



CRC 1227  
Designed Quantum States of Matter



## **GASTVORTRAG**

am 29. Juni 2017, 15:30 Uhr  
Leibniz Universität Hannover  
Welfengarten 1, 30167 Hannover  
Hauptgebäude (1101),  
Seminarraum am Institut für Quantenoptik  
Raum D326

Vortragender: Prof. Dr. Selim Jochim,  
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(Gast von Prof. Dr. Piet O. Schmidt)

### **Thema: Understanding many body physics, atom by atom**

Understanding the interplay between many particles is a challenging problem spanning many scales, from structure formation in the universe to protein folding in biological systems to condensed matter and nuclear systems.

In our experiments we work with model systems made from ultracold atoms, with their quantum properties, namely superposition, indistinguishability and entanglement being essential ingredients. These lead to remarkable many-body properties, such as superfluidity and superconductivity with sometimes surprisingly high critical temperatures.

To understand essential mechanisms behind these phenomena we realize systems small enough such that the full quantum state of the system can be controlled, while many properties start to emerge. Some observables to be measured, like the energy of the system are readily available, and its convergence to a many body system has already been shown. Characterising quantum correlations between particles at the microscopic level is part of an ongoing effort on which progress will be presented.

**Zu dieser Veranstaltung sind alle DQ-mat-Mitglieder und  
alle Interessierten herzlich eingeladen.**