

## Quantum Technologies within INFN: status and perspectives



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### The SECRET project

One popular way to realize quantum communication protocols is through energy-time entanglement (and its synchronized version, called time-bin), since it is robust to environmental disturbances during optical fiber propagation. However, most experiments based on this type of entanglement have an inherent flaw, called the post-selection loophole, which compromises security unless extra assumptions are taken. The members of the SECRET consortium have considerable experience in proposing and realising schemes of entanglement demonstration without the post-selection loophole. The aim of SECRET is to move post-selection loophole-free energy-time/time-bin entanglement towards practical applications such as quantum cryptography, as well as aim towards the building blocks of the Quantum Internet, such as quantum relays.

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