SFB/TRR 21 - Seminar

3. Juni 2013, Stuttgart

Cornee Ravensbergen

(Eindhoven University of Technology, Netherlands)

Shaping the Rydberg excitation light

Ultracold atomic gases are used extensively to realize textbook examples of condensed matter phenomena. Typically, such experiments deal with neutral atoms interacting via short-range VdW potentials much weaker than the Coulomb interactions between electrons in solids. In contrast, we study highly excited Rubidium Rydberg atoms arranged on a lattice in a magneto-optical trap, representing a more accurate dilute model system for e.g. metallic conductors. Here, the interaction strengths approach Coulombic potentials, while retaining the controllability characteristical of cold atom experiments. This controllability is further enhanced by shaping the excitation light with a spatial light modulator, which enables us to arbitrarily choose the Rydberg crystal shape, dimension and size. The resulting cloud of Rydberg atoms is then field ionized and imaged onto a detector with single atom resolution, which can be used to directly observe strong interaction phenomena like blockade effects and crystallization.

3. Juni 2013, 10:00 Uhr

Universität Stuttgart, NWZII, Raum 3.123
Pfaffenwaldring 57, 70569 Stuttgart

CO.CO.MAT