

Atomic nano assembler

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch Fortsetzungsanträge)

Bewilligung: 08.07.2010

Laufzeit: 3 Jahre

Projekt-Website: <http://www.quantenbit.de/#/research/solidstate>

The project is aiming at the realization of an atomic nano assembler, a novel device capable of placing an exactly defined number of atoms or molecules into solid state substrates with sub nano meter precision in depth and lateral position. Current state of the art production techniques do not offer these possibilities and pose a major production problem for the realization of scaled quantum devices. The project is motivated by the quest for novel tailored solid state quantum materials generated by deterministic high resolution ion implantation. The major goals are the deterministic generation of colour centers or quantum dots, placing them in special geometries in order to exploit the mutual coupling for the realization of macroscopic functional systems and interfacing them to the macroscopic world with the help of electrode structures, single electron transistors and optical micro cavities. Targeted applications range from quantum repeater, correlated triggered multi photon sources, calibrated single photon sources, quantum computation circuits, sensors with unprecedented sensitivity.

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