CFEL SCIENCE

SEMINAR

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CFEL-Building 99, seminar room I, ground floor

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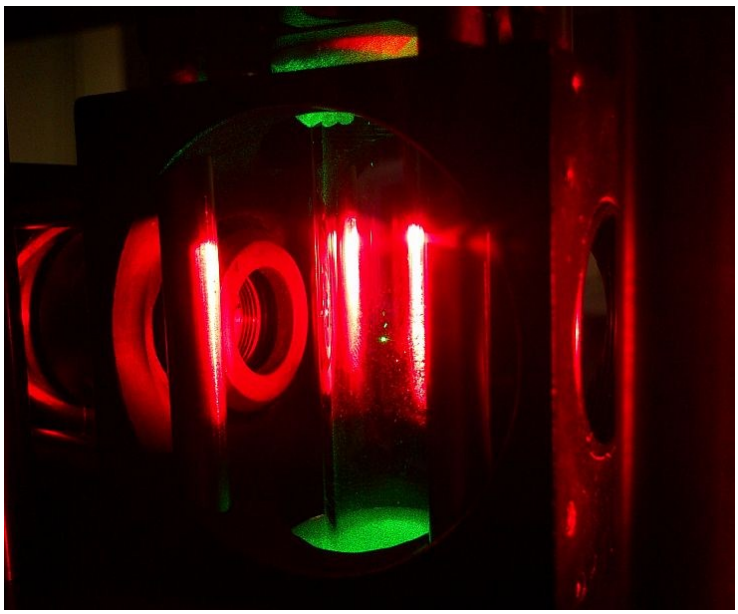
Trapping of air-born particles with optical vortices



In physics and biology, manipulation of microscopic objects in liquids achieved remarkable precision and functionality using very small radiation pressure of light and dipole-induced gradient forces induced by optical tweezers. Stable trapping of absorbing particles in gases was not achieved until now due to the dominance of thermal forces from interaction of the laser-irradiated particle with the molecules of ambient gas, so called photophoretic forces. We address this challenge by developing a touch-free optical trapping of particles suspended in air with optical vortices. The ability to guide absorbing particles along the vortex core in a stable and controlled manner can be employed further for high-accuracy manipulation of particles in three dimensions in air and in any gaseous environment. This presentation will review recent results and discuss the unresolved problems in trapping and manipulating particles with photophoretic forces.

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Host: Jochen Küpper, CFEL Molecular Physics Seminar