



# Allgemeines Physikalisches Kolloquium

Donnerstag, 06.11.2014 um 16 Uhr c.t.

*Prof. Dr. Ortwin Hess*

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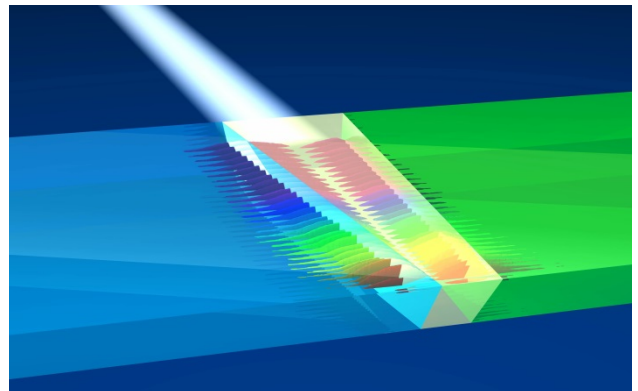


## Active Nano-Plasmonics and Metamaterials: From 'Trapped Rainbows' to Cavity-Free Stopped-Light Nano-Lasing

Nanoplasmonics and optical metamaterials bridge the gap between conventional optics and the nanoworld. Exciting and technologically important capabilities range from subwavelength focusing [1] and invisibility cloaking [2] to stopped light [3] with applications across science and engineering from biophotonics to nanocircuitry.

Recently, the efficient use of optical gain has been shown to compensate hampering losses at optical wavelengths and to allow for loss-free operation, amplification and nanoscopic lasing [4].

The lecture will deliberate on recent and ongoing progress in active, gain-enhanced nano-plasmonics and optical metamaterials. Discussing the complex spatio-temporal interaction between plasmons, light and nonlinear gain media on the nanoscale and at ultrafast time-scales, the lecture will then chart the way towards control of nanoscale emitters [5], ultra-thin metasurfaces [6] and introduce the concept of cavity-free stopped-light nanolasing [7].



#### REFERENCES

- [1] B Pendry, Phys Rev Lett 85, 3966 (2000).
- [2] B Pendry, D Schurig, D R Smith, Science 312, 5781 (2006).
- [3] K L Tsakmakidis, A Boardman and O Hess, Nature 450, 397 (2007).
- [4] O Hess, et al., Nature Materials 11, 573-584 (2012).
- [5] O Hess and K L Tsakmakidis, Science 339, 654 (2013).
- [6] M Hamm and O Hess, Science 340, 1298 (2013).
- [7] T Pickering, J M Hamm, A F Page, S Wuestner and O Hess, Nature Communications 5, 4971 (2014).

IG1 HS2, Wilhelm-Klemm-Straße 10  
Kolloquiums-Kaffee ab 16.00 Uhr vor dem Hörsaal  
Im Anschluss an den Vortrag findet ein geselliges  
Beisammensein mit Getränken und Knabberien statt.

Kolloquiumsbeauftragter: Prof. Dr. Bratschitsch  
Einladender: Prof. Dr. Kuhn