TECHNISCHE UNIVERSITÄT CHEMNITZ

Institut für Physik
Physikalisches Kolloquium

Mittwoch, 21.06.2023, um 11:15 Uhr

Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum C10.013

Prof. Síle Nic Chormaic

OIST Graduate University, Okinawa Japan

Trapping micro and nanoparticles using near-field optics

This talk will be concerned with some of the many applications of near-field optical traps that use optical waveguides or plasmonic nanostructures. Due to the very tight confinement of the light fields and the resulting very high field intensities that can be reached, trapping of sub-wavelength particles or complex particles may be more readily achieved than for conventional optical tweezers using tightly focussed light. During the talk, I will introduce two specific devices, namely optical nanofibers and metamaterial-assisted plasmonic nanotweezers, and illustrate how they are used to trap and control particles from inhomogeneous Janus particles, through gold and dielectric micro- and nanoparticles, to atoms. The two different devices are suitable for different types of particle manipulation experiments, and this will be discussed. Finally, some perspectives on the future applications will be presented, including current limitations due to thermal and fabrication considerations.

Bio Síle Nic Chormaic (Professor) holds a BSc (Hons) in Experimental and Mathematical Physics, and an MSc by Research in Atomic Physics from the National University of Ireland, Maynooth. In 1994 she was awarded a PhD on hydrogen atom interferometry from the Université Sorbonne Paris Nord. Subsequently, she held research positions in Austria, Australia, and Germany. She returned to Ireland in 2000 for a faculty post at Cork Institute of Technology. In 2006, she transferred to University College Cork. Since 2012 she has been at Okinawa Institute of Science and Technology Graduate University, Japan, where she leads the Light-Matter Interactions for Quantum Technologies Unit. She is recognized for her work on optical nanofibres and other micro- and nanostructured devices for a variety of applications including fundamental studies with cold atoms, novel atom trapping schemes, microscopic and nanoscopic particle manipulation, complex optical mode propagation in nanofibres, and whispering gallery resonators for sensing and nonlinear optics. During her career she has received several awards including an EU Science Bursary, an Austrian Science Foundation Lise Meitner Fellowship, and a Science Foundation Ireland Principal Investigator Award. She is a Fellow of Optica and the Institute of Physics. In her spare time she explores the Ryukyu Islands on foot or on bicycle.

Alle Zuhörer sind ab 11:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
Prof. Dr. Martina Hentschel, Tel. 0371 531 39403

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