Universität Basel

Research Project

SIQS - Simulators and Interfaces with Quantum Systems

Third-party funded project

Project title SIQS - Simulators and Interfaces with Quantum Systems
Principal Investigator(s) Treutlein, Philipp ;
Co-Investigator(s) Schmied, Roman ;
Organisation / Research unit
Departement Physik / Experimentelle Nanophysik (Treutlein)
Department
Project start 01.05.2013
Probable end 30.04.2016
Status Completed

The overarching goal of our project is to develop systems based on direct and deterministic interactions between individual quantum entities, which by involving large-scale entanglement can outperform classical systems in a series of relevant applications.

We plan to achieve that by improving technologies from atomic, molecular and optical physics as well as from solid-state physics, and by developing new ones, including combinations across those different domains. We will explore a wide range of experimental platforms as enabling technologies: from cold collisions or Rydberg blockade in neutral atoms to electrostatic or spin interactions in charged systems like trapped ions and quantum dots; from photon-phonon interactions in nano-mechanics to photon-photon interactions in cavity quantum electrodynamics and to spin-photon interactions in diamond color centers.

We will work on two deeply interconnected lines to build experimentally working implementations of quantum simulators and of quantum interfaces. This will enable us to conceive and realize applications exploiting those devices for simulating important problems in other fields of physics, as well as for carrying out protocols outperforming classical communication and measurement systems.

Keywords quantum science, quantum technology
Financed by
Commission of the European Union

Add publication

Add documents

Specify cooperation partners