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INM

# INM-KOLLOQUIUM

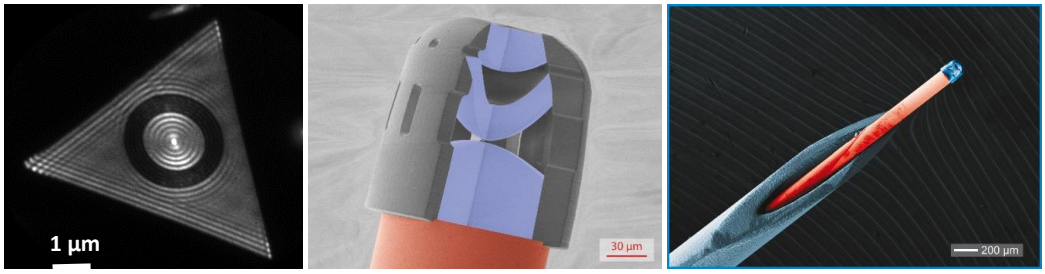
## "MERGING MICRO- AND NANO-OPTICS: FUNDAMENTAL ASPECTS AND APPLICATIONS"

Prof. Dr. Harald Gießen
Universität Stuttgart

Dienstag, 20.02.2018, 11.00 Uhr

INM, Leibniz-Saal, Campus D2 5
Gastgeber: Prof. Dr. Eduard Arzt

Plasmonic nanostructures enable extreme subwavelength concentration of light. This has led to many exciting new avenues in linear and nonlinear optics as well as in sensing.
Highly nonlinear optical processes can lead to electron emission from atomically flat plasmonic surfaces. This reveals the subfemtosecond dynamics of plasmon focusing to 60 nm and subsequent vortex formation. Higher orbital angular momenta can be confined to below 100 nm, possibly suited for nondipolar interaction with large individual quantum systems (see left picture).
On the micro-scale, femtosecond 3D printing opens a new avenue in micro-optics. Arbitrary freeform and aspheric shapes can realize high-quality and even diffraction-limited imaging systems as well as multi-element microscope objectives for endoscopes and sensors with sizes of only a few hundred micrometers (see middle and right picture). When combined with active nano-optical elements, beam shifting, scanning as well as zooming can be realized without any moving parts.
Combining micro- and nano-optics will serve as enabling technology for understanding fundamental material science questions as well as realizing optical, chemical, biological and medical applications in the future.



**Revealing the subfemtosecond dynamics of orbital angular momentum in nanoplasmonic vortices**
G. Spektor et al., Science 355, 1187 (2017).

**Short-range Surface Plasmonics: Localized Electron Emission Dynamics from a 60 nm Spot on Atomically Flat Single Crystalline Gold**
B. Frank, et al., Science Advances 3, e1700721 (2017).

**Two-photon direct laser writing of ultracompact multi-lens objectives**
T. Gissibl et al., Nature Photonics 10, 554 (2016).

**3D printed eagle eye: Compound microlens system for foveated imaging**
S. Thiele et al., Science Advances 3, e1602655 (2017).

Harald Giessen holds the Chair for Ultrafast Nanooptics in the Department of Physics at the University of Stuttgart. He is also co-chair of the Stuttgart Center of Photonics Engineering, SCoPE.

Wir laden 15 Minuten vor Beginn zu einem Get-together mit dem Referenten ein.

KONTAKT

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