Physikalisches Kolloquium — Physics Colloquium

Einladung — **Invitation**

Monday, 23 January 2023

Lecture Hall N24/H13, at 16:15
Coffee and cookies will be served in front of the lecture hall from 16:00

The quantum physics of interacting atoms and ions

Prof. Dr. Rene Gerritsma

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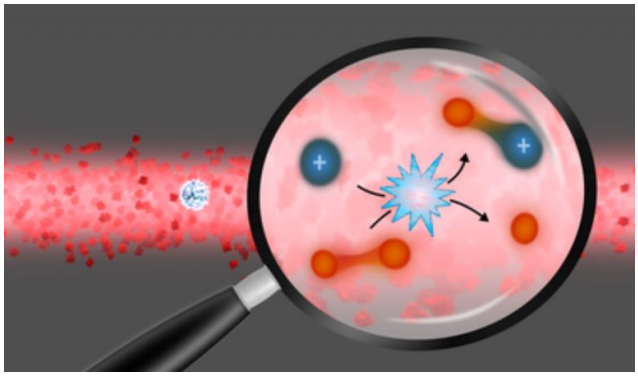
In recent years, a novel field of physics and chemistry has developed in which trapped ions and ultracold atomic gases are made to interact with each other. These systems find applications in studying quantum chemistry and collisions [1], and form a natural environment in which to study quantum impurity physics. In our experiment, we buffer gas-cooled a single ion in a gas of ultracold atoms to the quantum regime [2]. This opens up new opportunities in controlling the interactions between the particles and in quantum chemistry [3]. I will illustrate how we can control the interactions between atoms and ions by using Rydberg excitation [4]. Finally, I will discuss strategies and prospects for reaching deeper into the quantum regime [5].

[1] M Tomza et al., Rev. Mod. Phys. 91, 035001 (2019).
[2] T. Feldker et al., Nature Physics 16, 413–416 (2020).
[3] H. Hirzler et al., Phys. Rev. Lett. 128, 103401 (2022).
[4] N.V. Ewald et al., Phys. Rev. Lett. 122, 253401 (2019).
[5] E. Trimby et al., New Journal of Physics 24, 035004 (2022).



Host: Prof. Dr. Johannes Hecker Denschlag, Institute of Quantum Matter

Organisation: Prof. Dr. Jens Michaelis, Institute of Biophysics, jens.michaelis@uni-ulm.de, +49-731-50-23050