

Stephanie Wehner

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Born: 8 May 1977
Nationality: German
Languages: German, Dutch, English



- Highlights Over 100 publications (> 11.000 citations of which > 2000 in 2020, hindex 47, i10-index 103, Google Scholar June 2021) Works selected for Science's "Top 10 Breakthroughs of 2015", Nature's "Science Events that shaped 2015", and voted in Top 10 of 2014 in physics news at phys.org.
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- | Year | Publications |
|------|--------------|
| 2013 | ~200 |
| 2014 | ~300 |
| 2015 | ~400 |
| 2016 | ~800 |
| 2017 | ~900 |
| 2018 | ~1000 |
| 2019 | ~1300 |
| 2020 | ~2000 |
| 2021 | ~1000 |
- Leadership Coordinator EU Quantum Internet Alliance - EU Flagship on Quantum Technologies, Co-Founder QCRYPT, now the largest annual international conference on quantum cryptography
- Funding Personal grants: ERC Starting Grant 2015 (1.5M EUR), NWO VIDI Grant 2015 (800k EUR). Collaborative grants Netherlands (19.4M EUR), EU (10M EUR).
- Press Popular science coverage in New York Times (Front Page), The Economist, TIME, The Times, Huffington Post, New Scientist, Wired, Vice, and others.
- Outreach Talks at TEDx, New Scientist Live, Public Audience MOOC, and others.
- Education Founder QuTech Academy, 11 distinct classes, of which one has received a perfect score on teaching evaluation. edX MOOC Quantum cryptography in fall 2016.

Employment Background

Academic appointments

- 2016-now **Antoni van Leeuwenhoek Professor**, QU^TEC^H, TU DELFT, Delft, Netherlands.
Roadmap Leader/Division Research Lead Quantum Internet and Networked Computing
- 2014-2016 **Associate Professor**, QU^TEC^H, TU DELFT, Delft, Netherlands.
- 2013-2014 **Associate Professor**, SCHOOL OF COMPUTING, NATIONAL UNIVERSITY OF SINGAPORE (NUS), Singapore.
- 2010-2013 **Assistant Professor**, SCHOOL OF COMPUTING, NATIONAL UNIVERSITY OF SINGAPORE, Singapore.
- 2010-2016 **Principal Investigator**, CENTRE FOR QUANTUM TECHNOLOGIES (CQT), Singapore.
- 2008-2010 **Postdoctoral Scholar**, CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena, USA.

Industry appointments

- 1999-2002 **Hacker**, ITSX BV, Amsterdam, Netherlands.
Security analysis and penetration testing. Full time and part time (0.4 fte)
- 1997-1999 **Network administrator**, XS4ALL INTERNET BV, Amsterdam, Netherlands.
Administration and custom solutions (some still in use today).

Academic Background

- 1 September **PhD**, *University of Amsterdam*, Netherlands.
2004- 27
February
2008
- 2002-2004 **MSc (Doctorandus)**, *University of Amsterdam*, Netherlands.
- 1999-2002 **BSc (Kandidaat)**, *University of Amsterdam*, Netherlands.
Exchange to University of New South Wales, Sydney, Australia in 2003

Awards

- 2019 KNAW Ammodo Science Award
- 2016 Paul Ehrenfest award, international award for quantum foundations
- 2015 ERC Starting Grant
- 2015 NWO VIDI Grant
- 2014 Dean's Chair, National University of Singapore
- 2004 KHMW Jong Talent Afstudeerprijs (Prize given by Royal Dutch Society to best master's student graduating in NL in computer science in 2004)
- 2003 STUNT Grant for Exchange to UNSW, Sydney

10 Selected Publications

- A link layer protocol for quantum networks, A. Dahlberg, M. Skrzypczyk, T. Coopmans, L. Wubben, F. Rozpedek, M. Pompili, A. Stolk, P. Pawelczak, R. Knegjens, J. Filho, R. Hanson, S. Wehner, *ACM SIGCOMM 2019*, *To appear*.
- Quantum internet: A Vision for the road ahead, S. Wehner, D. Elkouss, R. Hanson, *Science*, Vol. 362, Issue 6412 (2018)
- Capacity estimation and verification of quantum channels with arbitrarily correlated errors, C. Pfister, M. A. Rol, A. Mantri, M. Tomamichel, S. Wehner, *Nature Communications*, 9, 27 (2018)
- A universal test for gravitational decoherence, C. Pfister, J. Kaniewski, M. Tomamichel, A. Mantri, R. Schmucker, N. McMahon, G. Milburn, S. Wehner, *Nature Communications*, 7, 13022 (2016)
- The second laws of quantum thermodynamics, F. Brandao, M. Horodecki, N. Ng, J. Oppenheim, S. Wehner, *Proceedings of the National Academy of Sciences*, 112 (11), 3275-3279 (2015)
- Loophole-free Bell inequality violation using electron spins separated by 1.3 kilometres, B. Hensen, H. Bernien, A. Dréau, A. Reiserer, N. Kalb, M. Blok, J. Ruitenberg, R. Vermeulen, R. Schouten, C. Abellán, W. Amaya, V. Pruneri, M. Mitchell, M. Markham, D. Twitchen, D. Elkouss, S. Wehner, T. Taminiau, R. Hanson, *Nature*, 526 (7575), 682-686 (2015)
- Experimental implementation of bit commitment in the noisy-storage model, N. Ng, S. K. Joshi, C. Ming, C. Kurtsiefer, S. Wehner, *Nature Communications*, 3, 1326 (2012)
- The uncertainty principle determines the non-locality of quantum mechanics, J. Oppenheim,

S. Wehner, *Science*, 330, 6007, 1072-1074 (2010)

- A strong converse for classical channel coding using entangled inputs, R. Koenig and S. Wehner, *Physical Review Letters*, 103, 070504 (2009).
- Cryptography from noisy storage, S. Wehner, C. Schaffner and B. Terhal, *Physical Review Letters*, 100, 220502 (2008)

Leadership

- Coordinator, EU Quantum Internet Alliance
- Co-Founder QCRYPT, Now largest annual international conference on quantum cryptography, 2010
- Co-Founder QIRG (Quantum Internet Research Group), Internet Engineering Task Force (IETF), 2018
- Roadmap leader, Quantum Internet and Networked Computing, QuTech, 2017- (now called Division Research Lead)
- Roadmap leader, QuTech Academy, QuTech, 2015-2017
- SEB Vice Chair, Elected Science Vice Chair of the Science and Engineering Board, EU Flagship on Quantum technologies
- Steering Committees, QCRYPT 2011-2016, QIP 2013-2017 (Largest annual event in theoretical quantum computer science), QCMC 2014-2017 (International conference on quantum computing, measurement and communication), WQRN 2017- (International workshop on quantum repeaters and networks)
- Main organizer, QIP 2018 (550+ people)

Other Service

- Scientific Community
 - Elected member at-large, Executive Committee Division of Quantum Information, American Physical Society 2016-2019
 - Member of the core team of the SRA WG (Scientific Research Agenda Working Group), EU Flagship on Quantum Technologies, 2019-
 - NQC, National Quantum Coordinator 2017-2018, representing Netherlands in Scientific Body in EU Flagship CSA (Coordination and Support Action).
 - Board, FP7 QUTE Virtual Institute on Theoretical Quantum Information 2014-2016
 - Expert Groups Quantum Communication Infrastructure to European Commission, 2019,2020
 - NWO Veni Grant Panel member exact sciences (computer science, math, astronomy), 2016 and 2017
 - Editorial Board, New Journal of Physics, 2016-2017

- Program Committees
 - ACM Nanocom 2019
 - Chair, MP1209 COST Quantum Thermodynamics, Valetta, Malta, February 2015
 - AQIS Asian Conference Quantum Information Science 2010, 2011, 2012, 2013, 2014
 - QIP Quantum Information Processing 2010, 2012
 - ICITS International Conference on Information Theoretic Security 2012, 2013
 - Hacking at Random 2009, What the Hack 2005, Hackers at Large 2001 (Computer security festivals, ca 3000 participants, mentioned on BBC News and others) (Program team)

- Initial member EU COST Action MP1209 “Thermodynamics in the quantum regime”
- Journal referee: Nature (free subscriptions in 2012-2015 in recognition of numerous referee reports), Science, Nature Communications, Communications in Mathematical Physics, Physical Review Letters, and others
- Conference referee: CRYPTO, QIP, ITCS, STOC, FOCS, and others

- Conference organization
 - QIP 2018 (main organizer)
 - IMS workshop on inverse moment problems (2013, organizer topical week)
 - IMS workshop on quantum thermodynamics (2013, main organizer)
 - QCRYPT 2012 (main organizer)
 - QIP 2011 (Rump session organizer)
 - Workshop on Cryptography from Storage Imperfections, Caltech, March 2010 (main organizer)

- University service
 - Chair Faculty Meeting, QuTech, 2016-2017
 - QuTech Academy, TU Delft, 2015-2017 (Established QuTech Academy, a new education effort spanning three departments: Physics, EE and CS)
 - QuTech Management Team 2015-
 - Organizer and Initiator, QuTech Colloquium 2015-2017
 - Member faculty hiring committees (2015-)
 - NUS PhD Program Revision Team 2013
 - NUS 2013-2014 Welfare officer CQT (counseling)
 - NUS 2011-2014 Chair IT/Media Committee at CQT, NUS 2010-2013

Funding

- Europe
 - Quantum Internet Alliance, EU Flagship on Quantum Technologies, 2018-2021, EUR 10M, Coordinator (main PI)
 - Distributed systems protocols for quantum networks, 2018-2021, NWA Netherlands, EUR 167.000, joint with Michael Walter (UvA, Amsterdam).
 - Quantum Software Consortium, 2017-2027, NWO Zwaartekracht, EUR 19.5M, Consortium grant (6 PIs), including funding two tenure track positions at TU Delft.
 - Quantum Communication Networks, 2016-2021, ERC Starting Grant, EUR 1.5M, Personal Grant.
 - Large quantum networks from small quantum devices, 2015-2020, EUR 800.000, NWO VIDI, Personal Grant.

- Singapore
 - Space-based QKD, 2014-2019, S\$6.3 million (\approx 3.9M EUR), National Research Foundation Singapore, CRP Grant, joint with Alex Ling, Resigned due to move to Europe.
 - Quantum information as a tool, 2014-2016, S\$1.26 M (\approx 743k EUR), Ministry of Education, Singapore/Centre for Quantum Technologies, Resigned due to move.
 - Random numbers from quantum processes, 2013-2018, S\$ 10M (\approx 6.2 M EUR), Ministry of Education, Academic Research Fund Tier 3 Grant, 13 Investigators, personal share S\$1.03 million. Lead PI Cluster "Random numbers from complex systems" (7 PIs at 2 universities in Singapore), Resigned due to move to Europe.
 - Resources for cryptography, 2011-2013, S\$1 million (\approx 590k EUR), Ministry of Education, Singapore/Centre for Quantum Technologies, sole Principal Investigator.

Education

QuTech Academy Established QuTech Academy. Defined initial program, MOOC productions (QuCryptoX and General MOOC 1 - Quantum computing and internet applications), defined vision and planning. See <http://qutech.nl/academy/> for details.

Classes

2019/2020 MOOC edX "Quantum Cryptography", Taught at TU Delft in an inverted classroom format. Lecture notes and course materials presently being compiled for book publication. We (my Caltech co-lecturers Thomas Vidkck and myself) have had offers from all major publishers and are currently discussing an arrangement with Cambridge University Press in which the lecture notes are made available as a book and Julia labs and other electronic materials from our class may be made available via their new eduKado website, which offers quizzes and online content to be used directly in conjunction with CUP textbooks. We have not yet finalized this arrangement, but will likely do so sometime this spring. We prefer CUP over other publishers since they will consent to us offering the PDF freely online, have excellent services and print materials, and offer modern integration of electronic materials into books.

- 2017/2018 MOOC edX “Quantum Cryptography”, Taught at TU Delft in an inverted classroom format. Added new course aspect programming on SimulaQron simulator. MOOC edX “Quantum computing and internet: Applications”
- 2016/2017 MOOC edX “Quantum Cryptography”, Taught at TU Delft in an inverted classroom format. Joint venture with Caltech. Developed extensive course materials, including lecture notes, Julia lab practise sessions.
- 2015/2016 Fundamentals of Quantum Information, TU Delft (joint with Leo DiCarlo)
Quantum communication and cryptography, TU Delft
- 2014/2015 Quantum computation and Computation, TU Delft
- Supervision
- Graduated 4 PhD students who came with me from Singapore. 3 degree from Singapore, 1 degree from TU Delft
 - Currently supervising: 10 PhD students (2 joint supervision), 2 MEP
 - Past supervision at TU Delft 2015-2018: 13 Masster Students, 8 Bachelor Students

Invited Talks

Not counting declined invitations, and public audience events.

- 2021
- ERC Seminar, Online, Belgium (May)
 - BQIT:22 Bristol Quantum Information Technologies, Online, UK (April)
 - Max Planck Distinguished Lecturer Series, Online, Germany (April)
 - Quantum Science & Technology and ICFO IMPRS, Online, Germany (March)
 - APS March MEeting, Online, USA (March)
 - SFB BeyondC Workshop, Online, Austra (February)
 - Physics @ Veldhoven, Online, Netherlands (January)
- 2020
- IQT Europe, Online, Netherlands (october)
 - ACM Tech Talk, Online, USA (September)
 - Physics @ Veldhoven, Veldhoven, Netherlands (January)
- 2019
- IQT Europe, The Hague, Netherlands (October)
 - ACM Nanocom, Dublin, Ireland (September)
 - Network Games, Tropical Geometry, and Quantum Communication, Berlin, Germany (June)
 - Quantum Technology Standarization, Brussels, Belgium (March)
 - APS March Meeting, Boston, USA (March)
 - European Quantum Technologies Conference, Grenoble, France (February)

- 2018
- UK-Netherlands Bilateral International Meeting, Royal Society, London, UK (February)
 - MORE-IP, Amsterdam, Netherlands (May)
 - NetSci - Quantum Networks, Paris, France (June)
 - German Parliament (Bundestag), Berlin, Germany (June)
 - Gordon Conference, Quantum Science, Easton MA, USA (July)
 - QCRYPT, Shanghai, China (August)
 - Symposium on Hybrid Quantum Optics, Copenhagen, Denmark (September)
 - Inauguration Hy-Q Center, Copenhagen, Denmark (September)
 - Young Quantum Information Scientists, Vienna, Austria (September)
 - QTech 2018, Paris, France (September)
 - EU Flagship kickoff, Represented Quantum Communication Pillar (October)
 - International Symposium on Quantum Technologies, Madrid, Spain (November)
 - ICT 2018, Vienna, Austria (December)
- 2017
- Foundations of quantum mechanics and their impact on contemporary society, Royal Society, London, UK (December)
 - Analysis in Quantum Information Theory, Institute Henri Poincare, Paris, France (December)
 - Quantum elements of secure communication, NSF Quantum Leap workshop, Arlington, USA (November)
 - 2nd Workshop on Quantum Repeaters and Quantum Networks, Seefeld, Austria (September)
 - SPIE Photonics, San Diego, USA (August)
 - Quantum Networks Workshop, Oxford, UK (August)
 - Microsoft Faculty Summit, Redmond, USA (July)
 - SHA 2017, Netherlands (July)
 - CEWQO, Copenhagen, Denmark (June)
 - Hereaus Seminar on Gravitational Decoherence, Bad Honnef, Germany (June)
 - Colloquium Innsbruck, Austria (May)
 - RIPE 74, Budapest, Hungary (May)
 - Frontiers in Quantum Safe Cryptography (FOQUS), Paris, France (May)
 - ICT Open, Netherlands (March)
 - Colloquium University of Sydney, Sydney, Australia (January)
 - Coogee Workshop on Quantum Information, Sydney, Australia (January)
- 2016
- French GdR Quantum Information, Paris, France (November)
 - ESOF, UK (July)
 - Quantum Programming Languages and Logic, Glasgow, UK (June)
 - COST Conference on Quantum Thermodynamics, Erice, Italy (May)
 - Secrecy and Privacy, IHP, Paris (April)
 - Colloquium, Physics Department, Eindhoven, Netherlands (March)
 - APS March Meeting, Baltimore, USA (March)
 - FOM Veldhoven, Focus Session on the physics of quantum information, Veldhoven, Netherlands (January)

- 2015
- Colloquium, Physics Department, University of Ulm, Germany (December)
 - Colloquium, Physics Department, St. Andrews University, UK (December)
 - Workshop on Quantum Cryptography and Quantum Information Semantic Security and Indistinguishability in the Quantum World, Aarhus, Denmark (October)
 - QUICC Summer School, Imperial CDTL, Warwick, UK (September)
 - QIPC, Leeds, UK (September)
 - ICMP International Congress of Mathematical Physics, Santiago de Chile, Chile (August) (primary event in mathematical physics held only every three years)
 - Trustworthy Quantum Cryptography, Michigan, USA (July)
 - Google Sci Foo Conference, Mountain View, USA (June)
 - Quantum systems and technology, Monte Verita, Switzerland (June)
 - Randomness in quantum physics, May, ICFO, Barcelona, Spain (May)
 - APS March Meeting, San Antonio, Texas, USA (March)
 - Coogee Workshop on Quantum Information, Sydney, Australia (January)
- 2014
- Quantum Computation, Measurement and Communication (QCMC), Hefei, China (November)
 - Algorithmic spectral graph theory: Semidefinite optimization, approximation and applications, Simon's Institute, Berkeley, USA (September)
 - The greatest inspiration surely is non-locality (GISIN '14), Riederalp, Switzerland (September)
 - New frontiers of quantum information theory, Ascoli Piceno, Italy (July)
 - Seefeld Workshop on Quantum Information, Seefeld, Austria (July)
 - New perspectives on thermalization - Interdisciplinary Physics, Aspen Center for Theoretical Physics, Aspen, USA (March)
 - ICERM Semidefinite Programming and Graph Algorithms, Providence, USA (February)
- 2013
- University Colloquium, University of Wuerzburg, Germany (December)
 - Symposium in Theoretical Physics, Freie Universitaet Berlin, Germany (October)
 - IEEE Summer Topicals on Quantum Communication and Photonics, Hawaii, USA (July)
 - Thematic Program on Quantum Foundations and Cryptography, Madrid, Spain (July)
 - QSTART Inauguration Conference for the Quantum Information Science Center, Hebrew University, Jerusalem, Israel (June)
 - Conference on the Theory of Quantum Computing, Communication and Cryptography (TQC), Guelph, Canada (May)
 - 4th SDP Days Workshop, Amsterdam, Netherlands (March)
 - Symposium on Quantum Information Theory, Vienna, Austria (March)

- 2012
 - CIFAR Quantum Information Processing, Ottawa, Canada (November)
 - Symposium on Quantum Foundations, Baltimore, USA (October)
 - Q+ Hangouts, online talk series (September)
 - Japan-Singapore Workshop on Multi-user Qu. Networks, Singapore (Sept)
 - Quantum Physics of Information, Shanghai, China (August)
 - Quantum information workshop, Seefeld, Austria (July), Plenary
 - University colloquium, IST Austria, Vienna (June)
 - SQUINT (Southwest Quant, Inf. and Technology), Albuquerque, USA (April)

- 2011
 - Conceptual Foundations for Quantum Information Processing, Waterloo, Canada (May)
 - Central European Conference on Quantum Information Processing (CEQIP), Znojmo, Czech Republic (June)
 - Scottish Universities Summer School in Physics (SSUSP67) (August)
 - Quantum information and foundations of thermodynamics, Zurich (August)

- 2010
 - IPAM Workshop on Convex Optimization and Algebraic Geometry, Los Angeles, USA (September)
 - DOE Roundtable on Cybersecurity, San Jose, USA (March)
 - APS March Meeting, Portland, USA (March)
 - Caltech Lunch Bunch (colloquium), Pasadena, USA (February)

- 2009
 - 4th TQC (Conf. on theory of computation, communication and cryptography), Waterloo, Canada (May)
 - Operator Structures in Quantum Information, Fields Institute, Toronto, Canada (July) 2008
 - Workshop on Quantum Algorithms and Complexity, Singapore (Nov)
 - CIFAR Quantum Information Processing, Kelowna, Canada (Nov)
 - Workshop on information primitives and laws of nature, Zurich (May)

- 2007
 - China Theory Week, Beijing, China (September)
 - Bellairs Cryptography Workshop, McGill University Research Center, Barbados (March)

- 2006
 - IPAM Securing Cyberspace, UCLA, Los Angeles, USA (September)
 - 7th European workshop on quantum information processing and communication, Royal Society, London, UK

Selected Outreach and Press

- Inside Europe's Quest to build an unhackable Quantum Internet, MIT Technology Review, 2018, <https://www.technologyreview.com/s/612327/europes-quest-for-an-unhackable-quantum-internet/>
- The quantum internet has arrived (and it hasn't), Nature News, 2018, <https://www.nature.com/articles/d41586-018-01835-3>
- TEDxVienna "Quantum Internet", Vienna (October 2017),

- Popular science coverage in New York Times (Front Page), The Economist, TIME, The Times, as well as on several occasions in Huffington Post, New Scientist, Wired, Vice, and others.
- Classical internet events , such as RIPE 74 Budapest and SHA1.
- TEDxDelft “Hacking nature”, Delft (March 2015)
- KNAW Talk “De ultieme privacy van de natuur”, Amsterdam (January 2016)
- NWA Eureka Festival, Amsterdam (November 2015)
- New Scientist Live, London (2x, February at Inaugural Event, and November 2015)

Publications

Each research result is listed **only once**, even if it first appeared in conference proceedings and later as a much longer journal version under a potentially different title.

Due to the interdisciplinary nature of quantum information my publications are both in journals (more important in physics) and in conferences (more important in computer science).

Following my mathematical background author ordering of my papers prior to supervising my own students (prior to 2011) is generally alphabetical, with only two exceptions during my PhD (when I collaborated with physicists). Now, when working with my physics students, I consider it appropriate to adopt the physics convention of non-alphabetical author ordering, typically making the student the first and myself as the supervisor the last author.

(Accepted) preprints and selected software contributions can be found in the next sections.

112. Optimizing entanglement generation and distribution using genetic algorithms, F .da Silva, A. Torres-Knoop, T. Coopmans, D. Maier and S. Wehner *Quantum Science and Technology*, 2021
111. Optimizing repeater schemes for the quantum internet, K. Goodenough, D. Elkouss, S. Wehner, *Physical Review A*, 103, 032610, 2021
110. Realization of a multinode quantum network of remote solid-state qubits, M. Pompili, S. L. N. Hermans, S. Baier, H. K. C. Beukers, P. C. Humphreys, R. N. Schouten, R. F. L. Vermeulen, M. J. Tiggelman, L. dos Santos Martins, B. Dirkse, S. Wehner, R. Hanson, *Science*, Vol. 372, Issue 6539, pp. 259-264 (2021)
109. A P4 Data Plane for the Quantum Internet, W. Kozlowski, F. Kuipers, S. Wehner, *Proceedings of the 3rd P4 Workshop in Europe*, pp 49-51, 2020
108. Designing a Quantum Network Protocol, W. Kozlowski, A. Dahlberg, S. Wehner, *Proceedings of the 16th International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, pp 1-16, 2020
107. Transforming graph states to Bell-pairs is NP-Complete, A. Dahlberg, J. Helsen, S. Wehner, *Quantum*, 4, 348, 2020
106. Entanglement Distribution in a Quantum Network: A Multicommodity Flow-Based Approach, K. Chakraborty, D. Elkouss, B. Rijsman, S. Wehner, *IEEE Transactions on Quantum Engineering*, 1, 2020

105. How to transform graph states using single-qubit operations: computational complexity and algorithms, A. Dahlberg, J. Helsen, S. Wehner, *Quantum Science and Technology*, 5, 045016, 2020
104. Secure multiparty quantum computation with few qubits, V. Lipinska, J. Ribeiro, S. Wehner, *Physical Review A*, 102, 022405, 2020
103. Key rates for quantum key distribution protocols with asymmetric noise, G. Murta, F. Rozpedek, J. Ribeiro, D. Elkouss, S. Wehner, *Physical Review A*, 101, 062321, 2020
102. Certification of a functionality in a quantum network stage, V. Lipinska, L. Thinh, J. Ribeiro, S. Wehner, *Quantum Science and Technology*, 5 (3), 035008, 2020
101. Verifiable Hybrid Secret Sharing With Few Qubits, V. Lipinska, G. Murta, J. Ribeiro, S. Wehner, *Physical Review A*, 101, 032332, 2020
100. Counting single-qubit Clifford equivalent graph states is #P-Complete, A. Dahlberg, J. Helsen, S. Wehner, *Journal of Mathematical Physics*, 61, 022202, 2020
99. A new class of efficient randomized benchmarking protocols, J. Helsen, X. Xue, L. M. K. Vandersypen, S. Wehner, *Nature Partner Journal Quantum Information*, 5, 71 (2019)
98. Towards Large-Scale Quantum Networks, W. Kozłowski, S. Wehner, *Proceedings of ACM NANOCOM*, 2019, 3 (2019)
97. High fidelity GHZ generation within nearby nodes, V. Caprara Vivoli, J. Ribeiro, S. Wehner, *Physical Review A*, 100, 032310 (2019)
96. Multi-qubit Randomized Benchmarking Using Few Samples, J. Helsen, J. J. Wallman, S. T. Flammia, S. Wehner, *Physical Review A*, 100, 032304 (2019)
95. A Link Layer Protocol for Quantum Networks, A. Dahlberg, M. Skrzypczyk, T. Coopmans, L. Wubben, F. Rozpedek, M. Pompili, A. Stolk, P. Pawelczak, R. Knegjens, J. de Oliveira Filho, R. Hanson, S. Wehner, *Proceedings of ACM SIGCOMM*, 2019, pp 159-173 (2019)
94. Towards a realization of device-independent quantum key distribution G. Murta, S. B. van Dam, J. Ribeiro, R. Hanson, S. Wehner, *Quantum Science and Technology*, 4, 035011 (2019)
93. Near-term quantum repeater experiments with NV centers: overcoming the limitations of direct transmission, F. Rozpedek, R. Yehia, K. Goodenough, M. Ruf, P. Humphreys, R. Hanson, S. Wehner, D. Elkouss, *Physical Review A*, 99, 052330 (2019)
92. Benchmarking Gate Fidelities in a Si/SiGe Two-Qubit Device, X. Xue, T. F. Watson, J. Helsen, D. R. Ward, D. E. Savage, M. G. Lagally, S. N. Coppersmith, M. A. Eriksson, S. Wehner, L. M. K. Vandersypen, *Physical Review X*, 9, 021011 (2019)
91. Quantum codes for quantum simulation of Fermions on a square lattice of qubits, Mark Steudtner and Stephanie Wehner, *Physical Review A*, 99, 022308 (2019)
90. Efficient Unitarity Randomized Benchmarking of Few-qubit Clifford Gates, Bas Dirkse, Jonas Helsen, Stephanie Wehner, *Physical Review A*, 99, 012315 (2019)

89. Practical and reliable error bars for quantum process tomography, Le Phuc Think, Philippe Faist, Jonas Helsen, David Elkouss, Stephanie Wehner, *Physical Review A*, 99, 052311 (2019)
88. Quantum internet: A Vision for the road ahead, S. Wehner, D. Elkouss, R. Hanson, *Science*, Vol. 362, Issue 6412, 2018
87. Representations of the multi-qubit Clifford group, J. Helsen, J. J Wallman, S. Wehner, *Journal of Mathematical Physics*, 59, 072201 (2018)
86. SimulaQron - A simulator for developing quantum internet software, A. Dahlberg and S. Wehner, *Quantum Science and Technology*, Volume 4, Number 1 (2018) (Also invited talk FOSDEM and Quantum Software and Quantum Machine Learning given by student A. Dahlberg)
85. A crossbar network for silicon quantum dot qubits, R.Li, L. Petit, D. P Franke, J. Dehollain, J. Helsen, M. Steudtner, N. K Thomas, Z. R Yoscovits, K. J Singh, S. Wehner, L. MK Vandersypen, J. S Clarke, M. Veldhorst, *Science advances*, 4, 7, 2018
84. Optimizing practical entanglement distillation, F. Rozpedek, T. Schiet, L. Think, D. Elkouss, A. C. Doherty, S. Wehner, *Physical Review A*, 97, 062333, 2018, Open source software implementation at <https://github.com/StephanieWehner/EntanglementDist.jl>
83. Fermion-to-qubit mappings with varying resource requirements for quantum simulation, M. Steudtner and S. Wehner, *New Journal of Physics*, 20, 2018
82. Quantum error correction in crossbar architectures, J. Helsen, M. Steudtner, M. Veldhorst and S. Wehner, *Quantum Science and Technology*, 3, 3, 2018
81. Transforming graph states using single-qubit operations, A. Dahlberg and S. Wehner, *Special issue foundations of quantum mechanics, Philosophical Transactions of the Royal Society A*, 376, 20170325 (2018)
80. Device-independence for two-party cryptography and position verification for memory less devices, J. Ribeiro, T. Le Phuc , J. Kaniewski, J. Helsen, and Stephanie Wehner, *Physical Review A*, 97, 062307 (2018)
79. Anonymous transmission in a noisy quantum network using the W state, Victoria Lipinska, Glauca Murta, Stephanie Wehner, *Phys. Rev. A* 98, 052320 (2018)
78. Fully device independent Conference Key Agreement, J. Ribeiro, G. Murta, and S. Wehner, *Physical Review A*, 97, 022307 (2018)
77. Continuous-variable protocol for oblivious transfer in the noisy-storage model, F. Furrer, T. Gehring, C. Schaffner, C. Pacher, R. Schabel and S. Wehner, *Nature Communications*, 9, 1450 (2018)
76. Parameter regimes for a single sequential quantum repeater, F. Rozpedek, K. Goodenough, J. Ribeiro, N. Kalb, V. Vivoli, A. Reiserer, R. Hanson, S. Wehner, and D. Elkouss, *Quantum Science and Technology*, 3,3, 2018
75. Capacity estimation and verification of quantum channels with arbitrarily correlated errors, C. Pfister, M. A. Rol, A. Mantri, M. Tomamichel, and S. Wehner, *Nature Communications*, 9, 27 (2018)

74. Smoothed generalized free energies for thermodynamics, R. van der Meer, N. Ng, S. Wehner, *Physical Review A*, 96, 062135 (2017)
73. Multiplexed entanglement generation over quantum networks using multi-qubit nodes, S. B. van Dam, P. C. Humphreys, F. Rozpedek, S. Wehner, and R. Hanson *Quantum Science and Technology*, 2 (3) (2017)
72. Quantum preparation uncertainty and lack of information, F. Rozpedek, J. Kaniewski, P. Coles and S. Wehner, *New Journal of Physics* (2017)
71. Entropic uncertainty relations and their applications, P. J. Coles, M. Berta, M. Tomamichel, and S. Wehner, *Reviews of Modern Physics*, 89, 015002 (2017)
70. (Nearly) optimal P-values for all Bell inequalities, D. Elkouss and S. Wehner, *Nature Partner Journal Quantum Information*, 2, 16026 (2016)
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Selected Software

- SimulaQron - A simulator for application development for a quantum internet, <http://www.simulaqron.org>
- Used for example at RIPE NCC Hackathon.
- NetSquid - Discrete event simulator for quantum networks, <http://www.netsquid.org>
- Authentication for PHP Scripting language for Web Servers, former Committer, creator YP/NIS module (1999) (PHP was deployed on 244 million web sites in 2012)
- IP Layer encryption ports SKIP (BSD/OS kernel) and IPSec (FreeBSD kernel) (1997) This software enabled encrypted communication of e.g. B92 Radio Station in Belgrade with the outside world.