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Seminar über Quanten-, Atom- und Neutronenphysik (QUANTUM)

Nov. 26, 2020 at 2 p.m. c.t.
None

Dr. James Millen
King's College London, UK

Levitated Electromechanics

Nanoparticles suspended and cooled in vacuum are seen as ideal candidates for testing the limits of quantum mechanics, beyond state-of-the-art sensing, and tabletop detection of gravitational waves and dark matter. The standard technology involves optical trapping and levitation, though this comes with issues of optical absorption and photon scattering.

Away from the optical regime, electromechanics concerns the control of mechanical motion via its coupling to an electrical circuit. Chip-based electromechanical systems are leading quantum technologies, allowing entanglement between different circuit-signals, quantum squeezing, and the coherent conversion of signals between different frequency regimes.

I will present our preliminary results in the field of Levitated Electromechanics, where particles are levitated, detected and controlled all-electrically. I will introduce the concept of bath engineering in this system with a preliminary study of non-equilibrium dynamics, and our work towards miniaturization.

For more information see www.levi-nano.com

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