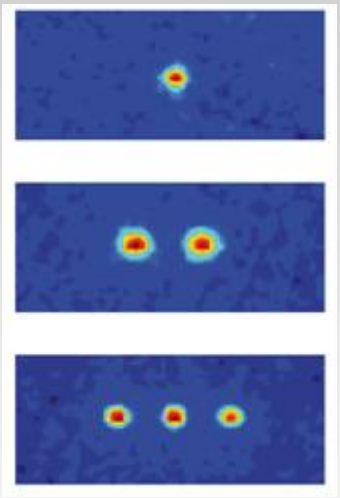
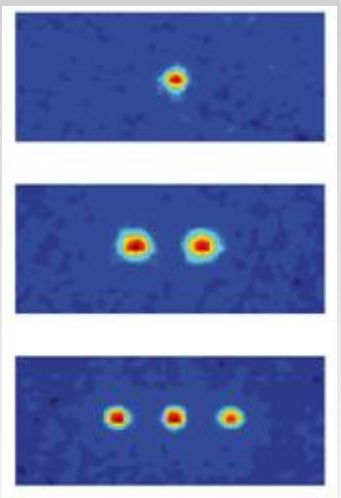


PH 959/555 Experimental Quantum Optics



Professor Stefan Kuhr

Dr Elmar Haller, Dr Paul Griffin

Sem II - Tues 12pm-2pm & Thurs 1pm-3pm

Goal: Understand modern Quantum Optics experiments ... and much more

Selected Topics:

- **Light-atom interaction and quantisation of the electromagnetic field (with strong focus on experiments)**
  Rabi oscillations, optical Bloch equations, Ramsey method, quantisation of the em field, Fock states, coherent states, squeezed states
  Optical dipole traps, Quantisied light-atom interaction, Jaynes-Cummings model, Dressed states picture, Quantum Rabi oscillations,
  Cavity QED, Non-destructive photon counting

- **Modern Experiments in Atomic Physics and Quantum optics**
  Laser cooling of atoms and ions, ultracold quantum gases, Bose-Einstein condensates,
  optical lattices, superfluid-Mott-Insulator transition
  EIT and „slow light“

- **Basics of Quantum information**
  quantum gates, quantum cryptography, quantum computation with trapped ions