

**Abstract:**

Worldwide secure communication is important for an increasingly connected international society. Currently deployed cryptographic methods are at risk by future attacks e.g. by quantum computer algorithms. Quantum Key Distribution will offer provable long-term security for critical infrastructure and secure communication. Today several approaches are being developed. I will review concepts that combine ground-based and space optical quantum communication links to achieve world-wide coverage.

Optical free space communication is a reliable means to transmit classical and quantum information. Free space links offer ad-hoc establishment in intra-city communication, air-to-ground or satellite-to-ground scenarios. Quantum communication in space offers a fast route to global coverage [1]. I will discuss current activities, including the development of quantum key distribution with coherent optical communication in satellite systems, employing both discrete and continuous variable detection.