Curriculum Vitae of Debdeep Jena

Contact Information

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Personal Data

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

Summary

Debdeep Jena is the David E. Burr Professor of Engineering at Cornell University. He is in the departments of Electrical and Computer Engineering and Materials Science and Engineering, and is a field member in the department of Applied and Engineering Physics. 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).

His teaching and research are in the quantum physics of semiconductors and electronic and photonic devices based on quantized semiconductor structures (e.g. Nitrides, Oxides, 2D Materials), and their heterostructures with superconductors, ferroelectrics and magnets. The research realizes device applications in energy-efficient transistors, light-emitting diodes and lasers, RF and power electronics, and quantum computation and communications. His research is driven by the goal to enable orders of magnitude increase in the energy efficiency and speed for computation, memory, communications, lighting, and electrical energy management ranging from the chip to the grid.

The research from his group has been published in more than 400 journal papers including in Science, Nature, Physical Review Letters, Applied Physics Letters and Electron Device Letters. He is a Clarivate highly cited researcher every year since 2020. He is a fellow of the American Physical Society and is the winner of teaching awards and research awards such as the ISCS young scientist award in 2012, MBE young scientist award in 2014, and awards from the industry such as the IBM faculty award in 2012, and most recently the Intel Outstanding Research award in 2020. He has served in leadership roles in several national centers such as the SRC/DARPA JUMP centers, DOE EFRC, NSF DMREF, and NSF EFRI. His research work has resulted in several patents and a spinoff company. Jena's recorded *lectures* have been viewed more than 230,000 times, and his 2022 textbook *Quantum Physics of Semiconductor Materials and Devices* has been adopted by several universities for undergraduate and graduate courses.

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"

Professional Experience

Academic Appointments

2015 - **Cornell University**, Ithaca, NY
Department of Electrical and Computer Engineering
Department of Materials Science and Engineering
Title: David E. Burr Professor of Engineering

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

Distinctions, Honors, & Awards

2023	Most Valuable Contribution, WOCSEMMAD (Workshop on Compound Semiconductor Materials and Devices)
2022	Advisor of PhD student Len van Deurzen, winner of the best student paper award for IWN Berlin, 2022.
2022	Advisor of PhD student Jon McCandless, winner of the best student paper award for IWGO Nagano, 2022.
2022	Advisor of PhD student Joseph Casamento, winner of the best student paper award for CSW Ann Arbor, 2022.
2022	Advisor of PhD student Reet Chaudhuri, winner of the Springer outstanding thesis award for 2022.
2022	Advisor of PhD student Reet Chaudhuri, winner of the best Cornell ECE PhD dissertation award for 2022.
2021	Advisor of PhD student Jon McCandless, winner of the best student paper award for EMC, 2021.
2021	Advisor of PhD student Austin Hickman, winner of the Cornell Comercialization Fellowship for 2021.
2020	Advisor of Undergraduate student Ms. Rosalyn Koscica, winner of the Dorothy and Fred Chau award for outstanding undergraduate research, 2020.
2020	Advisor of PhD student John Wright, winner of the Ed Nicollian award for IEEE SISC, 2020.
2020	Intel Outstanding Research award, 2020.
2019	Advisor of visiting PhD student Ms. Riena Jinno, winner of the best student paper award for IWGO Columbus, 2019.
2019	Advisor of PhD student Kevin Lee, winner of the best student paper award for Device Research Conference (DRC), University of Michigan, 2019.
2018	Appointed David E. Burr Chaired Professor of Engineering at Cornell University.
2018	Advisor of PhD student Shyam Bharadwaj, winner of the best student paper award for Compound Semiconductor Week (CSW), Boston, 2018.
2017	Fellow, American Physical Society
2017	Advisor of PhD student Kevin Lee, winner of a best student paper award for the International Workshop on UV Materials and Devices (IWUMD), Fukuoka 2017.
2017	Advisor of Shyam Bharadwaj, winner of the best student paper award for Device Research Conference (DRC), Notre Dame, 2017.
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

Patents Issued

10. *High-voltage p-channel FET based on III-nitride heterostructures.*
Samuel James Bader, Reet Chaudhuri, Huili Grace Xing, and Debdeep Jena
Issued on December 6, 2022, **US Patent Number 11,522,080 B2**.

9. *Platforms enabled by buried tunnel junction for integrated photonic and electronic systems.*
Henryk Turski, Debdeep Jena, Huili Grace Xing, Shyam Bharadwaj, Alexander Austin Chaney, and Kazuki Nomoto
Issued on October 18, 2022, **US Patent Number 11,476,383 B2**.

8. *Light emitting diodes using ultra-thin quantum heterostructures.*
SM Islam, Vladimir Protasenko, Huili Grace Xing, Debdeep Jena, and Jai Verma
Issued on June 22, 2021, **US Patent Number 11,043,612 B2**.

7. *Polarization field assisted heterostructure design for efficient deep ultraviolet light emitting diodes.*
SM Islam, Vladimir Protasenko, Huili Grace Xing, and Debdeep Jena
Issued on March 23, 2021, **US Patent Number US10,957,817 B2**.

6. *Polarization-induced 2D hole gases for high-voltage p-channel transistors.*
Reet Chaudhuri, Samuel James Bader, Debdeep Jena, and Huili Grace Xing
Issued on October 26, 2021, **US Patent Number 11,158,709 B2**.

5. *Group III-Nitride compound heterojunction tunnel field-effect transistors and methods for making the same.*
Patrick Fay, Lina Cao, Debdeep Jena, and Wenjun Li
Issued on April 24, 2018, **US Patent Number 9,954,085**.

4. *Polarization Induced Doped Transistor.*
Huili (Grace) Xing, Debdeep Jena, Kazuki Nomoto, Bo Song, Mingda Zhu and Zongyang Hu
Issued on June 7, 2016, **US Patent Number 9,362,389**.

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**.

Important research publications of Prof. Debdeep Jena

Wide bandgap nitride semiconductors and superconductors:

1. Discovery[1] of distributed polarization doping for mobile electrons (n-type doping) in wide bandgap semiconductors in 2002, and its use for the first PolFET in 2002 (chapter 5 of Jena's PhD thesis, and patent: US Patent 7,525,130). This discovery enabled PolFET transistors in the semiconductor industry by companies such as HRL and Qorvo Inc.

2. Discovery[2] of distributed polarization doping for mobile holes (p-type doping) in wide bandgap semiconductors in 2009 and its use in UV LEDs (US Patent 8,835,998, US Patent 10,957,817 B2). The p-type doping of GaN with the acceptor Mg that enabled blue LEDs and lasers in 1990s and 2000s was insufficient to realize UV lasers with wider bandgap AlGaN and AlN. Our discovery of distributed polarization doping of holes was used by industry to realize the first ever electrically injected deep-UV semiconductor laser its CW operation in 2022, by the company Asahi Kasei.

3. Discovery[3] of ultrahigh density 2D hole gases at undoped wide bandgap semiconductor heterojunctions due to polarization discontinuity in 2019. Even though p-type doping of GaN with the acceptor Mg had enabled blue LEDs and lasers in 1990s and 2000s, the hole density remained insufficient for high-performance p-channel transistors. This 2019 discovery enabled us to demonstrate the first ever RF p-channel GaN transistors in 2020, and the patents US Patent 11,158,709 B2 and US Patent 11,522,080 B2.

4. Realization[4] of epitaxial nitride semiconductor-superconductor heterostructures in 2018, and in 2021, subsequent use of such heterostructures for the demonstration of co-existence of the integer quantum Hall effect and superconductivity.[5]

Atomically thin 2D materials:

5. Dielectric effects on scattering and mobility in 2D crystals and nanomembranes,[6] and scattering and mobility limits in atomically thin semiconductors,[7] and one of the earliest realization (in collaboration with Samsung) of a 2D material channel FETs to show current saturation and near ideal switching.[8]

[1] D. Jena et al. "Realization of wide electron slabs by polarization bulk doping in graded III-V Nitride semiconductor alloys". In: *Appl. Phys. Lett.* 81 (2002), p. 4395.

[2] John Simon et al. "Polarization Induced Hole Doping in Wide Bandgap Uniaxial Semiconductor Heterostructures". In: *Science* 327 (2010), pp. 60–64.

[3] Reet Chaudhuri et al. "A polarization-induced 2D hole gas in undoped gallium nitride quantum wells". In: *Science* 365.6460 (2019), pp. 1454–1457.

[4] R. Yan et al. "GaN/NbN epitaxial semiconductor/ superconductor heterostructures". In: *Nature* 555 (2018), p. 183.

[5] Phillip Dang et al. "An all-epitaxial nitride heterostructure with concurrent quantum Hall effect and superconductivity". In: *Science Advances* 7 (2021), eabf1388.

[6] Debdeep Jena and Aniruddha Konar. "Enhancement of carrier mobility in semiconductor nanostructures by dielectric engineering". In: *Physical Review Letters* 98.13 (2007).

[7] Nan Ma and Debdeep Jena. "Charge scattering and mobility in atomically thin semiconductors". In: *Physical Review X* 4 (2014), p. 011043.

[8] Sunkook Kim et al. "High-mobility and low-power thin-film transistors based on multilayer MoS_2 crystals". In: *Nature communications* 3 (2012), p. 1011.

Ultra wide-bandgap oxide semiconductors:

6. Realization[9] of the first nanomembrane transistors with the wide bandgap oxide semiconductor Ga_2O_3, the evaluation of mobility limits in this semiconductor,[10] and demonstration[11] of epitaxy of the widest energy bandgap semiconductor heterostructures up to 8.8 eV.

Important review articles of Prof. Debdeep Jena

Wide bandgap nitride semiconductors and superconductors:

1. The earliest review article on the many nuances of controlling and using electronic polarization discontinuities in semiconductor heterostructures as a new engineering tool was outlined in a review article by Jena.[12] His more recent review article on this topic[13] considerably expands the nitride semiconductor family and discusses exciting new possibilities afforded by heterostructures of polar nitride semiconductors with correlated nitrides: ferroelectrics, magnets, and superconductors, to create a "New-nitride eco-system".

Atomically thin 2D materials:

2. Jena wrote an early article[14] on electron tunneling phenomena in atomically thin and 2D materials such as graphene, MoS2, and related materials, and a commentary[15] on the difficulty and possibilities of making transparent low resistance contacts to their bands. In another review article[16] Jena's contribution is all sections on the future of 2D materials for use in transistor technologies due to their atomically thin nature, and their ultimate quantum mechanical and ballistic limits.

Ultra wide-bandgap oxide semiconductors:

3. In the first book on Gallium Oxide (Springer, 2019), Jena wrote a chapter called *Gallium Oxide Materials and Devices - A Personal Recent History* which gives a deeply personal account of science and physics of this exciting new semiconductor material, but more importantly several anecdotes of its history, and the twisted and connected paths that led to the rapid expansion of this semiconductor family in the last decade.

Important lecturing of Prof. Debdeep Jena

1. Jena's recorded *lectures* have been viewed more than 230,000 times, and his 2022 textbook[17]

[9] Wan Sik Hwang et al. "High-voltage field effect transistors with wide-bandgap Ga_2O_3 nanomembranes". In: *Applied Physics Letters* 104.20 (2014), p. 203111.

[10] Nan Ma et al. "Intrinsic electron mobility limits in Ga_2O_3". In: *Applied Physics Letters* 109.21 (2016), p. 212101.

[11] Riena Jinno et al. "Crystal orientation dictated epitaxy of ultrawide-bandgap 5.4- to 8.6-eV $(Al_xGa_{1-x})_2O_3$ on m-plane sapphire". In: *Science Advances* 7.2 (2021).

[12] Debdeep Jena et al. "Polarization-engineering in group III-nitride heterostructures: New opportunities for device design". In: *physica status solidi (a)* 208.7 (2011), pp. 1511–1516.

[13] Debdeep Jena et al. "The new nitrides: layered, ferroelectric, magnetic, metallic and superconducting nitrides to boost the GaN photonics and electronics eco-system". In: *Japanese Journal of Applied Physics* 58 (May 2019), SC0801. ISSN: 1347-4065.

[14] D. Jena. "Tunneling Transistors based on Graphene and 2D Crystals". In: *Proceedings of the IEEE* 101.12 (2013), pp. 1585–1602.

[15] Debdeep Jena, Kaustav Banerjee, and Huili Xing. "Intimate Contacts". In: *Nature Materials* 13 (2014), p. 1076.

[16] Manish Chhowalla, Debdeep Jena, and Hua Zhang. "Two-dimensional semiconductors for transistors". In: *Nature Reviews Materials* 1.11 (2016).

[17] D. Jena. *Quantum Physics of Semiconductor Materials and Devices*. Oxford University Press, 2022.

Quantum Physics of Semiconductor Materials and Devices has been adopted by several universities for undergraduate and graduate courses.

2. Jena has co-edited two books: the first on polarization effects in semiconductors,[18] and the second on high-frequency gallium nitride transistors.[19] In addition to leading the organization of the books, he has written several chapters of each book. These books have found wide usage in academia and industry because in these fast moving fields of new semiconductor materials, older textbooks are yet to incorporate the novelties of the materials physics and transport phenomena.

3. Since mid 2000s, Jena has regularly offered plenary talks, tutorials, and short courses in several national and international conferences, workshops, and summer schools. Assorted examples over the years include:

[2019] DFG German summer school on Oxide semiconductors in Como (Italy).

[2018] Short course in the 2018 International Workshop on Nitride Semiconductors in Kanazawa (Japan).

[2014] Summer School: Finding Nano summer school in Munich (Germany).

[2013] Short course on 2D materials in the IEEE DRC at Notre Dame (USA).

[2012] Short course on GaN transistors at the CSW in Santa Barbara (USA).

[2011] Short course on: Polarization physics and device applications in III-Nitride Heterostructures in the Jaszowiec School at Krynica (Poland).

[18] C. Wood and D. Jena. *Polarization Effects in Semiconductors: From Ab-Initio Theory to Device Applications*. New York: Springer, 2007.

[19] P. Fay, D. Jena, and P. Maki. *High Frequency GaN Electronic Devices*. Springer, 2020.

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

Books:

3) **Book**
Quantum Physics of Semiconductor Materials and Devices
Oxford University Press (2022), ISBN: 0198856857
Textbook for senior undergraduate and early graduate students.

2) **Book**
High-Frequency GaN Electronic Devices
Springer, Berlin (2020), ISBN: 978-3-030-20207-1
Editor, jointly with P. Fay and P. Maki, contributed 3 chapters.

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.

Monographs and Book Chapters:

7) **Book Chapter**
Gallium Oxide Materials and Devices - A Personal Recent History
Debdeep Jena
Gallium Oxide, Springer, 2019.

6) **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), WSPC, 2016.

5) **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.

4) **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.

3) **Book Chapter**
Graphene
Debdeep Jena
Springer Encyclopedia on Nanotechnology, 2012.

2) **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

1) **Monograph**
Studies of MBE-Grown Single and Multiple AlN/GaN Heterojunctions
Cao Yu and Debdeep Jena
VDM Verlag (2008), ISBN: 3836475944

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

Electronic copies are available upon request. The most recent list is available at:
`https://djena.engineering.cornell.edu/PaperArchivesDJ.htm`

Journal Articles (>400) Publications, including in Science, Nature Journals, PRL, PRX, PRB, Nano Lett, IEEE Proceedings, EDL, TED, APL, JAP, etc...

Updated list@ `https://djena.engineering.cornell.edu/PaperArchivesDJ.htm`

211- Please find the publications from 211 - today at this website.

210. A. Franklin et al.,
75 Years of the Device Research Conference: A History Worth Repeating.
IEEE Journal of the Electron Device Society, **6**, 116, (2018).

209. Z. Hu et al.,
Enhancement-Mode Ga_2O_3 Vertical Transistors With Breakdown Voltage >1 kV.
IEEE Electron Device Letters, **39**, 869, (2018).

208. J. Encomendero et al.,
Room temperature microwave oscillations in GaN/AlN resonant tunneling diodes with peak current densities up to 220 kA/cm^2.
Applied Physics Letters, **112**, 103101, (2018).

207. R. Yan et al.,
GaN/NbN epitaxial semiconductor/superconductor heterostructures.
Nature, **555**, 183, (2018).

206. E. Marin et al.,
A New Holistic Model of 2-D Semiconductor FETs.
IEEE Transactions on Electron Devices, **65**, 1239, (2018).

205. A. Verma et al.,
Steep Sub-Boltzmann Switching in AlGaN/GaN Phase-FETs With ALD VO_2.
IEEE Transactions on Electron Devices, **65**, 945, (2018).

204. S. Vishwanath et al.,
MBE growth of few-layer 2H-$MoTe_2$ on 3D substrates.
Journal of Crystal Growth, **482**, 61, (2018).

203. C. Liu et al.,
234 nm and 246 nm AlN-Delta-GaN quantum well deep ultraviolet light-emitting diodes.
Applied Physics Letters, **112**, 011101, (2018).

202. J. Y. Tsao et al.,
Ultrawide Bandgap Semiconductors: Research Opportunities and Challenges.
Advanced Electronic Materials, **4**, 1600501, (2017).

201. H. Paik et al.,
Adsorption-controlled growth of La-doped $BaSnO_3$ by molecular-beam epitaxy.
Applied Physics Letters Materials, **5**, 116107, (2017).

200. J. Encomendero et al.,
New Tunneling Features in Polar III-Nitride Resonant Tunneling Diodes.
Physical Review X, **7**, 041017, (2017).

199. S. M. Islam et al.,
Deep-UV emission at 219 nm from ultrathin MBE GaN/AlN quantum heterostructures.
Applied Physics Letters, **111**, 091104, (2017).

198. H. Condori Quispe et al.,
Terahertz spectroscopy of an electron-hole bilayer system in AlN/GaN/AlN quantum wells.
Applied Physics Letters, **111**, 073102, (2017).

197. Z. Hu et al.,
1.1-kV vertical GaN pn diodes with p-GaN regrown by molecular beam epitaxy.
IEEE Electron Device Letters, **38**, 1071, (2017).

196. Y. Cho et al.,
Single-crystal N-polar GaN p-n diodes by plasma-assisted molecular beam epitaxy.
Applied Physics Letters, **110**, 253506, (2017).

195. M. Zhu et al.,
Electron mobility in polarization-doped $Al_{0-0.2}GaN$ with a low concentration near 10^{17} /cm^3.
Applied Physics Letters, **110**, 182102, (2017).

194. A. Zubair et al.,
Hot electron transistor with van der Waals base-collector heterojunction and high-performance GaN emitter.
Nano Letters, **17**, 3089, (2017).

193. C. Liu et al.,
Physics and Polarization Characteristics of 298 nm AlN-δ-GaN Quantum Well UV LEDs.
Applied Physics Letters, **110**, 071103, (2017).

192. W. Li et al.,
Design and realization of GaN trench junction-barrier-Schottky-diodes (JBSD).
IEEE Transactions on Electron Devices, **64**, 1635 (2017).

191. L. Zhang et al.,
ICP-RIE etching of single-crystal $\beta-Ga_2O_3$.
Japanese Journal of Applied Physics, **56**, 030304, (2017).

190. M. Qi et al.,
Strained GaN Quantum-Well FETs on Single-Crystal Bulk AlN Substrates.
Applied Physics Letters, **110**, 063501, (2017).

189. S. M. Islam et al.,
MBE-grown 232-270 nm deep-UV LEDs using monolayer-thin binary GaN/AlN quantum heterostructures.
Applied Physics Letters, **110**, 041108, (2017).

188. D. Bayerl et al.,
Deep-UV Emission from Ultra-Thin GaN/AlN Heterostructures.
Applied Physics Letters, **109**, 241102, (2016).

187. N. Ma et al.,
Intrinsic electron mobility limits in β-Ga_2O_3.
Applied Physics Letters, **109**, 212101, (2016).

186. M. Chhowalla, D. Jena, and H. Zhang,
Two-Dimensional Semiconductors for Transistors.
Nature Reviews, **1**, 1-15, (2016).

185. P. Gupta et al.
Layered transition metal dichalcogenides: promising near-lattice-matched substrates for GaN growth.
Nature Scientific Reports, **6**, srep23708, (2016).

184. J. H. Park et al.
Scanning Tunneling Microscopy and Spectroscopy of Air Exposure Effects on MBE-Grown WSe_2 Monolayers and Bilayers.
ACS Nano, **10**, 4258, (2016).

183. A. Verma et al.
Room temperature weak ferromagnetism in $Sn_xMn_{1-x}Se_2$ 2D films grown by Molecular Beam Epitaxy.
APL Materials, **4**, 032601, (2016).

182. A. Verma et al.
Large electron concentration modulation using capacitance enhancement in $SrTiO_3$/$SmTiO_3$ Fin-FETs.

Appl. Phys. Lett., **108**, 183509, (2016).

181. S. M. Islam et al.
Sub-230 nm deep-UV emission from GaN quantum disks in AlN grown by a modified Stranski-Krastanov mode.
Jap. J. Appl. Phys., **55**, 05FF06, (2016).

180. S. M. Islam et al.
High-quality InN films on GaN using graded InGaN buffers by MBE.
Jap. J. Appl. Phys., **55**, 05FD12, (2016).

179. S. Vishwanath et al.
Controllable growth of layered selenide and telluride heterostructures and superlattices using MBE.
J. Mat. Res., **31**, 900, (2016).

178. K. Nomoto et al.
1.7 kV and 0.55 mΩ.cm^2 GaN p-n diodes on Bulk GaN substrates with Avalanche Capability.
IEEE Electron Device Letters, **37**, 161, (2016).

177. B. Song et al.
Ultralow-Leakage AlGaN/GaN HEMTs on Si with Non-Alloyed Regrown Ohmic Contacts.
IEEE Electron Device Letters, **37**, 16, (2016).

176. Z. Hu et al.
Near unity ideality factor and Shockley-Read-Hall lifetime in GaN-on-GaN p-n diodes with avalanche breakdown.
Appl. Phys. Lett., **107**, 243501, (2015).

175. M. Qi et al.
High breakdown single-crystal GaN p-n diodes by molecular beam epitaxy.
Appl. Phys. Lett., **107**, 232101, (2015).

174. A. Verma et al.
Ferroelectric transition in compressively strained $SrTiO_3$ thin films.
Appl. Phys. Lett., **107**, 192908, (2015).

173. X. Yan et al.
Polarization-induced Zener tunnel diodes in GaN/InGaN/GaN heterojunctions.
Appl. Phys. Lett., **107**, 163504, (2015).

172. R. Yan et al.
Esaki Diodes in van der Waals Heterojunctions with Broken-Gap Energy Band Alignment.
Nano Letters, **15**, 5791, (2015).

171. K. Feng et al.
Determination of the Mott-Hubbard gap in $GdTiO_3$.
Physical Review B, **92**, 085111, (2015).

170. K. Feng et al.
Localized surface phonon polariton resonances in polar gallium nitride.
Applied Physics Letters, **107**, 081108, (2015).

169. R. Jana et al.
Transistor Switches using Active Piezoelectric Gate Barriers.
IEEE J. Expl. CDC, **1**, 35, (2015).

168. W. Li et al.
Polarization-Engineered III-Nitride Heterojunction Tunnel Field-Effect Transistors.
IEEE J. Expl. CDC, **1**, 28, (2015).

167. S. Vishwanath et al.
Comprehensive structural and optical characterization of MBE-grown MoSe2 on graphite, CaF2, and graphene.
2D Materials, **2**, 024007, (2015).

166. F. Faria et al.
Low-temperature AlN growth by MBE and its application in HEMTs.
J. Crystal Growth, **425**, 133, (2015).

165. Z. Guo et al.
Anisotropic Thermal Conductivity in Single-Crystal beta-Gallium Oxide.
Appl. Phys. Lett., **106**, 111909, (2015).

164. M. Zhu et al.
1.9 kV AlGaN/GaN lateral Schottky barrier diodes on Silicon.
IEEE Electron Dev. Lett., **36**, 375, (2015).

163. M. Li et al.
2-dimensional heterojunction interlayer tunneling FETs (Thin-TFETs).
IEEE J. Electron Devices Society, **3**, 200, (2015).

162. M. Qi et al.
Dual optical marker Raman characterization of strained GaN channels on AlN using AlN/GaN/AlN quantum wells and ^{15}N isotopes.
Appl. Phys. Lett., **106**, 041906, (2015).

161. N. Ma and D. Jena

Carrier statistics and quantum capacitance effects on mobility extraction in 2D crystal FETs.
2D Materials, **2**, 015003, (2015).

160. S. Fathipour et al.
Synthesized multi wall MoS_2 nanotube and nanoribbon FETs.
Appl. Phys. Lett., **106**, 022114, (2015).

159. W. S. Hwang et al.
Graphene Nanoribbon FETs on wafer-scale epitaxial graphene on SiC substrates.
APL Materials, **3**, 011101, (2015).

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Polarization sensitive photodetectors based on solution-synthesized semiconductor nanowire based quantum-wire solids.
Nano Letters, **7** (10), 2999 (2007).

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MBE-Grown Ultra-shallow AlN/GaN HFET Technology.
ECS Transactions, **11**, 233, (2007).

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Carrier statistics and quantum capacitance in Graphene sheets and ribbons.
Applied Physics Letters, **91** 092109 (2007).

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Hydrodynamic instability of one-dimensional electron flow in semiconductors.
Journal of Applied Physics, **102** 023703 (2007).

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A High-Mobility Window for Two-Dimensional Electron Gases at Ultrathin AlN/GaN Heterojunctions.
Applied Physics Letters, **90** 182112 (2007).

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Resonant Terahertz generation from InN thin films.
Optics Letters, **32** 1432 (2007).

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Journal of Applied Physics, **101** 073704 (2007).

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Enhancement of carrier mobility in semiconductor nanostructures by dielectric engineering.
Physical Review Letters, **98**, 136805, (2007).

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Compositional modulation and optical emission in AlGaN 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).

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Effect of dislocation scattering on the transport properties of InN grown on GaN substrate by Molecular Beam Epitaxy.
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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 AlGaN.
Applied Physics Letters, **88** 042109 (2006).

16. K. Wang, J. Simon, N. Goel, and D. Jena
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15. S. Rajan, S. DenBaars, U. K. Mishra, H. Xing, and D. Jena
Electron mobility in graded AlGaN 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).

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
AlGaN/GaN polarization-doped field-effect transistor for microwave power applications.
Applied Physics Letters **84**, 1591-1593 (2004).

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Magnetotransport measurement of effective mass, quantum scattering time, and alloy scattering potential of polarization-doped 3D electron slabs in graded AlGaN.
Physica Status Solidi (c), **0**, 2339-2343 (2003).

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Magnetotransport properties of a polarization doped three-dimensional electron slab.
Physical Review B, **67**, 153306-(1-4) (2003).

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Explanation of anomalously high current gain (β) 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
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).

Invited Talks

Note: An updated list is available upon request. The list below is terminated in 2014. I have since then given typically ∼10 invited talks/year. Some of these talks are plenary talks at international conferences.

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).

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*
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).

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).

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).

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 multifunctional 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).

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).

Industrial Activities

2023-2024 **Northrup Grumann**, Redondo Beach, CA
Task: Development of AlScN for non linear photonics.

2021-2023 **Northrup Grumann**, Linthicum, MD
Task: Development of AlScN/GaN FETs.

2018-2021 **Intel**, Portland, OR
Task: Development of high-voltage p-channel FETs.

2018-2021 **Crystal-IS**, Albany, NY
Task: Development of deep-UV photonic devices.

2018-2020 **Teledyne**, Thousand Oaks, CA
Task: Development of GaN high-power microwave electronics.

2014-2017 **Qorvo/Triquint Semiconductors**, Richardson, TX
Task: Development of GaN power electronics.

2014-2017 **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.

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 AlGaN thin films

2007 **Traycer Diagnostic Systems**, Columbus, OH
Task: MBE growth of AlN/GaN Heterostructures for enabling terhahertz imaging of biological species

Professional Activities

Note: An updated list is available upon request. The list below is terminated in 2017. I have since then continued to organize and serve on several committees ranging from international conferences, and NSF, SRC, and DARPA panels and workshops.

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.

Program Committee Chair or Co-Chair:

2017 Device Research Conference (IEEE DRC), General Chair.
2016 Device Research Conference (IEEE DRC), Program Chair.
2015 Device Research Conference (IEEE DRC), Program Vice Chair.
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 Chair.

Program Committee Member:

2016 International Electron Devices Meeting (IEDM).
2015 International Electron Devices Meeting (IEDM).
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
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)