



## **L4H Seminar CORNELIA DENZ 'Optical Tweezer-Assisted Assembly in the Micro- and Nanoworld: From Particles to Droplets and Bio-Hybrid Robots'**

CORNELIA DENZ  
Institut für Angewandte Physi  
Westfälische Wilh

March 12, 2014

---

Wednesday, March 12, 2014, 10:30. Seminar Room

**CORNELIA DENZ**

**Institut für Angewandte Physik**

**Westfälische Wilhelms-Universität Münster, GERMANY**

Holographic optical beam shaping techniques have advanced optical tweezers in the past

years, because the  
allow complex trapping configurations to overcome current challenges in applications in  
fluidic and biomedical systems.

Holographically generated higher-order light modes, for example, can induce highly  
structured and ordered three-dimensional optical potential landscapes to create assemblies  
of nanocontainers or biohybrid nano robots, and can be used as a tool to explore the inner  
cell, paving the way to optically-assisted analysis of diseases.

Tailored light fields can also be implemented to induce non-optical forces. Optoelectronic  
tweezers take advantage of dielectrophoretic forces to trap microstructures in a massively  
parallel way. Photophoretic trapping makes use of thermal forces and by this means is  
perfectly suited for trapping absorbing particles in dynamic light cages or to guide droplets.

Therefore, the combination of holographically tailored light fields with complementary  
dielectrophoretic and photophoretic trapping provides a holistic approach to novel optical  
nano- and microassembly scenarios of bio-hybrid or fluidic matter.

**Wednesday, March 12, 2014, 10:30. Seminar Room**

**Hosted by Prof. Niek van Hulst**

