



Im Rahmen des Physikkolloquiums spricht

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über

Quantum technologies with trapped ions

Abstract:

The upcoming European Flagship on quantum technologies highlights the rich field of applications of controlled quantum systems: from outstanding clocks and sensors, via secure communications, to quantum simulations and quantum computing. Here, trapped ions are one of the very few systems that serve as a research platform for all these four pillars of quantum technologies. The goal of this presentation is to provide a basic understanding of an ion trap experiment, various techniques to control ions, means to quantify the level of quantum control established in trapped-ion experiments, and how those techniques can be applied in various experiments. Building on these techniques, a brief outline will be provided on state-of-the-art experiments on ion clocks and sensors, the "Innsbruck quantum network", and scalable quantum computing.