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III-Nitride Micro- and Nano-photonics: From Energy Savings to Energy Generation

Prof. Hongxing Jiang

时间: 5月20日(星期四) 15:00—16:40
地点: 北京大学物理大楼中212教室



HONGXING JIANG, Edward E. Whitacre, Jr. Endowed Chair and Professor

Dr. Hongxing Jiang received his B.S. in Physics in 1981 from Fudan University, Shanghai, China and Ph.D. in Physics in 1986 from Syracuse University. Dr. Jiang directs the Nanophotonics research program at Texas Tech University and is the Ed Whitacre Endowed Chair and Professor of Electrical and Computer Engineering. Prior to his current position, he was a university distinguished professor at Kansas State University. His group has pioneered the fabrication of micro- and nano-photon structures and devices based upon III-nitride semiconductors including micro-LEDs, lasers, detectors, microdisplays, photonic crystals emitters, and III-nitride solar cells and thermoelectric materials. His group's concentration areas are epitaxial growth, micro- and nano-structure and device fabrication, and fundamental optical and transport investigations. His group is currently exploring these materials for applications of solid-state lighting, sensors, and energy-conversion devices, and optical communications. Dr. Jiang has published over 300 technical papers in the area of compound semiconductors, holds 20 patents, edited 8 books, and delivered over 80 invited talks in professional conferences. His journal publications have generated 4750 citations with an h-index of 39. Dr. Jiang is also a co-founder of III-N technology, Inc (3N).

Abstract: The III-nitride wide bandgap semiconductors have been at the center stage in the semiconductor research and development effort over the last decade. Photonic/electronic devices based on III-nitrides, including UV/blue/green/white LEDs, violet/blue LDs, UV detectors, and high power/temperature transistors, have been successfully realized. This talk will provide a brief overview on recent advances made by our group in the area of micro- and nano-photon nitride structures and devices. These materials/devices have applications ranging from solid-state lighting, sensors, entertainment, to optical communications. Besides applications for energy savings through the emerging solid-state lighting technology, I will also discuss the prospects of nitride semiconductors for energy generation. Our preliminary works on III-nitrides for thermoelectric (TE) materials and devices, solar cells, and hydrogen generation using solar water splitting, will be presented.

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