IEEE Advancing Technology for Humanity

IEEE COMMUNICATIONS SOCIETY

BUENAVENTURA COMMUNICATIONS SOCIETY CHAPTER

New Frontiers in TeraHertz Technology

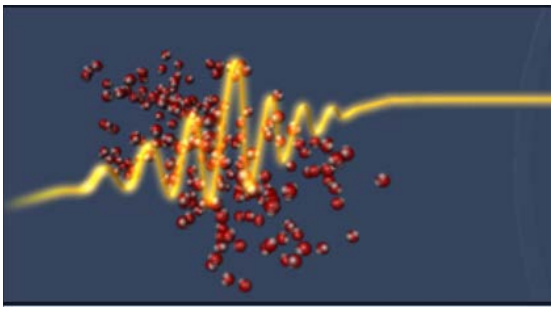
Speaker, Mona Jarrahi, Ph.D., UCLA

Tues Sep 8, 2015 at 6:30 pm

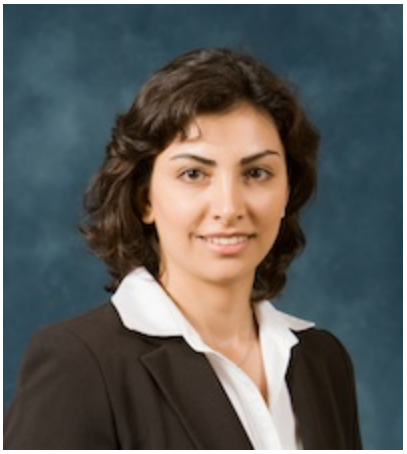
Location: Skyworks Solutions, Newbury Park, CA

Meetings are free and open to the public

RSVP at this link



Although unique potentials of terahertz waves for chemical identification, material characterization, biological sensing, and medical imaging have been recognized for quite a while, the relatively poor performance, higher costs, and bulky nature of current terahertz systems continue to impede their deployment in field settings. In this talk, I will describe some of our recent results on developing fundamentally new terahertz electronic/optoelectronic components and imaging/spectrometry architectures to mitigate performance limitations of existing terahertz systems. In specific, I will introduce new designs of high-performance photoconductive terahertz sources that utilize plasmonic antennas to offer terahertz radiation at record-high power levels of several milliwatts – demonstrating more than three orders of magnitude increase compared to the state of the art. I will describe that the unique capabilities of these plasmonic antennas can be further extended to develop terahertz detectors and heterodyne spectrometers with single-photon detection sensitivities over a broad terahertz bandwidth at room temperatures, which has not been possible through existing technologies. To achieve this significant performance improvement, plasmonic antennas and device architectures are optimized for operation at telecommunication wavelengths, where very high power, narrow linewidth, wavelength tunable, compact and cost-effective optical sources are commercially available. Therefore, our results pave the way to compact and low-cost terahertz sources, detectors, and spectrometers that could offer numerous opportunities for e.g., medical imaging and diagnostics, atmospheric sensing, pharmaceutical quality control, and security screening systems. And finally, I will briefly highlight our research activities on development of new types of high-performance terahertz passive components (e.g., modulators, tunable filters, and beam deflectors) based on novel reconfigurable meta-films.



Biography: Mona Jarrahi received her B.S. degree in Electrical Engineering from Sharif University of Technology in 2000 and her M.S. and Ph.D. degrees in Electrical Engineering from Stanford University in 2003 and 2007. She served as a Postdoctoral Scholar at University of California Berkeley from 2007 to 2008. After serving as an Assistant Professor at University of Michigan Ann Arbor, she joined University of California Los Angeles in 2013 as an Associate Professor of Electrical Engineering and the Director of the Terahertz Electronics Laboratory. Her research group focuses on Terahertz, Millimeter-Wave Electronics and Optoelectronics; Imaging and Spectroscopy Systems; and Microwave Photonics. Prof. Jarrahi has made significant contributions to the development of ultrafast electronic and optoelectronic devices and integrated systems for terahertz and millimeter-wave sensing, imaging, computing, and communication systems by utilizing novel materials, nanostructures, and quantum well structures as well as innovative plasmonic and optical concepts. In recognition of her outstanding achievements, Prof. Jarrahi has received several prestigious awards in her career including the Presidential Early Career Award for Scientists and Engineers (PECASE); Early Career Award in Nanotechnology from the IEEE Nanotechnology Council; Outstanding Young Engineer Award from the IEEE Microwave Theory and Techniques Society; Booker Fellowship from the United States National Committee of the International Union of Radio Science (USNC/URSI); Lot Shafai Mid-Career Distinguished Achievement Award from the IEEE Antennas and Propagation Society; Grainger Foundation Frontiers of Engineering Award from National Academy of Engineering; Young Investigator Awards from the Army Research Office (ARO), the Office of Naval Research (ONR), and the Defense Advanced Research Projects Agency (DARPA); Early Career Award from the National Science Foundation (NSF); the Elizabeth C. Crosby Research Award from the University of Michigan; and best-paper awards at the International Microwave Symposium and International Symposium on Antennas and Propagation. She has also been named a Kavli Fellow by the National Academy of Sciences. Prof. Jarrahi is actively involved in several professional societies and has been on program committees of several conferences from IEEE, OSA, and SPIE societies. She is a senior member of IEEE, OSA, and SPIE societies and serves as a member of the Terahertz Technology and Applications Committee of IEEE Microwave Theory and Techniques, an editorial board member of Journal of Infrared, Millimeter and Terahertz Waves, a Distinguished Lecturer of IEEE Microwave Theory and Techniques Society, a Traveling Lecturer of OSA, and a Visiting Lecturer of SPIE. In addition, she serves as a panelist and reviewer for National Science Foundation (NSF) and Department of Energy (DOE).

Location

Skyworks Solutions
Intersection of West Hillcrest Drive and Lawrence Drive
Newbury Park, CA 91320
(not the main building, please use link below to arrow that pinpoints building)
http://maps.google.com/maps?q=34.187542,-118.930994&num=1&t=h&vpsrc=0&ie=UTF8&z=18&iwloc=A

Directions

From Los Angeles

Highway 101 North
Take exit 47A for Rancho Conejo Blvd
Use the left lane to turn right onto Rancho Conejo Blvd
Turn left onto W Hillcrest Dr
Destination will be on the right

Highway 101 South
Take exit 47B for Wendy Dr toward Newbury Park
Turn right onto N Wendy Drive
Continue onto Camino Dos Rios
Turn right onto W Hillcrest Drive
Destination will be on the left.