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Quantum networks and their implementation with trapped ions

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Aula A102 – Povo 1 – Via Sommarive n. 5

Abstract:

In this talk I will give an introduction to the quantum networks of light and matter and present examples of their experimental realization. This field of research addresses two major questions: How to distribute entanglement between remote quantum systems and how to use the distributed entanglement as a resource for applications. Conceptually, quantum networks provide a path to scale up controllable quantum systems in complexity or and/or distances. After an overview of the field, I will briefly introduce the particular experimental techniques used in the platform of trapped ions, and then present experimental demonstrations of the key ingredients of a quantum network implemented with this platform in our group.

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