

# Allgemeines Physikalisches Kolloquium

Donnerstag, 11.06.26 – 16 Uhr c.t.  
*IG1 – HS 2 | Wilhelm-Klemm-Str. 10*

Kolloquiums-Kaffee ab 16 Uhr vor dem Hörsaal

## Prof. Dr. Andreas Zumbusch

Fachbereich Chemie, Universität Konstanz



© privat

## Optical spectroscopy under the microscope: Method development and applications in colloid science

Optical microscopy has always relied on spectroscopic techniques for contrast generation. The most straightforward approach is to combine it with linear techniques such as absorption and fluorescence spectroscopy. Over the last three decades, especially fluorescence excitation in the form of confocal fluorescence microscopy has become an important method present in all cell biology laboratories. However, fluorescence microscopy also is a valuable tool in material science. This will be exemplified by investigations of the structural dynamics of colloidal systems close to the glass transition. Yet, the great success of spectroscopic approaches in microscopy is not restricted to linear methods. Meanwhile, non-linear spectroscopy has found ample applications in modern optical microscopy with the aim of overcoming limitations encountered with linear approaches.

I will present the development of non-linear Raman imaging based on stimulated Raman scattering (SRS) that is especially useful for studying unlabeled samples. This will be demonstrated with examples of vibrational imaging of samples from material science and cellular biology. Here, a special emphasis will be given to the presentation of new approaches for ultrasensitive SRS microscopy.