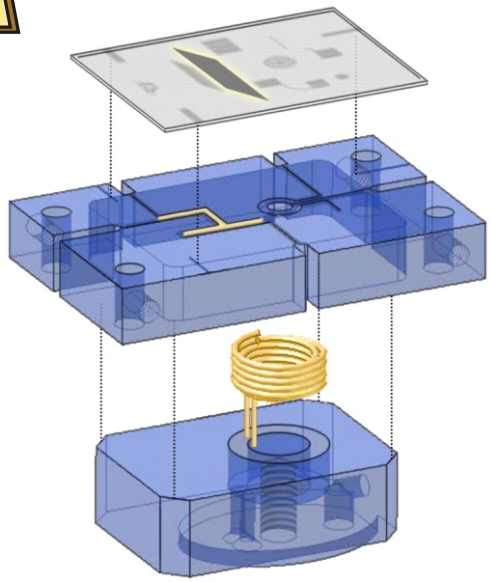
Atom Chips Amsterdam

Next-generation atom chips (Design)



Atom chips are devices consisting of a pattern of wires or magnets used to create tailor-made magnetic potentials for ultracold [(sub)microKelvin temperature] atoms. Atom chips have potential new applications, in diverse areas such as: quantum gases in exotic potentials, integrated atomic clocks/interferometers and quantum information processing.

A next-generation atom chip will be compact and robust through the integration of all experimentally required magnetic fields for trapping and manipulating atoms.

A sub-layer of conductors integrated into the atom chip will replace our existing magnetic coils to produce magnetic traps and homogeneous fields with arbitrary orientation. This flexibility is desired for many of our latest experiments, and is essential for future work with radio-frequency potentials. The project involves atom-chip design and magnetic field engineering. The chip will be fabricated from ultra-high vacuum compatible materials and will ultimately be used for new studies with quantum gases and quantum information.

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