ICFO

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

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March 12, 2014

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

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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.

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Hosted by Prof. Niek van Hulst