2016 FINAL PROGRAM
SCROLL DOWN TO VIEW ALL SESSIONS AND ABSTRACTS

SUNDAY KEYNOTE LECTURE
Democratization of Next-Generation Microscopy, Sensing and Diagnostics: Tools through Computational Photonics

MONDAY PLENARY LECTURES
Spectroscopy Magazine’s Emerging Leader in Molecular Spectroscopy Award

TUESDAY PLENARY LECTURES
FACSS Charles Mann Award for Applied Raman Spectroscopy

WEDNESDAY PLENARY LECTURES
ANACHEM Award

THURSDAY PLENARY LECTURES
Lester W. Strock Award

SCIX 2016 SESSIONS AND ABSTRACTS:

Tuesday, September 20

16I06: Quantum Cascade Lasers - 1

Location: Lakeshore B

4:30 pm  QCL based Raman sensing 2.0; A single chip solution
Benedikt Schwarz1, Gabriela Rosanic2, Peter Reithinger1, Werner Schram2, Hermann Datz3, Tobias Zidarovich2, Aaron Maxwell Andrews4, Donald Craik5, Mathias Hofmann6, Gotthard Strasser4, Institute for Solid State Electronics, TU Wien; University of California, Berkeley
Abstract:
QCLs are compact coherent light sources with designable wavelength, which makes them attractive to realize compact sensing systems for many different applications. Integrated mid-infrared photonics enables even more compact systems, where all optical components such as source, interaction region and detector are combined on a single chip. In order to realize this, we equip a QCL active region with an additional detection capability at the laser emission wavelength. This allows a straightforward integration, where different parts of the chip are used for lasers and others for detectors. During the last years, we were able to push the performance of such bi-functional designs to reach a similar laser performance as conventional QCLs, allowing for high duty cycle operation at room-temperature.
Our sensor for liquids utilizes surface plasmon polaritons to allow a strong interaction within a short distance. Different distributed-feedback-laser/waveguide/detector units can be combined on a single chip, to use the inherent selectivity of the mid-infrared region. Based on the first generation of bi-functional quantum cascade laser/detectors, the prototype sensor is capable to detect water in isopropanol down to the ten ppm range over a wide concentration range. A much better performance can be expected with our new generation.