



## Seminar

**Dr. Alejandro Lobos**

(Instituto Balseiro, Bariloche, Argentinien)

### Magnetic atoms in quantum corrals

In the quantum mirage experiment, confinement of surface electrons by an elliptical nanoscopic corral built on Cu(111) has been used to project the Kondo effect from one focus to other points inside the corral. The STM space map of the differential conductance, obtained by scanning the surface of the corral with a cobalt atom inside acting as a magnetic impurity, resembles the density map of the hard-wall corral eigenstate lying at the Fermi energy.

In order to describe the experiment, we approximate the corral by a continuous confining delta potential. The introduction of the magnetic atom is modelled with the Anderson hamiltonian. Two different techniques are used to handle the many-body aspects of the problem, 2nd order perturbation in the  $U$  parameter of the Anderson hamiltonian and slave bosons in the saddle-point approximation.

We calculate the resulting change in the differential-conductance as a function of the gate voltage and real-space position. The main features seen in the experiments are reproduced. By studying the lineshapes of the differential conductance, we propose a means to discern the relative importance of the bulk states in the formation of the Kondo singlet, and issue that remains unclear yet.

**Wann?** Montag 24.07.2006, 14:00 Uhr

**Wo?** Universität Stuttgart, NWZ II, Raum 5.331