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“National Quantum Science & Technology Institute” NQSTI

Bando a Cascata per Organismi di Ricerca pubblici o privati

SPOKE N. 7 – BANDO 1

CUP: C63C22000830006

Allegato 1 – Activity's topic

Activity	S	Description
A7.1		Development of quantum-enhanced optical imaging systems, based on photon number entangled states, capable of addressing the challenges connected with target detection and ranging in low-light conditions. In order to improve microscopy, particularly for biological imaging applications, implementation of schemes conjugating classical and quantum super-resolution, based either on single photon emitters and/or high-order correlations measurements, and supersensitivity methods for faint objects, exploiting spatially quantum correlated optical beams.
A7.2		Broadband RF Quantum Sensors for Space Applications (SSA & Antennae). Quantum-based/enhanced magnetic or electric field sensors to be used as large bandwidth antennas for RF sensing for space applications (and related constraints). Implementation, control, characterisation & comparison of quantum devices based on atom-based sensors and/or NV-centers in diamonds and experimental testbed for benchmarking them.
A7.3		Integrating Free-Space and Fibre Links for Extended-Range Quantum Communications. Development of quantum communication systems capable of exchanging secure keys utilising various degrees of freedom, singularly as well as combined. These systems should demonstrate functionality both within fibre networks and under the diverse conditions of free space, encompassing night and day ambient light. Additionally, these systems ought to incorporate the efficient and rapid generation of quantum random numbers, framed within a semi-device independent context, to increase the key exchange security.