

Physikalisches Kolloquium

Thursday, 11.06.15, 17:15, HS 100
 Reception with coffee & cookies 16:45



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Ultra-close to absolute zero: Bose-Einstein Condensates and Ultracold Fermi gases

Abstract

Ultracold gases have been found to form a new state of matter called Bose-Einstein Condensates. In general these systems are an example of well controlled quantum manybody states and are perfectly suited to simulate complex systems ranging from condensed matter systems to ultracold chemistry to analogue gravity. We create cold gases out of fermionic lithium 6 and bosonic cesium 133. In the case of lithium 6 we work with a mixture of two spin states, which can pair up to form bosonic molecules. In addition we are able to tune the scattering interactions between the two states and in this way observe either ultracold bosonic molecules or strongly interacting Fermi gases. In this way the BEC-BCS crossover has been observed in earlier experiments. We study and describe strongly interacting Bose-Einstein-Condensates which are complex systems. We will detail the cooling methods and discuss the experimental setup for the creation of such ultracold gases. The addition of a low number of caesium atoms allows the study of impurities in a bosonic gas and the formation of polarons.

All of you interested in physics are cordially invited!

