Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

QE

Quantum Efficiency Seminar und Colloquium

GUIDO PUPILLO

Université de Strasbourg

Engineering strong Correlations in Gases of Atoms and Molecules: superfluid, solid and supersolid phases of matter

The possibility to control and tune system parameters via external fields is key to the experimental realization of fundamental quantum phases and phase transitions in cold atomic gases. For example, control over contact interparticle interactions using Feshbach resonances has allowed the observation of the BEC-BCS crossover in fermionic atomic gases, and the realization of the superfluid-insulator quantum phase transitions with cold bosonic atoms loaded in optical potentials. In this talk we discuss novel control techniques to induce and shape long-range interactions in cold gases of atoms and molecules. These offer new opportunities to observe fundamental and exotic quantum phases of matter in these systems. As examples, we will discuss the possibility to observe both superfluid and solid phases, as well as the famous and elusive free-space supersolid.

Date: **Tuesday, December 6th, 2011 16:15 pm**
Location: **Lecture Hall 1, Hermann-Herder-Str. 3, Freiburg**

Contact: Andreas Buchleitner, Institute of Physics, Quantum Optics and Statistics
T +49 761 203 5821 F +49 761 203 5967 E buchleitner_office@physik.uni-freiburg.de
www.physik.uni-freiburg.de