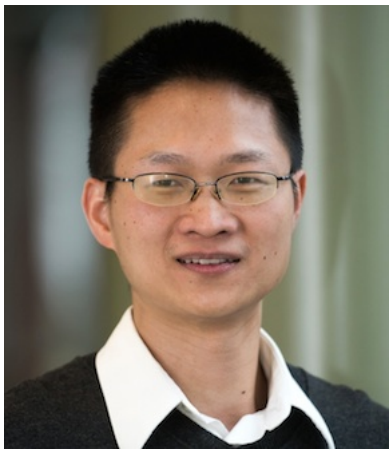
Mathematics and Physics Seminar Series



Announcing

A Seminar Presentation on Thursday October 4, 2018 at 3:00 pm in North Hall 102

at The University of New Haven

Cancer diagnosis using visible resonance Raman spectroscopy

— **Dr.Binlin Wu**
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Abstract: Currently the gold-standard diagnostic method for cancer diagnosis is biopsy along with histopathology, which is invasive, time consuming, and subjective due to judgment of the pathologist. Optical biopsy is a collection of alternative optical diagnostic techniques that have attracted extensive attention in the past decades. Raman spectroscopy is one of the optical biopsy techniques which can detect molecular vibrational, rotational, and other low-frequency modes in a substance. Raman spectroscopy based on intrinsic biomarkers, can operate in situ and in real time, and has lead to a rapid progress for researches and clinical applications in cancer diagnosis. Most reports in the literature which demonstrated spectral differences between normal and cancerous tissues used near-infrared (NIR) laser excitation. Since Raman scattering is very weak, some researchers used high power (e.g. 300mW) and long signal collection time (e.g. minutes). Such approaches have limitations for practical applications. We have been developing a visible resonance Raman (VRR) spectroscopy technique using a 532nm laser beam for excitation which can address the limitations of NIR Raman spectroscopy techniques. The vibrational resonance effect occurs in RR spectroscopy when the energy of the excitation approaches an optical transition energy level in the substance. The resonance effect leads to greatly enhanced intensity of the Raman scattering, which facilitates the study of compounds present at low concentrations. In our preliminary studies, VRR spectra from many large biomolecules which may be used as biomarkers for cancer diagnosis exhibited enhanced peaks. The promising results from these studies showed that VRR may be used as a novel label-free optical molecular pathological technique for cancer diagnosis.

Further Information

For further information, please contact Dr. Yasanthi Kottegoda at the Department of Mathematics and Physics, Office: Maxcy 315, 203-932-1206, YKottegoda@newhaven.edu.