SFB/TRR 21 - Colloquium

2. November 2012, Stuttgart

Hendrik Weimer
(Leibniz University Hannover)

Binding by Dissipation

I will present two different routes to prepare strongly interacting states in long-range interacting quantum gases. The first approach consists of a novel approach to engineer coherent many-body dynamics to realize crystalline structures in an optical lattice [1]. In the second part, I will demonstrate how dissipative forces can act as a binding mechanism between two strongly interacting particles, even when the interaction potential is purely repulsive. The bound state arises as a quasi-stationary state of the dynamical evolution of the system. This method also carries the potential to serve as a cooling mechanism for strongly interacting quantum gases. Finally, I will discuss possible experimental realizations with ultracold Rydberg atoms or polar molecules.
[1] M. Lemeshko, R. V. Krems, H. Weimer, Phys. Rev. Lett. 109, 035301 (2012).

2. November 2012, 15:30 Uhr

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

CO.CO.MAT