Abstract: Although the unique potentials of terahertz waves for chemical identification, material characterization, biological sensing and medical imaging has been known for quite a while, low output power, low efficiency, high cost, and bulky nature of current terahertz sources continue to hinder practical feasibility of such applications. One of the most promising terahertz generation schemes is based on photoconductive photomixing. Photomixers are known to offer excellent frequency tunability and high spectral purity at room temperature, but their shortcoming is low output power, which is ultimately limited by thermal breakdown at high pump power levels. To address the output power limitations of existing photomixers, we present a new generation of plasmonic photomixers pumped at telecom pump wavelengths at which very high power, narrow linewidth, wavelength-tunable, compact and cost-efficient optical sources are available. By tackling the major obstacle of thermal breakdown of conventional photomixers, the proposed technology is expected to offer terahertz power levels that are orders of magnitude higher than is currently available from existing technologies.

Friday, April 8, 2011
1:30 p.m.
Bryan Hall, Room 305
(Light refreshments will be served.)

Host: Dr. Jung-Tsung Shen

Short Bio: Mona Jarrahi received her B.S in electrical engineering from Sharif University of Technology (2000) and M.S and Ph.D degree in electrical engineering from Stanford University (2003, 2007). At Stanford University, she was investigating optically assisted electronics for millimeter-wave/terahertz applications. She was a research associate at Berkeley Sensor and Actuator Center (2007-2008), working on MEMS-based tunable terahertz electronics. She joined University of Michigan in the Fall of 2008, where she is currently an assistant professor of Electrical Engineering, leading the Terahertz Electronics Laboratory. She is the recipient of NSF CAREER Award (2011), DARPA Young Faculty Award (2010), the first-place and the third-place student paper award at the International Microwave Symposium (2007 and 2008), and Robert Bosch FMA fellowship (2002). Her research focuses on Terahertz, Millimeter Wave, and Infrared Devices and Imaging/Spectroscopy Systems, Microwave Photonics and Ultrafast Electro-Optics.