Michael Walter

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PERSONAL born May 3, 1985, Lahr, Germany
Nationality: German
Languages: German, English, Spanish, French, Dutch

Employment and Education

2017–present **Assistant Professor** (Universitair docent), **University of Amsterdam.**
Member of the Korteweg-de Vries Institute for Mathematics (KdVI), the Institute for Theoretical Physics Amsterdam (ITFA), and the Institute for Logic, Language and Computation (ILLC).

2017–present **Senior Researcher**, **QuSoft**, Amsterdam.

2014–2017 **Postdoctoral Research Fellow**, **Theoretical Physics**, **Stanford University**.

2014 **Doctor of Sciences (Dr. sc.)**, **Dept. of Physics**, **ETH Zürich**.
Thesis: *Multipartite Quantum States and their Marginals*.
Supervisor: M. Christandl. Examiners: A. Harrow (MIT), G.M. Graf (ETH).

2010–2014 Doctoral studies in Physics at ETH Zürich.

2010 **Diploma in Mathematics** (with distinction), **University of Göttingen**.
Thesis: *Equivariant geometric K-homology with coefficients*.
Supervisor: T. Schick.

2005–2010 Undergraduate studies in **Computer Science** and **Mathematics** at University of Karlsruhe and University of Göttingen.

Grants, Awards, and Scholarships

2020 **NWO Klein grant** Taming tensors – an optimization approach to computational invariant theory (EUR 298k)

2018 **NWA startimpuls project** *Distributed systems protocols for quantum networks* (EUR 167k), joint with Stephanie Wehner (QuTech, Delft)

2017 **NWO Veni grant** *Quantum bits in space and time* (EUR 250k)

2014 ETH medal for outstanding doctoral thesis.

2007–2010 Studienstiftung des deutschen Volkes (German National Academic Foundation).

Talks

Since 2012, more than 60 invitations for colloquia, seminars and conference talks. See my homepage (staff.fnwi.uva.nl/m.walter) for slides of recent talks.

Plenary Talks & Colloquia

02/2020 Milestone Conference Algebraic Geometry, Berlin.
11/2018 Wolfgang-Pauli-Center Theoretical Physics Symposium, Hamburg.
10/2018 Workshop on Discrete Phase Space Methods for Quantum Fault-Tolerance, Bad Honnef.
07/2016 Institute for Quantum Computing, University of Waterloo.
03/2016 Mathematics Department, University of Rome Tor Vergata.
10/2015 Mathematics Department, Dartmouth College.
05/2015 Zürich Theoretical Physics Colloquium.

Invited Talks

08/2021 International Congress on Mathematical Physics, Geneve.
06/2020 Quantum Information seminar, Perimeter Institute.
06/2020 Geometric Complexity Theory webinar, Chennai Mathematical Institute.
04/2020 Dutch Mathematical Congress, Veldhoven (corona-cancelled).
12/2019 Lower Bounds in Computational Complexity, Simons Institute, Berkeley.
11/2019 Buildings, Varieties, and Applications, MPI for Mathematics in the Sciences, Leipzig.
07/2019 Quantum Information mini-symposium, Applied Algebraic Geometry (SIAM-AG), Bern.
06/2019 It from Qubit workshop, Yukawa Institute for Theoretical Physics, Kyoto.
06/2019 It from Qubit seminar, Stanford.
05/2019 Mathematics of Quantum Information Theory workshop, Lorentz Center, Leiden.
03/2019 DPG Spring Meeting, Munich.
03/2019 Tensor Networks from Simulation to Holography workshop, MPI-AEI, Potsdam-Golm.
01/2019 Qubits on the Horizon, Aruba (co-organized focus session).
12/2018 Computer Science & Discrete Mathematics, Institute for Advanced Study, Princeton.
10/2018 Geometric Quantization and Applications, CIRM, Marseille.
08/2018 Quantum Information seminar, JILA, Boulder.
07/2018 Information Universe conference, Groningen.
06/2018 Rocky Mountain Summit on Quantum Information workshop, Boulder.
06/2018 Optimising, Renormalising, Evolving, Quantising Tensor Networks, MPI-PKS, Dresden.
06/2018 Quantum Information in Quantum Gravity workshop, Galileo Galilei Instite, Florence.
06/2018 Optimization, Complexity, Invariant Theory workshop, Institute for Advanced Study.
05/2018 Quantum information seminar, Stanford University.
05/2018 Condensed matter theory seminar, University of Amsterdam.
04/2018 Dutch Mathematical Congress, Veldhoven.
04/2018 Gravity, Quantum Fields and Information group seminar, MPI-AEI, Potsdam-Golm.
03/2018 QuTech seminar, TU Delft.
02/2018 Algorithmic Mathematics und Complexity Theory seminar, TU Berlin.
12/2017 Workshop on Geometry and Number Theory, Saarbrücken.
12/2017 Analysis in Quantum Information Theory program, IHP.
10/2017 Quantum Physics of Information program, KITP.
10/2017 High Energy Theory seminar, California Institute of Technology.
10/2017 Frontiers of Quantum Information Physics conference, KITP.
10/2017 Tensor Networks from Simulation to Holography workshop, DESY, Hamburg.
07/2017 Tensors and their uses in approx. theory, quantum information, geometry, Auburn.
01/2017 Quantum Information Theory workshop, Coogee, Sydney.
12/2016 Entanglement in Field Theory and Gravity, Simons Center, Stony Brook.
11/2016 Theoretical Information Technology seminar, TU Munich.
11/2016 QuSoft seminar, CWI, Amsterdam.
10/2016 Mathematical Results in Quantum Physics, Georgia Tech, Atlanta.
09/2016 Algorithmic Mathematics und Complexity Theory seminar, TU Berlin.
09/2016 Quantum lunch seminar, University of Copenhagen.
05/2016 Discrete Mathematics seminar, UC Davis.
04/2016 Geometry seminar, Texas A&M University.
03/2016 Condensed Matter Theory seminar, University of Cologne.
03/2016 Quantum information seminar, University of Cologne.
02/2016 ETH Zürich: quantum information seminar.
12/2015 Algorithms and Complexity in Algebraic Geometry, Simons Institute, Berkeley.
10/2015 Quantum Information Seminar, Massachusetts Institute of Technology.
09/2015 AdS/CFT and Quantum Gravity, CRM, Université de Montréal.
08/2015 University of Guelph, workshop on "Quantum Marginals and Numerical Ranges".
08/2015 SIAM Conference on Applied Algebraic Geometry, NIMS, Daejeon
07/2015 Quantum Groups and Quantum Information Theory, Herstmonceux Castle.
06/2015 Institute for Quantum Information seminar, California Institute of Technology
11/2014 Combinatorics and Complexity of Kronecker coefficients, AIM, Palo Alto.
09/2014 Quantum Information seminar, University of Hannover.
06/2014 Representation Theory seminar, Institut de Mathématiques de Jussieu, Paris.
03/2014 Random Matrices and Random Systems, Institute for Advanced Study, Princeton.

12/2013 Quantum Measurement seminar, NUS, Singapore.
12/2013 Quantum Computing Workshop on Inverse Moment Problem, NUS, Singapore
10/2013 Mathematics seminar, Institut des Hautes Études Scientifiques.
08/2013 Workshop on Mathematical Physics, ETH Zürich.
11/2012 Open Systems and Quantum Information seminar, University of Freiburg.
09/2012 Lectures on the Quantum Marginal Problem (with M. Christandl), Aberystwyth.
08/2012 Int. Colloq. on Group-Theoretical Methods in Physics, Chern Institute, Tianjin.
05/2012 Algebraic Complexity seminar, University of Paderborn.
04/2012 Theoretical Physics seminar, Polish Academy of Sciences.

Contributed Talks

07/2020 Computational Complexity Conference (CCC'20).
06/2020 Theory of Quantum Computation, Communication and Cryptography (TQC'20).
11/2019 IEEE Symposium on Foundations of Computer Science (FOCS'19), Baltimore.
01/2019 Quantum Information Processing (QIP'19), Boulder.
10/2018 IEEE Symposium on Foundations of Computer Science (FOCS'18), Paris.
01/2018 Quantum Information Processing (QIP'18), Delft (three papers).
09/2016 Theory of Quantum Computation, Communication and Cryptography (TQC'16), Berlin.
01/2016 Quantum Information Processing (QIP'16), Banff.
03/2014 Symposium Quantum Correlations beyond Entanglement, DPG Spring Meeting, Berlin.
07/2014 IEEE International Symposium on Information Theory (ISIT'14), Honolulu.
01/2016 Quantum Error Correction and Tensor Network Project Meeting of the 'It From Qubit' Collaboration, KITP.
01/2013 Quantum Information Processing (QIP'13), Tsinghua University, Beijing (two papers).
10/2012 IEEE Symposium on Foundations of Computer Science (FOCS'12), New Brunswick.
08/2012 International Congress on Mathematical Physics (ICMP'12), Aalborg.
06/2012 Annual Meeting of the Swiss Physical Society, ETH Zürich.
01/2012 Geometry of Quantum Entanglement, CIRM, Marseille.
10/2011 Quantum Information: Codes, Geometry and Random Structures, CRM, Université de Montréal.
03/2010 Young Researchers in Mathematics, University of Cambridge.
08/2009 Tableaux 2009, University of Oslo.

Extended Research Visits

06/2019 Yukawa Institute for Theoretical Physics, Kyoto University (invited)
12/2017 Institut Henri Poincaré, Paris (invited)
10–11/2017 Kavli Institute for Theoretical Physics, Santa Barbara (invited 'key participant')
10–12/2013 Isaac Newton Institute, Cambridge

Publications

[45] P. Bürgisser, Y. Li, H. Nieuwboer, M. Walter; *Interior-point methods for unconstrained geometric programming and scaling problems*; arXiv:2008.12110.

[44] C. Franks and M. Walter, *Minimal length in an orbit closure as a semiclassical limit*; arXiv:2004.14872.

[43] F. Witteveen and M. Walter, *Wavelet construction of bosonic entanglement renormalization circuits*; arXiv:2004.11952.

[42] B. Dirkse, M. Pompili, R. Hanson, M. Walter, S. Wehner, *Witnessing Entanglement in Experiments with Arbitrary Noise*; Quantum Science and Technology **5** (3), 035007.

[41] M. Walter, F. Witteveen, *Hypergraph min-cuts from quantum entropies*; arXiv:2002.12397.

[40] A. Garg, C. Ikenmeyer, V. Makam, R. Oliveira, M. Walter, A. Wigderson, *Search problems in algebraic complexity, GCT, and hardness of generator for invariant rings*; Proceedings of the 35th Computational Complexity Conference (CCC), 12:1–12:17 (2020).

[39] C. Ikenmeyer, M. Walter, *Hyperpfaffians and Geometric Complexity Theory*; arXiv:1912.09389.

[38] A. Brown, H. Gharibyan, S. Leichenauer, H. Lin, S. Nezami, G. Salton, L. Susskind, B. Swingle, M. Walter, *Quantum Gravity in the Lab: Teleportation by Size and Traversable Wormholes*; arXiv:1911.06314.

[37] P. Bürgisser, C. Franks, A. Garg, R. Oliveira, M. Walter, A. Wigderson, *Towards a theory of non-commutative optimization: geodesic first and second order methods for moment maps and polytopes*; Proceedings of the 60th IEEE Symposium on Foundations of Computer Science (FOCS), 845–861 (2019).

[36] M. Berta, D. Sutter, M. Walter, *Quantum Brascamp-Lieb Dualities*; arXiv:1909.02383.

[35] F. Witteveen, V. Scholz, B. Swingle, M. Walter, *Quantum circuit approximations and entanglement renormalization for the Dirac field in 1+1 dimensions*; arXiv:1905.08821.

[34] V. Baldoni, M. Vergne, M. Walter, *Horn conditions for Schubert positions of general quiver subrepresentations*; arXiv:1901.07194.

[33] M. Christandl, F. Leditzky, C. Majenz, G. Smith, F. Speelman, M. Walter, *Asymptotic performance of port-based teleportation*; arXiv:1809.10751; accepted in Communications in Mathematical Physics; presented at QIP'19.

[32] D. Ding, H. Gharibyan, P. Hayden, M. Walter, *A Quantum Multiparty Packing Lemma and the Relay Channel*; IEEE Transactions on Information Theory **66**, 3500–3519 (2020).

[31] S. X. Cui, P. Hayden, T. He, M. Headrick, B. Stoica, M. Walter, *Bit Threads and Holographic Monogamy*; arXiv:1808.05234; Communications in Mathematical Physics (2019).

[30] P. Bürgisser, C. Franks, A. Garg, R. Oliveira, M. Walter, A. Wigderson, *Efficient algorithms for tensor scaling, quantum marginals and moment polytopes*, Proceedings of the 59th IEEE Symposium on Foundations of Computer Science (FOCS), 883–894 (2018).

[29] V. Baldoni, M. Vergne, M. Walter, *Horn inequalities and quivers*; arXiv:1804.00431.

[28] F. Gesmundo, J.M. Landsberg, M. Walter, *Matrix product states and the quantum max-flow/min-cut conjectures*; Journal of Mathematical Physics **59** (2018) 102205.

[27] D. Gross, S. Nezami, M. Walter, *Schur-Weyl Duality for the Clifford Group with Applications: Property Testing, a Robust Hudson Theorem, and de Finetti Representations*; arXiv:1712.08628; presented at QIP'18.

[26] P. Bürgisser, A. Garg, R. Oliveira, M. Walter, A. Wigderson, *Alternating minimization, scaling algorithms, and the null-cone problem from invariant theory*, Proceedings of the 9th Innovations in Theoretical Computer Science Conference (ITCS 2018).

[25] J. Haegeman, B. Swingle, M. Walter, J. Cotler, G. Evenbly, V.B. Scholz, *Rigorous free fermion entanglement renormalization from wavelet theory*, Physical Review X **8** (2018) 011003; presented at QIP'18.

[24] J. Cotler, P. Hayden, G. Penington, G. Salton, B. Swingle, M. Walter, *Entanglement Wedge Reconstruction via Universal Recovery Channels*, Physical Review X **9** (2019) 031011; presented at QIP'18.

[23] V. Baldoni, M. Vergne, M. Walter, *Computation of Dilated Kronecker Coefficients*, Appendix. Journal of Symbolic Computation **84** (2018).

[22] M. Walter, J. Eisert, D. Gross, *Multi-partite entanglement*; invited book chapter of 'Lectures on Quantum Information', D. Bruss, G. Leuchs (eds.), second edition; arXiv:1612.02437.

[21] N. Berline, M. Vergne, M. Walter, *The Horn inequalities from a geometric point of view*; L'Enseignement Mathématique **63**, 403–470 (2017).

[20] G. Salton, B. Swingle, M. Walter, *Entanglement from Topology in Chern-Simons Theory*, Physical Review D **95** (2017) 105007.

[19] D. Ding, P. Hayden, M. Walter, *Conditional Mutual Information of Bipartite Unitaries and Scrambling*, Journal of High Energy Physics **12** (2016) 145.

[18] S. Nezami, M. Walter, *Multipartite Entanglement in Stabilizer Tensor Networks*, arXiv:1608.02595.

[17] F.G.S.L. Brandao, M. Christandl, A. Harrow, M. Walter, *The Mathematics of Entanglement*, arXiv:1604.01790.

[16] M. Berta, H. Gharibyan, M. Walter, *Entanglement-assisted capacities of compound quantum channels*, IEEE Transactions on Information Theory **63** (5), 3306–3321 (2017).

[15] P. Hayden, S. Nezami, X.-L. Qi, N. Thomas, M. Walter, Z. Yang, *Holographic duality from random tensor networks*, Journal of High Energy Physics **11** (2016) 009; presented at QIP'16.

[14] P. Bürgisser, M. Christandl, K.D. Mulmuley, M. Walter, *Membership in moment polytopes is in NP and coNP*, SIAM Journal on Computing **46** (2017).

[13] N. Bao, C. Cao, Z. Wang, M. Walter, *Holographic entropy inequalities and gapped phases of matter*, Journal of High Energy Physics **09** (2015) 203.

[12] C. Ikenmeyer, K.D. Mulmuley, M. Walter, *On vanishing of Kronecker coefficients*, Computational Complexity **26** (26), 949–992 (2017).

[11] N. Bao, S. Nezami, H. Ooguri, B. Stoica, J. Sully, M. Walter, *The holographic entropy cone*, Journal of High Energy Physics **09** (2015) 130; presented at QIP'16.

[10] M. Vergne and M. Walter, *Inequalities for Moment Cones of Finite-Dimensional Representations*, Journal of Symplectic Geometry **15** (4), 1209 (2017).

[9] M. Walter and J.M. Renes, *A Heisenberg Limit for Quantum Region Estimation*, IEEE Symposium on Information Theory (ISIT), 1126–1130 (2014).

[8] M. Walter and J.M. Renes, *Lower Bounds for Quantum Parameter Estimation*, IEEE Transactions on Information Theory **60** (12), 8007–8023 (2014).

[7] D. Gross and M. Walter, *Stabilizer information inequalities from phase space distributions*, Journal of Mathematical Physics **54** (8), 082201 (2013).

[6] M. Christandl, M.B. Şahinoğlu, M. Walter, *Recoupling Coefficients and Quantum Entropies*, Annales Henri Poincaré **19** (2), 385–410 (2018); presented at QIP'13.

[5] M. Walter, B. Doran, D. Gross, M. Christandl, *Entanglement Polytopes: Multiparticle Entanglement from Single-Particle Information*, Science **340** (6137), 1205–1208 (2013); presented at QIP'13.

[4] A. Sawicki, M. Kuś, M. Walter, *When is a pure state of three qubits determined by its single-particle reduced density matrices?*, J. Phys. A **46**, 055304 (2013).

[3] M. Christandl, B. Doran, M. Walter, *Computing multiplicities of Lie group representations*, Proceedings of the 53rd IEEE Symposium on Foundations of Computer Science (FOCS), 639–648 (2012).

[2] M. Christandl, B. Doran, S. Kousidis, M. Walter, *Eigenvalue Distributions of Reduced Density Matrices*, Communications in Mathematical Physics **332**, 1–52 (2014).

[1] P. Baum, H. Oyono-Oyono, T. Schick, M. Walter, *Equivariant geometric K-homology for compact Lie group actions*, Abh. Math. Sem. Univ. Hamburg **80**, 149–173 (2010).

For pdf copies of my papers see my homepage (staff.fnwi.uva.nl/m.walter) or the arXiv.

Theses

Doctoral Thesis: *Multipartite Quantum States and their Marginals*, ETH Zürich (2014).
Available online at arXiv:1410.6820.

Diploma Thesis: *Equivariant geometric K-homology with coefficients*, Univ. Göttingen (2010).
Available online at https://staff.fnwi.uva.nl/m.walter/diploma.pdf.

Software

TENSORSCALING – PYTHON package for tensor scaling and entanglement polytopes
PORT-BASED – PYTHON package to compute asymptotic rates for port-based teleportation
PYFERMIONS – free fermion entanglement renormalization using wavelets
QUANTBOX – versatile MATLAB package for quantum information theory
JUSTAMOMENT – Python package for computing quantum marginal and moment polytopes
BARVIKRON and KRONECKER – world's fastest algorithm for Kronecker coefficients of large size
WWW.ENTANGLEMENT-POLYTOPES.ORG – interactive browser for entanglement polytopes

Teaching and Supervision

spring 2020	Reading group 'From Euclidean to Geodesic Convex Optimization' at the University of Amsterdam and CWI. See staff.fnwi.uva.nl/m.walter/convex for details.
	Master's course 'Quantum Information Theory' (MasterMath) at the University of Amsterdam. See staff.fnwi.uva.nl/m.walter/qit20 for material.
	Master Seminar in Algebra, Geometry and Mathematical Physics (joint with G. Regts).
01/2020	Lecture series on *Quantum Information* at the 14th Kavli Asian Winter School on Strings, Particles and Cosmology. See www.tfc.tohoku.ac.jp/other-activity/7065.html for details.
12/2019	Lecture series on *Quantum Information* at the Amsterdam–Brussels–Geneva–Paris Doctoral School on Quantum Field Theory, Strings and Gravity. See www.solvayinstitutes.be/html/doctoral.html for details.
fall 2019	Designed and taught new Bachelor's course 'Introduction to Information Theory' at the University of Amsterdam. See staff.fnwi.uva.nl/m.walter/iit19/ for material.
	Theoretical Physics Master Seminar (joint with B. Freivogel, E. Verlinde, J. van Wezel).
	Master Seminar in Algebra, Geometry and Mathematical Physics (joint with G. Regts).
spring 2019	Designed and taught new Master's course 'Quantum Information Theory' (MasterMath) at the University of Amsterdam (joint with M. Ozols).
	Co-organized the 'Master Seminar in Algebra, Geometry and Mathematical Physics' (joint with G. Regts).
fall 2018	Designed and organized web class 'The Quantum Quest' to introduce high-school students to quantum computing (joint with M. Ozols). See www.quantum-quest.nl.
10/2018	Obtained university teaching qualification (BKO), which is recognized by all universities in the Netherlands.
summer 2018	Organized study group on 'Continuous-Variable Quantum Information' (joint with C. Schaffner).
06/2018	Lecture series at the school 'Masterclass on Tensors: Geometry and Quantum Information', at the University of Copenhagen (see indico.nbi.ku.dk/event/1088/ for details).
spring 2018	Taught new course 'Symmetry and Quantum Information' at the University of Amsterdam (see staff.fnwi.uva.nl/m.walter/qit18/ for material).
09/2017	Lecture series at the school 'Mathematical Aspects of Quantum Information' at Institut d'Études Scientifiques de Cargèse, Corsica, organized by G. Aubrun, B. Collins, I. Nechita and S. Szarek.
spring 2017	Designed and taught new course, 'PHYSICS 491: Symmetry and Quantum Information', at Stanford University (see staff.fnwi.uva.nl/m.walter/physics491 for details).
07/2016	Lecture on 'Quantum Information and Symmetry' at the 'It from qubit' summer school at Perimeter Institute, Waterloo (see www.pirsa.org/displayFlash.php?id=16070044 for a video recording).
08/2014	Designed syllabus and organized summer course 'Das 3-Mal-5 der Quantencomputer' at summer academy of the German National Academic Foundation, Leysin (held jointly with P. Herbrich).
05–06/2013	Problem sessions at school 'The Mathematics of Entanglement' at the Universidad de los Andes, Bogotá.
2010–2014	Teaching assistant for courses Theoretical Mechanics, Quantum Mechanics II, Thermodynamics, Statistical Physics, Advanced Topics in Quantum Information Theory, and Computational Quantum Physics at ETH Zürich.
2009–2010	Teaching assistant for course Differential- und Integralrechnung III at the University of Göttingen.
2006–2009	Teaching assistant for courses Linear Algebra I, Linear Algebra II, and Algebra I at the University of Karlsruhe.

Student Supervision

since 2018 Supervision of graduate and undergraduate students in my group at the UvA:
- PhD: Freek Witteveen (2018–), Bas Dirkse (2018–), Harold Nieuwboer (2019–)
- MSc: Marten Folkertsma (ongoing), Laurens Ligthard (ongoing), Jeroen Dekker (2019), Emma Loos (2019), Philip Verduyn Lunel (2019), Raja Damanik (2018)
- BSc: Maxim van den Berg (ongoing), Slawi Dimitrov (ongoing), Lars van Geest (2019), Philip Roeleveld (2018), Wouter Borg (2018)

See my homepage (staff.fnwi.uva.nl/m.walter) for more information.

2014–2017 Supervision of graduate student research at Stanford (Jordan Cotler, Dawei Ding, Hrant Gharibyan, Sepehr Nezami, Grant Salton).

2010–2014 Co-supervision of master's theses at ETH Zürich (Sebastian Seehars, Burak Şahinoğlu, Konstantin Wernli; joint with M. Christandl).

Professional Activities and Outreach

05/2021 Co-organizing a workshop on 'Efficient Tensor Representations for Learning and Computational Complexity' as part of a long program at IPAM, UCLA. See www.ipam.ucla.edu/programs/workshops/workshop-iv-efficient-tensor-representations-for-learning-and-computational-complexity/ for more detail.

01/2021 Co-organizing focus session on 'Information at all Length Scales' at Physics@Veldhoven.

2021 Research in Pairs, Oberwolfach (joint with V. Baldoni, N. Berline, M. Vergne).

2021 Member of the program committee of the 24th Annual Conference on Quantum Information Processing (QIP 2021).

06/2020 Co-organized an *online* Lorentz Center workshop on 'Complexity from Quantum Information to Black Holes'. See sites.google.com/view/complexity-workshop for more information, video recordings, etc.

05/2020 Talk at 'Leve de Wiskunde!' 2020. See www.betapartners.nl/leve-de-wiskunde2020/ for more information (corona-cancelled).

07/2019 Co-organized mini-symposium on 'Efficient algorithms for geometric invariant theory' at SIAM-AG 2019, Bern. See staff.fnwi.uva.nl/m.walter/siam2019 for more information.

10/2018 Evening on 'Space-time 'tangled up in quantum information', Science Café, Nijmegen.

10/2018 Co-organized FOCS workshop on 'Scaling Algorithms and Applications' at IHP, Paris. See staff.fnwi.uva.nl/m.walter/focs2018scaling for more information.

09/2018 Article 'How to program a quantum computer' for Dutch IT magazine 'AG Connect'.

2018 Review work for US DOE Office of Science.

2018 Member of the program committee of the 13th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2018).

11/2017 Co-organized 'Amsterdam Math-Physics Colloquium' with M. Cheng and M. Ozols.

since 2016 Founding editor of the community-run journal 'Quantum'.

since 2016 DoD Multidisciplinary University Research Initiatives (MURI) collaboration on 'Semantics, Formal Reasoning, and Tools for Quantum Programming'.

10/2013 Co-organized workshop 'Quantum Marginals' at the Isaac Newton Institute, Cambridge.

09/2011 Local co-organizer of 'First Annual Conference on Quantum Cryptography (QCRYPT 2011)' at ETH Zürich.

since 2011 Referee work for major journals in quantum physics, mathematical physics, information theory, including ACM Symposium on the Theory of Computing (STOC), Physical Review, Quantum Information and Computation, Communications of Mathematical Physics, Journal of Mathematical Physics, IEEE Transactions on Information Theory, Foundations of Computational Mathematics, Linear Algebra and its Applications, and for the conferences CRYPTO, ISIT, QIP, TQC.

Previous Employment

2008–2009 Research assistant at Logic and Formal Methods group, University of Karlsruhe. Research on theoretical foundations of formal verification tool KeY.

2004–2005 Realtime Computer Graphics programmer, R&D, Ubisoft, Montréal, Canada. Ubisoft is a multinational video game developer and publisher.

1999–2004 Technology programmer, avenit ag, Offenburg (part-time).