

Raj Vinnakota

Department of Chemistry&Physics
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Curriculum Vitae

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Education

- 2012-2018 **PhD in Engineering (Engineering Physics concentration)**, Louisiana Tech University, Department of Physics, Ruston, LA, USA. Advisor: Prof.Dentcho Genov.
Thesis: "Electromagnetic Wave-Matter Interactions in Complex Opto-electronic Materials and Devices"
- 2016-2018 **M.S. in Microsystems Engineering**, Louisiana Tech University, Department of Engineering and Science, Ruston, USA. Advisor: Dr.Adarsh Radadia.
Project1: "Fabrication and electrical characterization of Graphene Field Effect Transistor"
Project2: "Polyol synthesis of copper and silver nanocubes"
- 2013-2015 **M.S. in Applied Physics**, Louisiana Tech University, Department of Engineering and Science, Ruston, LA, USA. Advisor: Prof.Dentcho Genov.
Project: "Active control Surface Plasmon Propagation using giant thermo-optic non-linearity at heavily doped PN⁺-junction interfaces"
- 2009-2012 **M.S. in Engineering (Electrical Engineering concentration)**, Louisiana Tech University, Department of Engineering and Science, Ruston, LA, USA. Advisor: Prof.Dentcho Genov.
Project1: "Surface Plasmon Polariton Diode"
Project2: "Design and simulation of MEMS capacitive accelerometer"
- 2003-2007 **Bachelor's in Electronics and Communications**, Jawaharlal Nehru Technological University, Department of Engineering and Science, Andhra Pradesh, India.

Research Interests

- Semiconductor Plasmonics, Novel Plasmonic based optoelectronic devices, Semiconductor Optics and Photonics, Plasmonic interconnects and Plasmon enhanced Light Matter Interactions.
- Finite element Multiphysics modeling with applications in Computational Electrodynamics.

Professional Experience

- Jan 2020-present **Assistant/Associate Professor, Program Coordinator for Electrical Engineering Technology**, Department of chemistry&Physics, Troy University, Troy, AL.
- Aug 2019-Dec 2019 **Lecturer-II/Visiting Assistant Professor, Engineering Technology**, Grambling State University, Grambling, LA.
- Dec 2018-Jul 2019 **Post-Doctoral Fellow, Consortium for Innovation in Manufacturing and Materials (CIMM)**, Louisiana Tech University, Ruston, LA.
- Jan 2019-Jul 2019 **Adjunct Faculty, Engineering Technology**, Grambling State University, Grambling, LA.
- 2012-2018 **Research Assistant at Computational Electromagnetism Research Lab (CERL)**, Louisiana Tech University, Department of Physics, Ruston, LA.
Expertise Area/ Works performed:
 - Multiphysics Finite element modeling and complete theoretical investigation of:
 - Novel optoelectronic devices.
 - Metal and semiconductor based Plasmonic Devices.

- Nano photonics, nonlinear optics and optical elements.
 - Light scattering from metal particles.
 - Artificial materials: metamaterials and negative index media.
 - Heat Transfer and fluid dynamics problems.
 - Selective Laser Melting.
 - Electromagnetic interaction in complex systems.
 - Full coupling of optical, semiconductor/metal and thermal effects.
 - Solving fundamental problems in physics and engineering.
 - Proposed the design and experimental run plans related to PN-Junction optoelectronic switch in collaboration with University of Texas Austin.
 - TCAD simulations to design, optimize process flow, design device structures and study electrical characteristics.
 - Micro-fabrication of electrolyte gated Graphene Field Effect Transistor.
 - Hands-on experience inside Class 100 clean room for microfabrication processes: photolithography, thin-film deposition using sputtering, thermal evaporator and layer-by-layer CVD, spin coating, wet etching and RIE.
 - Expertise in device characterization and testing using AFM, SEM, optical microscope, surface profilometer, filmetrics, oscilloscope, power meters, picoammeter, UV-Vis etc.
 - Writing automation code scripts in UNIX and VISUAL BASIC for data acquisition, data manipulation and data processing.
 - Adept in using COMSOL, Mathematica, MATLAB.
 - Experience with Silvaco TCAD tools (TCAD Process and/or TCAD Device Simulation).
 - Assisted PhD adviser in teaching classes, lab demonstration and grading courses for graduate and undergraduate students.
 - Mentored and trained 3-undergraduate, 1-graduate and 2-summer REU's students.
 - Assisted supervisor in writing grant proposals.
 - Maintaining and managing lab inventory and equipment.
- 2014-2016 **Vice President, Research and Development**, *La New Product Development Team LLC*, Ruston, LA.
- Enhanced leadership skills by Coordinating voluntary students, managing project progress and delivery.
- 2012-2015 **Teaching Assistant**, *Louisiana Tech University, Department of Physics*, Ruston, La.
- Instructor and grader for advance undergraduate laboratories and physics courses; General Physics Laboratory for investigation of basic physical principles; Electricity and Magnetism Laboratory.
- 2009-2011 **Research Assistant**, *Louisiana Tech University, IFM*, Ruston, LA.
- Repair and maintenance of the He-Ne laser system. Setting up an experimental bench for trapping, sorting, manipulating cells and micrometer sized particles within the microfluidic systems using laser forces.
- 2007-2009 **Software Engineer**, *Sasken, Motorola Division*, Bangalore, India.
- Mobile Application and Multimedia subsystem developer for a tier-1 handset manufacturer; Motorola. Mobile applications created on Symbian and Android operating system platform. Adept at developing efficient image decoders for smart phones using C, C++ and Core-Java.
 - Worked on optimization of image decoders, bug analysis & fixing and managed a team of 4 members.
- 2006-2007 **Teaching Assistant**, *University of MVGR, Department of ECE, Faculty of Science*, Andhra Pradesh, India.

- Laboratory assistant and grader for undergraduate laboratories, worked as instructor for undergraduate courses; Electronic design and communications; Digital signal processing.
- Tutored more than 30 students through effective tutoring techniques to help students to achieve set goals.

Appointments

- 2023 **Member of the Graduate Faculty**, *Louisiana Tech University*, Physics, College of Engineering and Science.
This is an honorary professional status at the rank of External Member of Graduate Committee.
-Serving as an Committee member on a PhD students Dissertation.

Honors & Awards

- 2022 **Chancellor's Award of Distinction for Sponsored Program Success**, *Troy University*.
- 2016 **Best Graduate Oral Presentation**, *Louisiana Academy of Sciences*.
90th Annual Meeting, Louisiana State University.
- 2015 **The People's Choice Award in Business Pitch Competition**, *Center for Entrepreneurship and Information Technology (CEnIT), Louisiana Tech University*.
Won in One provides the entrants an opportunity to present their concepts in a way that is exiting, informative, and financially appealing. The competition is a component of the I-20 Corridor Regional Accelerator.
- 2015 **1st Runner-up, New Venture Championship**, *Center for Entrepreneurship and Information Technology (CEnIT), Louisiana Tech University*.
Start-up Idea: Using photons as information carriers instead of electrons and design new generation integrated circuits.
- 2015 **CIMM Research Scholarship**, *College of Engineering and Science (COES), Louisiana Tech University*.
Awarded towards the tuition for doctoral program at Louisiana Tech University.
- 2014 **Finalist in Louisisana Startup prize**, *Shreveport, LA, USA*.
- 2014 **The Anjum Sadiq International Scholarship Award**, *International Student Organization (ISO)*.
For Outstanding Service to International Students at Louisiana Tech University.
- 2012 **Graduate Research Scholarship**, *Louisiana Tech University, Ruston, LA, USA*.
- 2007 **Best Idea Award**, *National level Student technical Symposium (SPACETECH), Andhra Pradesh, India*.
- 2006 **Best Robotic Design**, *KSHITIJ International Robotic competition, IIT Kharagpur, Andhra Pradesh, India*.
- 2006 **Best student presenter**, *National symposium advanced computing (NSACIS), Andhra Pradesh, India*.

Articles in Magazine

- R. K Vinnakota, "Future supercomputing with Terahertz Optoelectronics", E&S Magazine, LaTech, spring edition 2015.
- R. K Vinnakota, "Metamaterials: escorting in an age of near-magical technology", E&S Magazine, LaTech, spring edition 2017.

Media Mentions

- "TROY awarded \$ 161K National Science Foundation grant"
website: <https://today.troy.edu/news/troy-awarded-161k-national-science-foundation-grant/>
website: <https://www.troymessenger.com/2022/05/04/troy-university-awarded-national-science-foundation-grant/>
website: https://dothaneagle.com/news/local/troy-professor-awarded-national-science-foundation-grant/article_a67648bc-cbb2-11ec-b094-9b87858b81db.html
- Publication titled "Active Control of Charge Density Waves at Degenerate Semiconductor Interfaces" is mentioned in online media [4-traders.com](http://www.4-traders.com).
website: <http://www.4-traders.com/news/Investigators-from-Louisiana-Technical-University-Zero-in-on-Optoelectronics-Active-Control-of-Char-25197362/>
- Third place in Louisiana Startup Prize competition held October 2014 in Shreveport
Startup Idea: Patho Radar-Device for detecting multiple pathogens at once in food products.
website: <http://lastartupprize.com/louisiana-tech-students-shine-at-louisiana-startup-prize-competition/>
website: <http://news.latech.edu/2014/06/26/louisiana-tech-students-shine-at-louisiana-startup-prize-competition/>
- Louisiana Tech Talk News: Interview on Louisiana Startup Prize competition held October 2014
website: <https://www.thetechtalk.org/tech-teams-win-cash-for-ideas/>
- Won in One Pitch competition: People choice award for technology for faster computer processors
website: <https://www.newspapers.com/image/113958075/>

Publications

- **R. K. Vinnakota**, Z. Dong, A. F. Briggs, S. R. Bank, D. Wasserman, & D. A. Genov "Response Times of Degenerately Doped Semiconductor Based Plasmonic Modulator", Journal of the Optical Society of America B, 40, 5 (2023).
- **R. K. Vinnakota**, Z. Dong, A. F. Briggs, S. R. Bank, D. Wasserman, & D. A. Genov "Plasmonic electro-optic modulator based on degenerate semiconductor interfaces", Nanophotonics, 9, 1105 (2020). **4 citations**
- D. A. Genov, **R. K. Vinnakota**, Z. Dong, A. F. Briggs, S. R. Bank, & D. Wasserman, & D. A. Genov "Excitation and Modulation of Surface Plasmon Polaritons at PN++ Junctions", Conference Proceedings AES Symposium, Marrakesh, Morocco, June 2020.
- G. Neal Blackman III, Christopher Perry, **R. K. Vinnakota**, & D. A. Genov, "Universal statistical characteristics of metal powders and roadmap toward improved deposition rates pertaining to metal printing" Proceedings of Louisiana EPSCoR RII CIMM 2020 Symposium, pg 129-132, Baton Rouge, LA
- Z. Dong, **R. K. Vinnakota**, A. F. Briggs, L. Nordin, D. A. Genov & D. Wasserman "Electrical Modulation of a Degenerate Semiconductor Plasmonic Interfaces", Journal of Applied Physics, Vol. 126, issue 4 (2019). **7 citations**
- **R. K. Vinnakota** and D.A. Genov, "Surface plasmon induced enhancement in selective laser melting processes", Rapid Prototyping Journal, Vol. 25 No. 6, pp. 1135-1143 (2019).
- **R. K. Vinnakota**, G. Neal Blackman III, & D. A. Genov, "Plasmonic excitation-assisted volumetric deposition rate improvement pertaining to Selective Laser Melting" Proceedings of Louisiana EPSCoR RII CIMM 2019 Symposium, pg 85-88, Baton Rouge, LA

- **R. K. Vinnakota**, G. Neal Blackman III, & D. A. Genov, "Plasmonic excitation-assisted optical enhancement pertaining to Selective Laser Melting" Proceedings of Louisiana EPSCoR RII CIMM 2018 Symposium, pg 169-172, Baton Rouge, LA
- **R. K. Vinnakota** and D.A. Genov, "Active Control of Charge Density Waves at Degenerate Semiconductor Interfaces", Scientific Reports, vol. 7, pp. 10778 (2017). **6 citations**
- Mona H. Alsaleh, **R. K. Vinnakota**, D.A. Genov, "Magnetic response of parallel slabs metamaterials at THz frequencies," Proc. SPIE 10345, Active Photonic Platforms IX, 1034508 (24 August 2017).
- **R. K. Vinnakota**, M. H. Alsaleh and D.A.Genov "Self-consistent electro-optical Modeling of light matter interactions at the interface of InAs PN+-junction," in Advanced Photonics 2017 (IPR, NOMA, Sensors, Networks, SPPCom, PS), OSA Technical Digest (online) (Optical Society of America, 2017), paper ITh2C.2. **1 citations**
- M. H. Alsaleh, **R. K. Vinnakota**, and D.A. Genov, "Saturation of Diamagnetic Response at THz Frequencies for Parallel Slabs Metamaterials," in Advanced Photonics 2017 (IPR, NOMA, Sensors, Networks, SPPCom, PS), OSA Technical Digest (online) (Optical Society of America, 2017), paper NoM2C.6. **2 citations**
- **R. K. Vinnakota** and D. A. Genov "Self-consistent modeling of laser matter interactions in laser-based 3D printing of metals & alloys," in Conference on Lasers and Electro-Optics, OSA Technical Digest (online) (Optical Society of America, 2017), paper STh3J.5. **1 citations**
- **R. K. Vinnakota**, Liam Springer, & D. A. Genov, "Model of radiation and heat transfer in laser matter interactions pertaining to Selective Laser Melting" Proceedings of Louisiana EPSCoR RII CIMM 2017 Symposium, pg 133-136, Baton Rouge, LA
- **R. K. Vinnakota**, C. E. Maher, & D. A. Genov, "Self-consistent modeling of laser matter interactions pertaining to laser- based 3D printing of metals & alloys". Proceedings of Louisiana EPSCoR RII CIMM 2016 Symposium, pg 133-136, Baton Rouge, LA
- **R. K. Vinnakota** and D. A. Genov, "Terahertz Optoelectronic Switching with Surface Plasmon Polariton Diode," in Conference on Lasers and Electro-Optics, OSA Technical Digest (online) (Optical Society of America, 2016), paper FTh1B.4. **2 citations**
- **R. K. Vinnakota** and D. A. Genov, "Terahertz optoelectronics with surface plasmon polariton diode", Scientific Reports, vol. 4, pp. 4899 (2014). **29 citations**

Conference Presentations

○ Scheduled Talks:

- **R. K. Vinnakota**(presenter), D. A. Genov, Z. Dong, A. F. Briggs, L.Nordin, S. R. Bank, & D. Wasserman, "Active Control and Response Times of Charge Density Waves excited at the Degenerately Doped Interfaces", International Summit on Lasers, Optics and Photonics (ISLOP2023), Valencia, Spain, April 2023. (Virtual presentation)
- **R. K. Vinnakota**(presenter), "Optoelectronic Control of Surface Plasmon Polaritons Waves at Metal-Doped semiconductor Interfaces", 2nd International Conference on Physics and its Applications, Los Angeles, CA, July 2023.
- **R. K. Vinnakota**(presenter), "All-optical switching using extraordinary thermo-optic nonlinearity of surface electronic waves at doped semiconductor interfaces", European Summit on Laser Optics & Photonics Technology (ELOPS2023), Barcelona, Spain, Sep 2023. (Virtual presentation)
- **R. K. Vinnakota**(presenter), "Thermal Assisted Plasmon-Plasmon interaction for active control of Electron Density Waves at Metal Semiconductor Interfaces", 4th INTERNATIONAL CONFERENCE ON OPTICS, PHOTONICS, AND LASERS (OPL-2023), Hiroshima, Japan, Dec 2023.

○ **Presented Talks:**

- **R. K. Vinnakota**(presenter), D. A. Genov, Z. Dong, A. F. Briggs, L.Nordin, S. R. Bank, & D. Wasserman, “Excitation and Active Control of Charge Density Waves at Degenerately Doped PN++ Junctions”, APS March Meeting, LasVegas, Nevada, March 2023.
- **R. K. Vinnakota**(presenter), D. A. Genov, Z. Dong, A. F. Briggs, L.Nordin, S. R. Bank, & D. Wasserman, “PN++ Junctions Based Plasmonic Electro-Optic Modulator”, 3rd International Conference on Optics, Photonics and Lasers, Nov 2022. (presented Virtually)
- **R. K. Vinnakota**(presenter), D. A. Genov, Z. Dong, A. F. Briggs, L.Nordin, S. R. Bank, & D. Wasserman, “Plasmonic Modulator based on Extraordinary Electro-Optic effect at Degenerately Doped PN++ Junctions”, 2nd International Meet & Expo on Semiconductors, SEMICONMEET2022, Barcelona, Spain, Sep 2022. (presented Virtually)
- D. A. Genov (presenter), **R. K. Vinnakota**, Z. Dong, A. F. Briggs, S. R. Bank,& D. Wasserman, “Excitation and Modulation of Surface Plasmon Polaritons at PN++ Junctions”, International conference on Antennas and Electromagnetic Systems (AES), Marrakesh, Morocco, June 2020.
- **R. K. Vinnakota**, and D. A. Genov, “Self-consistent electro-optical Modeling of light matter interactions at the interface of InAs PN+-junction”, Advanced Photonics Congress, New Orleans, Louisiana, July 27th 2017.
- **R. K. Vinnakota**, and D. A. Genov, “Self-consistent modeling of laser matter interactions in laser-based 3D printing of metals & alloys”, CLEO-Laser Science to Photonic Applications, San Jose, California, May 18th 2017.
- **R. K Vinnakota** and D. A. Genov, “Active control of charge density waves at Degenerate Semiconductor Interfaces”, 91st Annual Meeting of the Louisiana Academy of sciences, Ruston, Louisiana, March 2017.
- **R. K Vinnakota** and D. A. Genov, “Thermo-Optical Modelling of Laser Matter Interactions in Selective Laser Melting Processes”, 91st Annual Meeting of the Louisiana Academy of sciences, Ruston, Louisiana, March 2017.
- **R. K. Vinnakota**, and D. A. Genov, “Laser Matter Interactions in Selective Laser Melting Technique based on Thermo-optical Modelling”, Louisiana Tech Student Research Symposium, Louisiana Tech University, Ruston, Louisiana, Feb 2017.
- **R. K. Vinnakota** and D. A. Genov, “Thermo-optical model of laser matter interactions in selective laser melting”, presented at the CIMM’s 2017 February Technical Meeting, Louisiana Board of Regents Building, Baton Rouge, Louisiana, February 2017.
- **R. K Vinnakota** and D. A. Genov, “Terahertz optoelectronics with surface plasmon polariton diode”, CLEO-Laser Science to Photonic Applications, San Jose, California, June 2016.
- **R. K Vinnakota** and D. A. Genov, “Optoelectronic switching in Mid-Infrared”, 90th Annual Meeting of the Louisiana Academy of sciences, Alexandria, Louisiana, April 2016.
- D. A. Genov (presenter) and **R. K Vinnakota**, “Terahertz optoelectronics with surface plasmon polariton diode”, 7th International Conference on Surface Plasmon Photonics, Jerusalem Israel, June 2015.
- **R. K. Vinnakota**, V. K. Pappakrishnan and D. A. Genov, “Surface Plasmon Diode,” Louisiana Tech Graduate Student Conference, Louisiana Tech University, Ruston, Louisiana, Oct 2011.

Invited Seminars and Talks

- **R. K Vinnakota** and D. A. Genov, “Electromagnetic Wave-Matter Interactions in Complex Optoelectronic Materials and Devices”, Bidesix, Steamboat springs, Colorado, July 2019.

- **R. K Vinnakota** and D. A. Genov, “Electromagnetic Wave-Matter Interactions in Complex Optoelectronic Materials and Devices”, Physics Seminar Session, Ruston, Louisiana, October 2018.
- **R. K Vinnakota** and D. A. Genov, “Multiphysics Modeling of extreme Light Matter Interactions in semiconductor Plasmonics and Opto-electronic Materials”, Physics Seminar Session, Ruston, Louisiana, Dec 2017.
- **R. K Vinnakota** and D. A. Genov, “Self-Consistent Modeling of Light Matter Interactions in Plasmonic Devices and Opto-electronic Materials”, CIMM Seminar Series, Louisiana State University (LSU) Baton Rouge, Louisiana, Nov 2017.
- **R. K Vinnakota** and D. A. Genov, “Thermo-optical Modelling of Laser Matter Interactions in Selective Laser Melting Processes”, Physics Seminar Session, Ruston, Louisiana, April 2017.
- **R. Vinnakota** and D. A. Genov, “Surface Plasmon Polariton Based Optoelectronic Diode”, presented at the CIMM Student Retreat, Louisiana State University, Baton Rouge, Louisiana, February 2017.
- **R. k.Vinnakota** and D. A. Genov, “Thermo-optical modelling of laser matter interactions in selective laser melting Processes”, CIMM Student Retreat, Louisiana State University, Baton Rouge, Louisiana, February 2017.
- **R. K Vinnakota**, and D. A. Genov, “Thermo-optical model of laser matter interactions in selective laser melting”, CIMM Technical Conference, Baton Rouge, Louisiana, April 2016.
- **R. K Vinnakota** and D. A. Genov, “Optoelectronic switching in Mid-Infrared”, Physics Seminar Session, Ruston, Louisiana, April 2016.

Posters

- **R. K Vinnakota**, G. Neal Blackman III, and D. A. Genov, “Plasmonic excitation-assisted volumetric deposition rate improvement pertaining to Selective Laser Melting”, CIMM Technical Conference, Baton Rouge, Louisiana, 3rd June 2019.
- **R. K Vinnakota**, G. Neal Blackman III, and D. A. Genov, “Plasmonic excitation-assisted optical enhancement pertaining to Selective Laser Melting”, CIMM Technical Conference, Baton Rouge, Louisiana, 25th July 2018.
- **R. K Vinnakota**, G. Neal Blackman III, and D. A. Genov, “Model of radiation and heat transfer in Laser Matter Interactions pertaining to Selective Laser Melting”, CIMM Technical Conference, Baton Rouge, Louisiana, 25th July 2017.
- **R. K Vinnakota** and D. A. Genov, “Active Control of Charge Density Waves at Degenerate Semiconductor Interfaces”, APS March Meeting, New Orleans, Louisiana, March 2017.
- **R. K Vinnakota** and D. A. Genov, “Thermo-optical Modelling of Laser Matter Interactions in Selective Laser Melting Processes”, APS March Meeting, New Orleans, Louisiana, March 2017.
- **R. K Vinnakota**, Charles Maher, and D. A. Genov, “Thermo-optical model(3D) of light matter interactions in selective laser melting technique”, CIMM Technical Conference, Baton Rouge, Louisiana, 25th July 2016.
- **R. K Vinnakota**, Shravan Rakesh Animilli, and D. A. Genov, “Thermo-optical model (2D) of light matter interactions in selective laser melting technique”, CIMM Technical Conference, Baton Rouge, Louisiana, 25th February 2016.

Sponsored Research

Research Grants:

- Proposal Title: "ERI: Thermal Assisted Plasmon-Plasmon interaction for active control of Electron Density Waves at Metal Semiconductor Interfaces - A Roadmap to Novel All-Optical Devices", funded by the NSF (ECCS-2138198): Total award amount: \$ 161,597 (PI). Period covered: 02/22 - 01/24.
- Proposal Title: "New to IUUSE: EDU DCL: Multiphysics Simulations Assisted Engaged Student Learning in Optoelectronics - A Roadmap to Novel Evidence-Based Teaching Approach," Submitted to NSF and under review

Service

Service to Profession:

Editorial Board Member:

- Guest Editor for MDPI Photonics Journal
- Journal of applied Materials Science & engineering research

Reviewer for Professional Journals: (reviewed >20 research papers)

- ACS applied electronic materials, Journal of Optics, Journal of Physics D, MDPI Applied Sciences, MDPI Photonics, New Journal of Physics, Physica Scripta

Memberships:

- American Physical Society (APS), The Optical Society of America (OSA), IEEE Photonics, The International Society for Optics and Photonics (SPIE), Louisiana Academy of Sciences (LAS), Golden Key International Honor Society

Conference Activities:

- Organizing Committee member for International Summit on Lasers, Optics and Photonics (ISLOP2023)
- Organizing Committee member for European Summit on Laser Optics & Photonics Technology (ELOPS2023)
- Session Chair for 2nd International Conference on Physics and its Applications, (scheduled for July 2023).
- Session Chair for 3rd International Conference on Optics, Photonics and Lasers, Nov 2022.
- Plenary Session Chair for 3rd International Conference on Optics, Photonics and Lasers, Nov 2022.
- Panelist/Judge to evaluate the best poster presentation, for 3rd International Conference on Optics, Photonics and Lasers, Nov 2022.

Service to University, College and Academic Program:

- 2020-present **Electronics Engineering Technology Program coordinator.**
- 2021-present **Troy University Institutional Review Board Member.**
- 2021-present **Troy University Honor's Convocation Committee Member.**
- 2021-present **Troy University Recruitment Drives - Trojan Day, Major Exploration Fair.**
- 2021-present **Troy University - Boy Scouts of America.**
- 2021 **EET Faculty Search Team/Committee.**
- 2020-present **Academic Advisor for all EET Majors.**

- 2020-present **Undergraduate Students Research Advisor & Mentor:**, Mayra Schliemann & Jacob Trimm (*"Active Control of Charge Density Waves at Schottky Junction"*, NSF ERI 2022); Ved Dharkar (*"Extreme Light Matter Interaction at metal particle/doped semiconductor interfaces"*, NSF ERI 2022) Alain Pacquette, Kimorah John and Kish Jean (guided for *"Golden Pitch Competition"* at Grambling State University. My team won first place with a \$3000 cash prize); Liam Springer (REU student, CIMM 2017); Caylin Vanhook (*"Volumetric Deposition rate of Titanium metal powder in Selective Laser Melting"*); Charles Maher (REU student, CIMM 2016) .
- 2017-2019 **Graduate Student Research Mentor & Mentor:**, Rana Dey (Engineering Physics PhD student, LaTech); Srabanti Datta (Engineering Physics PhD student, LaTech).
- 2019 **Conducted Workshop on "Semiconductor Device Modelling & Simulation" at Grambling State University.**

Teaching Undergraduate Courses

Troy University:

Electronics Engineering Technology (I have developed all the EET courses)

- EET 2220 - Electrical Circuits I
- EET 2221 - Electrical Circuits II
- EET 3311 - Electronic Devices I
- EET 3312 - Electronic Devices II
- EET 3315 - Digital Logic Circuits
- EET 4420 - Fundamentals of Microcontrollers
- EET 4444 - Optical Electronics I
- EET 4445 - Optical Electronics II
- EET 4480 - Senior Project I Capstone
- EET 4481 - Senior Project II Capstone
- EET 4498 - Internship in Electronic Engineering Technology
- EET L220 - Electrical Circuits I Lab
- EET L221 - Electrical Circuits II Lab
- EET L311 - Electronic Devices I Lab
- EET L312 - Electronic Devices II Lab
- EET L315 - Digital Logic Circuits Lab
- EET L420 - Fundamentals of Microcontrollers Lab
- EET L444 - Optical Electronics I Lab
- EET L445 - Optical Electronics II Lab

Physics

- PHY L263 - Physics II with Calculus Lab
- SCI 2233 - Physical Science
- SCI L233 - Physical Science Laboratory

Grambling State University:

Electronics Engineering Technology (I have developed all the below courses)

- EET 104 - Princ. of Electrical Circuits I
- EET 124 - Electrical Circuits I Lab

- EET 201 - Princ. of Electrical Circuits II
- EET 202 - Electronic Devices I
- EET 222 - Electronic Devices I Lab
- EET 303 - Electronic Devices II
- EET 321 - Digital Logic Systems Lab
- EET 323 - Electronic Devices II Lab
- EET 401 - Princ of Circuit Analysis
- EET 421 - Princ of Circuit Analysis Lab

General and Organizational Skills

- Vice President, Research and Development for La New Product Development Team LLC
- CEO, Lightonix technologies LLP, India
- Proposed and executed design and experimental run plans related to my dissertation studies in collaboration with UT Austin
- Six Sigma Green Belt Certification
- Experience in working with collaborations
- Mentored undergraduate students
- Served as a judge for Louisiana Academy of Science graduate student presentations.

Technical Skills

Multiphysics Modeling and Micro-nano Fabrication

- Expertise in computational electromagnetics, Maxwells equations, Heat equation and numerical methods; strong skills in the fields semiconductor physics, photonics, plasmonics, and optics; Multiphysics modelling involving electromagnetics, heat transfer, fluid dynamics, structural mechanics, semiconductors.
- Expertise in the product design, modeling, simulation, processing, fabrication, optical and electrical characterization and testing of optoelectronics, semiconductive (PN Diode, MOSFET) and Graphene FET devices.
- Hands-on experience inside Class 100 clean room for microfabrication processes: photolithography, thin-film deposition using sputtering, thermal evaporator and layer-by-layer CVD, spin coating, wet etching and RIE.
- Hands-on experience for device characterization and testing using AFM, SEM, optical microscope, surface profilometer, Filmetrics, photoluminescence, solar spectrum analyzer, oscilloscope, power meters, pico-ammeter, monochromator, solar simulator etc.

Six Sigma Green Belt

- Statistical analysis, quality control, FMEA, lean manufacturing, MSA, process and product development, process capability analysis, control charts, KAPA etc.

Professional Software

- COMSOL Multiphysics
- Wolfram Mathematica
- MEDICI and TSupreme4, Sentaurus TCAD
- MATLAB
- Multisim, PSpice

Computer Languages

- C, C++, Core JAVA, Perl, TCL, Python, UNIX Shell and FORTRAN

Graphic software

- Adobe Illustrator, Adobe Photoshop

Computer Skills

- Platforms: UNIX/Linux and Windows
- Databases: MySQL
- Tools: MS Office, Open Office, LATEX
- Experience in writing automating scripts for data management and analysis in UNIX environment
- Maintaining and servicing software systems: Analysis and software on-call experience