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To all members of the
Faculty of Physics

Vienna, 09 December 2025

Invitation to the public defense of the doctoral thesis

**“Design and Evaluation of Simplified Quantum Key
Distribution Architectures over Free-Space and Fiber-
Based Optical Links”**

by

Florian Honz

Tuesday, 16 December 2025, 14:30 p.m.

Lise-Meitner-Lecturehall, first floor, Boltzmanngasse 5, 1090 Vienna

In today's digital age, our daily lives depend on the secure transmission of vast amounts of valuable data. However, with the rise of quantum computers, the traditionally employed asymmetric cryptography algorithms, based on complex mathematical problems, are deemed unsafe. In response, quantum key distribution (QKD), which exploits the fundamental laws of quantum physics to provide information-theoretic security, has been developed. Although first real-world QKD deployments are underway, significant challenges remain for the widespread rollout of QKD. To this end, I will present investigations of quantum random number generation, continuous-variable QKD and discrete-variable QKD over fiber and free-space optical channels with and without classical/quantum signal co-existence. These studies employ simplified architectures, multi-purpose quantum/classical optics and photonic integrated circuits, including the first fully monolithic QKD transmitter realized exclusively on silicon. This paves the way towards seamlessly co-integrated opto-electronic QKD transmitters for commodity applications, where a small form factor is paramount.

Defense committee:

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