Jonathan J. Wierer, Jr., Ph.D.

Jonathan Wierer is a professor in the Department of Electrical and Computer Engineering at North Carolina State University. His research interests include semiconductor device physics and materials science. Specifically, he has made significant contributions to III-nitride electronic and optoelectronic devices. Throughout his career, he has conducted research across various organizations, including universities, industry, and national laboratories. This work has led to an extensive patent portfolio and highly cited journal articles

Jonathan earned his M.S., B.S., and Ph.D. in electrical engineering from the University of Illinois at Urbana-Champaign in 1994, 1995, and 1999, respectively. His Ph.D. advisor was Nick Holonyak, Jr., and his thesis research topic was tunnel junctions in InGaAs light emitters. This was the first time tunnel junctions were used in LEDs and laser diodes, enabling efficient current rerouting and removing absorptive p-type layers. This method now enables near-infrared, vertical-cavity surface-emitting lasers, and III-nitride ultraviolet and visible LEDs.

After his doctorate, he joined Hewlett-Packard (later Lumileds Lighting), researching novel III-nitride light-emitting diodes (LEDs). He worked with the team that produced the world's first high-power (1-watt) III-nitride flip-chip LEDs (FCLEDs). These illumination-grade LEDs drastically differed from indicator LEDs and are arguably the light sources that began solid-state lighting (SSL). Jonathan was a key contributor to the research and development of FCLEDs, leading them into successful manufacturing. Today, most high-power LEDs are variations on this original FCLED.

Later, at Lumileds, he joined the Advanced Laboratories, pursuing high-risk, long-term LED research. There, he primarily investigated photonic crystal LEDs. His seminal papers on photonic crystal LEDs demonstrated the ability to control emission patterns and established records in extraction efficiency. His most cited and patented works include his photonic crystal LED research.

In 2008, he joined Sandia National Laboratories. His interests broadened to include III-nitride research on laser diodes (LDs) for SSL, solar cells, intersubband devices, power electronic devices, and ultraviolet-emitting LEDs. Most notable is his ground-breaking work on proposing LDs as an ultra-efficient light source for SSL. His critical insight is that LDs can circumvent the decrease in efficiency in III-nitride LEDs (efficiency droop). This work began more substantial research efforts into this area by other researchers and companies.

From 2015 to 2021, he served as a professor at Lehigh University, where his research focused on investigating InGaN-based quantum dot active layers to develop higher-efficiency LEDs and laser diodes. His group worked on synthesis methods to create controlled ensembles of quantum dots (QDs). He has also been researching long-wavelength visible (green to red) InGaN LEDs utilizing AlGaN interlayer quantum well designs. This research demonstrated that a tensile AlGaN interlayer can control the compressive strain of InGaN quantum wells and prevent defect formation, leading to higher efficiencies. Another research area Jonathan explored at Lehigh involved new wide-bandgap power electronic devices using III-nitride semiconductors. The wide bandgap results in higher critical electric fields and higher breakdown voltages. This power device research includes investigating novel edge termination schemes and ultra-wide bandgap III-nitride semiconductors, such as AlGaN and AlInN. One noteworthy outcome of this research is the thermal oxidation of AlInN, which forms native AlInO.

In 2021, he moved to North Carolina State University and continued his semiconductor device physics and materials research at NC State University, working in III-nitride photonics and power electronic devices.

Dr. Wierer has authored or co-authored over 200 journal publications and conference presentations and holds 42 patents, predominately related to III-nitride devices. He is a senior editor for IEEE Photonics Technology Letters and an associate editor for the IEEE Journal of Quantum Electronics. He is a Fellow of Optica (formerly OSA) and is a senior member of the Institute of Electrical and Electronics Engineers.

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Academic Degrees

Ph.D. Electrical Engineering University of Illinois, Champaign Urbana, IL 1995-99
- Advisor: Nick Holonyak, Jr.
- Thesis Title: Tunnel contact junction AlGaAs-GaAs-InGaAs quantum well heterostructure lasers and light emitters with native-oxide-defined lateral currents
- Gregory Stillman Semiconductor Research Award (1998).

M.S. Electrical Engineering University of Illinois, Champaign Urbana, IL 1994-95
- Advisor: Paul D. Coleman
- Thesis Title: Overview of the Far Infrared p-type Ge Laser

B.S. Electrical Engineering University of Illinois, Champaign Urbana, IL 1990-94
- Honors

Professional Experience

Aug 2021-present
Professor
North Carolina State University, Raleigh, NC
College of Engineering
Electrical and Computer Engineering

June 2021 - Aug 2021
Adjunct Professor
North Carolina State University, Raleigh, NC
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July 2015 - Aug 2021
Associate Professor
Lehigh University, Bethlehem, PA
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Electrical and Computer Engineering

	Center for Photonics and Nanoelectronics
Oct 2008 - June 2015	Principal Member of Technical Staff Sandia National Laboratories, Albuquerque, NM Semiconductor Materials and Device Sciences
March 2013 - June 2013	Acting Manager (concurrent with Technical Staff position) Sandia National Laboratories, Albuquerque, NM Semiconductor Materials and Device Sciences Department
Jan 2004 - Sept 2008	Senior Scientist Lumileds Lighting/Philips Lumileds Lighting, San Jose, CA Advanced Laboratories
Nov 2000 - Jan 2004	Staff Scientist Lumileds Lighting, San Jose, CA Advanced Laboratories
2000 Fall Semester	Instructor (concurrent with Lumileds employment) San Jose State University, San Jose, CA Department of Chemical and Materials Engineering
May 1999 - Nov 2000	Research and Development Engineer Hewlett Packard, San Jose, CA/Agilent/Lumileds Lighting III-V Materials Development
Jan 1999 - May 1999	Hardware Design Engineer Hewlett Packard, San Jose, CA Fiber Optics Division
June 1995 - Jan 1999	Graduate Research Assistant University of Illinois, Champaign-Urbana, IL Solid State Devices Laboratory (advisor: N. Holonyak, Jr.)
June 1994 – June 1995	Graduate Research Assistant University of Illinois, Champaign-Urbana, IL Electrophysics Laboratory (advisor: P. D. Coleman)
June 1993 - June 1994	Undergraduate Research Assistant University of Illinois, Champaign-Urbana, IL Electrophysics Laboratory (advisor: P. D. Coleman)

Publication Statistics

- Published Refereed Publications: 80 (2 under review)
- Conference Presentations: 141, Invited: 30
- Patents:
  - US Patents: 42 (search: Wierer.IN. *AND* Jonathan.IN.)

  - PatentGURU
  - European Patents: 35
- Book Chapters: 3
- Conference Proceedings: 7
- News Items: 39
- Google Scholar: https://scholar.google.com/citations?user=mnUvAGMAAAAJ&hl=en
  - Citations: 10016, h-index: 47, i10-index: 91
- Web of Science ResearcherID: https://www.webofscience.com/wos/author/record/1380925
  - Citations: 5127, h-index: 31
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Additional Web Information

- AcademicTree
- ScholarGPS
- ResearchGate
- Linkedin
- Scopus
- Kudos
- Semantic Scholar
- AMiner
- AD Scientific index
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- Research.com

Publications

1. K. Markham, M. Rabbani, F.-C Hsiao, J. J. Wierer, Jr., and F. Kish, "Visible-Spectrum (405-505nm) Low-Temperature-Deposited Deuterated(D) SiNx-SiOy Waveguides," under review at Appl. Phys. Lett. (2025).
2. H. Xue, E. Palmese, B. J. Sekely, D. Gray-Boneker, A. Gonzalez, D. Rogers, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr., "Parametric Analysis of Optical and Structural Characteristics of AlInN/GaN Superlattices with Varying AlInN Fractions," accepted Journal of Crystal Growth (2005).
3. D. Rogers, H. Xue, E. Palmese, and J. J. Wierer, Jr., "Comment on Structural and optical characterization of thin AlInN films on c-plane GaN substrates," Journal of Applied Physics, 136, 166101 (2024). DOI: 10.1063/5.0237160
4. E. Palmese, H. Xue, D. Rogers, and J. J. Wierer, Jr., "Light-Triggered, Enhancement-Mode AlInN/GaN HEMTs with Sub-microsecond Switching Times," IEEE Electron Device Letters, 54, 1903-1906 (2024). DOI: 10.1109/LED.2024.3440177
5. D. Rogers, H. Xue, F. Kish, F.-C. Hsiao, B. Pezeshki, A. Tselikov, and J. J. Wierer, Jr., "High Bandwidth GaN-based Micro-LEDs for Visible Light Communications at Temperatures up to 400°C," IEEE Photonics Technology Letters, 36, 1069-1072 (2024). DOI: 10.1109/LPT.2024.3434601

6. H. Xue, E. Palmese, B. J. Sekely, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr., "Growth and Characterization of AlInN/GaN Superlattices," Journal of Crystal Growth, 630, 127567 (2024). DOI: 10.1016/j.jcrysgro.2024.127567
7. E. Palmese, H. Xue, S. Pavlidis, and J. J. Wierer Jr., "Enhancement-Mode AlInN/GaN High-Electron-Mobility Transistors Enabled by Thermally Oxidized Gates," IEEE Transactions on Electron Devices, 71, 1003 (2023). DOI: 10.1109/TED.2023.3343313
8. H. Xue, E. Palmese, R. Song, M. I. Chowdhury, N. C. Strandwitz, and J. J. Wierer Jr., "Structural and Optical Characterization of Thin AlInN Films on c-Plane GaN Substrates," Journal of Applied Physics, 134, 075301 (2003). DOI: 10.1063/5.0136004
9. E. Palmese, H. Xue, R. Song, and J. J. Wierer Jr., "Thermal Oxidation of Lattice Mismatched $Al_{1-x}In_xN$ films on GaN," e-Prime - Advances in Electrical Engineering, Electronics and Energy, 5, 100208 (2023). DOI: 10.1016/j.prime.2023.100208
10. L. Shvilberg, T. Mimura, H. Xue, J. J. Wierer Jr., El. A. Paisley, H. Heinrich, and J. F. Ihlefeld "Electrical Performance of Sputtered Epitaxial Magnesium Oxide on *n*-Type Gallium Nitride Metal-Oxide-Semiconductors Devices," IEEE Transactions on Electron Devices, 70, 3442 (2023). DOI: 10.1109/TED.2023.3269406
11. X. Wei, S. A. A. Muyeed, H. Xue, and J. J. Wierer, Jr., "Anisotropic Etching of InGaN Thin Films with Photoelectrochemical Etching to Form Quantum Dots," Materials, 16, 1890 (2023). DOI: 10.3390/ma16051890
12. H. Xue, S. A. A. Muyeed, E. Palmese, D. Rogers, R. Song, N. Tansu, and J. J. Wierer, Jr., "Recombination rate analysis of InGaN-based red-emitting light-emitting diodes," IEEE Journal of Quantum Electronics, 59, 3200109, (2023). DOI: 10.1109/JQE.2023.3246981
13. I. Fragkos, W. Sun, D. Borovac, R. Song, J. J. Wierer Jr., and N. Tansu, "Delta InN-InGaN Quantum Wells with AlGaN Interlayers for Long Wavelength Emission," IEEE Journal of Quantum Electronics, 58, 3600106 (2022). DOI: 10.1109/JQE.2022.3142270
14. X. Wei, S. A. A. Muyeed, H. Xue, E. Palmese, R. Song, N. Tansu, and J. J. Wierer, Jr., "Near-Infrared Electroluminescence of AlGaN Capped InGaN Quantum Dots Formed by Controlled Growth on Photoelectrochemical Etched Quantum Dot Templates," Photonics Research, 10, 33 (2022). DOI: 10.1364/PRJ.441122
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29. W. Sun, S. A. A. Muyeed, R. Song, J. J. Wierer, Jr., and N. Tansu "Integrating AlInN Interlayers into InGaN/GaN Multiple Quantum Wells for Enhanced Green Emission," Appl. Phys. Lett. 112, 201106 (2018). DOI: 10.1063/1.5028257
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39. J. J. Wierer, Jr., A. A. Allerman, E. J. Skogen, A. Tauke-Pedretti, G. A. Vawter, and I. Montano, "Selective layer disordering in intersubband $Al_{0.028}Ga_{0.972}N$/AlN superlattices with silicon nitride capping layer" Applied Physics Express, 8, 061004 (2015). DOI:10.7567/APEX.8.061004
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41. A. M. Armstrong, B. N. Bryant, M. H. Crawford, D. D. Koleske, S. R. Lee, and J. J. Wierer Jr., "Defect-reduction mechanism for improving radiative efficiency in InGaN/GaN light-emitting diodes using InGaN underlayers" J. Appl. Phys. 117, 134501 (2015). DOI:10.1063/1.4916727
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44. D. D. Koleske, A. J. Fischer, B. N. Bryant, P. G. Kotula, and J. J. Wierer, Jr., "On the increased efficiency in InGaN-based multiple quantum wells emitting at 530–590nm with AlGaN interlayers" J. Crystal Growth, 415, 57, (2015). DOI:10.1016/j.jcrysgro.2014.12.034
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Presentations: Conferences and Seminars

1. B. J. Sekely, H. Xue, C. T. Kuhs, H. O. Everitt, J. J. Wierer, Jr., and J. F. Muth, "Effect of Gaseous Adsorbents on Gallium Nitride Surface Quantum Wells," TBD Conference, (2025).
2. B. J. Sekely, H. Xue, C. T. Kuhs, H. O. Everitt, J. J. Wierer, Jr., and J. F. Muth, "Passivation and Optical Emission Modification of Gallium Nitride Surface Quantum Wells," MRS Fall Meeting, Boston, MA (Dec. 2024).

3. J. J. Wierer, Jr., E. Palmese, H. Xue, and D. Rogers, "Light-Triggered AlInN/GaN HEMTS with Sub-microsecond Switching Times," International Workshop on Nitride Semiconductors, Honolulu, Hawai'i (Nov. 2024). Late News.
4. H. Xue, E. Palmese, B. J. Sekely, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr, "Epitaxial Growth, Characterization, and Applications of AlInN/GaN Superlattices," International Workshop on Nitride Semiconductors, Honolulu, Hawai'i (Nov. 2024).
5. D. Rogers, H. Xue, F. Kish, B. Pezeshki, A. Tselikov, and J. J. Wierer, Jr., "Demonstration and Analysis of High Bandwidth InGaN Micro-LEDs at Temperatures up to 400°C," International Workshop on Nitride Semiconductors, Honolulu, Hawai'i (Nov. 2024).
6. H. Xue, E. Palmese, B. J. Sekely, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr, "MOCVD Growth and Characterization of AlInN/GaN Superlattices," Holonyak Workshop I, Champaign-Urbana, IL (Sept 2024).
7. H. Xue, E. Palmese, B. J. Sekely, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr, "Epitaxial Growth and Characterization of AlInN/GaN Superlattices," 66th Electronic Materials Conference, College Park, MD (July 2024).
8. E. Palmese, H. Xue, S. Pavlidis, and J. J. Wierer Jr., "Enhancement-Mode AlInN/GaN High-Electron-Mobility Transistors Via Thermally Oxidized Gates," 66th Electronic Materials Conference, College Park, MD (July 2024).
9. L. Shvilberg, H. Xue, J. J. Wierer Jr., N. Shukla, F. Ihlefeld "The Deposition Temperature Impact in Sputtered Magnesium Oxide on n-Type Gallium Nitride for Metal-Oxide-Semiconductor Capacitors Applications," 66th Electronic Materials Conference, College Park, MD (July 2024).
10. D. Rogers, H. Xue, F. Kish, B. Pezeshki, A. Tselikov, and J. J. Wierer, Jr., "Recombination Rate Analysis of High-Speed Blue InGaN/GaN micro-LEDs at Elevated Temperatures," CLEO, Charlotte, NC. (May 2024).
11. J. J. Wierer, Jr., E. Palmese, H. Xue, D. Rogers, A. Gonzalez, D. Grey, S. G. Utsha, F. A. Kish, F.-C, H, B. Little, K. Markham, M. F. Rabbani, J. Melkun, and E. Musico, "III-Nitride Photonic Integrated Circuits for Trapped-Ion and Neutral Atom Quantum Computing", NC State University Quantum Computing Annual Symposium, (June 2024).
12. H. Xue, E. Palmese, B. J. Sekely, B. D. Little, F. A. Kish, Jr., J. F. Muth, and J. J. Wierer Jr "Epitaxial Growth and Characterization of AlInN/GaN Superlattices," ICMOVPE, Las Vegas, NV (May 2024).
13. D. Rogers, H. Xue, F. Kish, B. Pezeshki, A. Tselikov, and J. J. Wierer, Jr., "High Temperature and Large Bandwidth Blue InGaN/GaN Micro-LEDs," Optical Fiber Communication Conference, San Diego, CA. (March 2024).
14. H. Xue, E. Palmese, R. Song, Md I. Chowdhury, N. C. Strandwitz, and J. J. Wierer, Jr. "Structural and Optical Characterization of Thin AlInN Films on c-Plane GaN Substrates," 65th Electronic Materials Conference, Santa Barbara, CA (July 2023).
15. J. J. Wierer, Jr., H. Xue, D. Rogers, and E. Palmese, "Interlayer-based active regions for long-wavelength III-nitride LEDs," Optica Adv. Photonics Congress PVLED, (July 2022) (invited).
16. H. Xue, S. A. A. Muyeed, E. Palmese, R. Song, N. Tansu, and J. J. Wierer, Jr., "Impact of InGaN-based underlayers on the performance of InGaN-based red-emitting LEDs," 80th Device Research Conference (July 2022), Virtual.

17. J. J. Wierer, Jr., S. A. A. Muyeed, X. Wei, H. Xue, and E. Palmese, "Size-controlled InGaN quantum dots for light emitters," Photonics North, (May 2022) (invited).
18. J. J. Wierer, Jr., "Efficient III-nitride long wavelength emitters," NC State ECE Spring Colloquium, (Feb 2022) (invited).
19. J. J. Wierer, Jr., S. A. A. Muyeed, H. Xue, X. Wei, R. Song, and N. Tansu "Efficient III-nitride LEDs for displays," 21st International Meeting on Information Display - IMID, (August 2021) Virtual (invited).
20. E. Palmese, J. Goodrich, S. A. A. Muyeed, H. Xue, X. Wei, R. Song, N. Tansu, and J. J. Wierer, Jr. "Characterization of $A_{lx}In_{1-x}N$ Mismatched to GaN for Thin Oxide Applications," 63rd Electronic Materials Conference (July 2021), Virtual.
21. H. Xue, S. A. A. Muyeed, E. Palmese, R. Song ,N. Tansu, and J. J. Wierer, Jr., "Red-Emitting InGaN/AlGaN/GaN Multiple Quantum Wells with Various Underlayers," 63rd Electronic Materials Conference (July 2021), Virtual.
22. J. J. Wierer, Jr., S. A. A. Muyeed, H. Xue, X. Wei, E. Palmese, D. Rogers, and R. Song, "Researching Efficient InGaN LEDs for Displays," Clarkson University, (April 2021) Virtual (invited).
23. J. J. Wierer, Jr., X. Wei, S. A. A. Muyeed, H. Xue, R. Song, and N. Tansu "Size-controlled self-assembled InGaN quantum dots," SPIE Photonics West 2021, (February 2021) Virtual (invited).
24. J. J. Wierer, Jr., "Researching efficient III-nitride micro-LEDs for displays," Facebook's Annual AR Optics Academic Forum (Sept 2020), Virtual (invited).
25. X. Wei, S. A. A. Muyeed, M. Peart, N. Tansu, and J. J. Wierer, Jr., "Controlled growth of InGaN quantum dots on photoelectrochemically etched InGaN quantum dots templates," 62nd Electronic Materials Conference (July 2020), Virtual.
26. E. Palmese, M. R. Peart, S. A. A. Muyeed, X. Wei, R. Song, N. Tansu, and J. J. Wierer, Jr. "AlInN-GaN Based Power Electronic Devices Utilizing AlInO as a Gate Insulator," 62nd Electronic Materials Conference (July 2020), Virtual.
27. D. Borovac, W. Sun, R. Song, J. J. Wierer Jr., and N. Tansu, "High-temperature thermal stability of AlInN alloys nearly lattice-matched to GaN/sapphire grown via MOVPE," Proc. of the SPIE Photonics West 2020, Optical Components and Materials XVII, (February 2020) San Francisco, CA.
28. D. Borovac, W. Sun, M. R. Peart, R. Song, J. J. Wierer Jr., and N. Tansu, "Growth optimization and characterization of an AlInN-based p-i-n diode," Proc. of the SPIE Photonics West 2020, Gallium Nitride Materials and Devices XV, (February 2020) San Francisco, CA.
29. J. C Goodrich, T. G. Farinha, L. Ju, A. J. Howzen, A. Kundu, O. N. Ogidi-Ekoko, J. J. Wierer, Jr., N. Tansu, N. C. Strandwitz, "Structural and electrical properties of MgO on GaN by thermal atomic layer deposition" SPIE Photonics West 2020, Oxide-based Materials and Devices XI, (February 2020) San Francisco, CA.
30. S. A. A. Muyeed, X. Wei, D. Borovac, R. Song, N. Tansu, and J. J. Wierer, Jr., " Controlled growth of self-assembled InGaN quantum dots using templates of quantum-size-controlled photo-electrochemical etched quantum dots," Dept of Energy Solid State Lighting Workshop (January 2019) San Diego, CA. (winner of student poster competition).

31. M. R. Peart and J. J. Wierer, Jr.," Polarization Edge Termination for GaN Vertical Power Devices," 13th International Conference on Nitride Semiconductors (July 2019), Bellevue, WA. (poster)
32. R. M. Lentz, M. R. Peart, and J. J. Wierer, Jr., "GaN/AlInO Waveguide for Visible Light Communications," 13th International Conference on Nitride Semiconductors (July 2019), Bellevue, WA. (poster)
33. X. Wei, S. A. A. Muyeed, M. Peart, N. Tansu, and J. J. Wierer, Jr., "Room Temperature Luminescence of Passivated InGaN Quantum Dots Formed by Quantum-Sized-Controlled Photoelectrochemical Etching," 13th International Conference on Nitride Semiconductors (July 2019), Bellevue, WA. (poster)
34. M. R. Peart, X. Wei, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," Wet Thermal Oxidation of AlInN," 13th International Conference on Nitride Semiconductors (July 2019), Bellevue, WA. (poster)
35. M. R. Peart, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," AlInN Power Diodes," 13th International Conference on Nitride Semiconductors (July 2019), Bellevue, WA.
36. X. Wei, S. A. A. Muyeed, M. Peart, N. Tansu, and J. J. Wierer, Jr., "Room Temperature Luminescence of Passivated InGaN Quantum Dots Formed by Quantum-Sized-Controlled Photoelectrochemical Etching," 61st Electronic Materials Conference (June 2019), Ann Arbor, MI.
37. M. Peart and J. J. Wierer, Jr.," Polarization Edge Termination for GaN Vertical Power Devices," 61st Electronic Materials Conference (June 2019), Ann Arbor, MI.
38. M. R. Peart, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," AlInN for Vertical Power Electronic Devices," 61st Electronic Materials Conference (June 2019), Ann Arbor, MI.
39. M. R. Peart, X. Wei, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," Wet Thermal Oxidation of AlInN," 61st Electronic Materials Conference (June 2019), Ann Arbor, MI.
40. S. A. A. Muyeed, W. Sun, X. Wei, R. B. Song, N. Tansu, and J. J. Wierer, Jr., "Improvement in the radiative efficiency of InGaN-based multiple quantum wells using AlGaN interlayers," SPIE Photonics West (February 2019) San Francisco, CA.
41. I. E. Fragkos, W. Sun, D. Borovac, R. B. Song, J. J. Wierer, and N. Tansu, "Delta-InN/AlGaN Interlayer Integrated in InGaN Active Region for Long Wavelength Emission," SPIE Photonics West 2019, Gallium Nitride Materials and Devices XIV, (February 2019) San Francisco, CA.
42. J. J. Wierer, Jr., "Green and red InGaN emitters for monolithic white light and displays," EERE Solid-State Lighting Conference (January 2019) Dallas, TX. (invited panel).
43. M. Peart, N. Tansu, and J. J. Wierer, Jr., "AlInN for Vertical Power Electronic Devices," International Workshop on Nitride Semiconductors 2018 (November 2108) Kanazawa, Japan.
44. I. E. Fragkos, D. Borovac, W. Sun, R. Song, J. J. Wierer, Jr, and N. Tansu, "Experimental Studies of Delta-InN Incorporation in InGaN Quantum Well for Long Wavelength Emission," IEEE Photonics Conference (October 2018) Reston, VA. DOI: 10.1109/IPCon.2018.8527290
45. X. Wei, S. A. A. Muyeed, M. Peart, N. Tansu, and J. J. Wierer, Jr., "Controlled Synthesis of InGaN Quantum Dots for Efficient Light Emitters," IEEE Photonics Conference 2018, (October 2018) Reston, VA. DOI: 10.1109/IPCon.2018.8527308

46. S. A. A. Muyeed, W. Sun, X. Wei, R. B. Song, D. Koleske, N. Tansu, and J. J. Wierer, Jr., "Improvement in the radiative efficiency of InGaN-based multiple quantum wells using AlGaN interlayers," IEEE Photonics Conference 2018, (October 2018) Reston, VA. DOI: 10.1109/IPCon.2018.8527340

47. M. Peart, N. Tansu, and J. J. Wierer, Jr., "AlInN for Vertical Power Electronic Devices," Les Eastman Conference 2018 (August 2108), Columbus, OH.

48. R. Lentz, M. Peart, S. A. A. Muyeed, and J. J. Wierer, Jr. "Differential Carrier Lifetime Measurements of InGaN Light-Emitting Diodes," David and Lorraine Freed Undergraduate Research Symposium, Lehigh University (April 2018) Bethlehem, PA. (Award: Honorable Mention).

49. T. Farinha, O. Ogidi-Ekoko, J. C. Goodrich, J. J. Wierer, Jr., N. Tansu, N. Strandwitz, "Epitaxial MgO Films Grown on GaN by Atomic Layer Deposition: Growth Temperature Dependence and Thermal Stability," David and Lorraine Freed Undergraduate Research Symposium, Lehigh University (April 2018) Bethlehem, PA. (Award: Winner)

50. N. Tansu, J. J. Wierer, Jr., I. Fragkos, D. Borovac, A. M. Slosberg, and C. K. Tan, "Next Generation III-Nitride Materials and Devices – from Photonics to New Applications," Proc. of the International Symposium on Advanced Plasma Science and its Application for Nitrides and Nanomaterials 2018 (March 2018) Nagoya, Japan (Invited).

51. S. A. Al Muyeed, W. Sun, X. Wei, R. Song, N. Tansu, and J. J. Wierer, Jr., "Strain compensation in InGaN-based multiple quantum wells with AlGaN interlayers," SPIE Photonics West (February 2018) San Francisco, CA.

52. N. Tansu, J. J. Wierer, Jr., C. K. Tan, and W. Sun "Next Generation III-Nitride Materials and Devices - from Photonics to New Applications," Proc. of the OSA Solid State Lighting (SSL) Topical Meeting 2017 (November 2017) Boulder, CO. (invited).

53. J. J. Wierer, Jr. Xiongliang Wei, and Syed Ahmed Al Muyeed, Wei, Sun, Nelson Tansu, J. Tsao, D. Koleske, M.-C. Tsai, R. P. Schneider, "Pathways to ultra-efficient solid-state lighting," IEEE Photonics Conference (October 2017), Orlando, FL (invited).

54. J. J. Wierer, Jr., Xiongliang Wei, Syed Ahmed Al Muyeed, Wei Sun, Nelson Tansu, J. Tsao, and D. Koleske "Routes to ultra-efficient III-nitride emitters for solid-state lighting," 11th International Symposium on Semiconductor Light Emitting Devices (October 2017) Banff, Canada (invited).

55. N. Tansu, J. J. Wierer, Jr., C. K. Tan, and W. Sun, "Next Generation III-Nitride Materials and Devices - From Photonics to New Applications," SPIE Optics+Photonics, (August 2017), San Diego, CA (invited).

56. N. Tansu, J. J. Wierer, Jr., C. K. Tan, and W. Sun, "Next Generation III-Nitride Materials and Research-From Photonics to New Applications," CLEO Pacific Rim, (August 2017), Singapore (invited).

57. W. Sun, R. Song, J. J. Wierer Jr., and N. Tansu, "Strain relaxation properties of OMVPE-grown AlInN semiconductors" AACGE (August 2017) Santa Fe, NM.

58. I. Fragkos, W. Sun, D. Borvac, R. Song, J. Wierer Jr., and N. Tansu, "Pulsed OMVPE growth studies of InN integration of InGaN active regions," AACGE (August 2017) Santa Fe, NM.

59. S. A. Al Muyeed, W. Sun, X. Wei, R. Song, N. Tansu, and J. J. Wierer, Jr., "Strain balancing in InGaN-based multiple quantum wells using AlGaN interlayers," 59th Electronic Materials Conference (June 2017), South Bend, IN.
60. J. J. Wierer, Jr., Xiongliang Wei, and Nelson Tansu, "III-nitride quantum dots for ultra-efficient LEDs," SPIE Photonics West (January 2017) San Francisco, CA (invited).
61. N. Tansu, and J. J. Wierer, Jr., "Next Generation III-Nitride Materials and Devices," SPIE Photonics West, Gallium Nitride Materials and Devices XI, (February 2017) San Francisco, CA. (invited)
62. W. Sun, C.-K. Tan, J. J. Wierer Jr., and N. Tansu, Ultra-broadband III-nitride digital alloys active region for optoelectronic applications," SPIE Photonics West (February 2017) San Francisco, CA.
63. A. A. Allerman, M. H. Crawford, A. G. Baca, A. Armstrong, J.R. Dickerson, M. King, A. J. Fischer, and J. J. Wierer Jr., "Power electronic devices based on Al-rich AlGaN alloys," SPIE Photonics West (February 2017) San Francisco, CA.
64. C.-K. Tan, W. Sun, J. J. Wierer Jr., and N. Tansu, "How the interface affects Auger process in quantum wells," SPIE Photonics West (February 2017) San Francisco, CA.
65. C. K. Tan, W. Sun, D. Borovac, J. J. Wierer, Jr., and N. Tansu, "Dilute-Anion Nitride Semiconductors," Proc. of the IEEE Photonics Conference 2016, (October 2016) Waikoloa, Hawaii. DOI: 10.1109/IPCon.2016.7831087
66. J. J. Wierer, Jr., N. Tansu, and J. Y. Tsao, "Ultra-efficient solid-state lighting using III-nitride quantum dots," International Workshop on Nitride Semiconductors 2016 (October 2016) Orlando, FL.
67. J. J. Wierer Jr., and N. Tansu, "Research areas for ultra-efficient solid-state lighting," EERE-SSL Roundtable, (September 2016), Washington D. C.
68. W. Sun, C.-K. Tan, J. J. Wierer, Jr., and N. Tansu, "Miniband Engineering in III-Nitride Digital Alloy for Broadband Device Applications," Lester Eastman Conference, (August 2016) Bethlehem, PA.
69. C.-K. Tan, W. Sun, D. Borovac, J. J. Wierer, Jr., and N, Tansu, "Band Gap Engineering in GaN-Based Semiconductor with Dilute-Anion Incorporation for Visible Light Emitters," Lester Eastman Conference, (August 2016) Bethlehem, PA.
70. J. J. Wierer, Jr., N. Tansu, and J. Y. Tsao, "Achieving ultra-efficiency in III-nitride LEDs and laser diodes for solid-state lighting," OSA Integrated Photonics Research, Silicon and Nano Photonics Integrated Photonics Research, Silicon, and Nano-Photonics, (July 2016) Vancouver, B.C, Canada (invited).
71. I. Montano, A. A. Allerman, J. J. Wierer, M. Moseley, E. J. Skogen. A. Tauke-Padretti, and G. A. Vawter, "Microscopic Modeling of Nitride Intersubband Absorbance," American Physical Society Meeting, (March 2016) Baltimore, MD.
72. N. Tansu, and J. J. Wierer, Jr., "Next Generation III-Nitride Materials and Devices," Proc. of the SPIE Photonics West 2016, Gallium Nitride Materials and Devices XI, (February 2016) San Francisco, CA. (invited)

73. C.-K. Tan, W. Sun, D. Borovac, J. J. Wierer, Jr., and N. Tansu, "InGaN-GaNAs 'Interface Quantum Well' for Long Wavelength Emission," DOE SSL Workshop, (February 2016) Raleigh, NC. (invited, student award winner)
74. J. J. Wierer, Jr. "Edge termination in vertical GaN diodes/Opportunity for GaN substrates in SSL," Roadmapping for GaN Workshop, (January 2016) Davis, CA.
75. N. Tansu, C. K. Tan, and J. J. Wierer, Jr., "Tutorial on III-nitride solid-state lighting and smart lighting," IEEE Photonics Conference, (October 2015), Washington D. C. DOI: 10.1109/IPCon.2015.7323753
76. A. A. Allerman, M. W. Moseley, M. H. Crawford, J. J. Wierer, A. M. Armstrong, A. G. Baca, R. J. Kaplar, and B. G. Clark, "Low Dislocation Density AlGaN Epilayers for UV Laser Diodes and Devices for Power Electronics," 228th ECS Meeting (October 2015), Phoenix, AZ.
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41. M. J. Ludowise, S. A. Maranowski, D. A. Steigerwald, J. J. Wierer, Jr., "METHOD OF FORMING CONTACTS TO A P-GAN LAYER," US Patent 6287947 (Sept 11, 2001)
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3. G. T. Wang, Q. Li, J. Huang, J. Wierer, A. Armstrong, Y. Lin, P. Upadhya, R. Prasankumar, "III-Nitride nanowires: Emerging Materials for Lighting and Energy Applications" ECS Transactions, 35, 3 (2011). DOI: 10.1149/1.3570840
4. N. F. Gardner, J. C. Kim, J. J. Wierer, Y.-C. Shen, M. R. Krames, "Linearly polarized spontaneous emission from m-plane InGaN/GaN multiple-quantum-well LEDs," Proceedings of SPIE Vol. 5941, 59410J (2005). DOI: 10.1117/12.627959
5. J. J. Wierer, M. R. Krames, J. Epler, N. F. Gardner, J. R. Wendt, M. M. Sigalas, S. R. J. Brueck, D. Li, and M. Y. Shagam, "III-nitride LEDs with photonic crystal structures," Proceedings of SPIE Vol. 5739, (2005). DOI: 10.1117/12.591218
6. Y.-C. Shen, J. J. Wierer, M. R. Krames, M. J. Ludowise, M. Misra, F. Ahmed, A. Y. Kim, G. O. Mueller, J. C Bhat, S. A. Stockman, P. S. Martin, "Optical cavity effects in InGaN/GaN quantum-well-heterostructure flip-chip light-emitting diodes," Proceedings of SPIE Vol. 5366, (2004). DOI: 10.1117/12.520571
7. J. J. Wierer, J.C Bhat, C.-Hua Chen, G. Christenson, L. W. Cook, M. G.Craford, N. F. Gardner, W. K. Goetz, R. S. Kern, R. Khare, A. Y. Kim, M. R. Krames, M. J. Ludowise, R. Mann, P. S. Martin, M. Misra, J. J. O'Shea, Y.-C. Shen, F. M. Steranka, S. A. Stockman, S. G. Subramanya, S. L. Rudaz, D. A. Steigerwald, J. Yu, "High-power AlInGaN light-emitting diodes," Proceedings of SPIE Vol. 4278, (2001). DOI: 10.1117/12.426841
8. M. R. Krames, G. Christenson, D. Collins, L.W. Cook, M. George Craford, A. D. Edwards, R. M. Fletcher, N. F. Gardner, W. K. Goetz, W. R. Imler, E. Johnson, R. Scott Kern, R. Khare, F. Kish, C. Lowery, M. J. Ludowise, R. Mann, M. Maranowski, S. A. Maranowski, P. S. Martin, J. J. O'Shea, S. L. Rudaz, D. A. Steigerwald, J. Thompson, J. J. Wierer, J. Yu, D. Basile, Y.-L. Chang, G. Hasnain, M. Heuschen, K. P. Killeen, Chris P. Kocot, Steven D. Lester, Jeffrey N. Miller, Gerd O. Mueller, Regina Müller-Mach, S. J. Rosner, R. P. Schneider, T. Takeuchi, T. S. Tan, "High-brightness AlGaInN light-emitting diodes," Proceedings of SPIE Vol. 3938, (2000). DOI: 10.1117/12.382822

Thesis

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2. J. J. Wierer, "Current Overview of the Far IR p-Ge Laser," Master's Thesis, University of Illinois, May 1995.

Book Chapters

1. J. Y. Tsao, J. J. Wierer Jr., Lauren E.S. Rohwer, Michael E. Coltrin, Mary H. Crawford, Jerry A. Simmons, Po-Chieh Hung, Harry Saunders, Dmitry S. Sizov, Raj Bhat, and Chung-En Zah, "Ultra-efficient Solid-State Lighting: Likely Characteristics, Economic Benefits, Technological Approaches," *III-Nitride Based Light Emitting Diodes and Applications,* (Springer, 2017).

2. J. Y. Tsao, J. J. Wierer Jr., Lauren E.S. Rohwer, Michael E. Coltrin, Mary H. Crawford, Jerry A. Simmons, Po-Chieh Hung, Harry Saunders, Dmitry S. Sizov, Raj Bhat, and Chung-En Zah, "Ultra-efficient Solid-State Lighting: Likely Characteristics, Economic Benefits, Technological Approaches," *III-Nitride Based Light Emitting Diodes and Applications,* (Springer, 2013).
3. M.H. Crawford, J.Y. Tsao, J. J. Wierer, Jr., M.E. Coltrin, and R.F. Karlicek, "Solid-State Lighting: Towards Smart and Ultra-Efficient Materials, Devices, Lamps and Systems," D.L. Andrews, Ed., *Photonics Volume 3: Photonics Technology and Instrumentation* (Wiley, 2013).

News Items

1. "Meet Optica's 2024 Fellows," https://www.optica-opn.org/home/articles/volume_35/february_2024/features/meet_optica_s_2024_fellows/?src=hplead
2. "Jonathan Wierer Elected as Fellow Member of Optica," https://ece.ncsu.edu/2023/jonathan-wierer-named-fellow-of-optica/
3. "Optica Announces 2024 Fellows Class," https://www.optica.org/about/newsroom/news_releases/2023/october/optica_announces_2024_fellows_class/
4. Quoted in "This Week in Tech & Culture: photon-recycling luminaires," Architect Magazine 2023. https://www.architectmagazine.com/design/culture/this-week-in-tech-culture-chipotles-100-electric-restaurants-the-dangers-of-artificial-intelligence-and-iconic-barbie-house-architecture_o
5. Quoted in "Incandescent lamp could save energy by recycling infrared light," NewScientist, April 2023. https://www.newscientist.com/article/2368619-incandescent-lamp-could-save-energy-by-recycling-infrared-light/
6. "Jon Wierer to Join ECE Faculty," NC State ECE, June 2021. https://ece.ncsu.edu/2021/05/jon-wierer-to-join-ece-faculty/
7. "Wierer receives the Joel and Ruth Spira Excellence in Teaching award," Lehigh ECE, Oct 2019. http://www.ece.lehigh.edu/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=63&cntnt01returnid=172
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9. "The Building of Innovation: Researchers needed tech that didn't exist; with NSF support, they are bringing it to life in Lehigh University's Center for Photonics and Nanoelectronics," American Association for the Advancement of Science (AAAS), Feb 22, 2018. https://www.eurekalert.org/pub_releases/2018-02/lu-tbo022218.php
10. "Lessons on Laser Diodes" Architectural Lighting Technology, Nov. 27, 2017. http://www.archlighting.com/technology/lessons-on-laser-diodes_o
11. "Strong showing by Lehigh faculty, students at IEEE photonics conference," Lehigh News, Oct 5, 2017. http://www.lehigh.edu/engineering/news/faculty/2017/20171005-IEEE-photonics-conference.html

12. "OSA Members Host Photonics Faculty Tour for Congressman Charlie Dent," The Optical Society, July 12, 2017.
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14. "Advancing the LED", Lehigh News, Jan 30, 2017.
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15. "Power/Performance Bits: Jan. 24", Semiconductor Engineering, Jan 24, 2017.
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16. "Nanoscale Structures Lead to More Efficient Solid-State Lighting," Resolve Magazine, Jan. 7, 2017.
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17. "Sandia research could improve defense electronics, electric vehicles, grids," Sandia News, Jan. 5, 2017.
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18. "Quantum Dots Could Lead to Ultra-Efficient Solid-State Lighting Sources," AZOquantum, Jan 4, 2017.
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19. "Nanoscale Structures Lead to More Efficient Solid-State Lighting", Lehigh News, Jan. 7, 1017.
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24. "Sandia team demonstrates III-nitride nanowire array solar cells," nanotechweb.org, Aug. 7, 2012.
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31. "Light your house with lasers" Electronics weekly.com, Nov 3, 2011.

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33. "High-quality white light produced by four-color laser source; Diode lasers could challenge LEDs for home and industrial lighting supremacy," ScienceDaily, Oct 27, 2011. https://www.sciencedaily.com/releases/2011/10/111026143731.htm
34. "Diode lasers may vie with LEDs for lighting supremacy," RDMag, Oct 2011. http://www.rdmag.com/news/2011/10/diode-lasers-may-vie-leds-lighting-supremacy
35. "SOLID-STATE ILLUMINATION: Four-color laser source produces high-quality white light," Laser Focus World, Aug. 1, 2011. http://www.laserfocusworld.com/articles/print/volume-47/issue-8/world-news/solid-state-illumination-four-color-laser-source-produces-high-quality-white-light.html
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Honors/Awards

- 2024, Optica Fellow
- 2019, Senior Member of Optica (formerly OSA)
- 2018, Joel and Ruth Spira Excellence in Teaching Award / Lutron Electronics Co.
- 2014, Honorary Member of Illumination Engineering Society (IES)
- 2012, R&D100 Award, "Photovoltaics that fit," R&D Magazine
- 2011, Senior Member of the Institute of Electrical and Electronics Engineers (IEEE)
- 2004, R&D100 Award, "Cantilever Epitaxy and Growth of Low-Dislocation Gallium Nitride," R&D Magazine
- 1998, Gregory Stillman Semiconductor Research Award

Societies

- Institute of Electrical and Electronics Engineers (IEEE): Senior Member 2011-present, Member 1998-2011.
- Optica (formerly OSA): Fellow 2024-present, Senior Member 2019-2024, Member 2011-2019.
- Illuminating Engineering Society (IES): Member 2014-2020.
- Society of Photographic Instrumentation Engineers (SPIE): Member 2016-2020.
- Sigma Xi, 2020

Conference Activities

- CLEO Conference, Subcommittee Member, S&I 15 LEDs, Photovoltaics, and Energy Efficient Photonics, 2012.
- CLEO Conference, Subcommittee Chair, S&I 15 LEDs, Photovoltaics, and Energy Efficient Photonics, 2013, 2014.
- Electronic Materials Conference, Organizer, Group III-Nitrides: Growth, Processing, Characterization, Theory and Devices, 2015-2023.
- International Workshop on Nitride Semiconductors, Proceedings Committee, 2016.
- Light-Emitting Diodes and their Industrial Applications (LEDIA), Program Committee, 2016-2020.
- Lester Eastman Conference, Program Committee, 2016, 2018, 2021, and 2023.
- International Workshop of Nitride Semiconductors (IWN), Program Committee Optical Devices, 2016, 2018, 2022, 2024.
- International Conference on Nitride Semiconductors (ICNS), Program Committee, 2021, 2023.

- IEEE Photonics Conference (IPC), Technical Program Committee, 2022.
- Holonyak Workshop, Program Committee, 2024

Journal Activities

- Senior Editor, IEEE Photonics Technology Letters, June 2022-present.
- Associate Editor, IEEE Photonics Technology Letters, Jan. 2018-June 2022.
- Associate Editor, IEEE Journal of Quantum Electronics, Jan. 2024-present.
- Guest Editor, physica status solidi (b) for the International Workshop on Nitride Semiconductors (IWN) 2016.
- Reviewer for: ACS Photonics, Applied Optics, Applied Physics Letters, IEEE Electron Devices Letters, IEEE Journal of Selected Topics in Quantum Electronics, IEEE Photonics, IEEE Photonic Technology Letters, IEEE Nanotechnology Magazine, IEEE Spectrum, IEEE Transactions on Electron Devices, Japanese Journal of Applied Physics, Journal of Applied Physics, Journal of Crystal Growth, Journal of Physical Chemistry, Lasers and Photonics Reviews, Materials Science B, Nature Light Science and Applications, Nature Materials, Nature Photonics, Nano Letters, Nanomaterials, Materials, Optics Express, Optical Materials Express, Physica Status Solidi a, Physica Status Solidi b, Physica Status Solidi c, Scientific Reports, Semiconductor Science and Technology, Solid-State Electronics, and Superlattices and Microstructures.

Teaching

Teaching interests

Semiconductor devices, semiconductor physics, optoelectronic devices, quantum mechanics, semiconductor lasers and LEDs, photonic crystals, power electronic devices, solid-state physics, applied quantum mechanics, semiconductor device simulation, electromagnetics, photovoltaics and photodetectors, semiconductor device processing, patents, and intellectual property.

Courses at San Jose State University

- 2000 Fall MatE 153

Courses at Lehigh University

- 2015 Fall ECE 325/425 Semiconductor Lasers I
- 2016 Spring ECE 308 Physics and Models of Semiconductor Devices
- 2016 Fall ECE 325/425 Semiconductor Lasers I
- 2017 Spring ECE 126 Fundamentals of Semiconductor Devices
- 2017 Fall ECE 325/425 Semiconductor Lasers I
  ENGR 5
- 2018 Spring ECE 126 Fundamentals of Semiconductor Devices
- 2018 Fall ECE 350/450 Semiconductor Optoelectronics
- 2019 Spring ECE 126 Fundamentals of Semiconductor Devices
  ECE 308 Physics and Models of Semiconductor Devices
- 2019 Fall ECE 350/450 Semiconductor Optoelectronics
- 2020 Spring ECE 126 Fundamentals of Semiconductor Devices
  ECE 308 Physics and Models of Semiconductor Devices

- 2020 Fall ECE 350/450 Semiconductor Optoelectronics
- 2021 Spring ECE 126 Fundamentals of Semiconductor Devices
  ECE 308 Physics and Models of Semiconductor Devices

Courses at North Carolina State University

- 2021 Fall ECE 492/592 Semiconductor Optoelectronic Devices
- 2022 Fall ECE 492/592 Semiconductor Optoelectronic Devices
- 2022 Fall ECE 592 Semiconductor Optoelectronic Devices
- 2023 Spring ECE 592 Laser Diodes and Photonic Integrated Circuits
- 2023 Fall ECE 592 Semiconductor Optoelectronic Devices
- 2024 Spring ECE 792 Wide Bandgap Semiconductor Fabrication and Technology
- 2024 Fall ECE 529 Semiconductor Optoelectronic Devices
- 2025 Spring ECE 592 Laser Diodes and Photonic Integrated Circuits

Course evaluation scores at Lehigh University, Fall 2015-Spring 2018

Semester	Course Number	Course Credits	Enroll-ment	Mean Question 1	Mean Question 2	Mean Question 14
Fall 2015	ECE 325/425	3	7	5	5	4.67
Spring 2016	ECE 308	3	8	4.75	4.63	4.25
Fall 2016	ECE 325/425	3	6	5	5	4.83
Spring 2017	ECE 126	3	22	5	5	4.69
Fall 2017	ECE 325/425	3	8	4.83	4.83	4.67
Fall 2017	ENGR 5	2	54	NA	NA	NA
Spring 2018	ECE 126	3	29	4.74	4.78	4.82

Notes: Evaluations are not performed for instructors in ENGR 5.
Answers are on a scale of 1-5 with 5 the highest
Question 1: Overall, the instructor's teaching was effective.
Question 2: Overall, the quality of the course was good.
Question 14: I learned a great deal in this course.

Course evaluation scores at Lehigh University, Spring 2018-Spring 2021

Semester	Course Number	Course Credits	Enroll-ment	Mean Quest 1	Mean Ques 2	Mean Ques 3	Mean Ques 4	Mean Ques 5	Mean Ques 6
Fall 2018	ECE 350/450	3	6	4.75	4.75	5	5	5	5
Spring 2019	ECE 126	3	27	4.79	4.86	4.5	4.29	4.79	4.86
Spring 2019	ECE 308	3	11	4.78	4.44	4.78	4.78	5	4.89
Fall 2019	ECE 350/450	3	7	5	5	5	5	5	5
Spring 2020	ECE 126	3	11	NA	NA	NA	NA	NA	NA
Spring 2020	ECE 308	3	6	NA	NA	NA	NA	NA	NA
Fall 2020	ECE 350/450	3	6	NA	NA	NA	NA	NA	NA
Spring 2021	ECE 126	3	29	4.75	4.69	4.63	4.25	4.5	4.94
Spring 2021	ECE 308	3	9	4.86	4.71	4.71	4.86	5	4.71

Notes: Spring 2020 and Fall 2020 scores were not given due to online learning/COVID-19.
Answers are on a scale of 1-5 with 5 the highest
Q1: Instructor presented content in an organized manner.
Q2: The instructor's teaching methods contributed to my understanding of the course material.
Q3: The instructor was responsive when I had difficulties or questions.
Q4: The instructor gave me constructive feedback.
Q5: The instructor's assignments provided opportunities for participative learning within the course.
Q6: The course increased my knowledge of the subject matter.

Course evaluation scores at NC State University, Fall 2021-present.

Semester	Course Number	Course Credits	answ/ enroll	Mean Quest 1	Mean Ques 2	Mean Ques 3	Mean Ques 8	Mean Ques 11
Fall 2021	ECE 492/592	3	8	NA	NA	NA	NA	NA
Fall 2022	ECE 492/592	3	6	5	5	4.7	5	5
Spring 2023	ECE 592	3	11	4.8	4.8	4	4.2	4.4
Fall 2023	ECE 592	3	7	5	5	5	5	5
Spring 2024	ECE 792	3	12	*	*	*	*	*
Fall 2024	ECE 529	3	4/8	4.8	4.3	4.3	4.5	5
Spring 2025	ECE 592	3	10					

** Co-taught*

Answers are on a scale of 1-5 with 5 the highest.

Q1. The instructors teaching aligned with the courses learning objectives/ outcomes.
Q2. The instructor was receptive to students outside the classroom.
Q3 The instructor explained material well.
Q8 Overall, the instructor was an effective teacher.
Q11 This course improved my knowledge of the subject.

Advising

Current Ph.D. research students:

1. Haotian Xue
   Research topic: "III-nitride growth of emitters and power devices"
   Duration: Jan 2021 – present

2. Daniel Rogers
   Research topic:" Efficient red III-nitride emitters"
   Duration: Sept 2020 – present

3. Dakota Gray-Boneker
   Research topic:" Efficient red III-nitride electronic devices"
   Duration: Sept 2022-present

4. Antonio Gonzalez
   Research topic/Thesis: "III-Nitride growth"
   Duration: Sept 2023-present

5. Swagata Goswami Utsha
   Research topic/Thesis: "III-Nitride laser diodes"
   Duration: Sept 2023-present

Ph.D. students supervised:

1. Matt Peart
   Research topic/Thesis: "Development of III-Nitride Power Device Technology"
   Duration: June 2016 - Aug 2020
   Placement: Magneton, Inc.
   Past Employment: Princeton Infrared Technologies
   Current Employment: Magneton, Inc.

2. Syed Ahmed Al Muyeed
   Research topic/Thesis: "III-Nitride interlayer active region light emitters in the visible range"
   Duration: Sept 2016 - May 2021
   Placement: Raxium, Inc.
   Current Employment: Google, Inc.

3. Xiongliang Wei
   Research topic/Thesis: "InGaN Quantum Dots for Efficient Light Emitters"
   Duration: June 2016 - Aug 2021
   Placement: Hisense Photonics
   Current Employment: Hisense Photonics

4. Elia Palmese
   Research topic/Thesis: "Development of AlInN and its Native Thermal Oxide for Semiconductor Power Devices"
   Duration: Sept 2019 – Aug 2024
   Placement: Post-Doc Univ. of Del.

PhD student advisory:

1. Onoriode Ogidi-Ekoko (Advisory role only)
   Research topic: "Oxide films on GaN"
   Duration: Jan 2021-Aug 2021

2. Hanlin Fu (Advisory role only)
   Research topic: "Growth of AlInN films"
   Duration: Jan 2021- Aug 2021

Master's student supervised:

1. Matt Peart
   Research topic/Thesis: "The Faraday Effect in Gallium Nitride"
   Duration: Sept 2015-May 2016
   Placement: PhD student in my group

1. Xiongliang Wei
   Research topic (no thesis): "Quantum Dot Etching"
   Duration: Sept 2015-May 2016
   Placement: PhD student in my group

2. Siyuan Guo
   Research topic: "III-nitride Photonic Integrated Circuits"
   Duration: Sept 2019- May 2020

4. Jing Xue
   Research topic: "Frequency response of micro-LEDs"
   Duration: Jan 2020- Jan 2021

5. Dakota Gray-Boneker
   Duration: Sept 2022-Dec 2002
   Placement: Converted to Ph.D. at NCSU

Undergraduate researchers supervised:

1. Seth Slavin
   Funding: Undergraduate Research Program
   Research topic: Corrective Running Socks
   Duration: Fall 2017- Spring 2018

2. Jasper Chumba
   Research topic: Programing of an LED test station
   Duration: Summer 2017

3. Alexander Goff
   Research topic: Kilovolt Bias Tee
   Duration: Summer 2017

4. Rebecca Lentz
   Funding: Clare Boothe Luce Scholar Program
   Research topic: Differential Carrier Lifetimes in III-nitrides
   Duration: Summer 2017 – Summer 2019
   Placement: PhD student at Univ. of Mich.

5. Mark Schafer
   Research topic: Optical gain measurements
   Duration: Fall 2019-Spring 2020
   Placement: M.S. student Lehigh

6. Chengxin Yu
   Duration: Summer 2019 – Summer 2020
   Placement: M.S. student at Univ. of Mich.

7. Sydney Wisniewski
   Duration: Summer 2019 – Spring 2020
   Placement: M.S. student at KU Leuven, Belgium

9. Geethu Alluri
   Duration: Sept 2022-May 2023
   Topic: MOCVD recipe converter
   Placement: M.S. NCSU

Post-doctoral associates supervised:

1. Benjamin Bryant
   Location: Sandia National Laboratories and Univ. of New Mexico,
   Research Topic: Differential carrier lifetimes in III-nitrides.
   Duration: Sept 2013-July 2015
   Placement: Avogy

Current employment: FLIR Systems

Visiting researchers supervised:

1. Elly Tsai
   Research topic: Light extraction in nanowire LEDs.
   Duration: Sept 2016-Oct 2017
   Placement: glo-USA
   Current employment: Google/Raxium

2. Justin Goodrich
   Research topic: "AlInN materials."
   Duration: Mar 2021-Aug 2021

3. Jing Xue
   Research topic: "Frequency response of micro-LEDs."
   Duration: Jan 2021-Aug 2021

Ph.D. committee member, NC State

1. Ujjwal Pratik, graduated 2024 (Zeljko Pantic)
2. Joshua Larson (Michael Kudenov)
3. Mas Hakimi Heris (Dima Farfunik)
4. Karthik Suresh Arulalan (Spyros Pavlidis)
5. Keith Markham (Fred Kish)

Ph.D. committee member, Lehigh

1. Wei Sun (Tansu)
2. Damir Borovac (Tansu)
3. Ioannis Fragkos (Tansu)
4. Le Zhao (Kumar)
5. Zhao Dong (Chao)
6. Jason Jerwick (Chao)
7. Ji Chen (Chao)
8. Liang Gao (Kumar)
9. Yuan Jin (Kumar)
10. Onoriode Ogidi-Ekoko (Tansu)
11. Hanlin Fu (Tansu)
12. Justin Goodrich (Tansu)

Service outside University

- IEEE Photonics Society Distinguished Lecturer Program Committee, 2024-present.

Service to the University

- NCSU
  - ECE Department, New Certificates and degrees, 2024-present

  - ECE Department, Faculty Awards, 2024-present
  - ECE Department, ECE Faculty Search Committee, 2022-present.
- Lehigh University
  - University, Internal Review Committee, Fall 2019-Aug 2021.
  - University, Graduate Research Council, 2018.
  - ECE department, Faculty Diversity Hiring Committee, Spring 2021
  - ECE department, Graduate Liaison for Masters in Photonics program, Spring 2020- Aug 2021
  - ECE department, Graduate student committee, Aug 2015 - Aug 2021
  - ECE department, Seminar speaker committee, Aug 2015 - Aug 2021
  - ECE department, Lehigh ECE 125th Anniversary committee, 2017-2018
  - Center for Photonics and Nanoelectronics, Member, Aug 2015 - Aug 2021
  - Center for Photonics and Nanoelectronics, Nanofabrication Facilities Committee, 2017 - Aug 2021