-Rodriguez, Rusen Yan, Tian Fang, Michelle Kelly, Debdeep Jena, Lei Liu and Huili (Grace) Xing

P-5 (issued): Polarization doped transistors
US Patent No. 9,362,389, (2016).
Huili G. Xing, Debdeep Jena, Kazuki Nomoto, So Song, Zongyang Hu and Mingda Zhu

P-6 (pending): Two-dimensional heterojunction interlayer tunneling field effect transistors.
US Patent Application No. 14/629,222, filed in 2014.
Mingda Li, David Esseni, Gregory Snider, Debdeep Jena, and Huili (Grace) Xing

Books and Monographs (5):

Book chapter-1: III-V nitride heterojunction bipolar transistors.
Huili (Grace) Xing, Chuanxin Lian* and John Simon**
Advanced semiconductor materials and device research - SiC and III-Nitrides, Edited by Ho-Young Cha, 2010.
(*Lian, Ph.D student of Xing's; and **Simon, Ph.D student of Prof. D. Jena's)

Book chapter-2: Graphene transistors.
Kristof Tahy,** Tian Fang,* Pei Zhao,** Aniruddha Konar,** Chuanxin Lian,* **Huili Xing,** Michelle Kelly* and Debdeep Jena
Intechweb, 2010.
(*Co-advisees of Xing's; and **Advisees of Prof. D. Jena's)

Book chapter-3: Nitride LEDs on quantum wells and quantum dots.
Jai Verma, Amit Verma, Vladimir Protasenko*, S.M. Islam, **Huili Xing**, and Debdeep Jena
Nitride semiconductor LEDs, Woodhead Publishers, Cambridge 2013.
(*Co-advisee of Xing's)

Book chapter-4: Graphene and 2D crystal tunnel transistors.
Qin Zhang, Pei Zhao, Nan Ma, **Grace (Huili) Xing,** and Debdeep Jena
CMOS and Beyond: Logic Switches for Terascale Integrated Circuits
Cambridge University Press, Edited by Tsu Jae King and Kelin Kuhn, 2014.

Book chapter-5: Epitaxy of GaN on Silicon.
Yu Cao, Oleg Laboutin, Wayne Johnson, Satyaki Ganguly, **Grace (Huili) Xing,** and Debdeep Jena
Thin Films on Si: Electronic and Photonic Applications
Series of "Materials and Energy"
World Scientific Publishing, Edited by Vijay Narayanan, Martin M. Frank and Alex Demkov, 2014.

Past Research Assistants:

Visiting and Research Scholars/professors (7):

1. Dr. Xiangyang Li (Dec. 2005 - Feb. 2006, UND)
   Co-director of Photodetector Department, Shanghai Institute of Technical Physics, Chinese Academy of Science
2. Dr. Michelle Kelly (Aug. 2009 - June 2012, RAP of NDNano)
3. Dr. Lei Liu (Sept. 2009 - Dec. 2012, RAP of AD&T at UND), now tenure-track Assistant Professor at UND
4. Dr. Jai Verma (Aug. 2013-Aug. 2014, RAP at UND), now with Intel
5. Prof. Erhard Kohn, University of Ulm (Feb. 2014 - July 2014, UND)
6. Dr. Vladimir Protasenko (2012-15, Research Assistant Professor, UND), now with Cornell
7. Dr. Kazuki Nomoto (2014-15, Visiting RAP, UND), now with Cornell

Postdoctoral scholars (9):

1. Tom Zimmermann (Sept. 2006 - April 2011, UND), now with Fraunhofer Institute, Head of Biohybrid Systems, Duisburg, Germany
2. Qingling Hang (Aug. 2008- July 2009, UND) jointly with Prof. Debdeep Jena
3. Chuanxin Lian (Jan. 2010- June 2010, UND) jointly with Prof. Debdeep Jena, now with M/A-COM (MA)
4. Ms. Yuping Zeng (Oct. 2011 - Nov. 2011, UND), now with UC Berkeley
5. Prem Kumar Kandaswamy (Jan. 2011- March 2012, UND) jointly with Prof. Debdeep Jena, now with IMEC, Belgium
6. Yuanzheng Yue (April 2011 - October 2014, UND) jointly with Prof. P. Fay, now a postdoc with ASU.
7. Vladimir Protasenko (Oct. 2008-2012, UND) jointly with Prof. D. Jena, now at Cornell.
8. Kazuki Nomoto (April 2012-2014, UND) jointly with Prof. D. Jena, now with Cornell.
9. Dr. Shudong Xiao (April 2013 - Dec. 2015)

Ph.D theses directed (9 +2):

1. Chuanxin Lian (Sept. 2004-, M.S. April 2006, Ph.D., Notre Dame, April 2009)
   Title: *Wafer-fused AlGaAs/GaAs/GaN HBTs*
   His doctoral work has resulted in 8 first-author publications and 16 conference presentations. Currently he is with M/A-COM.

2. Yu Cao (Sept. 2006-, M. S. April 2007, Ph.D., Notre Dame, Sept. 2010, co-advised with D. Jena)
   Title: *Study of AlN/GaN HEMTs: MBE growth, transport properties and device issues.*
   His doctoral work has resulted in over 7 first-author publications out of over 24 journal publications and numerous conference presentations. Currently he is with HRL (California).

3. David Deen (Sept. 2005 -, M.S. April 2007, Ph.D., Notre Dame, November 2010).
   Title: *Advanced design of ultra-thin barrier AlN/GaN HEMTs; a study of device design,*

modeling and analysis. He worked at Naval Research Laboratory, SVT Associates. Currently he is with Seagate (Minneapolis).

4. Tian Fang (Sept. 2006 -, M.S. April 2009, Ph.D., Notre Dame, February 2012, co-advised with D. Jena).
   Title: *Carrier transport in graphene and GaN high electron mobility transistors.*
   Currently he is with Solar City (CA).

5. Jia Guo (January 2008 -, Ph.D., Notre Dame, December 2012).
   Title: *InAlN HEMTs with regrown ohmic contacts by MBE*
   Currently he is with Cree (North Carolina).

6. Guangle Zhou (January 2008 -, Ph.D., Notre Dame, December 2012).
   Title: *III-V Tunnel FETs with tunneling aligned with the gate field*
   Currently he is a R&D scientist with Sandisk (CA).

7. Ronghua Wang (August 2008 -, Ph.D., Notre Dame, April 2013).
   Title: *InAlGaN-barrier GaN HEMTs for high speed applications*
   Currently he is with Transphorm (CA).

8. Berardi Sensale-Rodriguez (Oct. 2009 -, Ph.D., Notre Dame, April 2013).
   Title: *Novel terahertz devices based on tunable 2DEG systems*
   Shaheen Award (Best Ph.D. Dissertation in Engineering)
   Currently he is a tenure-track assistant professor at the University of Utah.

9. Zongyang Hu (May 2008 -, Ph.D., Notre Dame, December 2014).
   Title: *GaN HEMTs and MOSHEMTs for power switching applications*
   Currently he is a postdoc in Prof. Xing's group.

10. Bo Song (June 2011 -, Ph.D. Cornell, July 2016)
    Title: *Advanced GaN devices and technology for for RF and power switching applications*
    Currently he is with Analog Devices, Inc. (Massachusetts)

11. Rusen Yan (June 2010 -, Cornell, Ph.D., Dec. 2016)
    Title: Exploring novel electronic and optoelectronic devices based on layered materials
    Currently he is a postdoc in the Xing-Jena group.

Master's theses directed (5):

1. Chuanxin Lian (MS, Notre Dame, spring 2006)
   Title: *Scanning Kelvin probe microscopic study of Ni-(Al)GaN and heterogeneous integration of GaAs/GaN by wafer fusion*
   Master's thesis work has resulted in one first-author publication in Applied Physics

Letters, and one conference presentation.

2. Ms. Jing Zhou (MS, Notre Dame, spring 2006)
   Title: *Fabrication of AlGaN/GaN high electron mobility transistors*

3. David Deen (MS, Notre Dame, spring 2007)
   Title: *Fabrication of ultra-shallow AlN/GaN high electron mobility transistors*
   Master's thesis work has resulted in two second-author publications and two conference presentations.

4. Tian Fang (MS, Notre Dame, spring 2009, co-directed with Dr. Debdeep Jena)
   Title: *Electronic properties of graphene and graphene nanoribbons*
   This work has resulted in one first-author publication, two second-author publications and two conference presentations.

5. Ms. Rachel Rasmussen (Sept. 2006-, M.S., Notre Dame, July 2009, co-directed with Dr. Masaru Kuno)
   Title: *Laser assisted dielectrophoretic alignment and optoelectronic properties of solution-grown CdS and CdSe semiconductor nanowires*
   This work has resulted in one first-author publication (in preparation) and 4 conference presentations.

Master of Engineering projects directed (1):

1. Mr. Fengming Chang (August 2015- May 2016, MEng in ECE, Cornell University)
   Title: *Thermal issues in layered material electronics*

Undergraduate Students (18)

1. Jon Valenzuela (B.S. UND, EE'2005, later graduate student in UTEP)
2. Jason Kulick (B.S. UND, EE'2008, currently co-founder of Indiana Integrated Circuits)
3. Ian Evans (B.S. UND, EE'2009)
4. Ms. Jane Fleming (B.S. Chemistry'2011, Dual Degree Program at St. Mary's College and University of Notre Dame)
5. Ms. Barbara Raynal (B.S. EE'2011, University of Notre Dame; later graduate student at Duke University)
6. Ms. Nicole Whener (B.S. EE'2011, University of Notre Dame)
7. Kevin Burke (NURF-REU, Civil Engineering'2012, University of Notre Dame)
8. Haojun Zhang (iSURE-REU, Electrical Engineering, Tsinghua University, China; later graduate student at U of California, Santa Barbara)
9. Ms. Qinglan Huang (iSURE-REU, Electrical Engineering, Fudan University, China; later graduate student at UIUC)
10. Ruijie Luo (iSURE-REU, Electrical Engineering, Tsinghua University, China; later graduate student at Tsinghua U.)
11. John Weissenberger (NURF-REU, EE'2015, University of Notre Dame)
12. Wenshen Li (REU, Electrical Engineering, Tsinghua University, China)

13. Ms. Bihan Zhu (Physics'2014, University of Notre Dame)
14. Ms. Katrina Magno (NURF-REU, Physics'2015, Notre Dame)
15. Xianyuan Jerry Jia (‘2018, Cornell University)
16. Qixi Chen (MSE’2018, Cornell University)
17. Ms. Ava Tan (ECE’2016, Cornell University)
18. Ms. Maya Martirossyan (Physics’2017, Harvey Mudd College)

High School Teachers (3)

Mr. Ian Lightcap (Clay High School, South Bend, IN; now Research Scientist at UND)
Research Experience for Teachers (RET) program
Summer 2005, co-advised with D. Jena
Project: Nanoscale imaging of semiconductors

Mr. Phil Cook (Culver Academy, Indiana)
Research Experience for Teachers (RET) program
Summer 2008
Project: Semiconductor ion sensitive field-effect transistors
Summer 2009
Project: Graphene preparation and characterization
Summer 2010
Project: Comparative study on CVD and epi graphene using scanning Kelvin probe measurements
Summer 2011
Project: Growth and Raman characterization of CVD graphene

Mr. Mark Prochaska (Culver Academy, Indiana)
Research Experience for Teachers (RET) program
Summer 2010
Project: ICP-Reactive Ion Etching of Al2O3

High School Students (1)

Ms. Livia Caligor (Trinity School, New York City)

Current Research Assistants:

Research Associates (2):

Dr. Vladimir Protasenko (December 2015 -) jointly with Prof. D. Jena
Dr. Kazuki Nomoto (August 2015 -) jointly with Prof. D. Jena

Visiting Professors (1):

Dr. Tongbo Wei (January 2016 - January 2017) jointly with Prof. D. Jena

Postdoctoral scholars (4):

- Dr. Zongyang Hu (Jan. 2015 -) jointly with Prof. D. Jena
- Dr. Yongjin Cho (July 2016 -) jointly with Prof. D. Jena
- Dr. Henryk Turski (Oct. 2016 -) jointly with Prof. D. Jena
- Dr. Rusen Yan (Dec. 2016 -) jointly with Prof. D. Jena

Graduate Students (8)

Mr. Suresh Vishwanath
(Sept. 2011 - Dec. 2014, MS, Notre Dame; Jan. 2015-, Cornell, Expected Ph.D. May 2017)
Thesis title: Epitaxy of layered materials and their heterostructures

Mr. Mingda Li
(July 2012 - Dec. 2014, MS. Notre Dame; Jan. 2015-, Cornell, expected Ph.D. Dec. 2017)
Thesis title: Two-dimensional Heterojunction INterlayer Tunnel FETs (Thin-TFETs)

Mr. Mingda Zhu
(January 2012 - Aug. 2015, Notre Dame; Aug. 2015 -, Cornell, expected Ph.D. May 2017)
Thesis title: GaN power devices built on Si and bulk GaN substrates

Mr. Jimy Encomendero
(January 2013 - Aug. 2015, Notre Dame; Aug. 2015 -, Cornell, expected Ph.D. May 2018)
Thesis title: THz devices based on 2-dimensional electron systems

Mr. Wenshen Li
(August 2015 - , Cornell)
Thesis title: Advanced GaN power devices

Mr. Hyunjea Lee
(August 2016 - , Cornell)
Thesis title: Layered materials and devices

Mr. Xiang Li
(August 2016 - , Cornell)
Thesis title: Advanced logic devices

Mr. John Wright
(August 2016 - , Cornell)
Thesis title: Materials and devices for microwave technologies

Master in Engineering Students (2):

1. Mr. Hank Liu (August 2016- May 2017, MEng in ECE, Cornell University)
   Title: *Vertical GaN power electronics*

2. Mr. Yuxin Ji (August 2016- May 2017, MEng in ECE, Cornell University)
   Title: *GaN Fin-FETs*

Master in Science Students (4):

1. Mr. Aditya Sundar Fnu (August 2015- May 2017, MS in MSE, Cornell University)
   Title: *Layered materials: epitaxy and properties*

2. Mr. Huai-Hsun (Burt) Lien (August 2015- May 2017, MS in MSE, Cornell University, co-advised with Prof. D. Jena)
   Title: *Thermal conductivity in NbSe2: a layered metal and superconductor*

3. Mr. Liheng (Jerry) Zhang (August 2015- May 2017, MS in MSE, Cornell University, co-advised with Prof. D. Jena)
   Title: *Ga2O3 based power devices*

4. Mr. Jae Ho Shin (August 2016- May 2018, MS in MSE, Cornell University, co-advised with Prof. D. Jena)
   Title: *Manufacture-friendly nano electrode power Schottky diodes*

Undergraduate Students (1)

Malavika Attaluri (ECE'2019, Cornell University)

Courses

Taught at Cornell:

MSE 5430/ECE 4590 – Thin Film Materials Science
Fall 2015, Fall 2017

ECE 4360/MSE 5410 - Nanofabrication
Spring 2016, Spring 2017

ECE 5580/MSE 5461 – Compound Semiconductor Devices
Fall 2018

Taught at UND:

EE 60598 – Wide Bandgap Semiconductors
Fall 2004

SC190 – Nanotechnology: Shaping the world atom by atom
Fall 2004, Guest Lecturer

EE 60548 – Electromagnetic Theory
Spring 2005

EE 60556 – Fundamentals of Semiconductors
Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall'11

ESTS/STV 40403 – Nanotechnology: opportunities and challenges
Spring 2006, Guest Lecturer

EE 30357 – Semiconductors II: Devices
Spring 2006, Spring 2007, Spring 2009, Spring 2011, SP'12

EE 67051 – Optoelectronic Devices
Spring 2013

EE 67051 – Electronic and Photonic Materials
Fall 2013, Fall 2014

EE 30342 – Microelectronic Circuits
Spring 2014

Organized at UND:

EE 63520 – Solid State Seminar Series
Spring 2005, 2006, 2009

Developed at UND:

EE 60598 – Wide Bandgap Semiconductors
EE 67051 – Optoelectronic Devices

Pedagogical method initiated at UND:

Cinematic presentations for education: Einstein's Big Idea and the Forgotten Genius
Fall 2006, Spring 2007, and Fall 2007, 2008, 2009

University Service:

ECE & MSE at Cornell:

- General Recruiting Committee of ECE (2015 - 2016)
- Award Committee of MSE (2015 - 2016)
- Director of Undergraduate Studies of MSE (2016 -)
- Recruiting Committee of AEP (2016 - 2017)

College of Engineering at Cornell:

- WISE Group Co-Chair (2015 -)

University at Cornell:

- CNF Executive Committee (2015 -)
- Kavli Institute Executive Committee (2016 -)
- AEP Faculty Recruiting Committee (2016 - 2017)

University at UND:

- Mentor in the Building Bridges Mentoring Program (Fall 2005 -) and the last mentee was a female in Biochemistry class of 2010.
- Committee member of the Expand Your Horizon (EYH) -ND aiming at increasing young women's interests in math and science. (2006-2011, 2013)
- CAREER proposal writing panel (2011)
- Steering Committee Member of AD&T (2012-2014)
- University Committee on Women Faculty and Students (2012-2014)

College of Engineering at UND:

- Funding Chair of IEEE EDS/Photonics Chapter at Notre Dame (Fall 2009 - 2014).
- Faculty Advisor of the EE honorary society Eta Kappa Nu (Fall 2005 - 2012).
- Proposal writing workshop (organized by the Dean, 2010)
- Seminar (first-year UG course) on Gender Issues in Engineering (2011)

Department of Electrical Engineering at UND:

- Graduate Admission Committee (2005, 2008)
- Graduate Student Qualify Exam Committee (Spring 2005 - 2013)
- Undergraduate Committee (Fall 2006 - present)
- Undergraduate Curriculum Committee (2012 - 2014)
- Undergraduate Mentor (Fall 2005 - 2008, 2011- 2014)

Other outreach activities at UND:

- Presentation and demonstration on Nano Materials and Nanoscale Imagining, at the Culver Military Academy (high school) (2009 -2012)
- Presentation and demonstration on Nano Materials and Nanoscale Imagining, at the EYH workshop (6-8th grade girls) (Spring 2010)
- Faculty representative at Society of Women Engineers (SWE) discernment dinner at UND (2013 - 2014)
- Talk at Association of Women in Science (AWIS) and SWE-Grad at UND (2014)

Journal Articles (173 total, in Science, Nature Comm, Proceedings of IEEE, EDL, PRL, Nano Lett, APL etc.):
(Underlined personnel: advised; *personnel in italic*: co-advised)

Non-peer-reviewed Manuscripts:

[NM-1] Rusen Yan, *Tian Fang,* Simone Bertolazzi, Jacopo Brivio, Aniruddha Konar, Michelle Kelly, Debdeep Jena, Andras Kis, and **Huili Grace Xing**
Raman and photoluminescence study of dielectric and thermal effects on atomically thin MoS2.
Uploaded in 2012. arXiv:1211.4136

2017 (?):

[J-?] Zongyang Hu, Bo Song, Mingda Zhu, Kazuki Nomoto, Debdeep Jena and **Huili Grace Xing**
Recent development on GaN electronic devices and technologies for RF and power applications.
To be Submitted, (2015).

[J-?] Bo Song, Mingda Zhu, Zongyang Hu, Debdeep Jena and **Huili Grace Xing**
Unipolar figure-of-merit of polarization-doped GaN power devices.
To be submitted, (2015)

[J-?] Wenshen Li, Kazuki Nomoto, Manyam Pilla, Ming Pan, Xiang Gao, Debdeep Jena, **Huili Grace Xing**
Design and realization of GaN trench junction-barrier-Schottky-diodes (trench JBSD)
Submitted. (2016).

[J-?] Liheng Zhang, Amit Verma, **Huili Grace Xing** and Debdeep Jena
ICP-RIE etch of single crystal b-Ga2O3
Submitted. (2016).

[J-?] Meng Qi, Guowang Li, Satyaki Ganguly, Pei Zhao, Xiaodong Yan, Jai Verma, Bo Song, Mingda Zhu, Kazuki Nomoto, **Huili Grace Xing** and Debdeep Jena
Strained GaN quantum-well FETs on single crystal bulk AlN substrates
Submitted. (2016).

[J-?] Wencan Jin,* Suresh Vishwanath,* Jianpeng Liu, Lingyuan Kong, Rui Lou, Zhongwei Dai, Jerzy T. Sadowski, Xinyu Liu, Huai-Hsun Lien, Junzhang Ma, Tian Qian, Jerry I. Dadap, Karsten Pohl, Shancai Wang, Jacek Furdyna, Hong Ding, Huili Grace Xing,* and Richard M. Osgood, Jr.*
Ultrahigh Fermi velocity in the surface state of epitaxial rock-salt SnSe topological crystalline insulator

Submitted, (2016). *equal contributions

2016 (16):

[J-174] Mingda (Oscar) Li, Ozan Irsoy, Claire Cardie and **Huili Grace Xing**
Physics-inspired neural networks (Pi-NN) for efficient device compact modeling.
IEEE J. of Exploratory Solid-State Computational Devices and Circuits, (2016).

[J-173] Nan Ma, Nicholas Tanen, Amit Verma, Zhi Guo, Tengfei Luo, **Huili Grace Xing** and Debdeep Jena
Intrinsic electron mobility limits in b-Ga2O3
Appl. Phys. Lett. **109**, 212101 (2016). DOI: 10.1063/1.4968550

[J-172] V Kanzyuba, S. Dong, X. Li, T Yoo, S. Rouvimov, S. Vishwanath, D. Jena, H. G. Xing, M. Dobrowolska, J.K. Furdyna.
Structural properties of (Sn,Mn)Se2 - a new 2D magnetic semiconductor with potential for spintronic applications
J. of Microscopy and Microanalysis, **22**, S3, 1512-1513 (2016).

[J-171] Hugo Condori Quispe, Jimy J. Encomendero-Risco, **Huili Grace Xing** and Berardi Sensale-Rodriguez
Terahertz amplification in RTD-gated HEMTs with a grating-gate wave coupling topology
Appl. Phys. Lett., **109**, 063111 (2016). DOI: 10.1063/1.4961053

[J-170] Tao Jiang,* Xueqiang Zhang,* Suresh Vishwanath,* Xin Mu,* Vasily Kanzyuba, Denis Sokolov, Sylwia Ptasinska,* David B. Go, **Huili Grace Xing*** and Tengfei Luo*
Fine-tunable thermal transport across graphene-metal interfaces via controlled graphene oxidation
Nanoscale, **8**, 10993 (2016). * equal contributions DOI: 10.1039/c6nr00979d

[J-169] Jun H. Park, Sara Fathipour, Iljo Kwak, Kasra Sardashti, Christopher F. Ahles, Suresh Vishwanath, **Huili Grace Xing,** Susan K. Fullerton-Shirey, Andrew Kummel and Alan Seabaugh
Atomic layer deposition of Al2O3 on WSe2 functionalized by Titanyl Phthalocyanine.
ACS Nano, **10**, 6888-6896 (2016). DOI: 10.1021/acsnano.6b02648

[J-168] Jun H. Park*, Suresh Vishwanath*, Xinyu Liu, Huawei Zhou, Sarah M. Eichfeld, Susan K. Fullerton-Shirey, Joshua A. Robinson, Randall M. Feenstra, Jacek Furdyna, Debdeep Jena, **Huili Grace Xing*** and Andrew Kummel*
Scanning tunneling microscopy and spectroscopy of air exposure effects on molecular beam epitaxy grown WSe2 monolayers and bilayers.
ACS Nano **10**, 4258-4267 (2016). DOI: 10.1021/acsnano.5b07698
* equal contributions

[J-167] S.M. Islam, Vladimir Protasenko, Sergei Rouvimov, **Huili Grace Xing** and Debdeep Jena
Sub-230 nm deep-UV emission from GaN quantum dots in AlN grown by a modified Stranski-Krastanov mode
J. J. Appl. Phys. **55**, 05FF06 (2016). DOI: 10.7567/JJAP.55.05FF06

[J-166] S.M. Islam, Vladimir Protasenko, Sergei Rouvimov, **Huili Grace Xing** and Debdeep Jena
High-quality InN films on GaN using graded InGaN buffers by MBE
J. J. Appl. Phys. **55**, 05FD12 (2016). DOI: 10.7567/JJAP.55.05FD12

[J-165] Priti Gupta, A.A. Rahman, Shruti Subramanian, Shalini Gupta, Arumugam Thamizhavel, Tatyana Orlova, Sergei Rouminov, Suresh Vishwanath, *Vladimir Protasenko*, Masihhur R. Laskar, **Huili Grace Xing**, Debdeep Jena and Arnab Bhattacharya
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2016:

[CP-89] (Invited) Mingda (Oscar) Li*, Rusen Yan*, Debdeep Jena and **Huili Grace Xing**
Two-dimensional Heterojunction Interlayer Tunnel Field Effect Transistor (Thin-TFET): From Theory to Applications
IEEE International Electron Device Meeting, pp.19.2/1-4, (2016).
* Equal contributions

[CP-88] Mingda Zhu, Bo Song, Zongyang Hu, Kazuki Nomoto, Ming Pan, Xiang Gao, Debdeep Jena and **Huili Grace Xing**
Comparing buffer leakage in PolarMOSH on SiC and free-standing GaN substrates
IEEE Lester Eastman Conference, Lehigh University, August 2016.

[CP-87] S.M. Islam, Meng Qi, Bo Song, Kazuki Nomoto, *Vladimir Protasenko,* Jingshan Wang, Sergei Rouvimov, Patrick Fay, **Huili Grace Xing** and Debdeep Jena
First demonstration of strained AlN/GaN/AlN quantum well FETs on SiC
IEEE Device Research Conference, University of Delaware, June 2016.

[CP-86] Mingda (Oscar) Li, Shudong Xiao, Rusen Yan, Suresh Vishwanath, Susan Fullerton-Shirey, Debdeep Jena and **Huili Grace Xing**
Fermi Level Tunability of a Novel 2D Crystal: Tin Diselenide (SnSe2)
IEEE Device Research Conference, University of Delaware, June 2016.

[CP-85] Bo Song, Amit K. Verma, Kazuki Nomoto, Mingda Zhu, Debdeep Jena and **Huili Grace Xing**
Vertical Ga2O3 Schottky Barrier Diodes on Single-Crystal b-Ga2O3 (-201) Substrates
IEEE Device Research Conference, University of Delaware, June 2016.

[CP-84] Amit Verma, Bo Song, David Meyer, Brian Downey, Virginia Wheeler, **Huili Grace Xing** and Debdeep Jena
Demonstration of GaN HyperFETs with ALD VO2
IEEE Device Research Conference, University of Delaware, June 2016.

[CP-83] Alexander Chaney, Meng Qi, S. M. Islam, **Huili Grace Xing** and Debdeep Jena
GaN tunnel switch diodes
IEEE Device Research Conference, University of Delaware, June 2016.

[CP-82] Meng Miao, Juin J. Liou, Bo Song, Kazuki Nomoto, **Huili Grace Xing,** Javier A. Salcedo, Jean-Jacques Hajjar
Investigation of forward transient characteristics of vertical GaN-on-GaN p-n diodes
IEEE International Nanoelectronics Conference (INEC), May 2016.
DOI: 10.1109/INEC.2016.7589466

2015:

[CP-81] Kazuki Nomoto, Zongyang Hu, Bo Song, Mingda Zhu, Meng Qi, Rusen Yan, *Vladimir Protasenko*, Eugene Imhoff, Jeff Kuo, N. Kaneda, T. Mishima, T. Nakamura, Debdeep Jena and **Huili Grace Xing**
GaN-on-GaN p-n power diodes with 3.48 kV and 0.95 mohm-cm2: a record high figure-of-merit of 12.8 GW/cm2
IEEE International Electron Device Meeting, **237**, pp.9.7.1, (2015).

[CP-80] Shubhendu Bhardwaj, Berardi Sensale-Rodriguez, **Huili Grace Xing**, John Volakis,
Full-wave hydrodynamic model for predicting THz emission from grating-gate RTD-gated plasma wave HEMTs
IEEE Device Research Conference, Ohio State University, June 2015.

[CP-79] S.M. Islam, *Vladimir Protasenko*, Sergei Rouvimov, Jai Verma, **Huili Grace Xing** and Debdeep Jena,
Deep-UV LEDs using polarization-induced doping: electroluminescence at cryogenic temperatures
IEEE Device Research Conference, Ohio State University, June 2015.

[CP-78] Meng Qi, Kazuki Nomoto, Mingda Zhu, Zongyang Hu, Yuning Zhao, Bo Song, Guowang Li, Patrick Fay, **Huili Grace Xing**, and Debdeep Jena,
High-voltage polarization-induced vertical heterostructure p-n junction diodes on bulk GaN substrates
IEEE Device Research Conference, Ohio State University, June 2015.

[CP-77] (Invited) **Huili Grace Xing**, Bo Song, Mingda Zhu, Zongyang Hu, Meng Qi, Kazuki Nomoto and Debdeep Jena,
Unique opportunity to harness polarization in GaN to override the conventional power electronics figure-of-merits
IEEE Device Research Conference, Ohio State University, June 2015.

[CP-76] Bo Song, Mingda Zhu, Zongyang Hu, Kazuki Nomoto, Debdeep Jena, **Huili Grace Xing**.
Design and optimization of GaN lateral Polarization-doped super junctions (PolarSJs): an

analytical study.
The 27th Symposium on Power Semiconductor Devices and ICs, HongKong, June 2015.

[CP-75] (Invited) Xinyu Liu, Suresh Vishwanath, S. Dong, T. Yoo, D. Jena, **Huili Grace Xing**, M. Dobrowolska, J. Furdyna.
MBE-grown Mn-doped SnSe2 2D films on GaAs (111)B substrates
Proceedings of IEEE Magnetics Conference, Beijing, May 2015. DOI: 10.1109/INTMAG. 2015.7156850

[CP-74] (Invited) **Huili Grace Xing**, Rusen Yan, Bo Song, Jimy Encomendero, Debdeep Jena.
THz devices based on 2D electron systems
Proceedings of SPIE, Baltimore, April 2015.

2014:

[CP-73] Jun Ren, Bo Song, **Huili Grace Xing**, Shuoqi Chen, Andrew Ketterson, Edward Beam, Tso-Min Chou, Manyam Pilla, Hua-Quen Tserng, Xiang Gao, Paul Saunier, Patrick Fay
Model development for monolithically-integrated E/D-mode millimeter-wave InAlN/AlN/GaN HEMTs.
IEEE Compound Semiconductor Integrated Circuit Symposium (CSICs), La Jolla, Oct. 2014. DOI:10.1109/CSICS.2014.6978570

[CP-72] (Invited) Patrick Fay, Y. Xie, Y. Zhao, Z. Jiang, S. Rahman, **Huili Grace Xing**, B. Sensale-Rodriguez, and L. Liu.
Emerging electronic devices for THz sensing and imaging.
Proceedings of SPIE, San Diego, Sept. 2014.

[CP-71] Suresh Vishwanath, Sergei Rouvimov, Tatyana Orlova, Xingyu Liu, Jacek K. Furdyna, Debdeep Jena and **Huili Grace Xing**.
Atomic structures of thin MoSe2 films grown by molecular beam epitaxy
Microscopy and Microanalysis, vol. 20, Suppl. 3, pp. 164-165, August 2014. doi:10.1017/S1431927614002542

[CP-70] Bo Song, Mingda Zhu, Zongyang Hu, Erhard Kohn, Debdeep Jena, **Huili Grace Xing**.
GaN lateral PolarSJs: polarization-doped super junctions.
IEEE Device Research Conference, University of Notre Dame, June 2014.

[CP-69] Shudong Xiao, Mingda Li, Alan Seabaugh, Debdeep Jena, **Huili Grace Xing**.
Vertical heterojunction of MoS2 and WSe2.
IEEE Device Research Conference, University of California, Santa Barbara, June 2014.

[CP-68] Mingda (Oscar) Li, David Esseni, Debdeep Jena and **Huili Grace Xing**.
Lateral transport in two-dimensional heterostructure interlayer tunneling field effect transistor (Thin-TFET).
IEEE Device Research Conference, University of California, Santa Barbara, June 2014.

[CP-67] Zongyang Hu, Raj Jana, Meng Qi, Satyaki Ganguly, Bo Song, Erhard Kohn, Debdeep Jena, **Huili Grace Xing**.
Characteristics of In0.17Al0.83GaN/AlN/GaN MOS-HEMTs with steeper than 60 mV/dec sub-threshold slopes in deep sub-threshold regions.
IEEE Device Research Conference, University of California, Santa Barbara, June 2014.

[CP-66] Bo Song, Mingda Zhu, Zongyang Hu, Meng Qi, X. Yan, Yu Cao, Erhard Kohn, Debdeep Jena, **Huili Grace Xing**.
AlGaN/GaN MIS-HEMT on silicon with steep sub-threshold swing < 60 mV/dec over 6 orders of drain current swing and relation to traps.
IEEE Silicon Nanoelectronics Workshop, Hawaii, June 2014.

[CP-65] (Invited) Debdeep Jena, Mingda Li, Nan Ma, Wan Sik Hwang, David Esseni, Alan Seabaugh, and **Huili Grace Xing**.
Electron transport in 2D crystal semiconductors and their device applications.
IEEE Silicon Nanoelectronics Workshop, Hawaii, June 2014.

2013:

[CP-64] (Invited) Patrick Fay, Yeqing Lu, Guangle Zhou, Yi Xie, Md. Itrat Bin Shams, Ze Zhang, **Huili (Grace) Xing**, and Alan C. Seabaugh
Interband tunneling in InAs/AlGaSb heterostructures: devices for low-power logic and THz applications.
ISDRS 2013, Bethesda, MD, December 11-13, 2013.

[CP-63] Bo Song, Berardi Sensale-Rodriguez, Ronghua Wang, Andrew Ketterson, Michael Schuette, Edward Beam, Paul Saunier, Xiang Gao, Shiping Guo, Patrick Fay, Debdeep Jena and **Huili G. Xing**
Source-drain scaling and its effect on the fringing capacitance for ultra-high speed GaN HEMT.
ISDRS 2013, Bethesda, MD, December 11-13, 2013.

[CP-62] Mingda Zhu, Xiaodong Yan, Bo Song, Zongyang Hu, Yuning Zhao, Debdeep Jena and **Huili Grace Xing**
Off-state drain leakage reduction for InAlN/GaN HEMTs using a HCl and O2-plasma two-step treatment.
ISDRS 2013, Bethesda, MD, December 11-13, 2013.

[CP-61] Zongyang Hu, Yuanzheng Yue, Mingda Zhu, Bo Song, Satyaki Ganguly, Josh Bergman, Debdeep Jena and **Huili Grace Xing**
Impact of CF4 plasma treatment on DC performance of Al2O3/InAlN/GaN MOS-HEMTs.
ISDRS 2013, Bethesda, MD, December 11-13, 2013.

[CP-60] (Invited) Pei Zhao, W.-S. Hwang, E. Kim, R. Feenstra, G. Gu, J. Kang, K. Banerjee, A.

Seabaugh, **G. H. Xing** and D. Jena
Novel logic devices based on 2D crystal semiconductors: opportunities and challenges.
IEEE International Electron Device Meeting (IEDM), Washington DC, December 2013.

[CP-59] Ronghua Wang, *Guowang Li*, Jia Guo, Bo Song, J. Verma, Zongyang Hu, Yuanzheng Yue, *Kazuki Nomoto*, Satyaki Ganguly, Sergei Rouvimov, Xiang Gao, Oleg Laboutin, Yu Cao, Wayne Johnson, Patrick Fay, Debdeep Jena, and **Huili (Grace) Xing**
Dispersion-free operation in InAlN-based HEMTs with ultra thin or no passivation.
IEEE International Electron Device Meeting (IEDM), Washington DC, December 2013.
Featured by Semiconductor-Today

[CP-58] (Invited) **Huili G. Xing**, Guangle Zhou, Mingda Li, Yiqing Lu, Rui Li, Mark Wistey, Patrick Fay, Debdeep Jena and Alan C. Seabaugh
Tunnel FETs with tunneling normal to the gate.
Berkeley Symposium on Energy Efficient Electronics Systems, University of California, Berkeley, CA, October 28-29, 2013.

[CP-57] (Invited student presentation) Rusen Yan, Subrina Rafique, Lei Liu, Berardi Sensale-Rodriguez, and **Huili Grace Xing**
IRMMW-THz, Mainz, Germany, September 2013.
Near-field enhanced graphene terahertz modulator.
Runner up for the Best Student Presentation Award.

[CP-56] (Invited) Berardi Sensale-Rodriguez, and **Huili Grace Xing**
Terahertz reconfigurable devices using graphene.
Proceedings of SPIE, San Diego, August 2013.

[CP-55] Pei Zhao, Amit Verma, Jai Verma, **Huili Grace Xing**, Patrick Fay and Debdeep Jena.
GaN heterostructure barrier diodes (HBD) with polarization-induced Delta-doping.
IEEE Device Research Conference, University of Notre Dame, June 2013.

[CP-54] WanSik Hwang, Amit Verma, *Vladimir Protasenko*, Sergei Rouvimov, **Huili Grace Xing**, Alan Seabaugh, Wilfred Haensch, Chris Van de Walle, Zbigniew Galazka, Martin Albrecht, Roberto Forrnari and Debdeep Jena.
Nanomembrane b-Ga2O3 high-voltage field effect transistors.
IEEE Device Research Conference, University of Notre Dame, June 2013.

[CP-53] Zhengping Jiang, Yu He, Guangle Zhou, Tillmann Kubis, **Huili Grace Xing**, and Gerhard Klimeck.
Atomistic simulation on gate-recessed InAs/GaSb TFETs and performance benchmark.
IEEE Device Research Conference, University of Notre Dame, June 2013.

[CP-52] S. M. Rahman, Zhenguo Jiang, Yi Xie, **Huili Xing,** Patrick Fay and Lei Liu
Terahertz focal plane arrays employing heterostructure backward diodes integrated with

folded dipole antennas.
IEEE MTT-S International Microwave Symposium Digest (IMS), Seattle, June 2013.

[CP-51] Pei Zhao, Amit Verma, Jai Verma, **Huili Xing** and Debdeep Jena
Comparison of Schottky Diodes on Bulk GaN substrates & GaN-on-Sapphire
CSManTech, New Orleans, Louisiana, May 2013.

[CP-50] Haojun Zhang, Mingda Zhu, Berardi Sensale-Rodriguez, and **Huili Grace Xing**
THz plasmonic absorption in periodically patterned semiconductor ribbons.
IEEE International Wireless Symposium (IWS), Beijing, March 2013.

[CP-49] Michael Schuette, Andrew Ketterson, Edward Beam, Tso-Min Chou, Hua-Quen Tserng, Shiping Guo, Xiang Gao, Patrick Fay, **Huili Grace Xing**, and Paul Saunier.
State-of-the-art E/D InAlN/AlN/GaN GaN HEMT technology.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), 2013.

2012:

[CP-48] Guangle Zhou, Rui Li, Tim Vasen, Meng Qi, SooDoo Chae, Yeqing Lu, Qin Zhang, H. Zhu, J. Kuo, Tom Kosel, Mark Wistey, Patrick Fay, Alan Seabaugh, **Huili (Grace) Xing**
Novel gate-recessed vertical InAs/GaAs TFETs with record high Ion of 180 uA/um at VDS = 0.5V.
IEEE International Electron Device Meeting (IEDM), San Francisco, December, 2012.

[CP-47] Berardi Sensale-Rodriguez, Yeqing Lu, L. Barboni, F. Silverira, Patrick Fay, Debdeep Jena, Alan Seabaugh, and **Huili Grace Xing**
IEEE Subthreshold Microelectronics Conference, Waltham, MA, October 2012.
Perspectives of TFETs for low power analog ICs.

[CP-46] (invited) Berardi Sensale-Rodriguez, Rusen Yan, Subrina Rafique, Mingda Zhu, *Vladimir Protasenko*, Debdeep Jena, Lei Liu, and **Huili Grace Xing**
IRMMW-THz, Wollongong, Australia, September 2012.
Exceptional tenability of THz reflection in graphene structures.
The Best Student Presentation Award.

[CP-45] Bo Song, Berardi Sensale-Rodriguez, Ronghua Wang, Michael Schuette, Andrew Ketterson, Edward Beam, Paul Saunier, Shiping Guo, Xiang Gao. Patrick Fay, Debdeep Jena, and **Huili Grace Xing**.
Monolithically integrated E/D-mode InAlN HEMTs with ft/fmax > 200/220 GHz.
Device Research Conference, Penn State University, June 2012.

[CP-44] *Guowang Li*, Ronghua Wang, Jai Verma, **Huili Grace Xing**, and Debdeep Jena.
Ultra-thin body GaN-on-Insulator nFETs and pFETs: towards III-nitride complementary logic.

Device Research Conference, Penn State University, June 2012.

[CP-43] Jai Verma, Prem Kumar, Amit Verma, *Vladimir Protasenko*, **Huili Grace Xing**, and Debdeep Jena
Tunnel injection GaN/AlN quantum dot UV LED.
Device Research Conference, Penn State University, June 2012.

[CP-42] Wan Sik Hwang, Maja Remskar, Rusen Yan, *Vladimir Protasenko*, Kristof Tahy, Soo Doo Chae, Alan C. Seabaugh, **Huili Grace Xing**, and Debdeep Jena
First demonstration of two-dimensional WS2 transistors exhibiting 10^5 room temperature modulation and ambipolar bahavior.
Device Research Conference, Penn State Univeristy, June 2012.

[CP-41] (Invited) Michael Schuette, Andrew Ketterson, Edward Beam, Tso-Min Chou, Hua-Quen Tserng, Shiping Guo, Xiang Gao. Patrick Fay, **Grace Xing**, Paul Saunier.
State-of-the-art E/D GaN technology based on an InAlN/AlN/GaN heterostructure.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), 2012.

2011:

[CP-40] Qin Zhang, Guangle Zhou, **Huili G. Xing**, Alan C. Seabaugh, Kun Xu, Oleg A. Kirillov, Curt A. Richter, Nhan V. Nguyen
Band alignment of TFET heterojunctions and post deposition annealing effects by internal photoemission spectroscopy.
ISDRS 2011, University of Maryland, College Park, MD, December 7-9, 2011.

[CP-39] Berardi Sensale-Rodriguez, Jia Guo, Ronghua Wang, *Guowang Li, Tian Fang,* Paul Saunier, Andrew Ketterson, Michael Schuette, Xiang Gao, Shiping Guo, Yu Cao, Oleg Laboutin, Wayne Johnson, Gregory Snider, Patrick Fay, Debdeep Jena, and **Huili (Grace) Xing**
Comparative study of E- and D-mode InAlN/AlN/GaN HEMTs with fT near 200 GHz
ISDRS 2011, University of Maryland, College Park, MD, December 7-9, 2011.

[CP-38] Satyaki Ganguly, Jai Verma, *Guowang Li*, Tom Zimmermann, **Huili Xing**, Debdeep Jena
Barrier height, interface charge & tunneling effective mass in ALD Al2O3/AlN/GaN HEMTs.
Device Research Conference, University of California, Santa Barbara, CA, June 20, 2011.

[CP-37] Ronghua Wang, *Guowang Li*, *Tian Fang*, Oleg Laboutin, Yu Cao, J. W. Johnson, Greg Snider, Patrick Fay, Debdeep Jena, **Huili Xing**
Improvement of fT in InAl(Ga)N Barrier HEMTs by Plasma Treatments.
Device Research Conference, University of California, Santa Barbara, CA, June 20 2011.

[CP-36] Guangle Zhou, Yeqing Lu, Rui Li, Qin Zhang, Wan Sik Hwang, Qingmin Liu, Tim

Vasen, H. Zhu, J. Kuo, S. Koswatta, Tom Kosel, Mark Wistey, Patrick Fay, Alan Seabaugh, **Huili (Grace) Xing**
Self-aligned InAs/Al0.45 Ga0.55 Sb vertical tunnel FETs.
Device Research Conference, University of California, Santa Barbara, CA, June 20, 2011.

[CP-35] *Tian Fang*, Ronghua Wang, Guowang Li, **Huili Xing,** S. Rajan, Debdeep Jena
Effect of optical phonon scattering on the performance limits of ultrafast GaN transistors.
Device Research Conference, University of California, Santa Barbara, CA, June 20, 2011.

[CP-34] (Invited) Paul Saunier, Andrew Ketterson, Michael Schuette, Tso-Min Chou, Jose Jimenez, Hua-Quen Tserng, **Grace Xing**, Shiping Guo, Xiang Gao.
State-of-the-art E/D GaN technology based on an InAlN/AlN/GaN heterostructure.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), Orlando, 2011.

[CP-33] (Invited) Debdeep Jena, Kristof Tahy, Tian Fang, Pei Zhao, Wan Sik Hwang, Michelle Kelly, S. Koswatta, K. Gaskill, R. L. Myers-Ward, J. Tedesco, C. Eddy, Rui Li, **Huili Xing** and Alan Seabaugh
Graphene transistors for digital applications.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), Orlando, 2011.

[CP-32] Guangle Zhou, Yeqing Lu, Rui Li, Wan Sik Hwang, Qingmin Liu, Qin Zhang, Tim Vasen, C. Chen, H. Zhu, J. Kuo, S. Koswatta, Tom Kosel, Mark Wistey, Alan Seabaugh, and **Huili (Grace) Xing**
Self-aligned In0.53 Ga0.47 As/InAs/InP vertical tunnel transistors.
International Conference on Compound Semiconductor Manufacturing Technology (CSManTech), Palm Springs, April 2011.

2010:

[CP-31] Yong Tang, Paul Saunier, Ronghua Wang, Andrew Ketterson, Xiang Gao, Shiping Guo, Gregory Snider, Debdeep Jena, **Huili (Grace) Xing** and Patrick Fay
High-performance monolithically-integrated E/D mode InAlN/AlN/GaN HEMTs for mixed-signal applications.
IEEE International Electron Device Meeting, San Francisco, 2010.

[CP-30] (Invited) Debdeep Jena, Kristof Tahy, David Shilling, Qin Zhang, Tom Zimmermann, Patrick Fay, **Huili Xing**, Alan Seabaugh, Luxmi, Randall Feenstra, Siyuranga Koswatta.
Graphene transistors.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), 2010.

[CP-29] (Invited) L. Liu, T. Wang, A. Biswas, Z. Cai, F. Watanabe, A. S. Biris, M. Lieberman, **H. Xing** and P. Fay

Narrow spectral features of cellulose nanocomposites characterized by a frequency domain terahertz spectroscopy.
ICCE, 2010.

[CP-28] L. Liu, B. Sensale-Rodriguez, Z. Zhang, T. Zimmermann, *Y. Cao*, D. Jena, P. Fay and **H. Xing**
Development of microwave and terahertz detectors utilizing AlN/GaN high electron mobility transistors.
The 21st International Symposium on Space Terahertz Technology, Oxford, March 2010.

[CP-27] Ronghua Wang, Xiu Xing, *Tian Fang*, Tom Zimmermann, Chuanxin Lian, *Guowang Li*, Paul Saunier, Xiang Gao, Shiping Guo, Gregory Snider, Patrick Fay, Debdeep Jena and **Huili (Grace) Xing**
High performance E-mode InAlN/GaN HEMTs: interface states from subthreshold slopes.
The 68th Device Research Conference, Notre Dame, June 2010.

[CP-26] Q. Zhang, Y. Lu, **G. H. Xing,** C. A. Richter, S. J. Koester and S. O. Koswatta
Graphene nanoribbon Schottky-barrier FETs for end-of-the-roadmap CMOS: Challenges and opportunities
The 68th Device Research Conference, Notre Dame, June 2010.
DOI: 10.1109/DRC.2010.5551933

[CP-25] *Kristof Tahy*, Margaret Jane Fleming, Barbara Raynal, *Vladimir Protasenko*, Siyuranga Koswatta, Debdeep Jena, **Huili (Grace) Xing** and Michelle Kelly
Device characteristics of single-layer graphene FETs grown on copper.
The 68th Device Research Conference, Notre Dame, June 2010.

[CP-24] *Guowang Li*, Tom Zimmermann, *Yu Cao*, Chuanxin Lian, Xiu Xing, Ronghua Wang, Patrick Fay, **Huili Xing** and Debdeep Jena
Work-function engineering in novel high Al composition $Al_{0.72}Ga_{0.28}N$/AlN/GaN HEMTs.
The 68th Device Research Conference, Notre Dame, June 2010.

[CP-23] Chuanxin Lian, *Yu Cao*, Ronghua Wang, *Guowang Li*, Tom Zimmermann, Debdeep Jena and **Huili Xing**
Molecular beam epitaxy regrowth of ohmics in metal-face AlN/GaN transistors.
International Conference on Compound Semiconductor Manufacturing Technology (Portland), April 2010.

2009:

[CP-22] Jia Guo, Tom Zimmermann, Debdeep Jena and **Huili (Grace) Xing**
Ultra-scaled AlN/GaN enhancement- and depletion- mode nanoribbon HEMTs.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-21] *Yu Cao*, Tom Zimmermann, **Huili Xing** and Debdeep Jena

MBE-grown buffer with high breakdown voltage for nitride HEMTs on GaN template.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-20] Guangle Zhou, Sajid Kabeer, Dana Wheeler, Patrick Fay, Alan Seabaugh and **Huili (Grace) Xing**
Field modulation in heavily-doped thin-body p+InGaAs for tunnel FETs.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-19] Dana Wheeler, Sajid Kabeer, Yeqing Lu, Tim Vasen, Qin Zhang, Guangle Zhou, Kevin Clark, Haijun Zhu, Yung-Chung Kao, Patrick Fay, Tom Kosel, **Huili Xing** and Alan Seabaugh.
Fabrication approach for lateral InGaAs tunnel transistors.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-18] Sajid Kabeer, Tim Vasen, Dana Wheeler, Qin Zhang, Siyuranga Koswatta, Haijun Zhu, Kevin Clark, Jenn-Ming Kuo, Yung-Chung Kao, Sean Corcoran, Brian Doyle, Patrick Fay, Tom Kosel, **Huili Xing** and Alan Seabaugh
Effect of dopant profile on current-voltage characteristics of p+n+ In0.53GaAs tunnel junctions.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-17] Chuanxin Lian, Kristof Tahy, Tian Fang, Guowang Li, **Huili (Grace) Xing** and Debdeep Jena
Quantum transport in patterned graphene nanoribbons.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-16] Kristof Tahy, Chuanxin Lian, **Huili (Grace) Xing** and Debdeep Jena
Operation regimes of double gated graphene nanoribbon FETs.
International Semiconductor Device Research Symposium (ISDRS), Dec. 2009.

[CP-15] Tom Zimmermann, *Yu Cao*, Jia Guo, Xiangning Luo, Debdeep Jena and **Huili Xing**
Top-down AlN/GaN enhancement- and depletion- mode nanoribbon HEMTs.
Conference digest of 67th Device Research Conference, Penn State University, June 2009.
DOI: 10.1109/DRC.2009.5354874

[CP-14] *Kristof Tahy*, David Shilling, Tom Zimmermann, **Huili Xing,** Patrick Fay, Luxmi, Randall Freenstra and Debdeep Jena
Gigahertz operation of epitaxial graphene transistors.
Conference Digest of 67th Device Research Conference, Penn State University, June 2009.

[CP-13] *Kristof Tahy*, Siyuranga Koswatta, Tian Fang, Qin Zhang, **Huili Xing** and Debdeep Jena
High field transport properties of 2D and nanoribbon Graphene FETs.
Conference Digest of 67th Device Research Conference, Penn State University, June 2009.

2008:

[CP-12] *John Simon*, Kejia Wang, **Huili Xing** and Debdeep Jena
Polarization induced graded AlGaN p-n junction grown by MBE.
Conference Digest of 66th Device Research Conference, UCSB, June 2008.

[CP-11] Xiangning Luo, YenChun Lee, Anirudda Konar, Tian Fang, Gregory Snider, **Huili Xing** and Debdeep Jena
Current-carrying capacity of long & short channel 2D graphene transistors.
Conference Digest of 66th Device Research Conference, UCSB, June 2008.

[CP-10] Chuanxin Lian, Xiu Xing, Patrick Fay, Yu-Chia Chang, Zhen Chen and **Huili Xing**
Wafer fused AlGaAs/GaAs/GaN HBTs with current gain of ~ 20 and ft of ~ 2.6 GHz.
Conference Digest of 66th Device Research Conference, UCSB, June 2008.

[CP-9] Chuanxin Lian and **Huili Grace Xing**
Wafer fused AlGaAs/GaAs/GaN HBTs with current gain ~ 20 and $V_{BR} > 35$ V.
International Conference on Compound Semiconductor Manufacturing Technology, Chicago, (April 2008).

[CP-8] (Invited) **Huili Xing,** Tom Zimmermann, David Deen, Yu Cao, Debdeep Jena and Patrick Fay
Ultrathin AlN/GaN heterostructure based HEMTs.
International Conference on Compound Semiconductor Manufacturing Technology (CS ManTech), Chicago, (April 2008).

2007:

[CP-7] *Yu Cao*, Tom Zimmermann, Huili (Grace) Xing and Debdeep Jena
Ultrashallow MBE-grown AlN/GaN HEMTs with record high current densities.
International Semiconductor Device Research Symposium (ISDRS), Washington D.C., (Dec. 2007) **Nominated for the Best Student Paper Award.**

2006:

[CP-6] *A. Singh*, A. Khandelwal, X. Li, **H. Xing,** M. Kuno and D. Jena
Field-effect transistors and photodetectors based on solution-synthesized nanowires.
Conference Digest of 64th Device Research Conference, Penn Sate University, June 2006.
DOI: 10.1109/DRC.2006.305121

2004-2000:

[CP-5] D. Scott, **H. Xing**, S. Krishnan, M. Urgeaga, N. Parthasarathy and M. Rodwell
InAlAs/InGaAs/InP DHBTs with polycrystalline InAs extrinsic emitter regrowth.
60th Device Research Conference, Santa Barbara, CA, USA, June 2002.

[CP-4] (Invited) **H. Xing,** D. S. Green, L. McCarthy, I. P. Smorchkova, P. Chavarkar, T. Mates, S. Keller, S. P. DenBaars, J. Speck and U. K. Mishra

Progress in gallium nitride-based bipolar transistors.
BIPOLAR/BiCMOS Circuits and Technology Meeting, Minneapolis, MN, USA, September 2001.

[CP-3] L. McCarthy, Y. Smorchkova, P. Fini, **H. Xing**, M. Rodwell, J. Speck, S. DenBaars and U. Mishra
HBT on LEO GaN.
Conference Digest of 58th Device Research Conference, Denver, CO, USA, June 2000.

[CP-2] (Invited) U. Mishra, R. Vetury, L. McCarthy, Y. Smorchkova, S. Keller, **H. Xing**, N. Zhang, J. Speck, R. York and S. DenBaars
AlGaN/GaN HEMTs and HBTs for microwave power.
Conference Digest of 58th Device Research Conference, Denver, CO, USA, June 2000.

[CP-1] **H. Xing**, L. McCarthy, S. Keller, S. P. DenBaars and U. K. Mishra
High current gain GaN homojunction bipolar transistors.
27th Int. Symp. on Compound Semi., Monterey, CA, USA, October 2000.

Conference Presentations (235 total till December 2013)

Starting from Year 2013, no more conference presentations will be archived here. But my group attends and presents regularly in international conferences and workshops as evidenced by the past records, including IEDM, DRC, EMC, IWN, ISCS etc. For example, in 2012 we contributed 37 conference presentations, as listed below.

2012:

[C-182] Rusen Yan, Berardi Sensale-Rodriguez, Lei Liu, Debdeep Jena, and **Huili Grace Xing**.
Near-field enhanced graphene terahertz modulators.
The 3rd International Workshop on Terahertz Nanoscience (TeraNano 3), Hawaii, Dec.2012.
(Best Poster Award)

[C-181] [Invited] Berardi Sensale-Rodriguez, Rusen Yan, **Huili Grace Xing**.
Reconfigurable THz devices using graphene.
The 3rd International Workshop on Terahertz Nanoscience (TeraNano 3), Hawaii, Dec.2012.

[C-180] Guangle Zhou, Rui Li, Tim Vasen, Meng Qi, SooDoo Chae, Yeqing Lu, Qin Zhang, H. Zhu, J. Kuo, Tom Kosel, Mark Wistey, Patrick Fay, Alan Seabaugh, **Huili (Grace) Xing**
Novel gate-recessed vertical InAs/GaAs TFETs with record high Ion of 180 uA/um at VDS = 0.5V.
IEEE International Electron Device Meeting (IEDM), San Francisco, December, 2012.

[C-179] Rusen Yan, Qin Zhang, Oleg A. Kirillov, Wei Li, James Basham, Xuelei Liang, Debdeep

Jena, Curt A. Richter, Alan Seabaugh, David J. Gundlach, **Huili G. Xing** and N. V.Nguyen.
Graphene as an electrode for directly observing hole injection from silicon to oxide.
Semiconductor Interface Specialist Conference, San Diego, Dec. 2012.

[C-178] Qin Zhang, Rusen Yan, Oleg A. Kirillov, Kun Xu, Curt A. Richter, Thomas Kosel, **Huili G. Xing**, Alan Seabaugh, Curt A. Richter, David J. Gundlach and N. V. Nguyen.
Band offsets of Al2O3 on an InAs/AlGaSb heterojunction measured by internal photoemission.
Semiconductor Interface Specialist Conference, San Diego, Dec. 2012.

[C-177] [Invited, keynote] **Huili (Grace) Xing**, Debdeep Jena
Ultra-scaled GaN HEMTs and their reliability challenges.
ESREF (European Symposium on Reliability of Electron Devices, Failure Physics and Analysis), Cagliari, Italy, October 2012.

[C-176] Berardi Sensale-Rodriguez, Yeqing Lu, L. Barboni, F. Silverira, Patrick Fay, Debdeep Jena, Alan Seabaugh, and **Huili Grace Xing**
Perspectives of TFETs for low power analog ICs.
IEEE Subthreshold Microelectronics Conference, Waltham, MA, October 2012.

[C-175] (Invited) **Huili (Grace) Xing**, Debdeep Jena
High speed GaN transistors.
IWN (International Workshop on Nitride Semiconductors), Sapporo, Japan, October, 2012.

[C-174] Satyaki Ganguly, Aniruddha Konar, Zongyang Hu, **Huili G. Xing** and Debdeep Jena
Reverse leakage in InAlN/AlN/GaN HEMTs: role of built-in polarization field.
IWN (International Workshop on Nitride Semiconductors), Sapporo, Japan, October, 2012.

[C-173] Yuanzheng Yue, Zongyang Hu, Jia Guo, Berardi Sensale-Rodriguez, *Guowang Li,* Ronghua Wang, Faiza Faria, Bo Song, Xiang Gao, Shipping Guo, Thomas Kosel, Gregory Snider, Patrick Fay, Debdeep Jena and **Huili (Grace) Xing**
Ultrascaled InAlN/GaN HEMTs with ft of 400 GHz.
IWN (International Workshop on Nitride Semiconductors), Sapporo, Japan, October, 2012.

[C-172] Ronghua Wang, *Guowang Li,* Golnaz Karbasian, Jia Guo, Yuanzheng Yue, Zongyang Hu, Oleg Laboutin, Yu Cao, Wayne Johnson, Gregory Snider, Patrick Fay, Debdeep Jena and **Huili (Grace) Xing**
Quaternary barrier InAlGaN HEMTs with ft/fmax of 230/300 GHz.
IWN (International Workshop on Nitride Semiconductors), Sapporo, Japan, October, 2012.
Best Paper Award

[C-171] (Invited) **Huili (Grace) Xing**, Guangle Zhou, Soo Doo Chae, Y. Lu, Rui Li, Tim Vasen, Q. Zhang, J.-M. Kuo, H. Zhu, Patrick Fay, Tom Kosel, Alan Seabaugh, Mark Wistey
Surfaces and interfaces in vertical tunnel FETs,"

AVS annual meeting, Tampa FL, October 2012.

[C-170] (invited) Berardi Sensale-Rodriguez, Rusen Yan, Subrina Rafique, Mingda Zhu, *Vladimir Protasenko*, Debdeep Jena, Lei Liu, and **Huili Grace Xing**
IRMMW-THz, Wollongong, Australia, September 2012.
Exceptional tenability of THz reflection in graphene structures.
Best Student Presentation Award

[C-169] Jai Verma, Prem Kumar Kandaswamy, *Vladimir Protasenko*, Amit Verma, **Huili Grace Xing**, and Debdeep Jena
GaN/AlN quantum dot UV LEDs utilizing tunnel transport by plasma-assisted molecular beam epitaxy.
The 17th International Conference on MBEs, Nara, Japan, September 2012.

[C-168] Berardi Sensale-Rodriguez, Patrick Fay, Lei Liu, Debdeep Jena, and **Huili Grace Xing**
Enhanced terahertz detection in resonant tunnel diode-gated HEMTs.
The 27th Symposium on Microelectronics Technology and Devices, Brasilia, Brazil, August 2012.

[C-167] Rusen Yan, Qin Zhang, Wei Li, Irene Calizo, Tian Shen, Curt Richard, Angela R. Hight-Walker, Xuelei Liang, Alan Seabaugh, Debdeep Jena, and **Huili Grace Xing,** David Gundlach, and Nhan Van Nguyen
Investigation of graphene-oxide-semiconductor band alignment by internal photoemission spectroscopy.
International Symposium on Compound Semiconductors, UCSB, August 2012.

[C-166] Berardi Sensale-Rodriguez, Rusen Yan, Mingda Zhu, Subrina Rafique, Suresh Vishwanath, Wan Sik Hwang, Kristof Tahy, *Vladimir Protasenko*, Michelle Kelly, Lei Liu, Debdeep Jena, and **Huili Grace Xing**
THz reconfigurable optoelectronic devices employing graphene.
International Symposium on Compound Semiconductors, UCSB, August 2012.

[C-165] Wan Sik Hwang, Pei Zhao, Kristof Tahy, Xuesong Li, Chun-Yung Sung, **Huili Grace Xing**, Alan C. Seabaugh, and Debdeep Jena
Ultrathin graphene nanoribbon transistors on wafer-scale chemical-vapor-deposited graphene.
International Symposium on Compound Semiconductors, UCSB, August 2012.

[C-164] Jai Verma, Prem Kumar Kandaswamy, *Vladimir Protasenko*, Amit Verma, **Huili Grace Xing**, and Debdeep Jena
GaN/AlN quantum dot UV LEDs utilizing tunnel transport by plasma-assisted molecular beam epitaxy.
International Symposium on Semiconductor LEDs, Berlin, Germany, July 2012.

[C-163] Berardi Sensale-Rodriguez, Rusen Yan, Subrina Rafique, Michelle Kelly, Lei Liu, Debdeep Jena, and **Huili Grace Xing**
Active THz metamaterials based on self-gated 2DEGs.
Lester Eastman Conference, Brown University, August 2012.

[C-162] Bo Song, *Berardi Sensale-Rodriguez,* Ronghua Wang, Edward Beam, Michael Schuette, Andrew Ketterson, Paul Saunier, Xiang Gao, Shiping Guo, Patrick Fay, Debdeep Jena, and **Huili Grace Xing**
Gate-recessed E-mode InAlN/AlN/GaN HEMTs with ft/fmax of 225/250 GHz.
Lester Eastman Conference, Brown University, August 2012.

[C-161] Yuanzheng Yue, Zongyang Hu, Jia Guo, *Berardi Sensale-Rodriguez, Guowang Li,* Ronghua Wang, Faiza Faria, *Tian Fang,* Bo Song, Xiang Gao, Shiping Guo, Gregory Snider, Patrick Fay, Debdeep Jena, and **Huili (Grace) Xing**
InAlN/AlN/GaN HEMTs with regrown ohmics and ft of 370 GHz.
Electronic Materials Conference, Penn State University, June 2012.

[C-160] *Vladimir Protasenko*, Jai Verma*,* **Huili Grace Xing**, and Debdeep Jena
Excitonic and free carrier recombination in high indium content InGaN layers grown by MBE for photovoltaics.
Electronic Materials Conference, Penn State University, June 2012.

[C-159] Faiza Faria, Jia Guo, Pei Zhao, *Guowang Li*, Prem Kandaswamy, **Huili Grace Xing**, and Debdeep Jena
Study on alloyed ohmic contacts to MBE grown n+GaN with various Si doping concentrations.
Electronic Materials Conference, Penn State University, June 2012.

[C-158] Bo Song, Berardi Sensale-Rodriguez, Ronghua Wang, Michael Schuette, Andrew Ketterson, Edward Beam, Paul Saunier, Shiping Guo, Xiang Gao. Patrick Fay, Debdeep Jena, and **Huili Grace Xing**.
Monolithically integrated E/D-mode InAlN HEMTs with ft/fmax > 200/220 GHz.
Device Research Conference, Penn State University, June 2012.

[C-157] *Guowang Li*, Ronghua Wang, Jai Verma, **Huili Grace Xing**, and Debdeep Jena.
Ultra-thin body GaN-on-Insulator nFETs and pFETs: towards III-nitride complementary logic.
Device Research Conference, Penn State University, June 2012.

[C-156] Jai Verma, Prem Kumar, Amit Verma, *Vladimir Protasenko*, **Huili Grace Xing**, and Debdeep Jena
Tunnel injection GaN/AlN quantum dot UV LED.
Device Research Conference, Penn State University, June 2012.

[C-155] Wan Sik Hwang, Maja Remskar, Rusen Yan, Vladimir Protasenko, Kristof Tahy, Soo

Doo Chae, Alan C. Seabaugh, **Huili Grace Xing**, and Debdeep Jena
First demonstration of two-dimensional WS2 transistors exhibiting 10^5 room temperature modulation and ambipolar bahavior.
Device Research Conference, Penn State University, June 2012.

[C-154] (invited) Wan Sik Hwang, Kristof Tahy, Pei Zhao, R. Myers-Ward, P. Campbell, C. Eddy Jr., K. Gaskill, Alan C. Seabaugh, **Huili Grace Xing**, and Debdeep Jena
Wafer-scale graphene nanoribbon transistor technology.
The 221st ECS Meeting, Seattle, May 2012.

[C-153] Syed M. Rahman, Yi Xie, Zhenguo Jiang, **Huili Xing,** Patrick Fay and Lei Liu
The development of terahertz focal-plane array elements using Sb-based heterostructure backward diode.
The 23rd International Symposium on Space Terahertz Technology, Tokyo, April 2012.

[C-152] Nan Sun, Gerald Arnold, Kristof Tahy, Jianchun Zeng, Huili Xing, Debdeep Jena and Steven Ruggiero
Low-frequency noise in graphene FETs
APS Marching Meeting, March 2012

[C-151] Golnaz Karbasian, A. O. Orlov, P. J. Fay, **Huili Xing**, D. Jena and G. L. Snider
High aspect ratio features in PMGI using electron beam lithography and solvent developers
International Conference on electron, ion and photon beam technology and nanofabrication

[C-150] (Invited) Michael Schuette, Andrew Ketterson, Edward Beam, Tso-Min Chou, Hua-Quen Tserng, Shiping Guo, Xiang Gao. Patrick Fay, **Grace Xing**, Paul Saunier.
State-of-the-art E/D GaN technology based on an InAlN/AlN/GaN heterostructure.
The Government Microcircuit Applications and Critical Technology Conference (GOMACTech), 2012.

[C-149] (Invited) **Huili (Grace) Xing**
GaN: The 3rd electronic revolution?
CSTIC,(China Semiconductor Technology International Conference), Shanghai, March 2012.

[C-148] (Invited) **Huili (Grace) Xing**, Alan Seabaugh
Tunnel field-effect transistors for low voltage electronics.
CSTIC (China Semiconductor Technology International Conference), Shanghai, March 2012.

[C-147] (Invited) **Huili (Grace) Xing**
Graphene THz modulators.
WOCSEMMAND (Workshop on Compound Seminconductor Materials and Devices), Nappa Valley, February 2012.

[C-146] Wan-Sik Hwang, K. Tahy, P. Zhao, R.L. Myers-Ward, P.M. Campbell, C.R. Eddy, Jr., D. K. Gaskill, **H. Xing**, A.C. Seabaugh and D. Jena
Wafer-scale graphene nanoribbons for tunnel FET applications.
The 19th Korean Conference on Semiconductors (KCS), Korea, February 2012.