

JINGYU LIN
Linda F. Whitacre Endowed Chair and Horn Distinguished Professor
Department of Electrical and Computer Engineering
Texas Tech University
jingyu.lin@ttu.edu



Professional Appointments

- Linda F. Whitacre Endowed Chair and Horn Professor, Electrical and Computer Engineering, Texas Tech University, 2014 – current
(Horn Professorships, the highest honor Texas Tech University may bestow on members of its faculty: http://www.swco.ttu.edu/university_archive/uacollections11.html)
- Linda F. Whitacre Endowed Chair and Professor, Electrical and Computer Engineering, Texas Tech University, 2008-2014
- Co-Director, Center for Nanophotonics, Texas Tech University (Center Founded 09/2010)
- Professor of Physics, Kansas State University, 2002-2008
- Associate Professor of Physics, Kansas State University, 1997-2002
- Assistant Professor of Physics, Kansas State University, 1992-1997
- Assistant Professor of Physics, University of Northern Iowa, 1991-1992
- Research Associate, Kansas State University, 1989-1991

Education

- B. S. in Physics, State University of New York, College at Oneonta, 1980-1983
- M. S. in Physics, Syracuse University, 1983-1985
- Ph. D. in Physics, Syracuse University, 1985-1989

Awards, honors, and special appointments

- Elected Fellow of the National Academy of Inventors (NAI), 2019
- Elected Fellow of the American Association for the Advancement of Science (AAAS), 2018
- Elected Fellow of the SPIE - the international society for optics and photonics, 2017
- Elected Fellow of the Optical Society (OSA), 2016
- Elected Fellow of the American Physical Society (APS), 2012
- Horn Distinguished Professor, Texas Tech University 2014 – present
- Barnie E. Rushing, Jr. Faculty Distinguished Research Award, TTU, 2014
- Linda F. Whitacre Endowed Chair, Texas Tech University, 2008 – current
- Member of Advisory Board of Science and Technology Council of Wenzhou, China, 2009-2013
- External Departmental Academic Advisor, Department of Applied Physics of The Hong Kong Polytechnic University (Hong Kong PolyU), academic years 2016 – 2022
- Member of Selection Committee of the Adolph Lomb Medal, the Optical Society, 05/19-02/21.
- NSF Career Advancement Award, 1994
- Senate Research Award, Syracuse University, 1986
- B.S. degree with highest honor, SUNY at Oneonta, 1983

Research Grants Activities

Over the past two decades, in addition to the continuous support from DOE and NSF for conducting fundamental research, our research group has been an active team member of important R & D programs in the US related to the development of III-nitride materials and devices, including DARPA's Semiconductor Ultra-Violet Optical Sources (SUVOS), Deep Ultraviolet Avalanche Photodetectors (DUVAP), Visible InGaN Injection Lasers (VIGIL), and Compact Mid Ultraviolet Technology (CMUVT) programs, and MDA's GaN Microwave Power Amplifier program (GAMPA), as well as the Department of Homeland Security DNDOS ARI program. Currently, we are a team member of the DOD Directed Energy – Joint Transition Office (DE-JTO) Multidisciplinary Research Initiative (MRU) Program as well as of ARPA-E's Ideas Program.

Professional and Scholarly Activities/Services

- Co-invented MicroLED in 2000 (<https://en.wikipedia.org/wiki/MicroLED>) and III-nitride self-emissive microdisplays. The MicroLED is regarded as the ultimate display technology and has led to the realization of MicroLED flat-panel display (See e.g., <https://www.pocket-lint.com/tv/news/samsung/143311-what-is-microled-the-tv-technology-to-take-on-oled-explained>). MicroLEDs are also considered to be the most suitable candidate for 3D/virtual reality/augmented reality (VR/AR) displays.
- Co-invented in 2002 single-chip high voltage AC/DC-LEDs for general illumination.
- Pioneered the development in 1997 of the first “frequency-quadrupled” deep UV picosecond time-resolved optical spectroscopy system (down to 195 nm). The system first developed by our group can be used to study the static and dynamic recombination processes of carriers in a broad range of materials by covering the spectral range of AlN and BN. The design has been adopted by the photonic industries to benefit the research communities at large.
- Pioneered the development in 2004 of the first III-nitride photonic crystal LED (PC-LED). PC-LED is recognized as one of the most effective technologies to boost the efficiency of LEDs for solid-state lighting.
- Pioneered the development of BN neutron detectors. Our research group has achieved BN neutron detectors with a record high detection efficiency at 58% among all solid-state detectors to date.
- Co-founder of III-N Technology, Inc. (3N). 3N has developed high voltage AC/DC-LED and facilitated large scale commercialization of the technology through its related entity, AC-LED Lighting, LLC. The single-chip high voltage AC-LED can be configured either to plug directly into standard power outlets without power conversion or require a much-reduced step-down voltage conversion and addresses the key compatibility issue between low voltage LEDs and high voltage AC power grid infrastructure for lighting. The technology has been adopted by LED manufacturers worldwide for energy efficient solid-state lighting. The high voltage DC-LED architecture has been widely deployed in commercial products including automobile headlights. 3N has also further developed III-nitride self-emissive microdisplays for future ultra-portable products such as next generation pico-projectors, and wearable displays.
- Panelist for NSF and German Research Foundation (DFG).
- External advisor for ARO MURI programs.
- Proposal reviewer for NSF, DOE, DOD, NRC, DFG, Dutch Technology Foundation, Polish Research Foundation, and National Natural Science Foundation of China.
- Journal reviewer for Appl. Phys. Lett.; J. Appl. Phys.; Optics Express; Optical Materials Express; IEEE Trans. Electron Devices; IEEE J. Quantum. Electronics; IEEE Trans. Nuclear Science; J. Mat. Res.; IEEE Photonics Technology Letters; Thin Solid Films; ACS Nano; Applied Optics, J. Crystal Growth, Materials Letters, Physica Status Solidi, etc.
- Involved in the organization of 15 conferences/workshops, including organized and served as the chair for the 1st APS March Meeting Focused Session on Nanophotonics: Optical properties of nano-structures and nanophotonics, 2004.
- Delivered more than 100 invited presentations in international conferences and universities.
- Students and Postdoctoral Researchers Mentored > 50

Patents issued

- 1 “Micro-size LED and detector arrays for mini-displays, hyperbright light emitting diodes, lighting, and UV detector and imaging sensor applications” US patent #6,410,940 (filed: 06/15/2000; issued date: 06/25/2002)
- 2 “Micro-size LED and detector arrays for mini-displays, hyperbright light emitting diodes, lighting, and UV detector and imaging sensor applications,” Korean patent #100802764 (filed: 06/13/2001; priority date: 06/15/2000; issued date: 02/12/2008)
- 3 “Light emitting diodes for high AC voltage operation and general lighting” US patent #6,957,899 (filed: 10/24/2002; issued date: 10/25/2005)
- 4 “Light emitting diodes for high AC voltage operation and general lighting” US patent #7,210,819 (filed: 04/19/2005; issued date: 05/01/2007)
- 5 “Light emitting diodes for high AC voltage operation and general lighting” US patent #7,213,942 (filed: 05/03/2005; issued date: 05/08/2007)
- 6 “Nitride microlens and arrays for blue and UV wavelength applications” U.S. patent #7,193,784 (filed: 05/20/2004; priority date: 05/20/2003; issued date: 03/20/2007)
- 7 “Heterogeneous integrated high voltage DC/AC light emitter” US patent #7,221,044 (filed: 01/21/2005; issued date: 05/22/2007)
- 8 “Micro-LED based high voltage AC/DC indicator lamp” US patent #7,535,028 (filed: 04/08/2005; issued date: 05/19/2009)
- 9 “Micro-LED based high voltage AC/DC indicator lamp (基于微型发光二极管的高压交直流 指示灯)” Chinese patent #1819255 (application date: 09/05/2005; priority date: 02/03/2005; issued date: 06/02/2010)
- 10 “Extreme ultraviolet (EUV) detectors based upon aluminum nitride (AlN) wide bandgap semiconductors” US patent #7,498,645 (filed: 10/04/2007; priority date: 10/04/2006; issued date: 03/03/2009)
- 11 “Light emitting diode lamp capable of high AC/DC voltage operation” US patent #8,272,757 (filed: 06/03/2005; issued date: 09/25/2012)
- 12 “AC/DC light emitting diodes with integrated protection mechanism” US patent #7,714,348 (filed: 03/07/2007; priority date: 10/06/2006; issued date: 05/11/2010)
- 13 “Micro-emitter array based full-color microdisplay” US patent #8,058,663 (filed: 09/26/2008; priority date: 09/26/2007; issued date: 11/15/2011)
- 14 “Er doped III-nitride materials and devices synthesized by MOCVD” US patent #8,227,328 (filed: 08/24/2006; issued: 07/24/2012)
- 15 “CMOS IC for micro-emitter based microdisplay” US patent #9,047,818 (filed: 03/12/2011; priority date: 03/23/2009; issued date: 06/02/2015)
- 16 “Structures and devices based on boron nitride and boron nitride-III-nitride heterostructures” US patent #9,093,581 (filed: 05/29/2012; issued date: 07/28/2015)
- 17 "Charge storage imaging devices using persistent photoconductivity crystals" U.S. Patent #5,072,122 (Expired)
- 18 "Persistent photoconductivity quenching effect crystals and electrical apparatus using same" U.S. Patent #5,101,109 (Expired)
- 19 “Method and apparatus for use of III-Nitride wide bandgap semiconductors in optical communications” US patent #7,345,812 (Expired)

Patents pending

- 20 “Solid-state neutron detectors,” US patent pending; Application # 16,170,500
- 21 “Novel optical gain materials for high energy lasers and laser illuminators,” US patent pending.
- 22 “Semiconductor optical phased arrays (OPAs),” US patent pending.

Patent disclosures filed

1. “Optical Hearing Device Based on Micro-LED Arrays”.

Selective Press Coverage Our Research Work

Our group's research work on MicroLED has been reported in German, Japanese, Russian, French, Italian, Indian, British, Portuguese, and Chinese technical magazines, in addition to press releases by media outlets including The New York Times, CNN.com, ABCnews.com and USA Today. Our recent achievement of thermal neutron detectors with a record high detection efficiency based on B-10 enriched hexagonal boron nitride epilayers has been reported by various scientific and technical media outlets, including AIP, AAAS (EurekAlert), APS (Physics.org), etc.

<http://www.depts.ttu.edu/ece/Nanophotonics/news.html>

Publications: > 400

Citations: > 19,800; H-Index: 79 (according to Google Scholar Citations as of 05/2019)

https://scholar.google.com/citations?user=478J1_AAAAAJ&hl=en

List of Publications:

<http://www.depts.ttu.edu/ece/Nanophotonics/publications.html>