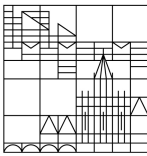


Physikalisches Kolloquium

Universität
Konstanz



Di 12.05.20
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



Prof. Dr. Tobias Schätz
Albert-Ludwigs-Universität Freiburg

Optical Traps for Ions & Ultracold Atoms and the Onset of Sympathetic Cooling

Isolating ions and atoms from the environment is essential for experiments, especially if we aim to study quantum effects. For decades, this has been achieved by trapping ions with radiofrequency (rf) fields and neutral particles with optical fields. We are trapping ions by the interaction with light and electrostatic fields, in absence of any rf-fields. We take our results as starting point for studying how to combine the advantages of optical trapping and ions.

We aim to demonstrate the prospects of our approach in the context of interaction and reaction at ultra-low temperatures as a showcase. Following the seminal work in other groups in hybrid traps, we embed optically trapped ions into quantum gases to reach lowest temperatures, circumventing the currently inevitable excess kinetic energy in hybrid traps, where ions are kept but also driven by rf-fields. It might permit to enter the temperature regime where quantum effects are predicted to dominate.

We will discuss our recent results on optically trapping $^{138}\text{Ba}^+$ and ^{87}Rb atoms in a bi-chromatic dipole trap, related challenges and perspectives.

