



CO.CO.MAT

CONTROL OF QUANTUM CORRELATIONS IN TAILORED MATTER
SFB/TR 21 – STUTTGART, ULM, TÜBINGEN

Kolloquium

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(Universität Tübingen)

Molecular nanostructures and quantum gases – nanotechnology at the quantum limit

The research field of ultracold quantum gases in microscopic traps has seen enormous advances within the last few years. Today, Bose-Einstein condensates and Fermi gases are routinely prepared and manipulated at the surface of microchips. An important result of the field is that we have a good understanding of the interaction between atoms and surfaces. This includes attractive Casimir-Polder and van der Waals forces, and spin decoherences of atoms near conducting surfaces. Technical limits have also been identified. Based on these results we are able to engineer advanced atom optical circuits at chip surfaces and control the position, momentum and internal quantum states of atoms. Recently single Q-bit operations and matterwave interferometer have been successfully realized. I will present results on the diffraction of Bose-Einstein condensates from a magnetic lattice, progresses towards superconducting microtraps, and a proposal for manipulating atoms by molecular nanostructures as well as for novel hybrid quantum systems based on a coherent interaction of ultracold atoms and macromolecules.

Wann? Freitag 15.12.2006, 15:30 Uhr

Wo? Universität Tübingen,
Auf der Morgenstelle 14, Raum D4 A19