KIDS TALK

“Long Range Rydberg Interactions in Cold Quantum Gases”

Speaker: Thomas Niederprüm, AG Ott

Abstract:

Over the last decade cold quantum gases developed into a fruitful playground to explore phenomena at the very heart of quantum mechanics. The enormous degree of control at the single particle level opened up new perspectives and brought scalable quantum computers and versatile quantum simulators within reach. However, one long-standing goal was not reached up to now: Establishing long range interactions between the atoms inside the quantum gas. One promising pathway to resolve this problem is the excitation into Rydberg states. Due to the high spatial separation of the negatively charged electron in the Rydberg state and the positively charged core, the Rydberg atom exhibits a huge polarizability, giving rise to strong long-range interactions between two adjacent Rydberg atoms.

In this talk I will give an insight into the opportunities and the challenges that arise when embedding Rydberg atoms into ultracold quantum gases in the high density regime. After revisiting the basic principles of trapping and cooling atoms to quantum degeneracy, the talk will focus on the creation of ultra-long range Rydberg molecules and the formation of excitation clusters due to strong Rydberg-Rydberg interactions.

When: Friday, December 04th 2015, **10:00 am**

Where: Room 46-387/388

All undergraduate and graduate students as well as postdocs are welcome and encouraged to join our discussion!

********** COFFEE AND COOKIES WILL BE SERVED **********

For questions, comments or suggestions: schmidtf@physik.uni-kl.de

MATERIALS IN SCIENCE MAINZ

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

OPTIMAS TU Kaiserslautern