Philip Walther (*12-May-1978 in Vienna, Austria)

Professor of Physics, Faculty of Physics, University of Vienna, Austria,
Research Platform Testing quantum and gravity interface with single photons (TURIS), and
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Focus of Research

Photonic quantum computation and quantum simulation;
Quantum-enhanced secure computing;
Development of scalable quantum photonic technology;
Experimental investigation of the interface between quantum physics and gravity

Education

2012 Habilitation in Quantum Optics, Faculty of Physics, University of Vienna, Austria
2005 PhD (Dr. rer. nat.) in Physics; University of Vienna, Austria (with A. Zeilinger)
2002 Diploma (Dipl-Ing.) in Chemistry, Vienna University of Technology, Austria (with K. Schwarz)

Current Positions

01/2017 – Speaker of Research Platform TURIS, Faculty of Physics, University of Vienna
10/2015 – Professor of Physics (temporary), Faculty of Physics, University of Vienna
10/2014 – Vice-Dean of the Faculty of Physics, University of Vienna
07/2013 – Head of the Quantum Optics, Quantum Nanophysics, Quantum Information Group (7 workgroups, 100 researcher, 10 admins), Faculty of Physics, University of Vienna

Career History

2013 – 2015 Associate Professor (tenured), Faculty of Physics, University of Vienna
2011 – 2012 Assistant Professor (tenure-track), Faculty of Physics, University of Vienna
2008 – 2011 Assistant Professor (Univ.-Ass.) Faculty of Physics, University of Vienna
2005 – 2008 Postdoctoral Researcher, Department of Physics, Harvard University, USA (with M. Lukin)

Honors and Awards

2014 Recognition Award for Science 2014 by Lower State Austria
2014 Visiting Professor Fellowship by the Brazilian Federal Government
2011 Vienna Funding Award in Science (Förderungspreis der Stadt Wien)
2011 START Prize, Austrian Ministry of Science and Education (BMWF)

2009 Fresnel Prize, European Physical Society (EPS)
2006 Prize for outstanding academic performance, University of Vienna
2005 Loschmidt Prize, Chemical-Physical Society of Vienna

Memberships

2015 American Physical Society, Fellow
2014 Austrian Academy of Sciences - "Junge Akademie" (Young Academy), Member
2012 The Global Young Academy, Member
2007 – 2012 The German Young Academy at the Berlin-Brandenburg Academy of Sciences and the German Academy of Natural Scientists Leopoldina, Alumni Member

Editorial Boards

2016 Journal of Optics, Guest Editor
2014 – Nature Publishing Group “Quantum Information”, Associate Editor
2014 – 2015 Nature Publishing Group “Scientific Reports”, Associate Editor

Institutional Responsibilities

2017 – Speaker of Research Platform TURIS, Faculty of Physics, University of Vienna
2014 – Vice-Dean of the Faculty of Physics, University of Vienna
2013 – Head of the Quantum Optics, Quantum Nanophysics, Quantum Information Group Faculty of Physics, University of Vienna
2012 – Member of the Vienna Center for Quantum Science and Technology (VCQ)
2012 – Member of the Committee for the Vienna Doctoral Training Center on Complex Quantum Systems (CoQuS),Faculty of Physics, University of Vienna

Commissions of Trust

2018 Member of the Conference program committee at the QCMC 2018 conference at the Louisiana State University, USA
2016 – 2018 Member of the Conference sub-committee, Fundamental Science 2: Quantum Science, Engineering, and Technology, at the CLEO 2017 and CLEO 2018 conference in Gaithersburg, USA
2017 – 2021 Best Paper Award Committee member at the Austrian Academy of Sciences
2014 – Member of the Laudimaxima Prize Committee, University of Vienna, Austria
2013 Member of the EPS-Thesis Award and Fresnel Prize Committee, European Physical Society
2009 – 2010 Executive Board Member of The German Young Academy at the Berlin-Brandenburg Academy of Sciences and the German Academy of Natural Scientists Leopoldina

Reviewer for Foundation for Polish Science, the Qatar National Research Fund, the Swiss National Science Foundation, the European Commission, the German Israeli Foundation for Scientific Research and Development, the John Templeton Foundation, The German Humboldt Foundation, the Slovak Academy of Sciences

Reviewer for Science, Nature, Nature Physics, Nature Photon., Nature Commun., Sci. Rep., Proc. Natl. Acad. Sci. USA., Appl. Phys. Lett, Phys. Rev. Lett., Phys. Rev. A, New. J. Phys, J. Opt. Soc. Am. B, Appl. Phys B., Found. Phys, Quant. Inf. Proc.

Other Activities

2017 Co-Founder of the research platform TURIS

Selected Presentations and Publications

more than 60 publications and 4,600 citations (h-index 24), 18 in Nature/Science, 4 patents

1. *Single-photon test of hyper-complex quantum theories using a metamaterial*
   L.M. Procopio, L.A. Rozema, Z.J. Wong, D.R Hamel, K. O'Brien, X. Zhang, B. Dakic, P. Walther; Nature Communications 8, 15044 (2017).
2. *Experimental Verification of an Indefinite Causal Order*
   G. Rubino, L.A. Rozema, A. Feix, M. Araújo, J.M. Zeuner, L.M. Procopio, C. Brukner, P. Walther; Science Advances 3, e1602589 (2017).
3. *Gravitationally induced phase shift on a single photon*
   C. Hilweg, F. Massa, D. Martynov, N. Mavalvala, P.T. Chrusciel, P. Walther,
   New Journal of Physics 19, 033028 (2017).
4. *Experimental superposition of orders of quantum gate,*
   L.M. Procopio, A. Moqanaki, M. Araújo, F. Costa, I. Alonso Calafell, E.G. Dowd, D.R. Hamel, L.A. Rozema, C. Brukner, P. Walther; Nature Communications 6, 7913 (2015).
5. *Experimental verification of quantum computations,*
   S. Barz, J. Fitzsimons, E. Kashefi, P. Walther; Nature Physics 9, 727-731 (2013).
6. *Experimental Boson* sampling,
   M. Tillmann, B. Dakic, R. Heilmann, S. Nolte, A. Szameit, P. Walther; Nature Photonics 7, 540 (2013).
7. *Quantum discord as optimal resource for remote state preparation,*
   B. Dakic, Y.-O. Lipp, X.S. Ma, M. Ringbauer, S. Kropatschek, S. Barz, T. Paterek, V. Vedral, A. Zeilinger, C. Brukner, P. Walther; Nature Physics 8, 666 (2012).
8. *Photonic quantum simulators*,
   A. Aspuru-Guzik, P. Walther; Nature Physics 8, 285-291 (2012).
9. *Demonstration of blind quantum computing*,
   S. Barz, E. Kashefi, A. Broadbent, J. Fitzsimons, A. Zeilinger, P. Walther; Science 335, 303(2012).
10. *Quantum simulation of a frustrated Heisenberg spin system;*
    X.S. Ma, B. Dakic, W. Naylor, A. Zeilinger, P. Walther; Nature Physics 7, 399 (2011).
11. *Heralded generation of entangled photon pairs*,

S. Barz, G. Cronenberg, A. Zeilinger, P. Walther; Nature Photonics 4, 553 (2010).

12. *Experimental One-Way Quantum Computing*,
P. Walther, K. Resch, T. Rudolph, H. Weinfurter, V. Vedral, M. Aspelmeyer, A. Zeilinger; Nature 434, 169 (2005).

More than 100 invitations to international conferences, workshops, colloquia and advanced graduate schools, more than 10 public talks, including

1. *Photonic Quantum Computing: Applications, Visions & Applications*, ThinkQ 2015 Conference, IBM Yorktown Heights, New York, USA, 2015
2. *Quantum Photonics Technology for Secure (Cloud) Quantum Computing*, Trustworthy Quantum Information Workshop, Ann Arbor, USA, 2015
3. *Experimental Quantum Computer Verification, and other benefits from one-way quantum computing*, Gordon Research Conference on Simulation, Verification, and Control of Complex Quantum Many-Body Systems, Stonehill College, Easton, USA, 2014
4. *Quantum computing and (related) quantum foundation experiments using single photons*, Annual Inter-Academy Seoul Science Forum (IASSF), Seoul National University & Korea Institute for Advanced Study, 2014
5. *Measurement-based and intermediate photonic quantum computing on chip*, Conference on Quantum Information and Technology, National Institute for Informatics (NII), Tokyo, Japan, 2013