universität innsbruck

Fakultäten Servicestelle

Fakultät für Mathematik, Informatik und Physik

KUNDMACHUNG

Öffentlicher Vortrag

Dr. Benjamin P. Lanyon

aus dem Bereich des Habilitationsfaches
Experimentalphysik

„Towards quantum networks of light and matter"

There is a current worldwide research effort to develop quantum networks that connect cities and even countries. Such networks are envisioned to consist of distributed quantum-matter based nodes that are linked together using photons. A handful of experiments have demonstrated remote entanglement of a few matter-based systems, over straight-line distances of up to a kilometer or so. In this talk I'll summarise some of our recent work in this field. First, we entangled two charged atoms trapped on opposite sides of the Technik campus [1]. Second, we demonstrated an atom-based quantum repeater node over 50 kilometers of optical fiber [2]. In future, an improved version of such a repeater node could allow atoms to be entangled in different countries. Finally, I'll show some recent unpublished results from the lab, in which we work towards entangling small-scale remote quantum processors.

[1] Krutyanskiy & Galli et al, *Entanglement of Trapped-Ion Qubits Separated by 230 Meters*, Phys. Rev. Lett. 130, 050803 (2023)

[2] V. Krutyanskiy *et al*, *Telecom-Wavelength Quantum Repeater Node Based on a Trapped-Ion Processor*, Phys. Rev. Lett. 130, 213601 (2023)

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Gemäß § 8 der Richtlinien für Habilitationsverfahren ist der Vortrag öffentlich zugänglich und erfolgt nach positivem Abschluss des Verfahrens

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