



TECHNISCHE
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IAP-SEMINAR

EINLADUNG

Termin: **Dienstag, 26.3.2013 um 16:00 Uhr**
Ort: **Technische Universität Wien,
Institut für Angewandte Physik,
Seminarraum 134A, Turm B (gelbe Leitfarbe), 5. OG
1040 Wien, Wiedner Hauptstraße 8-10**

Vortragender: **Univ.Prof. Dr. Thomas A. Klar**
Johannes-Kepler-Universität Linz, Institut für Angewandte Physik, Linz

Thema: **Nanoscopic Anchors for Antibodies: Form Nano-Bio-Sensors to
Single Antibody Presentation**

Kurzfassung

The ability to place individual proteins onto nano-confined structures plays a constantly growing role in bioscience, from basic studies in biology to the development of nanosensors. One of the possibilities to generate sub-micrometre sized structures is direct laser writing (DLW) lithography. The resolution of DLW can be enhanced by stimulated emission depletion (STED) for assembly of polymeric structures down to several tens of nanometres [1]. Using a pulsed 780nm laser for two-photon DLW and a 532nm laser for STED, we are able to obtain structure sizes of down to 55nm and manufacture two clearly separated lines with 120nm distance [2]. The structures show good biocompatibility and allow an easy bio-functionalization with proteins down to the single protein level. We use direct stochastic optical reconstruction microscopy (dSTORM), which enables determination of protein density at a nanoscale level [3]. Combining STED lithography with dSTORM allows us to produce and characterize biocompatible structures, applicable to many biological assays.

In the second part of the talk, nanoscopic biosensors comprising gold nanoparticles will be addressed. For instance, the refractive index change upon the recognition of an antigen by antibodies or aptamers on a single gold nanoparticle can be used for biosensing [4]. Gold nanoparticles are also ideally suited as quenchers in FRET type sandwich sensors[5] or for DNA sensing [6].

[1] Klar et al. Optics Lett. 24, 954 (1999); Fischer et al., Adv.Mat.,Vol.22,Nr.32,pp.3578-3582(2010);

[2] Wollhofen et al., submitted;

[3] van de Linde et al.,Photochem.&Photobiol.Sc.,Vol.8,Nr.4,pp.465-469(2009);

[4] Raschke et al. Nano Letters 3, 935 (2003); Nano Letters 4, 1853 (2004); Dondapati et al. ACS Nano 4, 6318 (2010)

[5] Mayilo et al. Analytica Chimica Acta 646, 119 (2009); Nano Letters 9, 4558 (2009)

[6] Stehr et al. Nano Letters 8, 619 (2008); Hrelescu et al. J. Phys. Chem. C 114, 7401 (2010)

*Alle interessierten Kolleginnen und Kollegen sind zu diesem Seminar
(45 min mit anschließender gemeinsamer Diskussion) herzlich eingeladen.*

*G. Schütz e.h.
(Seminar-Chairperson)*

*H. Störi e.h.
(LVA-Leiter)*