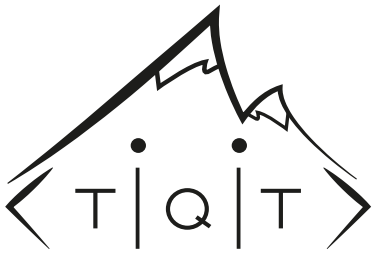

Trento - Innsbruck Quantum Information Tour

About the talks in Trento

Hereunder is reported list and a brief description of every talks that take place in Trento.

BEC

- **Quantum mechanics applied in condensed matter** (11:00 - 11:30)
  Franco Dalfovo: Full professor and Head of Trento Unit of INO-CNR BEC Center
  A brief presentation about theoretical and experimental guidelines of the BEC center in Trento, which is focused on the study of quantum gases and superfluidity phenomena.

- **Physics of vortices in superfluid** (11:30 - 12:10)
  Giacomo Lamporesi: CNR researcher at the BEC Center
  How to make and observe in laboratory quantum gases that contain vortices. Study of the vortices dynamic in superfluids and of the interaction mechanisms.

- **Topological states of matter in cold atoms** (12:10 - 12:50)
  Marco Di Liberto: Postdoc fellow at INO-CNR BEC Center and physics department
  After a brief view about the quantum Hall effect, the main topic shall focus on the challenge with cold atoms and the contribution of the BEC center in this field. In particular he will discuss about topological superfluids, border related states of two particles and simulation of the Hall effect in extra artificial dimensions.

Nanolab

- **Optical Quantum Technologies at UniTN laboratories** (14:00 - 14:30)
  Lorenzo Pavesi: Physics department director and full professor in Trento
  The talk aims to introduce the importance and the growing attention on quantum technologies, supported by a great European investment. Exactly under this scenario, the University of Trento and in particular the Nanoscience group works. The director will introduce the main current and future projects in this field, which aim to investigate the quantum properties of light on scale of a integrated silicon chips.

- **Quantum optics on chips** (14:30 - 15:00)
  Massimo Borghi: Postdoc fellow
  This talk will introduce the elements of an integrated quantum optics network, with an emphasis on the benefits that this platform can provide in terms of scalability, stability and cost, compared to a macroscopic optical network in which the photons propagate in free space.

- **Fluid light: an analogy with ultracold condensed gases** (15:00 - 15:30)
  Stefano Biasi and Fabio Turri: PhD students
  There is an analogy between the propagation of a perturbation in a Bose Einstein condensed system and the propagation of a beam of light in an integrated waveguide when it enters into the nonlinear regime. After introducing the model that predicts this analogy and its parameters, it will be described a possible experiment thanks to which this phenomenon can be verified exploiting the advantages of integrated optics.

- **Quantum Random Number Generation for Secure Communication and SiQuro movie** (15:30 - 16:00)
  Zahra Bisardi: PhD student
  Security of data transmission is of paramount significance in the modern world of today. Therefore, it is highly essential to encrypt the data transmitted through communication channels using secret keys based on random numbers. In this talk she will present a method to generate high quality random numbers for the applications in cryptography and secure communication in everyday life.