

# Università degli Studi di Trieste

## Dipartimento di Fisica

### Colloquia



## Alessandro Zavatta

Consiglio Nazionale delle Ricerche – Istituto Nazionale di Ottica (CNR – INO)  
LENS and Università di Firenze, Sesto F.no, Firenze, Italy

**Friday, October 25, 2:30 pm**  
**Lecture Room A, Department of Physics, via Valerio 2 - Trieste**

## In-field demonstrations of QKD in metropolitan fiber links

Nonclassical states of light are crucial for establishing new quantum communications protocols for the development of a quantum network. In this direction, we mainly succeed in the generation and manipulations of quantum states of light such as multiphoton entangled states [1], squeezed light at telecom wavelengths, and narrowband-entangled states from four wave mixing in atomic ensembles. Recently, we realized a field trial tests of a basic quantum communication protocol over a metropolitan network [2]. Here we present a simple, practical and efficient quantum key distribution (QKD) scheme, performed over a 21 dB-losses fiber link installed in the metropolitan area of Firenze (Italy). Coexistence of quantum and weak classical communication is also demonstrated by transmitting an optical synchronization signal through the same fiber link.

[1] N. Biagi, L. S. Costanzo, M. Bellini, and A. Zavatta, arXiv:1811.10466 (2018).

[2] D. Bacco, et al., "Field trial of a finite-key quantum key distribution system in the Florence metropolitan area", arXiv:1903.12501 (2019)

**Organizzazione a cura di: A. Bassi**