

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

Professor of Physics, Faculty of Physics, University of Vienna, Austria,
Research Platform Testing the quantum and gravity interface (TURIS),
Christian Doppler Laboratory for Photonic Quantum Computing, and
Vienna Center for Quantum Science and Technology (VCQ)
Boltzmanngasse 5, A-1090 Vienna, Austria
<http://walther.univie.ac.at>
<https://orcid.org/0000-0002-4964-817X>

Research Focus

Photonic quantum computation and quantum simulation;
Quantum-enhanced cybersecurity;
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

07/2020 – Head, Christian Doppler Laboratory for Photonic Quantum Computing, Faculty of Physics, University of Vienna
03/2019 – Speaker, Special Research Programme (SFB) Quantum Information Systems Beyond Classical Capabilities (BeyondC) by the Austrian Science Fund (FWF)
01/2017 – Speaker, Research Platform TURIS, Faculty of Physics, University of Vienna
07/2013 – Speaker, Quantum Optics, Quantum Nanophysics, Quantum Information Group, Faculty of Physics, University of Vienna

Career History

2014 – 2018 Vice-Dean of the Faculty of Physics, University of Vienna
2015 – Professor of Physics (tenured), Faculty of Physics, University of Vienna
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

Elected Memberships

- 2019 Fellow of The Optical Society (OSA)
- 2015 Fellow of The American Physical Society (APS)
- 2014 Member of the Austrian Academy of Sciences - "Junge Akademie" (Young Academy)
- 2012 – 2017 Member of The Global Young Academy
- 2007 – 2012 Member of The German Young Academy at the Berlin-Brandenburg Academy of Sciences and the German Academy of Natural Scientists Leopoldina

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

Commissions of Trust

- 2018 Member of the Scientific Committee of the International Centre for Theory of Quantum Technologies in Gdansk, Poland
- 2018 Member of the Review Committee for the Canadian Institute for Advanced Research (CIFAR), Canada
- 2018 Member of the Conference program committee at the QCMC 2018 conference at the Louisiana State University, USA
- 2018 Member of the program committee at the CEWQO 2018 conference at the University of Balearic Islands, Spain
- 2018 – 2022 Best Paper Award Committee Member at the Austrian Academy of Sciences
- 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
- 2014 – 2018 Member of the Evaluation Committee for the Slovak Academy of Sciences, Slovakia
- 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

2018 Member of the Advisory Board, VitreaLab GmbH

2017 Co-Founder of the research platform TURIS

Selected invitations to present at scientific conferences

More than 120 invitations to international conferences, workshops, colloquia and advanced graduate schools, more than 35 public talks, including

1. Colloquium Talk, Weizmann Institute of Science, Rehovot, Israel, 2019
2. Schrödinger Lecture, Trinity College Dublin, Dublin, Ireland, 2017
3. Nature Conference on Nanophotonics and Integrated Photonics, Nanjing University, Nanjing, China, 2018
4. META'17 - 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Meta Conferences, Incheon-Seoul, South-Korea, 2017
5. Photonics North 2017 symposium on light-matter interactions at the quantum level, University of Ottawa, Ottawa, Canada, 2017
6. 4th International Conference on Quantum Foundation and Technology: Frontier and Future (ICQFT2016), University of Science and Technology of China, Shanghai, China, 2016
7. International School of Physics "Enrico Fermi" on Quantum Simulators, University of Rome, La Sapienza, Varenna, Italy, 2016
8. ThinkQ 2015 Conference, IBM Yorktown Heights, New York, USA, 2015

Selected Publications

More than 80 publications, 24 in Science and Nature publishing group magazines, 4 patent applications, more than 7,400 citations (h-index: 29)

1. I. Alonso Calafell, J.D. Cox, M. Radonjic, J.R.M. Saavedra, F.J. Garca de Abajo, L.A. Rozema, P. Walther,
Quantum Computing with Graphene Plasmons
npj Quantum Information 5, 37 (2019). (15 citations)
2. V. Saggio, A. Dimić, C. Greganti, L.A. Rozema, P. Walther, B. Dakić,
Experimental few-copy multi-particle entanglement detection
Nature Physics 15, 935–940 (2019). (11 citations)
3. G. Rubino, L.A. Rozema, A. Feix, M. Araújo, J.M. Zeuner, L.M. Procopio, C. Brukner, P. Walther,
Experimental Verification of an Indefinite Causal Order
Science Advances 3, e1602589 (2017). (118 citations)
4. 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,
Experimental superposition of orders of quantum gates
Nature Communications 6, 7913 (2015). (131 citations)
5. S. Barz, J. Fitzsimons, E. Kashefi, P. Walther,
Experimental verification of quantum computations
Nature Physics 9, 727-731 (2013). (110 citations)
6. M. Tillmann, B. Dakic, R. Heilmann, S. Nolte, A. Szameit, P. Walther,
Experimental Boson sampling
Nature Photonics 7, 540-544 (2013). (597 citations)
7. B. Dakic, Y.-O. Lipp, X.S. Ma, M. Ringbauer, S. Kropatschek, S. Barz, T. Paterek, V. Vedral, A. Zeilinger, C. Brukner, P. Walther,
Quantum discord as optimal resource for remote state preparation
Nature Physics 8, 666-670 (2012). (442 citations)
8. S. Barz, E. Kashefi, A. Broadbent, J. Fitzsimons, A. Zeilinger, P. Walther,
Demonstration of blind quantum computing
Science 335, 303-308 (2012). (308 citations)
9. X.S. Ma, B. Dakic, W. Naylor, A. Zeilinger, P. Walther,
Quantum simulation of the wavefunction to probe frustrated Heisenberg spin systems
Nature Physics 7, 399-405 (2011). (167 citations)
10. P. Walther, K. Resch, T. Rudolph, H. Weinfurter, V. Vedral, M. Aspelmeyer, A. Zeilinger,
Experimental One-Way Quantum Computing
Nature 434, 169-176 (2005). (1231 citations)