

Infrared Nanospectroscopy: from Heat Transfer in Nanoelectronics to early Diagnosis of Cancer

Antonio CRICENTI – *CNR-ISM, Rome*

Heat transfer at nanoscale is very important in today's nanoelectronic circuits and is dominated by evanescent modes existing only in the near field. We will present a method to experimentally image the thermal near-field emitted by a hot sample by use of a home-made scattering SNOM setup. The emission will be in the infrared region and a cold tip will collect the IR light scattered.

Early diagnosis of cancer requires an instrument providing specific chemical images at sub-cellular level and the development of diagnostic imaging. We present IR-SNOM and micro-Raman in their spectroscopic mode, that is related to the local chemical composition and, thus, to the biological properties of the sample, for tissue imaging and early cancer diagnostics. Applications in the case of Oesophagous and Cervical Cancer as well as in the progression of Amyotrophic Lateral Sclerosis (ALS) will be presented.