

Center for Photonics and Nanoelectronics

Center for Photonics and Nanoelectronics (CPN)

Web: www.lehigh.edu/cpn (<http://www.lehigh.edu/cpn/>)

Locations: Sinclair Laboratory (7 Asa Drive, Bethlehem, PA 18015) and Sherman Fairchild Laboratory (16A Memorial Drive East, Bethlehem, PA 18015)

Center Director:

Nelson Tansu (ECE), CPN Director & Daniel E. '39 and Patricia M. Smith Endowed Chair Professor

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Core Faculty:

Nelson Tansu (ECE), CPN Director & Daniel E. '39 and Patricia M. Smith Endowed Chair Professor; Michael J. Stavola (Phys), Sherman Fairchild Chair Professor; Filbert J. Bartoli (ECE), Chandler Weaver Chair Professor; Volkmar Dierolf (Phys), AGT Distinguished Professor; Himanshu Jain (Mat Sci), Diamond Distinguished Chair Professor; Ivan Biaggio (Phys), Full Professor; Yujie Ding (ECE), Full Professor; Miltiadis Hatalis (ECE), Full Professor; James C. M. Hwang (ECE), Full Professor; H. Daniel Ou-Yang (Phys), Full Professor; Slava V. Rotkin (Phys), Full Professor; Svetlana Tatic-Lucic (ECE), Full Professor; Jean Toulouse (Phys), Full Professor; Xuanhong Cheng (Mat Sci), Associate Professor; Jonathan J. Wierer (ECE), Associate Professor; Yevgeny Berdichevsky (ECE), Assistant Professor; Mark Chen (Chem), Assistant Professor; Heather M. Jaeger (Chem), Assistant Professor; Sushil Kumar (ECE), Associate Professor; Chao Zhou (ECE), Assistant Professor; Siddha Pimputkar (MSE), Assistant Professor; Zakya H. Kafafi (ECE), Adjunct Professor

Affiliated Faculty:

Helen M. Chan (Mat Sci); James F. Gilchrist (Chem Eng); Brandon A. Krick (Mech Eng); Kai Landskron (Chem); Yaling Liu (Mech Eng); Wojtek Misiolek (Mat Sci); Sudhakar Neti (Mech Eng); Daniel Ou-Yang (Phys); Mark A. Snyder (Chem Eng); Nicholas Strandwitz (Mat Sci); Dmitrios Vavylonis (Phys); Dmitri Vezenov (Chem); Richard P. Vinci (Mat Sci)

Scientific / Technical Facility Manager:

Dr. Renbo Song

Overview

The Center for Photonics and Nanoelectronics (CPN) at Lehigh is a center formed from the merger of two long standing centers (Center for Optical Technologies / COT, and Sherman Fairchild Center for Solid State Studies / SFC). Both SFC and COT has long history of innovation and scientific advances tracking back to the late 1970s and early 2000s, respectively. The merged center CPN inherits the faculty (diverse expertise and core technical backgrounds), students, facilities, resources, reputation, history, and legacy (faculty alumni and student alumni connections) of both Center for Optical Technologies (COT) and Sherman Fairchild Center (SFC). The success of the former Center leaderships in establishing both COT and SFC as the leading programs in photonics and solid state electronics, respectively, has provided a solid foundation for the CPN leadership to advance further in advancing and integrating the science and technologies of photonics and nanoelectronics. The CPN is entrusted with a substantial resource, which is used for initiating and integrating new initiatives, as well as enabling facility operational and graduate students fellowship. Additional information is available: www.lehigh.edu/cpn (<http://www.lehigh.edu/cpn/>)

Faculty Expertise

The Center for Photonics and Nanoelectronics (CPN) at Lehigh has more than 25 highly-research active tenure-track / tenured faculty members spanning 4 different departments (Electrical and Computer Engineering, Material Sciences Engineering, Physics, and Chemistry). The investments in multiple faculty hiring, new facility enhancement, and targeted research-education areas within the CPN result in the significant built-up in the activities in the enabling technologies and sciences for addressing new application directions. These faculty

worked in collaborative manner to build large cluster of collaborations in the broad areas of photonics / optoelectronics / nanoelectronics.

PhD Research and Graduate Program

The CPN's central mission is to produce first-rate and highly-competitive PhD graduates in the fields of photonics, optoelectronics, and nanoelectronics, and applications of these core technologies [energy, medical, communications, and environments]. The CPN has produced more than 70 PhDs in engineering and applied sciences during the past decade, and 8 of our (graduate student / faculty) alumni had been elected as members of the Academies. Significant research activities exist within the Center for Photonics and Nanoelectronics at Lehigh (www.lehigh.edu/cpn (<http://www.lehigh.edu/cpn/>)), and the current strengths span from III-Nitride and compound semiconductor technologies, organic based electronics and photonics, bio-related materials and devices, nonlinear optics, plasmonic and metamaterials, and flexible photonics technologies.

Integrated Nanofabrication and Cleanroom Facility

The CPN operates the integrated nanofabrication and cleanroom facility at Lehigh. The Integrated Shared Facility provides tremendous access for MOCVD epitaxy, cleanroom fabrication, nanofabrication, packaging capabilities, and device characterizations / measurements for photonics / optoelectronics / nanoelectronics devices. The Integrated Facility is run by a set of highly accomplished technical staff, and the access to this facility is available for faculty at Lehigh, faculty from other universities, and industrial users. The details of such facility is available at: <http://www.lehigh.edu/~incpn/research/facilities/index.html>

Collaboration – Universities, National Laboratories, and Industry

The CPN faculty actively seeks to collaborate on groundbreaking research work with external faculty members, partners in national laboratories, and partners in industry. The broad topics of pursued within CPN in photonics, optoelectronics, and nanoelectronics areas provide opportunities to develop complementary research from basic sciences, materials, devices, integrated systems, and applications. The attractive industrial membership program in supporting research at Lehigh is also available.