POST-DOCTORAL RESEARCH ASSOCIATE/STUDENT EMPLOYEE
Theoretical Modeling of Infrared Lasers, Frequency Combs & Nanophotonic Processes

Optical Sciences Division, Naval Research Laboratory

We seek a highly motivated theoretical physicist or electrical engineer to fill a National Research Council (NRC) or American Society for Engineering Education (ASEE) post-doctoral Research Associateship. We could also consider hiring a graduate student in a relevant field as a part-time or full-time employee in the Optical Sciences Division at the Naval Research Laboratory. The potential candidate is expected to contribute in one or more of the following areas of research: i) the design, simulation, and analysis of infrared semiconductor lasers, frequency combs, and photodetectors; ii) the modeling of nanoscale fields in subwavelength optical resonators and photonic-crystal cavities; (iii) the modeling of molecular vibrational resonances that are strongly coupled to optical cavities; and (iv) photonic integrated circuits that combine multiple midwave infrared components on the same silicon or III-V platform. The successful candidate is expected to demonstrate expertise in analytical and numerical modeling based on fundamental device and material physics, as well as experience in using COMSOL Multiphysics, a general-purpose finite-element package, or another software package capable of electromagnetic simulations. NRL has also developed a number of in-house software packages for the bandstructure, optical, and transport properties of semiconductor structures to which the successful candidate may contribute. While experimental expertise relevant to the areas enumerated above is not required for this position, it will be considered a plus. We anticipate that a student employee would continue toward the Ph.D. degree at his or her institution while maintaining a mutually agreed-upon schedule at NRL.

NRL has achieved world leadership in the development of ICLs emitting in the 3-6 μm spectral range for a variety of military and commercial applications *[Vurgaftman et al., Nature Commun.* ***2****, 585 (2011); Vurgaftman et al., J. Phys. D* ***48****, 123001 (2015)]*. We also actively collaborate with multiple groups within NRL that are pursuing research in nanophotonics and light-matter interactions. The research position will bring contact with numerous DoD, university, and industrial collaborators and customers.

Postdoc appointments are usually for two or three years, with a starting salary of $81,548. The student appointment to federal service is of flexible length, includes full benefits, and may include tuition assistance. Due to security considerations, U.S. citizenship is usually required. Please contact: Igor Vurgaftman, Code 5613, or Jerry Meyer, Code 5604, Naval Research Laboratory, Washington, DC 20375 [(202)-767-3276, mwir_laser@nrl.navy.mil]. You may also learn more about NRL and its programs at: hroffice.nrl.navy.mil/jobs/postdoc.htm and hroffice.nrl.navy.mil/student/SSEP.htm.