

Prof. Dr. Peter van Loock
Institut für Physik
loock@uni-mainz.de

JOHANNES GUTENBERG
UNIVERSITÄT MAINZ



Dr. Lars von der Wense
Institut für Physik
lars.vonderwense@uni-mainz.de

Seminar über Quanten-, Atom- und Neutronenphysik (QUANTUM)

Jan. 7, 2021 at 2 p.m. c.t.
None

Prof. Dr. Antoine Browaeys
Laboratoire Charles Fabry, Palaiseau, France

Many-body physics with arrays of individual atoms and optical dipoles

This talk will present our effort to control and use the dipole-dipole interactions between cold atoms in order to implement spin Hamiltonians useful for quantum simulation of condensed matter or quantum optics situations. We trap individual atoms in arrays of optical tweezers separated by a few micrometers. We create almost arbitrary geometries of the atomic arrays in two and three dimensions up to about 200 atoms. To make the atoms interact, we either excite them to Rydberg states or induce optical dipoles with a near-resonance laser. Using this platform, we have in particular explored quantum magnetism, topological synthetic quantum matter, and a new light-matter interface.

Contact:
Andrea Graham
Institut für Physik
graham@uni-mainz.de