



TECHNISCHE
UNIVERSITÄT
WIEN

Vienna University of Technology

INSTITUT FÜR
ANGEWANDTE PHYSIK
Institute of Applied Physics
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IAP-SEMINAR

ANNOUNCEMENT

- Date:** Tuesday, 19.1.2016
Time: 16:00 p.m.
Location: Technische Universität Wien, Institut für Angewandte Physik, E134
yellow tower „B“, 5th floor, Sem.R. DB gelb 05 B (room number
DB05L03), 1040 Wien, Wiedner Hauptstraße 8-10
- Lecturer:** Haisen Ta
Department of NanoBiophotonics, Max-Planck-Institute for Biophysical
Chemistry, Göttingen/Germany
- Subject:** Exploring the molecule distributions with photon statistics in
scanning far-field fluorescence microscopy
- Abstract:** Fluorescence microscopy provides the information of not only the position but also the local abundance of the molecules. Although the molecular brightness varies due to the heterogeneity of local environment, the molecular abundance is usually obtained by dividing the measured fluorescence intensity by that of single emitters assuming constant molecular brightness throughout the whole sample. Here we obtain the distribution of the molecules by exploiting the detected photon statistics of the emitters. The quantum nature of the photon emission from a single emitter allows no more than one photon at a time. It is not only the identity of the existence of single emitters, but also encodes the number of the emitters in the photon statistics especially in the simultaneous detected multiple photons or the coincidence photons. By considering the spatial distribution of the coincidence photons, we establish the number and the local brightness of up to 20 molecules per confocal volume. The combination of the detected photon statistics in both stimulated emission depletion (STED) and confocal microscopy enables us to visualize the distribution of the molecules in the sample with diffraction unlimited resolution. By applying this method, we can map the nanoscale 3D organization of the internalized transferrin receptors in HEK293 cells.

*All interested colleagues are welcome to this seminar lecture
(45 minutes presentation followed by discussion).*

G. Schütz e.h.
(Seminar-Chairperson)

H. Störi e.h.
(LVA-Leiter)