Quantum Technologies within INFN: status and perspectives

Report of Abstracts

https://agenda.infn.it/e/21070

Abstract ID : **22**

Qu3D - Quantum 3D imaging at high speed and high resolution

Content

Qu3D aims at designing and implementing quantum plenoptic cameras: radically novel 3D imaging devices exploiting both momentum-position entanglement and photon-number correlations to enable the typical refocusing and ultra-fast, scanning-free, 3D imaging capabilities of plenoptic devices, but with dramatically enhanced performances.
Qu3D merges scientific research and engineering for optimizing the performances of the developed devices in terms of resolution, DOF, noise, and, most challenging, acquisition and elaboration speed. Key elements are world-class single-photon sensor arrays, as well as methods and algorithms for data acquisition, elaboration and analysis inspired by machine learning, compressive sensing, and quantum tomography, combined with high-performance low-level programming of fast computing platforms.

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Track Classification: Succesful initiatives within INFN

Contribution Type: Invited talk "succesful initiative within INFN"

Status: SUBMITTED

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