



**UNIVERSITÀ
DEGLI STUDI
DI TRIESTE**

Atomic and Photonic platforms for Quantum Technologies

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Wednesday June 30th 2021

16:00-17:00

Zoom Meeting



Link: <https://tinyurl.com/cataliotti>

Meeting ID: 920 1480 3276

Passcode: quantech

Contact: Dr. Antimo Marrazzo (UniTS)

Quantum Technologies are based on a wealth of platforms, atomic, photonic, superconducting, solid state etc. The integration of different physical components presents fundamental and practical challenges that are absent when considering each component/module individually but only a smart combination of different platforms can provide transformational solutions, useful for a variety of quantum applications. The key issue is to make use of the best characteristics of different quantum systems. Photons can efficiently and durably transmit quantum information (QI) over large distances, atomic or superconducting qubits can be manipulated to enable QI processing, and, together with solid-state spin ensembles, are particularly suited for long-lived quantum memories. The challenges we face are that these modules operate on very different energy scales (radio-frequency, micro-waves, optical), at different temperatures (mK, few-K, 300K) and have different spatial mode structure.

I will try to describe two particular platforms: ultracold atoms and photonic systems highlighting the possibilities for integration to obtain reliable and robust quantum devices, able to outperform uncorrelated assemblies of their quantum components.