

# Homogeneous Two-Dimensional Fermi Gases

Henning Moritz<sup>1</sup>

<sup>1</sup> *Institut für Laserphysik, Universität Hamburg, Luruper Chaussee 149, 22761 Hamburg, Germany.*

Ultracold 2D Fermi gases allow to precisely characterise the interplay of reduced dimensionality and strong interactions in a quantum many body system. In this talk I will present our realization of a homogeneous 2D Fermi gas [1] trapped in a box type potential which is ideally suited to measure non-local quantities like correlation functions and the momentum distribution and to create quantum phases which are predicted to exist in only small regions of the phase diagram.

To confine the homogeneous gas we radially confine it by a ring-shaped blue-detuned beam with steep walls. We perform matter wave focusing to extract its momentum distribution and directly observe Pauli blocking in a near unity occupation of momentum states. A digital micro mirror device can be used to remove residual inhomogeneities and to imprint arbitrary repulsive potentials.

[1] K. Hueck, N. Luick, L. Sobirey, J. Siegl, T. Lompe, H. Moritz, arXiv:1704.06626 (2017).