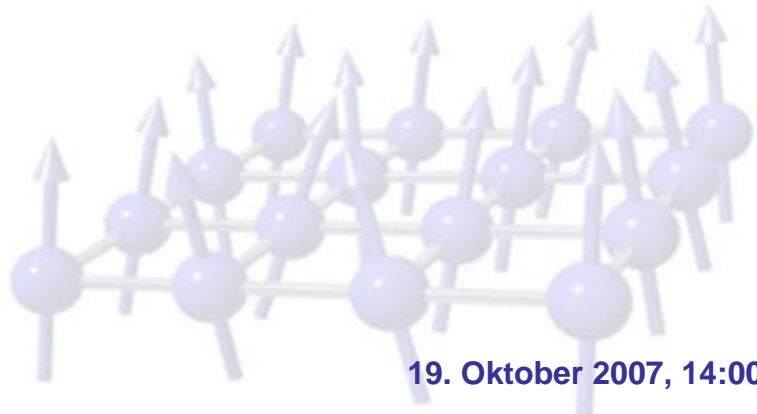


Dr. Robert J.C. Spreeuw

(Van der Waals-Zeeman Instituut, Universiteit van Amsterdam,
the Netherlands)

**A lattice of magnetic microtraps and shift register on an
atom chip**

We have realised a two-dimensional magnetic lattice of microtraps for ultracold atoms on a permanent magnet atom chip. The lattice consists of more than 15000 tightly confining trap sites with a density of 1250 traps/mm². We load a cloud of ultracold atoms to as many as 400 lattice sites at a distance of approximately 10 μm from the film surface. Radio frequency evaporation can be applied to cool the individual atom clouds towards quantum degeneracy. We have also realized an atomic shift register: we smoothly transport the atom clouds over the lattice by applying external magnetic fields with rotating orientation. Our magnetic lattice may be most promising as a scalable qubit register, a key ingredient for applications in quantum information processing.



19. Oktober 2007, 14:00 Uhr

Universität Stuttgart, NWZII, Raum 2.136
Pfaffenwaldring 57, 70569 Stuttgart

