

Advanced Seminar – Winter Semester 20/21

## Ultracold Quantum Gases

Dr. Wolfgang Limmer

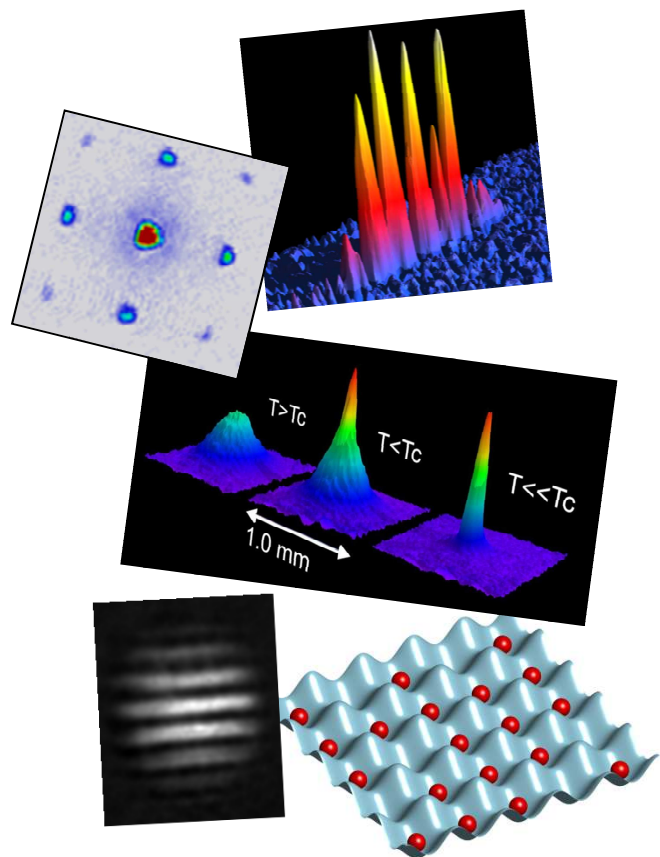
Institute of Quantum Matter

### Description:

The seminar addresses both fundamental and advanced topics in the fascinating field of ultracold quantum gases.

The talks are based on a small number of selected publications and are intended to provide a good understanding of the underlying physics.

Enough time is arranged for relaxed and stimulating discussions in order to deepen the acquired knowledge.



### Prerequisites:

Profound knowledge in atomic physics and quantum mechanics

### Language:

The presentations should be written in English. The spoken language will be German or English, depending on the students' preference and the participation of international students.

### List of talks (preliminary):

1. Matter-wave interferometry and gravitational measurements
2. Nonlinear atom optics, 4-wave mixing, and solitons
3. Scattering length and Feshbach resonance
4. Optical lattices and Hubbard model
5. Ultracold molecules
6. Repulsively bound atom pairs
7. Ultracold Fermi gases
8. Quantum cradle
9. Quantum walk
10. Rydberg atoms

**ECTS credits:** 4