

Physikalisches Kolloquium

Prof. Hervé Rigneault

Institut Fresnel, Marseille

From coherent Raman microscopy to coherent Raman endoscopy

Coherent Raman scattering (CRS) microscopy has become an established imaging techniques that as proved to have ground breaking potential in various application fields including cell machinery and tissue imaging. Recently the ability of CRS to distinguished cell nuclei from cell cytoplasm has opened the route toward coherent Raman histology, with potential applications in real time intra-operative cancer tissue diagnostic. However CRS for in vivo applications would require to access the vibrational spectrum information for every pixel in few microseconds only. We have developed a fast ratio-metric stimulated Raman (SRS) technology using a frequency modulation scheme to access vibrational information in few microseconds and suitable for tissue drug penetration monitoring and stimulated Raman histology. We are also working to extend the CRS imaging ability into flexible endoscopes that would enable intra vital exploration and remote CRS histology. Using hollow core fiber and resonant distal scanner we perform CRS images at few frames/s over a 350 microns field of view. This brings label free nonlinear imaging at the distal end of a flexible probe.

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Ort: Hörsaal 6