

Abstract Submitted  
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**Quantum gas microscopy of tailored few-body systems** ANDREAS KERKMANN, MICHAEL HAGEMANN, MATHIS FISCHER, CHRISTOF WEITENBERG, University of Hamburg — We are setting up a new quantum gas microscope for the detection of degenerate samples of  ${}^6\text{Li}/{}^7\text{Li}$  atoms to study strong correlations in small quantum systems.

Our design consists of a compact 2D-/ 3D-MOT loading scheme, a lambda-enhanced gray molasses and an all-optical approach for the preparation of degenerate samples. A red-detuned accordion lattice brings these samples into the two-dimensional regime. We then investigate the possibility of different cooling schemes in a phase-stabilized triangular pinning lattice to collect sufficient fluorescence for single-site imaging.

In the future, we will look at few-body systems in specifically tailored optical potentials to study new regimes, e.g., ionization dynamics in artificial atoms or fractional Quantum Hall physics in rotating microtraps. In this poster, we provide information about the details of the design, the current status of the experiment and our future plans.

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