GRAZ CENTER OF **PHYSICS**

PHYSICS COLLOQUIUM OF THE UNIVERSITY OF GRAZ AND
THE GRAZ UNIVERSITY OF TECHNOLOGY

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Near-field Raman Spectroscopy - via Apertures and Tips to Nanometer Resolution

Over the last 40 years, near-field Raman spectroscopy has evolved from an ambitious extension of optical microscopy into a versatile approach for chemically specific analysis with nanometer-scale spatial resolution. This seminar will trace its development from the early days of aperture-based near-field Raman experiments to modern tip-enhanced Raman spectroscopy. The focus will be on the physical concepts that enabled Raman measurements beyond the diffraction limit, the accompanying experimental challenges, and subsequent changes in perspective. Although aperture probes paved the way for localized vibrational spectroscopy, they are hardly used anymore due to their limitations. Tip-based approaches introduced strong local field enhancement, pushing spatial resolution to previously inaccessible dimensions while raising questions about reproducibility, spectral interpretation, and experimental control. By comparing these two strategies, the seminar will demonstrate how methodological constraints and scientific opportunities have shaped near-field Raman spectroscopy, defining its current scope and future potential.

Date: Tuesday, 12 May 16:15
Location: HS 05.01, Universitaetsplatz 5, Institute of Physics, University of Graz
Host: Joachim Krenn

For a regularly updated colloquium program see: https://gcp.tugraz.at/colloquium