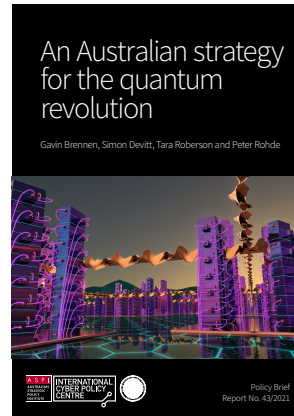
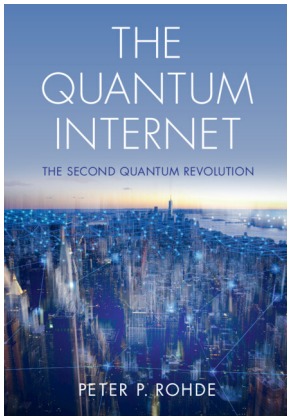


Peter P. Rohde

QUANTUM COMPUTER SCIENTIST · THEORETICAL PHYSICIST · COMPUTER SYSTEMS ENGINEER · MUSIC PRODUCER · ALPINIST

Australia

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📷 drpeterrohde | 📺 drpeterrohde | 🗣️ Peter Rohde | 🎧 MoodSnap | 📺 drpeterrohde | 🎓 Peter P. Rohde



Education

PhD in Quantum Computing

UNIVERSITY OF QUEENSLAND

- University of Queensland Postgraduate Research Scholarship
- Thesis: *Towards linear optics quantum computing* (supervised by Prof. Timothy Ralph)
- Academic visits: Max-Planck Institute for the Science of Light, Germany (Prof. Christine Silberhorn); Ultrafast Group at the University of Oxford, UK (Prof. Ian Walmsley); National Institute of Informatics, Japan (Prof. Kae Nemoto); Hewlett-Packard Labs, UK (Dr. William Munro)

Brisbane, Australia

2004-2007

Bachelor of Computer Systems Engineering (Hons I)

UNIVERSITY OF QUEENSLAND

- First Class Honours
- Grade Point Average: 6.6/7 (7 = High Distinction, 6 = Distinction)
- Dean's Commendations for High Achievement (semesters I-IV,VI-VIII)
- Thesis: *Non-idealised models for linear optics quantum computing* (supervised by Prof. Timothy Ralph)
- Specialisations: digital system design, computer architecture, signal & image processing, embedded systems, VLSI device physics & technology, semiconductor devices, operating systems, computer networks, electronics, modern physics & mathematics

Brisbane, Australia

2000-2003

Work History

2025-2026 **Independent Researcher**, Independent

2023-2024 **Senior Quantum Researcher**, BTQ

2017-2020 **ARC Future Fellow**, Centre for Quantum Software & Information (QSI), University of Technology Sydney

2016-2023 **Senior Lecturer**, Centre for Quantum Software & Information (QSI), University of Technology Sydney

2016 **Lecturer**, Centre for Quantum Software & Information (QSI), University of Technology Sydney

2015 **Postdoctoral Research Fellow**, Centre for Quantum Software & Information (QSI), University of Technology Sydney

2011-2014 **Postdoctoral Research Fellow**, Centre of Excellence for Engineered Quantum Systems (EQuS), Macquarie University

Australia

Sydney, Australia

Sydney, Australia

Sydney, Australia

Sydney, Australia

Sydney, Australia

Sydney, Australia

2011-2012 **Postdoctoral Research Fellow**, University of Paderborn

Paderborn, Germany

2010-2011 **Postdoctoral Research Fellow**, Centre for Quantum Computation & Communication Technology (CQC²T), University of Queensland

Brisbane, Australia

2010-2010 **Postdoctoral Research Fellow**, Max-Planck Institute for the Science of Light

Erlangen, Germany

2009-2010 **Bioinformatician**, Institute for Molecular Biosciences (IMB), University of Queensland

Brisbane, Australia

2008-2009 **Software Engineer**, Andrew Corp.

Wollongong, Australia

2007-2008 **Postdoctoral Research Fellow**, Quantum Information Processing IRC, University of Oxford

Oxford, UK

Associate Positions

2023-2025 **Honorary Senior Lecturer**, Macquarie Centre for Quantum Engineering (MQCQE), Macquarie University *Sydney, Australia*
2021-2025 **Associate Investigator**, Center of Excellence for Engineered Quantum Systems (EQuS) *Brisbane, Australia*
2015-2025 **Associate Member**, Hearne Institute for Theoretical Physics, Louisiana State University *Louisiana, USA*

Academic Supervision

PhD graduates, 3
PhD candidates, 6
Masters graduates, 1
Honours graduates, 1
Masters candidates, 1
Engineering Graduate Projects, 32
Undergraduate research projects, 4
Interns, 8

Grants

Australian Research Council (ARC) Future Fellowship

Australia

PETER P. ROHDE

2017-2020

- Title: *Secure quantum computing in a distributed world*
- Value: AU\$652,000

United States National Science Foundation (NSF)

USA

JONATHAN P. DOWLING & PETER P. ROHDE

2014

- Title: *The rise of the boson-sampling quantum computer and the renaissance of the linear optics quantum interferometer*
- Value: US\$10,000

Mentoring

Humanitarian mentoring program, University of Technology Sydney *Sydney, Australia*
PhD mentoring program, ARC Centres of Excellence Mentoring Program *Sydney, Australia*
PhD mentoring program, Centre of Excellence for Engineered Quantum Systems (EQuS) *Sydney, Australia*
Fellowship mentoring program, University of Technology Sydney *Sydney, Australia*

Awards

1999 **Armidale Young Citizen of the Year**, jointly awarded for contributions to Armidale's youth by organising drug and alcohol free events *Armidale, Australia*
1999 **Dux**, University Admission Index 98.05%, Armidale High School *Armidale, Australia*
2002 **Emmanuel College Foundation Medal**, for contributions to the college community *Brisbane, Australia*
2004-2007 **Postgraduate Research Scholarship (UQPRS)**, University of Queensland *Brisbane, Australia*
2000-2003 **Dean's Commendations for High Achievement**, semesters I-IV,VI-VIII, University of Queensland *Brisbane, Australia*
St. Andrew Society of Scotland D. M. Fraser Bursary, for outstanding contribution to the College Community, Emmanuel College, University of Queensland *Brisbane, Australia*
2000-2003 **Golden Key Honours Society**, a society recognising academic excellence *Brisbane, Australia*
2001,2002 **College Scholarship for Academic Achievement**, Emmanuel College, University of Queensland *Brisbane, Australia*
2002 **College Prize for Academic Achievement with Distinction**, Emmanuel College, University of Queensland *Brisbane, Australia*
Emmanuel College Full Blue, for outstanding contribution to the college, Emmanuel College, University of Queensland *Brisbane, Australia*
2001,2002 **Principal's Prize for Meritorious Academic Achievement**, Emmanuel College, University of Queensland *Brisbane, Australia*

Scientific Outreach

- Educational videos**, [Introduction to Mathematica](#) (~ 45, 000 views), [Introduction to boson-sampling](#) (~ 5, 500 views), [The quantum internet: technology, economics & politics](#) (> 200 views)
- 2020 **The Quantum Internet**, [QuBes Camp](#) run by Q-munity
- 2020 **Toward a Quantum Internet**, Kitchener-Waterloo Quantum Technologies Enthusiasts
- 2020 **Quantum computing & quantum cryptography**, Q-munity,
- 2020 **Digital Liberty – In defence of cryptoanarchy**, Public event on digital rights
- 2020 **The barriers to medical cannabis in Australia**, [Enpsychedelia](#), 3CR Radio
- 2019 **Are quantum computers the path to world peace?**, [TEDxNewtown](#), Sydney, Australia
- 2019 **Why quantum physics is science, not witchcraft**, Science @ The Local, Blue Mountains, Australia
- 2019 **An introduction to quantum computing & why it'll be a part of your future**, Kenmore State High School, Brisbane, Australia
- 2019 **What's wrong with quantum mechanics?**, [The Science Nation](#) event for National Science Week, Sydney Maritime Museum, Sydney, Australia
- 2019 **Intro to quantum computing**, [DSAI Special Edition @Microsoft Reactor](#), Sydney, Australia
- 2019 **For the love of science**, [The Science Nation](#), Maritime Museum, Sydney, Australia
- 2018 **Greatest discovery ever made**, [The Science Nation](#) — Great Debate, for National Science Week, Maritime Museum, Sydney, Australia
- 2018 **Quantum computing — What you need to know and why**, NSW Knowledge Management Forum, Sydney, Australia
- 2017 **Spot the Bull**, Sydney Science Festival
- 2017 **Science in the Club — Quantum What?**, Armidale, Australia
- 2016 **Australian Institute of Physics Pub Night**, Sydney, Australia
- 2016 **Dennis Ritchie: The unsung hero of modern computing**, [The Science Nation](#) — Great Debate, Sydney Powerhouse Museum, Sydney, Australia
- 2016 **Quantum technologies of the future**, [Pint of Science Festival](#), Sydney
- 2016 **Computing — Visions of the future**, [The Science Nation](#) — Storytelling of Science, Sydney Powerhouse Museum, Sydney, Australia
- 2015 **Australian Institute of Physics Pub Night**, Sydney, Australia
- 2015 **The Science Nation — Science Says!**, Sydney Powerhouse Museum, Sydney, Australia
- 2015 **Quantum physics beats astrophysics any day of the week!**, [The Science Nation](#) — Great Debate, Sydney Powerhouse Museum, Sydney Science Festival, Sydney, Australia
- 2014 **Australian Institute of Physics Pub Night**, Sydney, Australia
- 2015 **Australian Institute of Physics Free for All Variety Night**, Sydney, Australia
- 2015 **Science @ The Local**, Blue Mountains, Australia
- 2014 **An interview with Sir Peter Knight**, Macquarie University Physics & Astronomy Society, Sydney, Australia
- [The Science Nation \(volunteer\)](#), Sydney, Australia
- [BrisScience public science seminar series \(organising committee\)](#), Brisbane, Australia

Open-source

MoodSnap mood diary (www.moodsnap.app), A free mood diary app with analytics for iOS, made for everybody, written with features for people with mood disorders in mind. MoodSnap has been localised to 5 languages and is available on the [Apple AppStore](#).

QuNet, A multi-user quantum network simulator featuring multi-path entanglement routing, and temporal routing for simulating quantum memories, written in Julia.

Jabalizer, An efficient stabiliser state simulator written in Julia, featuring graph state compilation from Clifford circuits.

Programming language experience

C/C++, C#, Julia, Python, Swift, SwiftUI, LaTeX, Markdown, Unity Engine.

Personal Activities

Alpinism, Mont Blanc (4,808m), Signalkuppe/Punta Gnifetti (4,554m), Dôme du Goûter (4,300m), Naso del Liskamm (4,272m), Castor (4,225m), Zinalrothorn (4,221m), Punta Felik (4,174 meters), Breithorn (4,163m), Felikhorn (4,087m), Weissmies (4,017m), Lagginhorn (4,010m), Aiguilles d'Entrèves (3,600m), Monte Civetta (3,220m), Zugspitze (2,962m)

Student Club executive (Cultural Convener), Emmanuel College, University of Queensland

Writing & directing college musical, Emmanuel College, University of Queensland

Youth politics, Young Liberals QLD Management Committee, Fig Tree Pocket Executive, QLD Convention Delegate, QLD Senior Party Conference Delegate, QLD Policy Standing Committee, Fig Tree Pocket Newsletter Editor, Liberal Students Club Executive

Student Union, University of Queensland Postgraduate Committee

Election campaigning, Australian Federal election, Queensland State election, Brisbane City Council election

Running, Brisbane Marathon ("Lest we forget run") & Bridge to Brisbane run

Debating & public speaking, The Oxford Union, University of Queensland Debating Society, Commonwealth Bank Cup, Hume Barbor, Inter-College Cup, Plain English Speaking Awards, Mock Parliament, Young Liberal National Sir Jim Killen Public Speaking Competition, Griffith University Comedy Debate, Paderborn University Debating Society, Gutenberg Cup, Royal Australian Rant Society, Toastmasters

Drama, Emmanuel College One Act Play team, University of Queensland

Rowing, Emmanuel College rowing team (cox)

Choir, Macquarie University Choir, Wollongong Gospel Choir, Oxford Student Chorus, University of Queensland Musical Society, Emmanuel College, Armidale High School

Chess, University of Queensland Chess Club, Emmanuel College Chess team

Laughing Society, Emmanuel College Laughing Society (Founder & President)

Drumming, Samba Ninja Sydney, Trommel-Feuer Erlangen, Brisbane Samba School

Community & Charity

- 2020 **Senate inquiry submission**, "Current barriers to patient access to medicinal cannabis in Australia", submission #133 *Australia*
- 2012-2016 **Lifeline counsellor**, Suicide intervention and crisis support telephone counselling *Sydney, Australia*
- 2012-2015 **Human Capital Project (administrative committee)**, Providing micro-loans via personal equity contracts to provide university education for underprivileged students in Cambodia *Brisbane, Australia*
- 2012-2016 **Applied Suicide Intervention Skills Training (ASIST)**, Training in emergency suicide intervention counselling *Sydney, Australia*
- 2011 **Brisbane flood cleanup volunteer**, Volunteering to assist the recovery operation in Brisbane following the catastrophic 2011 floods *Brisbane, Australia*
- 2004 **Election scrutineering**, Overseeing the counting of election ballots in the Australian federal election *Brisbane, Australia*
- Charity fundraising**, Raising money for educational charities in South America and supporting local charity events with entertainment *Sydney, Australia*
- 2002 **'Shave for a Cure' Leukemia Foundation fundraiser**, *Brisbane, Australia*
- Community radio announcer**, 2ARM Armidale & VOX FM Illawarra *Australia*
- Blood donor**, Donating blood for the blood bank *Australia*
- Group leader of the 'Stop Gay- and Trans-Hate Now' workshop**, Leading a workshop for hate-affected gay and transexual youths to overcome stigma, discrimination and hatred *Brisbane, Australia*
- 1997-1999 **Armidale Dance Party organisation group**, Providing a safe alcohol- and drug-free social and dance environment for Armidale's youth *Armidale, Australia*
- 1996 **Armidale Streamwatch Society (vice president)**, Engaging with school students for environmental causes, specifically the preservation of waterways *Armidale, Australia*

Published Photography

- 2024 [Australia's 50 Best Multi-day Walks](#), Woodslane Press
- 2023 [Hiking Above Germany's Melting Glaciers During Europe's Record-Breaking Summer](#), We Are Explorers
- 2022 [Thine be the Glory](#), Wild Magazine
- 2022 [Italy's Iron Way: When Via Ferrata Routes Aren't Quite as Straight Forward as Expected](#), We Are Explorers
- 2022 [What's in my pack?](#), Great Walks
- 2022 [Kalymnos — A Climbing Haven in the Greek Isles](#), We Are Explorers
- 2022 [How Hiking Made Me Love NSW Even More](#), We Are Explorers
- 2022 [How Much Should You Spend On Hiking Gear?](#), We Are Explorers
- 2021 [Kosciuszko to Kiandra — Hiking The Snowy Mountains in Summer](#), We Are Explorers
- 2021 [Making Your Own Adventure on The NSW Mid-Coast](#), We Are Explorers
- 2020 [Climbing The Craggs of Point Perpendicular](#), We Are Explorers
- 2020 [Coffs Harbour to Yamba: 125km of Coastal Hiking](#), We Are Explorers

Radio & Podcasts

- 2023 [Will quantum computing break the internet?](#), D3 - The RMIT Digital3 Podcast
- 2023 [The Quantum State \(co-host\)](#), The Quantum Terminal podcast series
- 2022-2023 [Terminally Quantum \(co-host\)](#), The Quantum Terminal podcast series
- 2022 [Blockchain meets quantum computing](#), *Mint & Burn*, the RMIT Blockchain Innovation Hub podcast
- 2021 [The Quantum Internet](#), Talk of Today
- 2019 [Optical quantum computing, the quantum internet, geo-strategic quantum politics, and the upcoming book "The Quantum Internet"](#), meQuanics
- 2018 [Quantum Technology](#), Science @ The Local podcast
- 2016 [A quantum computer does what?](#), Think: Digital Futures, 2ser FM107.3, Sydney, Australia

Media Coverage

- 2023 [Quantum computers could slash the energy use of cryptocurrencies](#), New Scientist
- 2023 [Researchers mine boson sampling for quantum blockchain approach](#), The Quantum Insider
- 2023 [Scientists propose quantum proof-of-work consensus for blockchain](#), Cointelegraph
- 2023 [Research paper around blockchain's proof-of-work mechanism released](#), Financial Express
- 2023 [Quantum computing meets blockchain: Scientists propose new version of proof of work consensus – Future of crypto?](#), Cryptonews
- 2023 [Heeding the happiness call: why academia needs to take faculty mental health more seriously](#), Nature
- 2022 [Data security in a post-quantum world](#), Sydney Quantum Academy
- 2020 [Quantum computing startup raises \\$215 million for faster device](#), Bloomberg Businessweek, by Ashlee Vance, author of the biography of Elon Musk
- 2019 [Science at the Local looks at biological markers of trauma](#), Blue Mountains Gazette
- 2018 [Sydney conferences seal city's global quantum computing reputation](#), Computer World
- 2018 [A small-scale demonstration shows how quantum computing could revolutionise data analysis](#), MIT Technology Review
- 2017 [Virtual interferometers may overcome scale issues](#), New Electronics
- 2017 ['Virtual' interferometers may overcome scale issues for optical quantum computers](#), Phys.org
- 2017 ['Virtual' interferometers may overcome scale issues for optical quantum computers](#), EurekAlert
- 2017 ['Virtual' interferometers may overcome scale issues for optical quantum computers](#), Scimex
- 2016 [Think: Digital Futures – A quantum computer does what?](#), Radio 2ser FM107.3
- 2015 [Getting the measure of matter](#), Sydney Morning Herald
- 2012 [Australian breakthrough brings quantum computing closer](#), The Conversation

Conference Organisation

2022	Technical program committee , Quantum Resource Estimation (QRE)	<i>New York, USA</i>
2021	Co-organiser , Pakistan International Conference on Quantum Information & Computation (PICQIC)	<i>Islamabad, Pakistan</i>
2020	Program committee , Quantum Frontiers & Fundamentals (QFF)	<i>Bangalore, India</i>
2018	Local organising committee , Conference on the Theory of Quantum Computation, Communication & Cryptography (TQC)	<i>Sydney, Australia</i>
2015	Local organising committee , Quantum Information Processing (QIP)	<i>Sydney, Australia</i>
2014	Editorial committee , International Conference on Mathematical Modelling in Physical Sciences	<i>Madrid, Spain</i>
	Organiser , Macquarie University Physics & Astronomy Colloquium	<i>Sydney, Australia</i>
2012	Organiser , First Australian Quantum Walkshop	<i>Sydney, Australia</i>
2012	Organising committee , BrisScience	<i>Brisbane, Australia</i>
2007	Local organising committee , Quantum Information Processing (QIP)	<i>Brisbane, Australia</i>
2005	Co-organiser , Mathematical Aspects of Quantum Information Science (MAQIS)	<i>Brisbane, Australia</i>
2005	Organiser , University of Queensland Physics Colloquium	<i>Brisbane, Australia</i>

Popular Articles

2023	An introduction to graph states , Peter P. Rohde	
2023	How do photonic Bell measurements work? , Peter P. Rohde	
2022	Leading by example: Living with mental illness in academia , Peter P. Rohde (Voices of Academia & Dragonfly Mental Health)	
2022	MoodSnap! Technology for mental health , Peter P. Rohde (The Spectator)	
2021	Blockchain finance in the quantum era , Peter P. Rohde & Gavin Brennen (BTQ Blog)	
2021	Australia should invest in a home-grown quantum industry , Gavin Brennen & Peter P. Rohde (The Strategist, Australian Strategic Policy Institute (ASPI))	
2021	Australia needs a strategy for critical technologies and the quantum revolution , Gavin Brennen, Simon Devitt, Tara Roberson & Peter Rohde (The Strategist, Australian Strategic Policy Institute (ASPI))	
2021	The vision for the global quantum internet , Peter P. Rohde (Fifteeneightfour — The Cambridge University Press Blog)	
2021	The logarithmic ape index , Peter P. Rohde	
2021	Apple's child protection software is a government backdoor , Peter P. Rohde	
2021	A case for universal basic income , Peter P. Rohde	
2020	Jonathan Dowling (1955-2020) , Peter P. Rohde	
2020	Medical marijuana in Australia is a scam , Peter P. Rohde	
2020	Sex crimes vs ware crimes (on Seth Lloyd, Jeffrey Epstein and the military industrial complex) , Peter P. Rohde	
2019	Encryption & anonymity is a responsibility not a right – in defence of cryptoanarchy , Peter P. Rohde	
2019	Don't stop fake news , Peter P. Rohde	
2012	Particles and persecution: why we should care about Iranian physicists , Thomas Stace & Peter P. Rohde (The Conversation)	
2012	Why I am opposed to an Australian Bill of Rights , Peter P. Rohde (Issues in Society – Human Rights & Civil Liberties)	

Publications

STATISTICS

Peer-reviewed publications, 65

Citations, > 3, 500

H-index, 32

i10-index, 64

Highlights, Author of "*The Quantum Internet*" (Cambridge University Press), 2 publications in *Science*, 5 publications in *Physical Review Letters*, 1 publication in *Optica*, 2 book chapters, 1 policy brief

BOOKS

2021 **The Quantum Internet**, Peter P. Rohde (Cambridge University Press)

THESES

2008 **Towards optical quantum information processing**, Peter P. Rohde (PhD thesis)

2004 **Non-idealised models in linear optics quantum computing**, Peter P. Rohde (Honours thesis)

BOOK CHAPTERS

2015 **An introduction to boson-sampling**, Bryan T. Gard, Keith R. Motes, Jonathan P. Olson, Peter P. Rohde & Jonathan P. Dowling (in: *From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexities*, World Scientific Publishing)

2005 **The ecological niches of parasites**, Klaus Rohde & Peter P. Rohde (in: *Marine Parasitology*, CSIRO Publishing)

POLICY BRIEFS

2021 **An Australian strategy for the quantum revolution**, Gavin Brennen, Simon Devitt, Tara Roberson & Peter Rohde (Australian Strategic Policy Institute (ASPI), International Cyber Policy Centre)

JOURNAL PUBLICATIONS

2025 **Faster and improved validation algorithm for boson sampling using coarse graining**, Gopikrishnan Muraleedharan, Sanaa Sharma, Deepesh Singh, Nicolas R. Newton, Peter P. Rohde & Gavin K. Brennen, *SMT* 2025

2025 **Proof-of-work consensus by quantum sampling**, Deepesh Singh, Boxiang Fu, Gopikrishnan Muraleedharan, Chen-Mou Cheng, Nicolas Roussy Newton, Peter P. Rohde & Gavin K. Brennen, *Quantum Science & Technology* **10**, 025020

2024 **Improving continuous-variable quantum channels with unitary averaging**, S. Nibedita Swain, Ryan J. Marshman, Peter P. Rohde, Austin P. Lund, Alexander S. Solntsev & Timothy C. Ralph, *Physical Review A* **110**, 032622

2024 **Optical cluster-state generation with unitary averaging**, Deepesh Singh, Austin P. Lund & Peter P. Rohde, *Physical Review A* **110**, 012457

2024 **Compilation of algorithm-specific graph states for quantum circuits**, Madhav Krishnan Vijayan, Alexandru Paler, Jason Gavriel, Casey R. Myers, Peter P. Rohde & Simon J. Devitt, *Quantum Science & Technology* **9**, 025005

2024 **Upper bounds for the clock speeds of fault-tolerant distributed quantum computation using satellites to supply entangled photon pairs**, Hudson Leone, S. Srikara, Peter P. Rohde & Simon Devitt, *Physical Review Research* **5**, 043302

2024 **Quantum conditional mutual information of W state in non-inertial frames**, Saveetha Harikrishnan, Peter P. Rohde & Chandrashekar Radhakrishnan, *Physica Scripta* **99**, 025106

2023 **Experimental Proposal for Validation of W-state Protocol for Qubits and Qudits**, Rohit K. Ramakrishnan, Aravinth Balaji Ravichandran, Srinivas Talabattula, Anindya Banerji, Nijil Lal, Sarika Mishra, R. P. Singh & Peter P. Rohde, *CLEO 2023*, JTh2A.30

2022 **Reducing circuit complexity in optical quantum computation using 3D architectures (editor's pick)**, Wen-Hao Zhou, Madhav Krishnan Vijayan, Xiao-Wei Wang, Yong-Heng Lu, Jun Gao, Zhi-Qiang Jiao, Ruo-Jing Ren, Yi-Jun Chang, Zi-Song Shen, Peter P. Rohde & Xian-Min Jin, *Optics Express* **30**, 32887

- 2022 **Integrated photonic platforms for quantum technology: A review (invited)**, Rohit K. Ramakrishnan, Aravinth Balaji Ravichandran, Arpita Mishra, Archana Kaushalram, Gopalkrishna Hegde, Srinivas Talabattula & Peter P. Rohde, ISSS Journal of Micro & Smart Systems
- 2022 **The quantum internet: A hardware review (invited)**, Rohit K. Ramakrishnan, Aravinth Balaji Ravichandran, Ishwar Kaushik, Gopalkrishna Hegde, Srinivas Talabattula & Peter P. Rohde, Journal of the Indian Institute of Science
- 2022 **Accessible and inaccessible quantum coherence in relativistic quantum systems**, Saveetha Hari Krishnan, Segar Jambulingam, Peter P. Rohde & Chandrashekar Radhakrishnan, Physical Review A **105**, 052403
- 2021 **Photonic quantum data locking**, Zixin Huang, Peter P. Rohde, Dominic W. Berry, Pieter Kok, Jonathan P. Dowling & Cosmo Lupo, Quantum **5**, 447
- 2020 **Photonic quantum error correction of linear optics using W-state encoding**, Madhav Krishnan Vijayan, Austin P. Lund & Peter P. Rohde, Quantum **4**, 303
- 2020 **Homomorphic encryption of linear optics quantum computation on almost arbitrary states of light with asymptotically perfect security**, Yingkai Ouyang, Si-Hui Tan, Joseph Fitzsimons & Peter P. Rohde, Physical Review Research **2**, 013332
- 2020 **Relativity of quantum states in entanglement swapping**, Chris Nagele, Ebubekukwu O. Ilo-Okeke, Peter P. Rohde, Jonathan P. Dowling & Tim Byrnes, Physics Letters A **384**, 126301
- 2019 **The resurgence of the linear optics interferometer – Recent advances & applications**, Si-Hui Tan & Peter P. Rohde, (invited) Reviews in Physics **4**, 100030
- 2018 **Practical quantum somewhat-homomorphic encryption with coherent states**, Si-Hui Tan, Yingkai Ouyang & Peter P. Rohde, Physical Review A **97**, 042308
- 2018 **Demonstration of topological data analysis on a quantum processor**, He-Liang Huang, Peter P. Rohde, Xi-Lin Wang, Yi-Han Luo, You-Wei Zhao, Chang Liu, Li Li, Nai-Le Liu, Chao-Yang Lu & Jian-Wei Pan, Optica **5**, 193
- 2017 **Passive quantum error correction of linear optics networks through error averaging**, Ryan J. Marshman, Austin P. Lund, Peter P. Rohde & Timothy C. Ralph, Physical Review A **97**, 022324
- 2017 **Multiphoton interference in quantum Fourier transform circuits and applications to quantum metrology**, Zu-En Su, Yuan Li, Peter P. Rohde, He-Liang Huang, Xi-Lin Wang, Li Li, Nai-Le Liu, Jonathan P. Dowling, Chao-Yang Lu & Jian-Wei Pan, Physical Review Letters **119**, 080502
- 2017 **Linear optical quantum metrology with single photons – Experimental errors, resource counting, and quantum Cramér-Rao bounds**, Jonathan P. Olson, Keith R. Motes, Patrick M. Birchall, Nick M. Studer, Margarite LaBorde, Todd Moulder, Peter P. Rohde & Jonathan P. Dowling, Physical Review A **96**, 013810
- 2017 **Measurement-based linear optics**, Rafael N. Alexander, Natasha Gabay, Peter P. Rohde & Nicolas C. Menicucci, Physical Review Letters **118**, 110503
- 2016 **Efficient recycling strategies for preparing large Fock states from single-photon sources: Applications to quantum metrology**, Keith R. Motes, Ryan L. Mann, Jonathan P. Olson, Nicholas M. Studer, E. Annelise Bergeron, Alexei Gilchrist, Jonathan P. Dowling, Dominic W. Berry & Peter P. Rohde, Physical Review A **94**, 012344
- 2016 **Quantum random walks on congested lattices**, Keith R. Motes, Alexei Gilchrist & Peter P. Rohde, Scientific Reports **6**, 19864
- 2015 **Implementing scalable boson sampling with time-bin encoding: analysis of loss, mode mismatch, and time jitter**, Keith R. Motes, Jonathan P. Dowling, Alexei Gilchrist & Peter P. Rohde, Physical Review A **92**, 052319
- 2015 **Multiplexed single-photon state preparation using a fibre-loop architecture**, Peter P. Rohde, L. G. Helt, M. J. Steel & Alexei Gilchrist, Physical Review A **92**, 053829
- 2015 **Multi-scale quantum simulation of quantum field theory using wavelets**, Gavin K. Brennen, Peter P. Rohde, Barry C. Sanders & Sukhwinder Singh, Physical Review A **92**, 032315
- 2015 **The on-ramp to the all optical quantum information processing highway**, Peter P. Rohde & Jonathan P. Dowling, invited perspective article, Science **349**, 696
- 2015 **Linear optical quantum metrology with single photons: Exploiting spontaneously generated entanglement to beat the shot-noise limit**, Keith R. Motes, Jonathan P. Olson, Evan J. Rabeaux, Jonathan P. Dowling, S. Jay Olson & Peter P. Rohde, Physical Review Letters **114**, 170802

- 2015 **Boson sampling with displaced single-photon Fock states versus single-photon-added coherent states — The quantum-classical divide and computational-complexity transitions in linear optics**, Kaushik P. Seshadreesan, Jonathan P. Olson, Keith R. Motes, Peter P. Rohde & Jonathan P. Dowling, *Physical Review A* **91**, 022334
- 2015 **Sampling arbitrary photon-added or photon-subtracted squeezed states is in the same complexity class as boson sampling**, Jonathan P. Olson, Kaushik P. Seshadreesan, Keith R. Motes, Peter P. Rohde & Jonathan P. Dowling, *Physical Review A* **91**, 022317
- 2015 **Evidence for the conjecture that sampling generalized cat states with linear optics is hard**, Peter P. Rohde, Keith R. Motes, Paul Knott, Joseph Fitzsimons, William Munro & Jonathan P. Dowling, *Physical Review A* **91**, 012342
- 2015 **Simple scheme for universal linear optics quantum computing with constant experimental complexity using fiber loops**, Peter P. Rohde, *Physical Review A* **91**, 012306
- 2015 **Boson sampling with photons of arbitrary spectral structure**, Peter P. Rohde, *Physical Review A* **91**, 012307
- 2014 **Scalable boson-sampling with time-bin encoding using a loop-based architecture**, Keith R. Motes, Alexei Gilchrist, Jonathan P. Dowling & Peter P. Rohde, *Physical Review Letters* **113**, 120501
- 2014 **Quantum walks with tuneable self-avoidance in one dimension**, Elizabeth Camilleri, Peter P. Rohde & Jason Twamley, *Scientific Reports* **4**, 4791
- 2013 **Spontaneous parametric down-conversion photon sources are scalable for boson-sampling in the asymptotic limit**, Keith R. Motes, Jonathan P. Dowling & Peter P. Rohde, *Physical Review A* **88**, 063822
- 2013 **Information capacity of a single photon**, Peter P. Rohde, Joseph F. Fitzsimons & Alexei Gilchrist, *Physical Review A* **88**, 022310
- 2013 **Quantum walks with memory provided by recycled coins and a memory of the coin-flip history**, Peter P. Rohde, Gavin K. Brennen & Alexei Gilchrist, *Physical Review A* **87**, 052302
- 2012 **Optical quantum computing with photons of arbitrarily low fidelity and purity**, Peter P. Rohde, *Physical Review A* **86**, 052321
- 2012 **Quantum walks with encrypted data**, Peter P. Rohde, Joseph F. Fitzsimons & Alexei Gilchrist, *Physical Review Letters* **109**, 150501
- 2013 **Increasing the dimensionality of quantum walks using multiple walkers**, Peter P. Rohde, Andreas Schreiber, Martin Štefaňák, Igor Jex, Alexei Gilchrist & Christine Silberhorn, *Journal of Computational & Theoretical Nanoscience* **10**, 1644
- 2012 **A 2D quantum walk simulation of two-particle dynamics**, Andreas Schreiber, Aurél Gábris, Peter P. Rohde, Kaisa Laiho, Martin Štefaňák, Václav Potoček, Craig Hamilton, Igor Jex & Christine Silberhorn, *Science* **336**, 55
- 2012 **Error tolerance of the boson-sampling model for linear optics quantum computing**, Peter P. Rohde & Timothy C. Ralph, *Physical Review A* **85**, 022332
- 2012 **Entanglement dynamics and quasi-periodicity in discrete quantum walks**, Peter P. Rohde, Alessandro Fedrizzi & Timothy C. Ralph, *Journal of Modern Optics* **59**, 710
- 2011 **Time-resolved detection and mode-mismatch in linear optics quantum gates**, Peter P. Rohde & Timothy C. Ralph, *New Journal of Physics* **13**, 053036
- 2011 **Multi-walker discrete time quantum walks on arbitrary graphs, their properties, and their photonic implementation**, Peter P. Rohde, Andreas Schreiber, Martin Štefaňák, Igor Jex & Christine Silberhorn, *New Journal of Physics* **13**, 013001
- 2010 **Scalable quantum computing with atomic ensembles**, Sean D. Barrett, Peter P. Rohde & Thomas M. Stace, *New Journal of Physics* **12**, 093032
- 2008 **Entanglement of remote spins with unequal coupling to an optically active mediator**, Erik M. Gauger, Peter P. Rohde, A. Marshall Stoneham & Brendon W. Lovett, *New Journal of Physics* **10**, 073027
- 2008 **How to measure host specificity**, Klaus Rohde & Peter P. Rohde, *Vie et Milieu (Life & Environment)* **58**, 121
- 2008 **Practical effects in the preparation of cluster states using weak non-linearities**, Peter P. Rohde, William J. Munro, Timothy C. Ralph, Peter van Loock & Kae Nemoto, *QIC* **8**, 0053
- 2007 **Photon number projection using non-number-resolving detectors**, Peter P. Rohde, James G. Webb, Elanor H. Huntington & Timothy C. Ralph, *New Journal of Physics* **9**, 233
- 2007 **Strategies for the preparation of large cluster states using non-deterministic gates**, Peter P. Rohde & Sean D. Barrett, *New Journal of Physics* **9**, 198
- 2007 **Spectral structure and decompositions of optical states, and their applications**, Peter P. Rohde, Wolfgang Mauerer & Christine Silberhorn, *New Journal of Physics* **9**, 91

- 2008 **Trade-off between the tolerance of located and unlocated errors in nondegenerate quantum error-correcting codes**, Henry L. Haselgrove & Peter P. Rohde, QIC **8**, 0399
- 2007 **Error tolerance and tradeoffs in loss- and failure-tolerant quantum computing schemes**, Peter P. Rohde, Timothy C. Ralph & William J. Munro, Physical Review A **75**, 010302(R)
- 2006 **Error models for mode-mismatch in linear optics quantum computing**, Peter P. Rohde & Timothy C. Ralph, Physical Review A **73**, 062312
- 2006 **Practical limitations in optical entanglement purification**, Peter P. Rohde, Timothy C. Ralph & William J. Munro, Physical Review A **73**, 030301(R)
- 2006 **Modeling photo-detectors in quantum optics**, Peter P. Rohde & Timothy C. Ralph, Journal of Modern Optics **53**, 1589
- 2005 **Optimal photons for quantum information processing**, Peter P. Rohde, Timothy C. Ralph & Michael A. Nielsen, Physical Review A **72**, 052332
- 2005 **Quantum gate characterization in an extended Hilbert space**, Peter P. Rohde, G. J. Pryde, J. L. O'Brien & Timothy C. Ralph, Physical Review A **72**, 032306
- 2005 **Non-deterministic approximation of photon number discriminating detectors using non-discriminating detectors**, Peter P. Rohde, Journal of Optics B **7**, 82
- 2005 **Frequency and temporal effects in linear optical quantum computing**, Peter P. Rohde & Timothy C. Ralph, Physical Review A **71**, 032320
- 2001 **Fuzzy Chaos: Reduced chaos in the combined dynamics of several independently chaotic populations**, Klaus Rohde & Peter P. Rohde, American Naturalist **158**, 553

PREPRINTS

- 2022 **A general framework for the composition of quantum homomorphic encryption & quantum error correction**, Yingkai Ouyang & Peter P. Rohde
- 2021 **QuNet: Cost vector analysis & multi-path entanglement routing in quantum networks**, Hudson Leone, Nathaniel Miller, Deepesh Singh, Nathan K. Langford & Peter P. Rohde
- 2021 **Quantum crypto-economics: Blockchain prediction markets for the evolution of quantum technology**, Peter P. Rohde, Vijay Mohan, Sinclair Davidson, Chris Berg, Darcy Allen, Gavin K. Brennen & Jason Potts
- 2019 **Photonic quantum simulations of SSH-type topological insulators with perfect state transfer**, M. Stobińska, T. Sturges, A. Buraczewski, W. R. Clements, J. J. Renema, S. W. Nam, T. Gerrits, A. Lita, Peter P. Rohde, W. S. Kolthammer, A. Eckstein & I. A. Walmsley
- 2016 **A quantum optics argument for the #P-hardness of a class of multidimensional integrals**, Peter P. Rohde, Dominic W. Berry, Keith R. Motes & Jonathan P. Dowling
- 2015 **Bosonic interference as a complementary resource for implementation of quantum walks**, agdalena Stobińska, Peter P. Rohde, Paweł Kurzyński & Anton Zeilinger
- 2014 **Will boson-sampling ever disprove the Extended Church-Turing thesis?**, Peter P. Rohde, Keith R. Motes, Paul Knott & William J. Munro
- 2011 **Optimising number resolving photo-detectors using classical post-processing**, Peter P. Rohde
- 2010 **Are quantum walks the saviour of optical quantum computing?**, Peter P. Rohde
- 2006 **Improving the fidelity of single photon preparation from conditional down-conversion via asymmetric multiport detection**, Peter P. Rohde
- 2007 **Noise thresholds for entanglement purification**, Peter P. Rohde
- 2007 **Error propagation in loss- and failure-tolerant quantum computation schemes**, Peter P. Rohde, Timothy C. Ralph & William J. Munro
- 2005 **Quantum state tomography of single photon sources in the spectral degree of freedom**, Peter P. Rohde

UNPUBLISHED PAPERS & NOTES

- 2025 **A mathematical critique of socio-political chaos**, Peter P. Rohde
- 2025 **Computer architecture notes (CMOS architecture using reversible differential codes)**, Peter P. Rohde
- 2024 **Distributed consensus networks**, Peter P. Rohde
- 2024 **Information security in the quantum era**, Peter P. Rohde
- 2024 **Information-theoretically secure post-quantum cryptography (notes #1)**, Peter P. Rohde
- 2024 **Information-theoretically secure post-quantum cryptography (notes #2)**, Peter P. Rohde
- 2024 **Quantum cryptographic primitives using graph states**, Peter P. Rohde
- 2024 **Graph state digital signature scheme**, Peter P. Rohde

Presentations

INVITED TALKS

2023	A brief history of optical quantum computing , Sydney Quantum Academy student seminar series	<i>Sydney, Australia</i>
2023	The quantum internet , CQuERE, TCG CREST	<i>Kolkata, India</i>
2023	The quantum internet , International School on Physics & Allied Disciplines (ISPAD)	<i>Islamabad, Pakistan</i>
2023	The quantum internet , Jonathan P. Dowling Memorial Conference	<i>Sydney, Australia</i>
2022	The vision of the global quantum internet , Telstra Unconference	<i>Sydney, Australia</i>
2022	Optical quantum computing, boson-sampling & quantum networking , ACM School on Quantum Computing, Indian Institute for Technology Madras	<i>Madras, India</i>
2021	Evolution of the quantum internet: Secure cloud quantum computation , Inside Quantum Technology (IQT)	<i>New York, USA</i>
2021	Quantum networking , Quantum Communications Workshop (QCW), IEEE-IISc Communications Society	<i>Bangalore, India</i>
2021	The quantum internet , Sydney Quantum Academy seminar series	<i>Sydney, Australia</i>
2020	Multi-path entanglement routing in the quantum internet , Quantum Frontiers & Fundamentals (QFF), Raman Research Institute (RRI)	<i>Bangalore, India</i>
2020	Geo-strategic politics in the quantum era , Raman Research Institute (RRI)	<i>Bangalore, India</i>
2018	The quantum internet — Towards the singularity , Indian Institute of Science	<i>Bangalore, India</i>
2018	The quantum internet — Implications for society , Quantum Frontiers & Fundamentals (QFF)	<i>Bangalore, India</i>
2018	The quantum internet — Implications for society , University of Science & Technology China	<i>Shanghai, China</i>
2017	The quantum internet — Implications for society , International Workshop on Quantum Computing & Quantum Information Processing (QCQIP)	<i>Beijing, China</i>
2017	Quantum computing — A gentle introduction , Indian Institute of Science	<i>Bangalore, India</i>
2017	Introduction to optical quantum computing , Brainstorming Workshop on Quantum Computation, Information, Communications & Cryptography, Indian Institute of Science	<i>Bangalore, India</i>
2017	Optical quantum information processing — From beginnings to the cutting edge (4 part series) , Summer school in Optics & Photonics (SOAP), Indian Institute of Science	<i>Bangalore, India</i>
2017	Advances in linear optics quantum information processing , Centre for Quantum Technologies (CQT), National University of Singapore	<i>Singapore</i>
2017	Encrypted optical quantum computation , Centre for Quantum Technologies (CQT), National University of Singapore	<i>Singapore</i>
2017	Encrypted optical quantum computation , Centre for Quantum Computation & Communication Technology (CQC ² T) Quantum Optics Workshop, University of Queensland	<i>Brisbane, Australia</i>
2016	Introduction to optical quantum information processing , COMMAD'2016, Optoelectronic & Microelectronic Materials & Devices, University of New South Wales	<i>Sydney, Australia</i>
2016	Post-classical quantum computation — A vision for the future , Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS) Quantum Photonics Connections Conference	<i>Sydney, Australia</i>
2016	Verification of boson-sampling devices , University of Science & Technology China	<i>Shanghai, China</i>
2016	An introduction to boson-sampling , University of Science & Technology China	<i>Shanghai, China</i>
2016	An introduction to computational complexity theory , University of Science & Technology China	<i>Shanghai, China</i>
2016	Bitcoin, the Blockchain & smart contracts , Australian Libertarian Society Friedman Conference	<i>Sydney, Australia</i>
2016	Strategies for the efficient preparation of large photon-number Fock states , Centre for Quantum Computation & Intelligent Systems	<i>Sydney, Australia</i>
2016	Errors and scalability in boson-sampling , RMIT Photonic Quantum Computing Workshop	<i>Melbourne, Australia</i>
2015	Resource efficient schemes for linear optics quantum computing using fiber-loops , University of Maryland	<i>Maryland, USA</i>
2015	Resource efficient schemes for linear optics quantum computing using fiber-loops , Macquarie University Quantum Sciences	<i>Sydney, Australia</i>
2015	Linear optical quantum metrology with single photons — Exploiting spontaneously generated entanglement to beat the shotnoise limit , University of Sydney	<i>Sydney, Australia</i>
2015	Fiber-loop architectures for optical quantum information processing , University of Sydney	<i>Sydney, Australia</i>
2014	Boson-sampling: the first post-classical quantum computer? , Sydney Quantum Information Theory Workshop	<i>Sydney, Australia</i>

2014	The role of charity in civil society , Australian Libertarian Society Friedman Conference	<i>Sydney, Australia</i>
2014	Boson-sampling: a new route for optical quantum computing , Centre of Excellence for Engineered Quantum Systems (EQuS), Macquarie University	<i>Sydney, Australia</i>
2014	Quantum walks with memory , American Mathematical Society Special Session on Quantum Walks, Quantum Computation & Related Topics	<i>Baltimore, USA</i>
2013	An introduction to boson-sampling , Institute of Theoretical Physics & Astrophysics, University of Gdansk	<i>Gdansk, Poland</i>
2012	An introduction to computational complexity theory , Centre of Excellence for Engineered Quantum Systems (EQuS), Macquarie University	<i>Sydney, Australia</i>
2012	An introduction to wavelet theory , Centre of Excellence for Engineered Quantum Systems (EQuS), Macquarie University	<i>Sydney, Australia</i>
2012	An introduction to quantum walks , First Australian Quantum Walkshop	<i>Sydney, Australia</i>
2011	Advances in linear optics quantum computing , Leibnitz University	<i>Hannover, Germany</i>
2011	What do we need to build an optical quantum computer? , University of Paderborn	<i>Paderborn, Germany</i>
2009	Escher — A de novo genetic sequencing tool using graph theory , International Conference on De Novo Sequencing	<i>Beijing, China</i>
2007	Strategies for the preparation of cluster states using non-deterministic gates , University of Oxford	<i>Oxford, UK</i>
2006	Mode-matching effects in linear optics quantum computing , International Conference on Quantum Optics (ICQO)	<i>Minsk, Belarus</i>
2005	A theoretical introduction to quantum walks , Max-Planck Institute for the Science of Light	<i>Erlangen, Germany</i>

INVITED PANEL DISCUSSIONS & DEBATES

2023	Future Communications Research Centre Industry Forum , Macquarie University	<i>Sydney, Australia</i>
2023	Cyber security in the quantum age , Quantum Australia	<i>Sydney, Australia</i>
2022	Keeping data safe in a post quantum world , Gateway Network Governance Body (GNGB)	<i>Sydney, Australia</i>
2022	Quantum Networking — A national quantum network: opportunities and challenges , Quantum Australia	<i>Sydney, Australia</i>
2022	Why quantum communication? , Inside Quantum Technology (IQT)	<i>The Hague, Netherlands</i>
2021	ASPI Presents: An Australian strategy for the quantum revolution , Australian Strategic Policy Institute (ASPI)	<i>Canberra, Australia</i>
2018	Should Australia be a Republic or a Monarchy? , Australian Libertarian Society Friedman Conference	<i>Sydney, Australia</i>

CONTRIBUTED TALKS

2023	Distributed consensus using quantum proof-of-work , Virtual Science Forum Speaker's Corner	<i>Online</i>
2015	Fiber-loop architectures for optical quantum information processing , Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS) Workshop, University of Sydney	<i>Sydney, Australia</i>
2013	Quantum walks with memory , Quantum Simulation & Quantum Walks Workshop	<i>Pisa, Italy</i>
2012	A 2D quantum walk simulation of two-particle dynamics , Australian Institute of Physics Congress (AIP)	<i>Sydney, Australia</i>
2012	Optical multi-walker quantum walks , Quantum Dynamics & Quantum Walks Workshop	<i>Okazaki, Japan</i>