

QSIT talk at ETH Zurich

Datum: Monday, 1. Febr. 2016, 11:00h

Place: HIT E 41.1

Speaker: Dorian Gangloff Ph.D. Candidate, CUA, MIT, Cambridge, USA

Title: "Nanocontacts atom-by-atom with a friction emulator"

Abstract:

Friction is the basic, ubiquitous mechanical interaction between two surfaces that results in resistance to motion and energy dissipation. To test long-standing atomistic models of friction processes at the nanoscale, we implemented a synthetic nanofriction interface using laser cooled ions subject to the periodic potential of an optical standing wave. We show that stick-slip friction can be tuned from maximal to nearly frictionless via arrangement of the ions relative to the periodic potential, and that friction at the nanoscale can substantially differ from the simple phenomenological laws observed at the macroscale. We also establish a direct link between Aubry's structural transition for an infinite chain in an incommensurate periodic potential, and the vanishing of friction in nanocontacts.

Host: Andreas Wallraff