

LOPS® 20244th Edition of Annual Conference on**LASERS, OPTICS, PHOTONICS,
SENSORS, BIO PHOTONICS &
ULTRAFAST NONLINEAR OPTICS**

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Chemical-bond imaging opens a window for life science and materials science by providing chemical information with minimal perturbation to molecules. Infrared and Raman microscopies are widely used, yet limited by poor spatial resolution or very slow imaging speed. Recently developed coherent anti-Stokes Raman scattering and stimulated Raman scattering microscopy enabled high-speed chemical imaging, whereas their performance is limited by a non-resonant background or a cross phase modulation. Vibrational excitation and subsequent relaxation efficiently generates heat, making photothermal detection a natural and sensitive means of imaging chemical bonds. AFM-IR has allowed nanoscale infrared imaging, but not applicable to live cells. This presentation will introduce a novel optically detected chemical microscopy called vibrational photothermal (VIP) microscopy. Modalities include mid-infrared photothermal (MIP), simulated Raman photothermal (SRP), and short-wave infrared photothermal (SWIP) microscopy. Principle, instrumentation, and applications to life science will be discussed.

Biography

Photothermal Spectroscopy Corp, which licenses all my photothermal imaging IP, is a sponsor of LOPS. My biosketch is attached here. Thanks! Ji-Xin Cheng is currently the Inaugural Theodore Moustakas Chair Professor in Photonics and Optoelectronics at Boston University. Authored in 320+ peer-reviewed articles with an h-index of 98 (Google Scholar) and holder of >30 patents, Cheng and his team has been constantly at the most forefront of the chemical imaging field in development, discovery, and delivery. Commercial chemical microscopes based on his innovations, including coherent Raman scattering and mid-infrared photothermal microscopes, are installed and used in many countries worldwide. Ji-Xin Cheng, Moustakas Chair Professor of Photonics and Optoelectronics. Professor of ECE, BME, PHYS and CHEM. Chair of Photonics Center Education Committee. Boston University. Office PH0827; Lab PH0801; Email jxcheng@bu.edu; Group website: <https://sites.bu.edu/cheng-group/>

**VIBRATIONAL PHOTOTHERMAL
MICROSCOPY: NEW WINDOW
FOR BIOLOGY AND MEDICINE****Ji-Xin Cheng**Moustakas Chair Professor of photonics and optoelectronics,
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