

Friday November 22th 2019 - 10h 00

Amphitheater of C2N

“Secure communications in quantum networks”

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Quantum cryptography systems based on photonics technologies enable global secure communications.

Quantum technologies have the potential to improve in an unprecedented way the security and efficiency of communications in network infrastructures. In this talk, we discuss the current landscape in quantum communication and cryptography, and focus in particular on recent photonic implementations, using encoding in discrete or continuous properties of light, of central quantum network protocols, enabling secret key distribution, verification of multiparty entanglement and transactions of quantum money, with security guarantees impossible to achieve with only classical resources. We also describe current challenges in this field and our efforts towards the miniaturization of the developed photonic systems, their integration into telecommunication network infrastructures, including with satellite links, as well as the practical demonstration of novel protocols featuring a quantum advantage for a wide range of tasks. These advances enrich the resources and applications of the emerging quantum networks that will play a central role in the context of future quantum-safe communications.



Eleni Diamanti is a CNRS researcher director at the LIP6 laboratory of Sorbonne University in Paris. She received her Diploma in Electrical and Computer Engineering from the National Technical University of Athens in 2000 and her PhD in Electrical Engineering from Stanford University in 2006. She then worked as a Marie Curie post-doc at the Institute of Optics Graduate School in Palaiseau before joining the CNRS in 2009. Her research focuses on experimental quantum cryptography and communication complexity, and on the development of photonic resources for quantum networks. She is a recipient of a European Research Council Starting Grant, vice director of the Paris Centre for Quantum Computing, steering committee member of the French regional and national networks on Quantum Technologies, and elected member of the Board of Stakeholders of the European Public Private Partnership in Photonics.

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