



The Institute of Radiocommunications  
of Poznan University of Technology,  
IEEE Comsoc Poland Chapter  
and RIMEDO Labs

invite you for a talk on:

## THE EVOLUTION OF QUANTUM KEY DISTRIBUTION NETWORKS: ON THE ROAD TO THE QINTERNET

by

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26th of October, 2023, 11:45 CET, [zoom meeting](#)

Quantum science is developing at an ever faster pace and as a benefit, Quantum Key Distribution (QKD) solutions have become an off-the-shelf commercial reality. However, they rely on point-to-point single-user communications either via optical fiber or free space links. The quantum keys are negotiated between a pair of QKD nodes, but they can be shared amongst multiple geographically distributed users. The challenge is that the quantum-domain information must not be amplified during its transmission because that would destroy the quantum states, which would collapse back into the classical domain. This inevitably limits the distances that can be bridged. The design of large-scale QKD networks requires sophisticated relaying techniques, which may evolve through the following four stages: i) At the current state-of-the-art optical switches may be harnessed in multi-node QKD networks; ii) The next evolutionary stage relies on so-called trusted relays, which are deemed to be 'trustworthy' because they are placed in protected customer premises; iii) The family of 'trusted relays' requires substantial further scientific advances for ensuring that they remain secure with the aid of sophisticated protocol design even of the eavesdropper had physical access to them; iv) Finally, true quantum relays would have to be developed in the future relaying quantum entanglement. We will conclude with a discussion of potential future research direction and provide design guidelines for QKD networks.

Please join this exciting journey, valued Colleague, in constructing the Quantum Internet!

Lajos Hanzo FREng, FIEEE, FIET, EURASIP Fellow, received his 5-year Master's degree in electronics from the Technical University of Budapest in 1976, his doctorate in 1983, and his Doctor of Sciences (DSc) degree in 2004. During his career in telecommunications, he has held various research and academic posts in Hungary, Germany, and the UK. Since 1986 he has been with the School of ECS, University of Southampton, UK, where he holds the Chair in Telecommunications. He published 2000+ research contributions at IEEE Xplore and his current research interests are featured at <http://www-mobile.ecs.soton.ac.uk>

This talk is addressed to graduate students, PhD students, researchers, and engineers. Join the Zoom meeting at: <https://zoom.us/j/96689483535?pwd=d2t2a3ExOHl4Vjl2RW9wRzBFbytpUT09>

