

Multilayer atom chips for versatile atom micromanipulation

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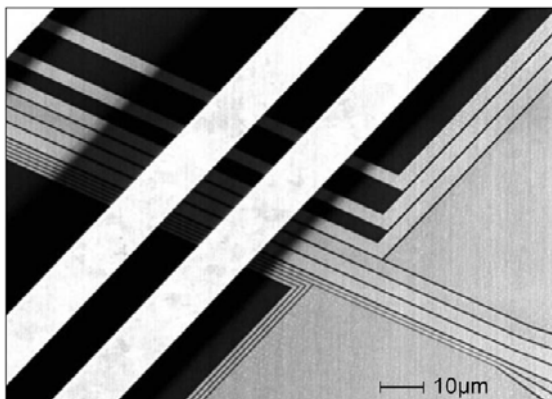
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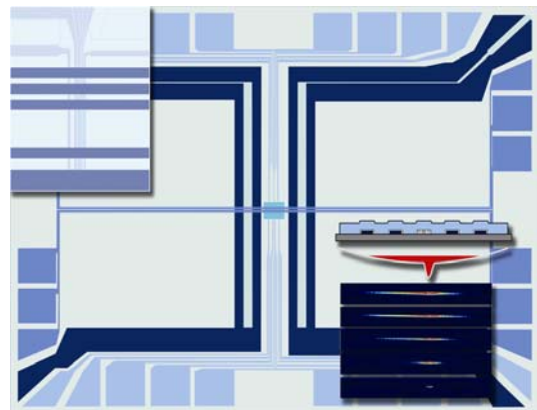
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We experimentally demonstrate the flexibility of our next generation atom chip by producing Bose–Einstein condensates in magnetic traps created by a combination of wires involving all different fabrication methods and structure sizes.

Employing optical and electron-beam lithography, we create an atom chip combining submicron wire structures with larger conventional wires on a single substrate. The multilayer fabrication enables crossed wire configurations, enhancing the flexibility in designing potentials for ultracold quantum gases and Bose–Einstein condensates.



The image shows an SEM micrograph of the central part of a multilayer chip.



The large image shows the atom chip layout. The inset shows images during preparation of a BEC below a sketch of the magnetic potential created by a multi-wire configuration.