Would you like to perform quantum optics experiments with atoms?

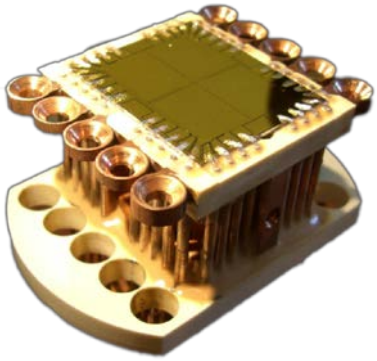
For your **Master thesis**, join us on our atom chip experiment!

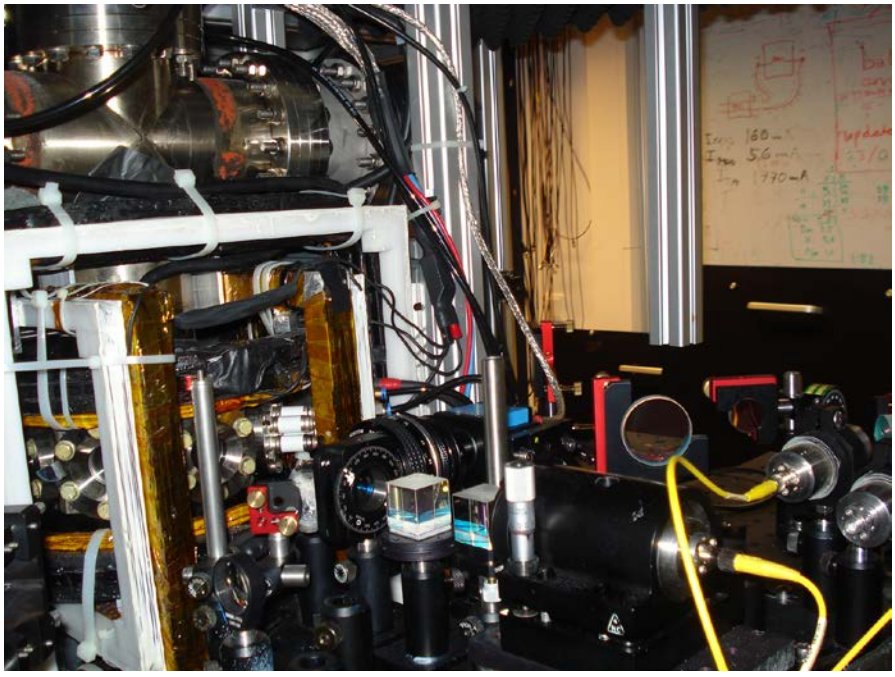
Using lasers and electromagnetic fields, we cool our rubidium atoms down to ultralow temperature (few 10^-8 K!). They are then in a quantum phase where all atoms form a coherent matter wave, called Bose-Einstein condensate. We confine the condensate in the magnetic field formed by microfabricated wires of our atom chip. Tuning the wires' currents, we control the shape of this magnetic trap, which can be for instance turned into a double-well trap.

Your project: Optimal manipulation of a Bose-Einstein condensate in a double-well trap
In the first part of your thesis, you will discover the experimental methods used for cooling and manipulating atoms, by taking part in the optimization of our experimental setup. In the second part, you will implement on this setup some transformations of the double-well potential (modulation of the tunneling J or of the energy difference ε between the wells) in order to transfer the condensate to specific states. You will then analyze and interpret the measurement results.

Interested students are invited to contact Dr. Marie Bonneau, mbonneau@ati.ac.at

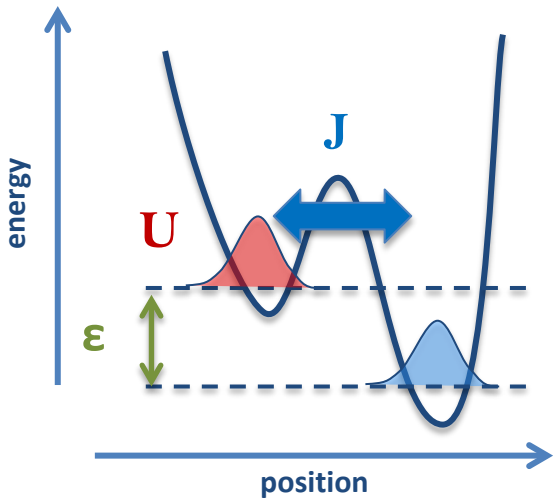
our atom chip





our experimental setup

double-well trap



matter-wave interference fringes