## Jonathan Klamkin, Boston University

Title: Next Generation Photonic Integrated Circuits

Abstract: Photonic Integrated Circuits (PICs) have evolved over a period of more than 30 years from one-off devices that were realized with complex crystal growth steps to now foundry qualified circuits that yield high performance and wafer uniformity. This evolution was fostered by the maturation of compound semiconductor materials and fabrication processes as well as the exploitation of already matured silicon manufacturing processes that were developed for the microelectronics industry. A field that was once dominated by indium phosphide now showcases a host of photonic materials including silicon, silica, lithium niobate, polymer, as well as hybrid platforms integrating more than one of these materials. PICs enable new and emerging applications such as optical interconnects for data communications, microwave photonics for phased-array radar and radio astronomy, readout circuits for fiber temperature and strain sensors, and sensing devices for biological and medical applications. In addition to enabling fabless business models, the introduction of photonics foundries allows researchers to focus on theory, design, and characterization or to realize new technologies by adding novel materials to photonic circuits that are fabricated externally. This talk will describe several examples of multifunctional PICs as well as the availability and capabilities of photonics foundries.

**Biography:** Jonathan Klamkin received the B.S. degree in electrical and computer engineering (ECE) from Cornell University in 2002, and the M.S. in ECE and Ph.D. in electronic materials from the University of California Santa Barbara in 2004 and 2008 respectively. From 2001-2002 he worked at BinOptics. From 2008-2011 he was a member of the Technical Staff in the Electro-Optical Materials and Devices Group at MIT Lincoln Laboratory. From 2011 he is an assistant professor at the Institute of Communication, Information and Perception Technologies (TeCIP), Scuola Superiore Sant'Anna, Pisa, Italy, where he is the recipient of an Erasmus Mundus scholarship and a Marie Curie fellowship. In January 2013 he will join the ECE Department at Boston University as an assistant professor. Dr. Klamkin received best paper awards at the 2006 Conference on Optoelectronic and Microelectronic Materials and Devices and the 2007 Microwave Photonics Conference. He has authored or coauthored 75 papers on photonic integrated circuits, microwave photonics, coherent receivers, high-power photodiodes, phase modulators, high-power lasers, widely-tunable lasers, and semiconductor optical amplifiers.