Quantum Information and Technologies (QITE)

Tue, 2016-04-19 13:55 - [Thomas Coudreau](http://qurope.eu/users/thomascoudreau) [1]   **Website:**
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Research Type: Theory
Experiment

Increasingly smaller and faster, devices for information processing are everywhere. Nevertheless, the impressive development of such technologies is threatened if the possibilities offered by quantum physics are not considered. It is thus of paramount importance to invest in quantum devices, algorithms and solutions to respond to the reconfiguration of the world technological scenario. This motivated the creation of QITE team at Laboratoire Matériaux et Phénomènes Quantiques.

Researchers in the field have used the counter intuitive properties of quantum mechanics, as entanglement, for instance, to make information and telecommunication processing protocols with substantial advantages over the analogous classical ones. The experimental efforts in this direction have already led to the emergence of technologies devoted to quantum information and to many quantum devices performing specific tasks.

Light is the natural vehicle for the transmission of information, while matter is better suited for its storage and handling. Both platforms are currently developed in the Qite team, that designed semiconductor sources of quantum correlated photons and laser cooled trapped ions experiments. The team's efforts are focused on the integration of these two devices on chip and to their application to quantum information and the study of its foundations. This research is cosely connected to technological developments in a clean room.

In parallel to these experimental axis, the Qite team develops a theoretical axis that is positioned in a multidisciplinary context combining fundamental aspects of entanglement and experimental developments.
Leader: Luca Guidoni and Pérola Milman

Location

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