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

Jonathan Wierer is Professor at North Carolina State University in the Department of Electrical and Computer Engineering. His research interests include semiconductor device physics and semiconductor materials science. Specifically, he has made seminal contributions in III-nitride electronic and optoelectronic devices. His career and research experience are unique, in that it has been performed across various organizations (university, industry, and a national laboratory), and has exposed him to different perspectives on semiconductor device research. This research has resulted in both a lengthy patent portfolio and highly reference journal articles.

Jonathan received his M.S., B.S., and Ph.D. from the University of Illinois at Urbana-Champaign in electrical engineering in 1994, 1995, and 1999, respectively. His Ph.D. advisor was Nick Holonyak, Jr., and his thesis was employing tunnel junctions in InGaAs light emitters. This was the first-time tunnel junctions were used in LEDs and laser diodes, and this enabled efficient rerouting of currents and the removal of absorptive p-type layers. This method now enables vertical-cavity surface-emitting lasers emitting in the near-infrared, and it is also being developed for 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 were drastically different 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, and he led them into successful manufacturing. Today most high-power LEDs are variations of this original FCLED.

Later at Lumileds, he joined the Advanced Laboratories pursuing high risk, and 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 demonstrated records in extraction efficiency. Some of his most cited and patented work is his photonic crystal LED research.

In 2008 he joined Sandia National Laboratories, and 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 that occurs in III-nitride LEDs (efficiency droop). This work began more substantial research efforts into this area by other researchers and companies.

At NC State University, he is continuing his research on semiconductor device physics and materials. He has several efforts on light-emitters for SSL and displays. This work includes investigating InGaN-based quantum dot active layers to create higher efficiency LEDs and laser diodes. Here his group is working on synthesis methods that creates controlled ensembles of QDs. He has also been researching long-wavelength visible (green to red) InGaN LEDs using AlGaN interlayer quantum well designs. This work has revealed that a tensile AlGaN interlayer is a means to control the compressive strain of InGaN quantum wells and prevent defect formation for higher efficiencies. Another research area Jonathan is pursuing is new wide-bandgap power electronic devices with III-nitride semiconductors. The wide bandgap leads to higher critical electric fields and higher breakdown voltages. This power device work includes investigating novel edge termination schemes and ultra-wide bandgap III-nitride semiconductors such as AlGaN and AlInN. One exciting result of this work is the thermal oxidation of AlInN to form native AlInO layers.

Dr. Wierer has authored or co-authored over 180 journal publications and conference presentations and holds 42 patents, predominately related to III-nitride devices. He is an associate editor for IEEE Photonics Technology Letters. He is a senior member of the Institute of Electrical and Electronics Engineers and the Optical Society of America, and a member of Illumination Engineering Society and the International Society for Optics and Photonics.

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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 College of Engineering Electrical and Computer Engineering
July 2015-Aug 2021	Associate Professor Lehigh University, Bethlehem, PA

	P. C. Rossin College of Engineering and Applied Sciences 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 Lumileds Lighting/Agilent/Hewlett Packard, San Jose, CA 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-June1995	Graduate Research Assistant University of Illinois, Champaign-Urbana, IL Electrophysics Laboratory (advisor: P. D. Coleman)
June 1993-June1994	Undergraduate Research Assistant University of Illinois, Champaign-Urbana, IL Electrophysics Laboratory (advisor: P. D. Coleman)

Publication Statistics

- Published Refereed Publications: 69 (2 submitted)
- Conference Presentations: 123, Invited: 26

- Patents:
  - US Patents: 42, US Applications: 1
  - European Patents: 35
- Book Chapters: 3
- Conference Proceedings: 7
- News Items: 34
- Google Scholar: https://scholar.google.com/citations?user=mnUvAGMAAAAJ&hl=en
  - Citations: 8216, h-index: 44, i10-index: 80
- Web of Science ResearcherID: https://publons.com/researcher/1389951/jonathan-j-wierer-jr
  - Citations: 3935, h-index: 26, Ave Citations Per Article: 45.2
- Semantic Scholar: https://www.semanticscholar.org/author/Jonathan-J.-Wierer/2636527
  - Citations: 4292, h-index: 29, Highly Influential Citations: 80
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Publications

1. E. Palmese, M. R. Peart, D. Borovac, R. Song, N. Tansu, and J. J. Wierer, Jr., "Thermal Oxidation Rates and Resulting Optical Constants of $Al_{0.83}In_{0.17}N$ Films Grown on GaN", Journal of Applied Physics, 129, 125105 (2021). DOI: 10.1063/5.0035711

2. M. R. Peart, X. Wei, D. Borovac, W. Sun, R. Song, N. Tansu, and J. J. Wierer, Jr., "AlInN/GaN diodes for power electronic devices", Applied Physics Express, 13, 091006 (2020). DOI: 10.35848/1882-0786/abb180

3. D. Borovac, W. Sun, M. R. Peart, R. Song, J. J. Wierer, Jr., and N. Tansu, "Low Background Doping in AlInN Grown on GaN via Metalorganic Vapor Phase Epitaxy" Journal of Crystal Growth 548, 125837 (2020). DOI: 10.1016/j.jcrysgro.2020.125847

4. O. O. Ekoko, J. C. Goodrich, A. J. Howzen, N. C. Strandwitz, J. J. Wierer, Jr. and N. Tansu "Electrical Properties of MgO/GaN Metal-Oxide-Semiconductor Structures" Solid State Elec. (2020). DOI: 10.1016/j.sse.2020.107881

5. S. A. A. Muyeed, X. Wei, D. Borovac, R. Song, N. Tansu, and J. J. Wierer, Jr., "Controlled growth of InGaN quantum dots on photoelectrochemically etched InGaN quantum dots templates", Journal of Crystal Growth, 540, 125652 (2020). DOI: 10.1016/j.jcrysgro.2020.125652

6. 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, "Surface Pretreatment and Deposition Temperature Dependence of MgO Epitaxy on GaN by Thermal Atomic Layer Deposition", Journal of Crystal Growth, 536, 125568 (2020). DOI: 10.1016/j.jcrysgro.2020.125568

7. M. R. Peart, and J. J. Wierer, Jr., "Edge Termination for III-Nitride Power Devices using Polarization Engineering", IEEE Transactions on Electron Devices, 67, 571 (2020). DOI: 10.1109/TED.2019.2958485

8. D. Borovac, W. Sun, R. Song, J. J. Wierer Jr., and N. Tansu, "On the thermal stability of nearly lattice-matched AlInN films grown on GaN via MOVPE", Journal of Crystal Growth, 533, 125469 (2020). DOI: 10.1016/j.jcrysgro.2019.125469

9. S. A. A. Muyeed, W. Sun, M. R. Peart, R. M. Lentz, X. Wei, D. Borovac, R. Song, N. Tansu, and J. J. Wierer, Jr., "Recombination Rates in Green-Yellow InGaN-Based Multiple Quantum Wells with AlGaN Interlayers", J. Appl. Phys. 126, 213106 (2019). DOI: 10.1063/1.5126965
10. J. J. Wierer, Jr. and N. Tansu, "III-nitride micro-LEDs for efficient emissive displays" Lasers and Photonics Review, 13, 1900141 (2019). DOI: 10.1002/lpor.201900141 (Cited: 33)
11. M. R. Peart, X. Wei, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr., "Thermal Oxidation of AlInN for III-nitride Electronic and Optoelectronic Devices", ACS Applied Electronic Materials, 1, 1367-1371 (2019). DOI: 10.1021/acsaelm.9b00266
12. X. Wei, S. A. A. Muyeed, M. Peart, W. Sun, N. Tansu, and J. J. Wierer, Jr., "Room Temperature Luminescence of InGaN Quantum Dots Formed by Quantum-Sized-Controlled Photoelectrochemical Etching", Appl. Phys. Lett., 113, 121106 (2018). DOI: 10.1063/1.5046857
13. M. R. Peart, N. Tansu, and J. J. Wierer, Jr., "AlInN for Vertical Power Electronic Devices", IEEE Trans. Elec. Devices, 65, 4276-4281 (2018). DOI: 10.1109/TED.2018.2866980
14. 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
15. W. Sun, C.-K. Tan, J. J. Wierer, Jr., and N. Tansu "Ultra-Broadband Optical Gain in III-Nitride Digital Alloys", Scientific Reports, 8, 3109 (2018). DOI: 10.1038/s41598-018-21434-6
16. S. A. A. Muyeed, W. Sun, X. Wei, R. Song, D. D. Koleske, N. Tansu, and J. J. Wierer, Jr., "Strain compensation in InGaN-based multiple quantum wells using AlGaN interlayers", AIP Advances 7, 105312 (2017). DOI: 10.1063/1.5000519
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19. A. A. Allerman, A. M. Armstrong, A. J. Fischer, J. R. Dickerson, M. H. Crawford, M. P. King, M. W. Moseley, J. J. Wierer, Jr., and R. J. Kaplar, "$Al_{0.3}Ga_{0.7}N$ PN diode with breakdown voltage greater than 1600 V", Elec. Letters, 52, 1319 (2016). DOI: 10.1049/el.2016.1280
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23. M. P. King, A. M. Armstrong, J. R. Dickerson, G. Vizkelethy, R. M. Fleming, J. Campbell, I. C. Kizilyalli, D. P. Bour, O. Atkas, D. Disney, J. J. Wierer, Jr., A. A. Allerman, M. W. Moseley, F. Leonard, A. A. Talin, and R. J. Kaplar "Performance and Breakdown Characteristics of Irradiated Vertical Power GaN P-i-N Diodes", IEEE Trans on Nuclear Science, 62, 2912 (2015). DOI: 10.1109/TNS.2015.2480071

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25. A. M. Armstrong, M Moseley, A. A. Allerman, M. H. Crawford, and J. J. Wierer Jr., "Growth temperature dependence of Si doping efficiency and compensating deep level defect incorporation in $Al_{0.7}Ga_{0.3}N$" J. Appl. Phys. 117, 185704 (2015). DOI:10.1063/1.4920926

26. 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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31. J. J. Wierer, Jr., A. A. Allerman, E. J. Skogen, A. Tauke-Pedretti, C. Alford, G. A. Vawter, and I. Montaño, "Layer disordering and doping compensation of an intersubband AlGaN/AlN superlattice by silicon implantation", Appl. Phys. Lett., 105, 131107 (2014). DOI:10.1063/1.4896783

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34. J. Y. Tsao, M. H. Crawford, M. E. Coltrin, A. J. Fischer, D. D. Koleske, G. Subramania, G. T. Wang, J. J. Wierer, and B. Karlicek, "Toward Smart and Ultra-Efficient Solid-State Lighting", Adv. Opt. Mat., 2, 803 (2014). DOI: 10.1002/adom.201400131, Altmetric: 23

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41. J. J. Wierer, Jr., D. S. Sizov, and J. Y. Tsao, "Comparison between Blue Laser and Light-Emitting Diodes for Future Solid-State Lighting", Lasers and Photonics Reviews, 7, 963 (2013). (Cited 336) DOI:10.1002/lpor.201300048, Altmetric: 24

42. J. R. Riley, S. Padalkar, Q. Li, P. Lu, J. J. Wierer, Jr., D. D. Koleske, G. T. Wang, and L. J. Lauhon, "Three-Dimensional Mapping of Quantum Wells in a GaN/InGaN Core-Shell Nanowire Array Light Emitting Diode", Nano Letters, 13, 4317 (2013). DOI:10.1021/nl4021045

43. S. Howell, S. Padalkar, K. Yoon, Q. Li, J. J. Wierer, Jr., D. D. Koleske, G. Wang, and Lincoln J. Lauhon, "Spatial Mapping of Efficiency of GaN/InGaN Nanowire Array Solar Cells using Scanning Photocurrent Microscopy", Nano Letters 13, 5123, (2013). DOI:10.1021/nl402331u, Altmetric: 3

44. S. R. Lee, D. D. Koleske, M. H. Crawford, and J. J. Wierer, Jr., "Effect of interface grading and lateral thickness variations on x-ray diffraction by InGaN-GaN multiple quantum wells" J. Crystal Growth, 355, 63 (2012). DOI:10.1016/j.jcrysgro.2012.06.048

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67. J. J. Wierer, A. Maranowski, N. Holonyak, Jr., P. W. Evans, and E. I. Chen, "Double Injection and Negative Resistance in Stripe Geometry Oxide Aperture $Al_yGa_{1-y}As$-GaAs-$In_xGa_{1-x}As$ Quantum Well Heterostructure Laser Diodes," Appl. Phys. Lett., 69, 2882-2884 (1996). DOI:10.1063/1.117350
68. J. J. Wierer, "Current Overview of the Far IR p-Ge Laser", Master's Thesis, University of Illinois, May 1995.
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Conference Presentations

1. 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).
2. 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.
3. 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.

4. 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).
5. 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).
6. J. J. Wierer, Jr., "Researching efficient III-nitride micro-LEDs for displays", Facebook's Annual AR Optics Academic Forum (Sept 2020), Virtual (invited).
7. 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", 62th Electronic Materials Conference (July 2020), Virtual.
8. 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", 62th Electronic Materials Conference (July 2020), Virtual.
9. 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.
10. 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.
11. 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.
12. 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 student poster competition).
13. 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)
14. 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)
15. 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)
16. 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)

17. 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.
18. 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", 61th Electronic Materials Conference (June 2019), Ann Arbor, MI.
19. M. Peart and J. J. Wierer, Jr.," Polarization Edge Termination for GaN Vertical Power Devices", 61th Electronic Materials Conference (June 2019), Ann Arbor, MI.
20. M. R. Peart, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," AlInN for Vertical Power Electronic Devices", 61th Electronic Materials Conference (June 2019), Ann Arbor, MI.
21. M. R. Peart, X. Wei, D. Borovac, W. Sun, N. Tansu, and J. J. Wierer, Jr.," Wet Thermal Oxidation of AlInN", 61th Electronic Materials Conference (June 2019), Ann Arbor, MI.
22. 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.
23. 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.
24. 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).
25. 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.
26. 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.
27. 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.
28. 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.
29. M. Peart, N. Tansu, and J. J. Wierer, Jr., "AlInN for Vertical Power Electronic Devices", Les Eastman Conference 2018 (August 2108), Columbus, OH.
30. 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).
31. 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)

32. 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).
33. 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.
34. 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).
35. 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).
36. 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).
37. 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).
38. 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).
39. 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.
40. 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.
41. 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.
42. 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).
43. 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)
44. 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.
45. 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.

46. 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.
47. 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.
48. 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.
49. J. J. Wierer Jr., and N. Tansu, "Research areas for ultra-efficient solid-state lighting", EERE-SSL Roundtable, (September 2016), Washington D. C.
50. 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.
51. 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.
52. 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).
53. 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.
54. 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)
55. 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)
56. J. J. Wierer, Jr. "Edge termination in vertical GaN diodes/Opportunity for GaN substrates in SSL", Roadmapping for GaN Workshop, (January 2016) Davis, CA.
57. 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.
58. 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.
59. R. J. Kaplar, A. A. Allerman, A. M. Armstrong, A. G. Baca, A. J. Fischer, J. J. Wierer, and J. C. Neely, "Ultra-Wide-Bandgap Semiconductors for Power Electronics," 228th ECS Meeting (October 2015), Phoenix, AZ.
60. J. J. Wierer, Jr. and N. Tansu, "Breakthrough research leading to ultra-efficient solid-state lighting", EERE-SSL Roundtable, (September 2015), Washington D. C.

61. M. W. Moseley, A. A. Allerman, I. Montano, J. J. Wierer, A. Tauke-Pedretti, E. Skogen and G. A. Vawter, "Strain-Mediated Interfacial Diffusion and Shifts in Intersubband Transition Energies in AlN/AlGaN Superlattices", ACCGE (August 2015), Big Sky, MT.
62. M. H. Crawford, A. A. Allerman, A. M. Armstrong, J. J. Wierer, W. Chow, M. Moseley, M. W. Smith, and K. C. Cross, "350-nm band edge-emitting laser diodes enabled by low-dislocation-density AlGaN templates", IEEE Summer Topical Meeting (July 2015), Nassau, Bahamas.
63. J. R. Dickerson, J. J. Wierer, M. P. King, B. Bryant, A. J. Fischer, A. A. Allerman and R. J. Kaplar, "A Numerical Analysis of Multiple Field Ring Designs for High Power GaN Diodes", 57th Electronic Materials Conference (June 2015), Columbus, Ohio.
64. M P. King, R. J. Kaplar, J. J. Wierer, M. W. Moseley, I. C. Kizilyalli, D. P. Bour, O. Aktas, H. Nie, D. Disney, A. A. Allerman, and A. M. Armstrong, "Investigation of Deep Levels in High-Breakdown-Voltage, Low-Threading-Dislocation-Density Vertical GaN P-i-N Diode", 57th Electronic Materials Conference (June 2015), Columbus, Ohio.
65. Montano, A. A. Allerman, J. J. Wierer, M. W. Moseley, E. J. Skogen, A. Tauke-Pedretti and G. A. Vawter, "Microscopic Modeling of Nitride Intersubband Absorbance", 57th Electronic Materials Conference (June 2015), Columbus, Ohio.
66. M. W. Moseley, A. A. Allerman, I. Montano, J. J. Wierer, A. Tauke-Pedretti, E. Skogen and G. A. Vawter, "Strain-Mediated Interfacial Diffusion and Shifts in Intersubband Transition Energies in AlN/AlGaN Superlattices", 57th Electronic Materials Conference (June 2015), Columbus, Ohio.
67. J. J. Wierer, Jr., and J. Y. Tsao, "Prospects for laser diodes in solid-state lighting", International Conference on Light-Emitting Devices and Their Industrial Applications -LEDIA (April 2015), Yokohama, Japan. (invited)
68. J. J. Wierer, Jr., and J. Y. Tsao, "Laser diodes in solid-state lighting", CS International (March 2015), Frankfurt, Germany. (Keynote)
69. J. J. Wierer, Jr., I. Montano, M. H. Crawford, M. Moseley, and A. A. Allerman, "Effect of Thickness and Carrier Density on the Optical Polarization and Extraction Efficiency of 275nm Ultraviolet Light Emitting Diodes", International Workshop on Nitride Semiconductors (August 2014), Wroclaw, Poland.
70. A. A. Allerman, M. Moseley, J. J. Wierer, Jr., A. Armstrong, and, M. H. Crawford, "Impact of electrically-conducting defects on UVC-LED performance", International Workshop on Nitride Semiconductors (August 2014), Wroclaw, Poland.
71. J. J. Wierer, Jr., and J. Y. Tsao, "Solid-state lighting with III-nitride laser diodes", International Workshop on Nitride Semiconductors (August 2014), Wroclaw, Poland.
72. G. T. Wang, Q. Li, J. B. Wright, H. Xu, J. J. Wierer, Jr., D. D. Koleske, J. J. Figiel, A. Hurtado, L. F. Lester, C. Li, S. R. J. Brueck, T. S. Luk, and I. Brener, "Top-down III-nitride nanowires: from LEDs to lasers", SPIE Optics and Photonics (August 2014), San Diego, CA.
73. J. J. Wierer, Jr., and J. Y. Tsao, "Laser diodes in solid-state lighting", SPIE Optics and Photonics (August 2014), San Diego, CA. (invited)
74. J. J. Wierer, Jr., "Research trends and future directions for solid-state lighting", IES Regional Conference, (July 2014), Albuquerque NM. (invited)

75. A. M. Armstrong, M. W. Moseley, A. A. Allerman, M. H. Crawford, J. J. Wierer, "Strong Sensitivity of Si Doping Efficiency and Deep Level Formation on Growth Temperature" for n-type $Al_{0.7}Ga_{0.3}N$, Electronic Materials Conference, (June 2014), Santa Barbara, CA.
76. G. T. Wang, Q. Li, J. B. Wright, H. Xu, J. J. Wierer, D. D. Koleske, J. J. Figiel, A. Hurtado, L. F. Lester, G. Subramania, T. S. Luk, I. Brener, "Top-Down III-Nitride Nanowire LEDs and Lasers", 56th Electronic Materials Conference, (June 2014), Santa Barbara, CA.
77. J. J. Wierer, Jr., I. Montano, M. H. Crawford, and A. A. Allerman, "Anisotropic optical polarization of AlGaN based 275 nm light-emitting diodes due to quantum-size effects," CLEO, (June 2014), San Jose, CA.
78. A. A. Allerman, A. A., J. J. Wierer, I. Montano, M. W. Moseley, E. J. Skogen, A. Tauke-Pedretti, G. A. Vawter, "MOVPE Grown Electromodulators based on Intersubband Absorption Utilizing AlN-AlGaN Coupled Quantum Wells", 5th International Symposium on Growth of III-Nitrides, (May 2014), Atlanta, GA.
79. M. Moseley, A. A. Allerman, M. H. Crawford, J. J. Wierer, M. L. Smith, L. Biedermann, "Electrical Current Leakage and the Performance of UV-C LEDs", 5th International Symposium on Growth of III-Nitrides, (May 2014), Atlanta, GA.
80. J. J. Wierer, A. J. Fischer, G. T. Wang, J. Y. Tsao, and B. Biefeld, "Laser Diodes for Solid-State Lighting", EERE SSL Workshop PI Meeting, (January 2014), Tampa, FL (invited).
81. J. Riley, S. Padalkar, Q. Li, P. Lu, D. Koleske, J. J. Wierer, G. Wang, L. Lauhon, "Revealing the 3-D Structure of Nanowire LEDs", 2014 DOE Solid-State Lighting R&D Workshop, (January 2014), Tampa, FL.
82. S. Howell, S. Padalkar, K. Yoon, Q. Li, D. D. Koleske, J. J. Wierer, G. T. Wang, L. J. Lauhon, "Spatial Mapping of Efficiency of GaN/InGaN Nanowire Array Solar Cells by using Scanning Photocurrent Microscopy", Fall MRS Meeting, (December 2013), Boston, MA.
83. J. J. Wierer, Jr., D. S. Sizov, A. Neumann, S. R. J. Brueck, and J.Y. Tsao," The potential III-nitride laser diodes as a future solid-state lighting source", IEEE Photonics Conference, (September 2013), Bellevue, WA. (invited)
84. J. J. Wierer, Jr., D. S. Sizov, A. Neumann, S. R. J. Brueck, and J.Y. Tsao," The potential III-nitride laser diodes for solid-state lighting", International Conference on Nitride Semiconductors, (August 2013), Washington, D. C.
85. J. J. Wierer, Jr., D. S. Sizov, and J.Y. Tsao," III-nitride laser diodes for solid-state lighting", Energy Frontier Research Centers Principal Investigators, (July 2013), Washington D.C.
86. J. J. Wierer, Jr., D. S. Sizov, A. Neumann, S. R. J. Brueck, and J.Y. Tsao," Study of III-nitride laser diodes for solid-state lighting", CLEO, (June 2013), San Jose, CA.
87. J. J. Wierer, Jr., D. Koleske, G. Wang, Q. Li, S. Lee, and A. Fischer, "III-nitride solar cells", Asia Photonics Conference, (November 2012), Guangzhou, China. (invited)
88. A. A. Allerman, J. J. Wierer, Q. Li, M. H. Crawford, and S. R. Lee, "Impurity-Induced Disordering in Si- and Mg-Doped AlGaN-AlN Superlattices" Meeting of the Electrochemical Society (October 2012) Honolulu HI.

89. G. T. Wang, Q. Li, J. J. Wierer, D. D. Koleske, J. J. Figiel, J. B. Wright, T. S. Luk, and I. Brener, "III-nitride nanowires: From the Bottom-Up to the Top-Down" SPIE Optics and Photonics Conference (Aug ust2012), San Diego, CA.
90. G. T. Wang, Q. Li, J. J. Wierer, D. D. Koleske, J. J. Figiel, J. B. Wright, T. S. Luk, and I. Brener, "III-nitride nanowires: Novel Materials for Lighting and Photovoltaics" Photonics North (June 2012), Montreal, Canada.
91. A. A. Allerman, J. J. Wierer, Q. Li, S. R. Lee, and M. H. Crawford, "MOVPE Growth of Intersubband Absorption in AlN-AlGaN Superlattices, "16th MOVPE Conference, (May 2012), Seoul, South Korea.
92. Q. Li, G. T. Wang, J. B. Wright, I. Brener, T. S. Luk, M. H. Crawford, G. S. Subramania, D. D. Koleske, J. J. Wierer, S. R. Lee, "Top-Down III-nitride nanowires" Electronic Materials Conference (June 2012), Santa Barbara, CA.
93. J. J. Wierer, Jr., G. T. Wang, Q. Li, D. D. Koleske, and S. R. Lee, "III-nitride nanowire array solar cells" CLEO, (May 2012), San Jose, CA. (postdeadline talk)
94. G. T. Wang, Q. Li, J. J. Wierer, D. D. Koleske, J. J. Figiel, "Fabrication and characterization of vertically-integrated, III-nitride nanowire based LEDs and solar cells", Spring Meeting of the Materials Research Society (March 2012), San Francisco, CA.
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Honors/Awards

- Senior Member of the Optical Society of America, 2019.
- Joel and Ruth Spira Excellence in Teaching Award / Lutron Electronics Co., 2018
- Honorary Member of Illumination Engineering Society (IES), 2014.

- R&D100 Award, "Photovoltaics that fit", R&D Magazine, 2012.
- Senior Member of Institute of Electrical and Electronics Engineers (IEEE), 2011.
- R&D100 Award, "Cantilever Epitaxy and Growth of Low-Dislocation Gallium Nitride", R&D Magazine, 2004.
- Gregory Stillman Semiconductor Research Award, 1998.

Societies

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

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, 2015-2020.
- 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, and 2021.
- International Workshop of Nitride Semiconductors (IWN), Program Committee Optical Devices, 2016, 2018, 2022.
- International Conference on Nitride Semiconductors (ICNS), Program Committee, 2021.

Journal Activities

- Associate Editor, IEEE Photonics Technology Letters, Jan. 2018-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-states physics, applied quantum mechanics, semiconductor device simulation, electromagnetics, photovoltaics and photodetectors, semiconductor device processing, patents, and intellectual property

Courses Taught at Lehigh

- 2000 Fall MatE 153 (at San Jose State)
- 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
  ECE 492 Graduate Independent Study
- 2019 Fall ECE 350/450 Semiconductor Optoelectronics
  ECE 492 Graduate Independent Study
- 2020 Spring ECE 126 Fundamentals of Semiconductor Devices
  ECE 308 Physics and Models of Semiconductor Devices
  ECE 492 Graduate Independent Study
- 2020 Fall ECE 350/450 Semiconductor Optoelectronics
  ECE 492 Graduate Independent Study
- 2021 Spring ECE 126 Fundamentals of Semiconductor Devices
  ECE 308 Physics and Models of Semiconductor Devices
  ECE 492 Graduate Independent Study

Courses Taught at NC State

- 2022 Fall ECE 492/592 Semiconductor Optoelectronic Devices

Course evaluation scores at Lehigh, Fall 2015-Spring 2018

Semester	Course Number	Course Credits	# Grades Assigned	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, Spring 2018-Spring 2021

Semester	Course Number	Course Credits	Grades Given	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
Question 1: *Instructor presented content in an organized manner.*
Question 2: *The instructor's teaching methods contributed to my understanding of the course material.*
Question 3: *The instructor was responsive when I had difficulties or questions.*
Question 4: *The instructor gave me constructive feedback.*
Question 5: *The instructor's assignments (i.e. projects, homework, papers, etc.) provided opportunities for participative learning within the course.*
Question 6: *The course increased my knowledge of the subject matter.*

Advising

Current graduate research students:

1. Elia Palmese
   Research topic/Thesis: "III-nitride power transistors"
   Duration: Sept 2019- present

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

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

Current vising researchers:

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

PhD student supervised:

1. Matt Peart
   Research topic/Thesis: "Development of III-Nitride Power Device Technology"
   Duration: June 2016 - Aug 2020
   Placement: 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.

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

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

5. Hanlin Fu (Advisory role only, Tansu departure)
   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

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

3. 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

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

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: Alta Devices

Visiting researchers supervised:

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

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

Service at Lehigh University

- Lehigh University, Internal Review Committee, Fall 2019-Aug 2021.
- Lehigh 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, 2015 - Aug 2021
- ECE department, Seminar speaker committee, 2015 - Aug 2021
- ECE department, Lehigh ECE 125th Anniversary committee, 2017-2018
- Center for Photonics and Nanoelectronics, Member, 2015 - Aug 2021
- Center for Photonics and Nanoelectronics, Nanofabrication facilities committee, 2017 - Aug 2021