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Poznań, February 25, 2025

**Prof. Martin Kubala, PhD**

Dean of the Faculty of Science

Palacký University

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Czech Republic

### **Recommendation letter for Assoc. Prof. Karel Lemr, PhD**

Dear Prof. Kubala,

I first met the candidate, Karel Lemr, in 2011 at the Central European Workshop on Quantum Optics in Madrid. At the time, he was a PhD student presenting his initial results in quantum physics. Since then, I have had the privilege of following his career progression. Now, 14 years later, he is an experienced senior researcher with four successful PhD graduates of his own.

The candidate has established a long-term collaboration with me and my colleagues at Adam Mickiewicz University, particularly with Prof. UAM Karol Bartkiewicz, PhD. In 2018, he spent three months at our department for a research visit and has continued to visit regularly. This collaboration has resulted in numerous research papers, including publications in prestigious journals such as Physical Review Letters, npj Quantum Information and PRX Quantum.

In particular, his experimental demonstration of new types of attacks on quantum cryptosystems using optimal cloning machines [Phys. Rev. Lett. 110, 173601 (2013)] were popularized in, e.g., New Scientist. Moreover his experimental demonstration of the prototype (first in the world) of quantum money and implementation of methods for counterfeiting them [npj Quantum Infor. 7, 1 (2017)] were popularized in Nature Physics, Science News, and European Commission CORDIS among others.

His deep expertise in quantum optics and quantum information processing has been invaluable to our work. He is an adept leader of the experimental team, effectively bridging theoretical concepts with experimental implementation. Additionally, he has contributed to several experimental demonstrations for our university's students.

The candidate is a well-established researcher with collaborations spanning the international quantum optics community, including Prof. Jens Eisert (Germany), Prof. Thomas Jennewein (Canada), Prof. Paweł Horodecki (Poland), and Prof. Franco Nori (Japan). He

has published 63 research papers in impact journals, serving as the corresponding author on 35 of them. Some of his most influential works include the conceptual design and experimental implementation of a quantum router, the realization of a controlled phase gate, controlled quantum teleportation, and a series of studies on collective measurements. He has repeatedly secured research funding from the Czech Science Foundation as a principal investigator and has also contributed to a research grant from the Polish National Science Centre as a team member.

I have also had the opportunity to observe Dr. Lemr's exceptional mentorship of his PhD students. He has successfully inspired and motivated them in their research, introducing them to international collaborations that led to significant results, such as the direct measurement of a Hilbert-Schmidt distance (Physical Review Letters) and a novel approach to quantifying the quantumness of channels (PRX Quantum).

In conclusion, I can confidently state that Dr. Karel Lemr is a skilled and accomplished researcher, an outstanding team leader, and a highly qualified university teacher. Without a doubt, he is ready for the next step in his career—promotion to full professor.

Yours sincerely,



Adam Miranowicz