

Physikalisches Kolloquium

Thursday, 20.11.14, 17:15, HS 100
Reception with coffee & cookies 16:45



Prof. Mikhail Lemeshko, Institute of Science and Technology,
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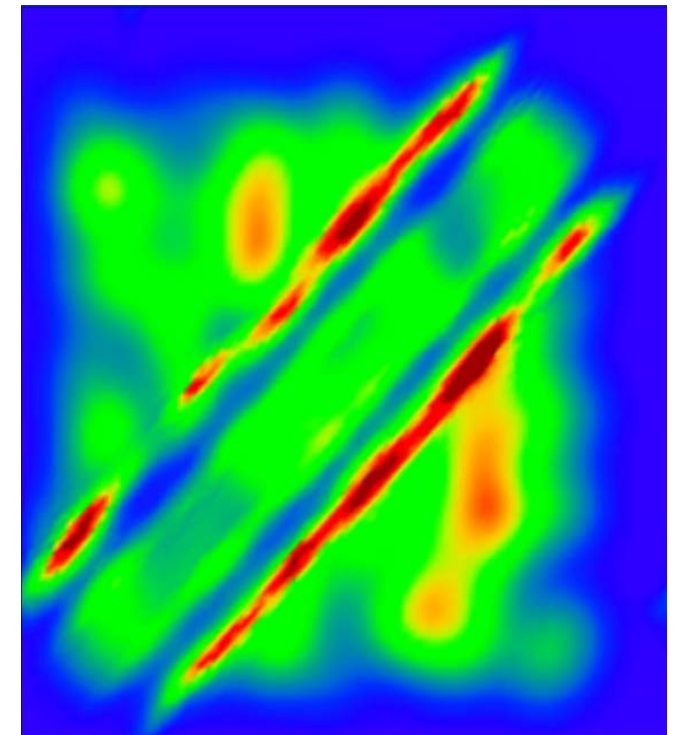
Understanding complex quantum systems using controllable Atoms and molecules

Abstract

Recent experimental progress in the fields of atomic, molecular, optical, and chemical physics affords an unprecedented degree of control over individual atoms, molecules, and their interactions. Ensembles of such controllable particles can be used to mimic (and thereby understand) the behavior of complex quantum systems in physics, chemistry, and biology. I will describe our recent work on the manipulation of individual molecules and molecular ensembles with electromagnetic fields, which paves the way to understanding the behavior of few- and many-particle systems in condensed-matter and chemical physics. In particular, I will discuss open quantum systems, i.e. systems interacting with a fluctuating environment, and describe ideas about how to turn controlled dissipation into a useful resource for quantum-state engineering.

[1] M. Lemeshko, H. Weimer, "Dissipative binding of atoms by non-conservative forces" Nature Communications 4, 2230 (2013)

[2] J. Otterbach, M. Lemeshko, "Dissipative Preparation of Spatial Order in Rydberg-Dressed Bose-Einstein Condensates", Phys. Rev. Lett., in press (2014); arXiv:1308.5905



All of you interested in physics are cordially invited!