



## PHYSIKALISCHES KOLLOQUIUM

*Referent:* **Prof. Dr. Philip Walther**  
Faculty of Physics,  
University of Vienna, Austria



*Thema:* **Quantum Photonics: from fundamental tests to new quantum technology**

*Zeit und Ort:* Dienstag, 15.5.2018, 16:40 Uhr  
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

*Leiter:* Prof. Dr. Carsten Timm

*Kurzfassung:* The advantages of single photons make optical quantum system ideally suited for fundamental quantum physics experiments and for quantum technology that enables strong improvements for a variety of applications. At this colloquium I will provide a brief overview of the basic concepts of quantum photonics and quantum information processing using single photons. In particular, I will present recent developments in quantum cloud computing and feasible special-purpose quantum computers as well as the newest quantum computer concepts that rely on the superposition of the order of computer gates. At the end I will discuss current technological challenges and promising research directions for the scale-up of optical quantum computers.

*Biographie:* Professor Walther is Professor at the Faculty of Physics at the University of Vienna, Austria. He earned his M.Sc in Chemistry from the Vienna University of Technology in 2002, and switched then to Physics, for obtaining his PhD from the University of Vienna in 2005. After working as a postdoctoral research at Harvard University from 2005 to 2008, he started an independent research group at the University of Vienna. Walther's research is dedicated to the development of advanced photonic quantum technology for applications in quantum information processing and for investigations in quantum science. The experiments are focused on secure quantum cloud computing and quantum-secure classical computers, quantum computation and quantum simulation as well as quantum foundations such as indefinite causal structures and the measurement of weak gravitational effects on single photons using table-top setups. He has authored numerous peer-reviewed articles, and is the recipient of the Loschmidt Prize (2005), the Fresnel Prize (2011), the Austrian START Prize (2011), the Vienna Funding Award in Science (2011), and the Recognition Award for Science by the Lower State of Austria (2014). He is Fellow of the American Physical Society (APS) and member of the Young Academy of the Austrian Academy of Sciences.

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