

Stephen D. Bartlett

Director, The University of Sydney Nano Institute and Professor in Physics

Address: School of Physics,
The University of Sydney,
NSW 2006, Australia
Phone: +61 2 9351 3169
Fax: +61 2 9351 7726
Email: stephen.bartlett@sydney.edu.au
Web: <https://www.sydney.edu.au/science/about/our-people/academic-staff/stephen-bartlett.html>
Citizenships: Australian and Canadian

Biography

I am a theoretical quantum physicist and Professor in the School of Physics. I lead a team pursuing both fundamental and applied research in quantum information theory, including the theory of quantum computing.

I am the Director of the University of Sydney Nano Institute, and the Director of the ARC Training Centre for Future Leaders in Quantum Computing. I have previously served as the Associate Dean Research for the Faculty of Science (2020-2023).

I am the inaugural Lead Editor of the APS journal *PRX Quantum*. I am a Fellow of the American Physical Society (APS), the Australian Institute of Physics (AIP), and the Royal Society of NSW. I led the establishment of *Quantum Australia* – the national centre for quantum growth; I serve on the Executive Board of the Sydney Quantum Academy, and on the International Scientific Advisory Board of the Stewart Blusson Quantum Matter Initiative at UBC.

Academic appointments

Director, University of Sydney Nano Institute, 2023-2028

Professor, School of Physics, The University of Sydney, Jan 2012 –

Lead Editor, APS journal *PRX Quantum*, 2020-2026

Associate Dean Research, Faculty of Science, The University of Sydney, 2020-2023

Visiting Researcher, Perimeter Institute for Theoretical Physics, Aug – Dec 2009

Associate Professor, The University of Sydney, Jan 2010 – Dec 2011

Senior Lecturer, The University of Sydney, Jan 2008 – Dec 2009

Lecturer, The University of Sydney, Jan 2005 – Dec 2007

Lecturer (fixed-term), The University of Queensland, Jan 2004 – Jan 2005

ARC Postdoctoral Research Fellow, University of Queensland, Jul 2003 – Dec 2003

ARC Postdoctoral Research Fellow, Macquarie University, Jan 2003 – Jul 2003

Macquarie University Research Fellow, Macquarie University, Jan 2001 – Jan 2003

Promoted to *Level B: Lecturer* effective 1/1/2003

Research Associate, Macquarie University, Jul 2000 – Jan 2001

Education

Doctor of Philosophy in Physics, University of Toronto, 2000

Thesis: *Quantization of a Classical Model with Symmetry*

Supervisor: Prof David J Rowe

Master of Science in Physics, University of Toronto, 1996

Bachelor of Science in Physics and Mathematics, University of Waterloo, 1995

Graduate Certificate in Higher Education, University of Sydney, 2007.

Selected Awards and Fellowships

Fellow of the American Physical Society (APS)	2020
Fellow of the Royal Society of New South Wales	2020
SUPRA Supervisor of the Year Award	2017
Selby Research Award	2005
Australian Research Council Postdoctoral Fellowship	2003-2005
Macquarie University Research Fellowship	2001-2004

Senior Advisory Roles

Foundation Director , Quantum Australia industry growth centre	2024-2027
Training Centre Director , Future Leaders in Quantum Computing	2024-2028
Board of Directors , Sydney Quantum Academy	2020-2024
Expert Advisory Panel , Transport for NSW Quantum program	2021-2024
College of Reviewers , Alliance Quantum program, Canada	2022-2025
Scientific Advisory Board , Steward Blusson Quantum Matter Institute, University of British Columbia, Canada	2021-2024
Scientific Advisory Board , Quantum Benchmark Inc	2018-2021

Research Grants

Summary

Over my career I have secured >20 major grants, many of which are large collaborative projects, with a combined research income exceeding \$150 million (of which over \$50 million has come to U. Sydney). Currently I manage a budget for my research group of over \$2 million p.a. in external funding.

Successful Competitive Research Grants - External

Project Title	Investigators	Scheme	Value	Year
ARC Training Centre for Future Leaders in Quantum Computing (FLiQC)	SD Bartlett +15 CIs +17 PIs	ARC ITTC	\$4.95M	2024-2028
Quantum Australia – National Centre for Quantum Growth	SD Bartlett (lead)	DISR Australian Centre for Quantum Growth	\$18.3M	2024-2027
Entangled HEX: Building Superconducting Logical Qubits	SD Bartlett R Harper B Brown	IARPA ELQ	\$ 4.2M	2023-2027
Benchmarking Quantum Enhancement in Science & Technology (BeQuest) Phase II	I Hen SD Bartlett	DARPA Quantum Benchmarking	\$ 400k Syd	2023-2025
Driven qubit implementations in silicon-MOS devices	A Dzurak SD Bartlett + 6 additional PIs	U.S. ARO QS5	\$ 464k Syd \$ 7.1M total	2023-2026
Simulating and verifying quantum circuits	SD Bartlett R Raussendorf	ARC Discovery	\$ 435 092	2022-2024



Hierarchical Quantum Estimation of Resources (HiQuER)	T Okhi SD Bartlett V Gheorghiu	DARPA Quantum Benchmarking	\$ 250k Syd \$ 4.1M total	2022- 2023
Verification of Quantum Fault Tolerance (VEQTOR)	T Monz R Blatt SD Bartlett + 6 internat. PIs	U.S. ARO QCISS	\$ 1.1M Syd \$ 7.3M total	2020- 2024
Multi-qubit operations using silicon-MOS quantum dots	A Dzurak A Morello SD Bartlett ST Flammia M Gyure	U.S. ARO Qubits in Silicon	\$ 1.0M Syd \$ 5.2M total	2017- 2021
Symmetry and topology for robust quantum information	SD Bartlett AC Doherty	ARC Discovery	\$ 285 000	2017- 2019
ARC Centre of Excellence for Engineered Quantum Systems	AG White SD Bartlett + 15 Aust. CIs + 16 internat. PIs	ARC Centres of Excellence	\$ 6.6M Syd \$ 31.9M tot	2017- 2024
Multi-qubit systems based on electron spins in coupled quantum dots	CM Marcus SD Bartlett in international team of 10 CIs	IARPA Multi-Qubit Coherent Operations Capstone Activity	\$ 116k Syd \$ 514k total	2015- 2016
Photonic Quantum Characterization, Verification, and Validation	JL O'Brien SD Bartlett + 7 internat. PIs	U.S. ARO QCVV	\$ 350k Syd \$ 4.4M total	2014- 2018
Bulk-boundary correspondence in quantum many-body systems	SD Bartlett AC Doherty	ARC Discovery	\$ 270 000	2013- 2015
ARC Centre of Excellence for Engineered Quantum Systems	GJ Milburn SD Bartlett + 15 Aust. CIs + 16 internat. PIs	ARC Centres of Excellence	\$ 5.6M Syd \$ 24.5M tot	2011- 2017
NSW state government support - ARC Centre of Excellence for Engineered Quantum Systems	SD Bartlett, MJ Biercuk, AC Doherty, DJ Reilly, J Twamley (MQ)	NSW Science Leveraging Fund	\$ 250k Syd \$ 500k total	2011
Multi-qubit systems based on electron spins in coupled quantum dots	CM Marcus SD Bartlett in international team of 14 CIs	IARPA Multi-Qubit Coherent Operations	\$ 4.2M Syd \$ 27.5M tot	2010- 2014
Quantum limits in measurement and communication <i>ranked A+ (top third of successful grants)</i>	GJ Pryde AC Doherty SD Bartlett HM Wiseman	ARC Discovery	\$ 410 000	2009- 2011
Quantum-enhanced reference systems <i>ranked A+ (top third of successful grants)</i>	SD Bartlett	ARC Discovery	\$ 317 000	2008 2009 2010
Optical quantum computing	P Kwiat A Zeilinger AG White SD Bartlett ...	ARDA QCCM	\$ 6.0M	2005- 2008
Entanglement as resource for quantum technology	AC Doherty SD Bartlett	ARC Discovery	\$ 300 000	2005- 2007
Controlling quantum technologies	AG White SD Bartlett AC Doherty A Gilchrist	ARC Discovery	\$ 660 000	2005- 2007

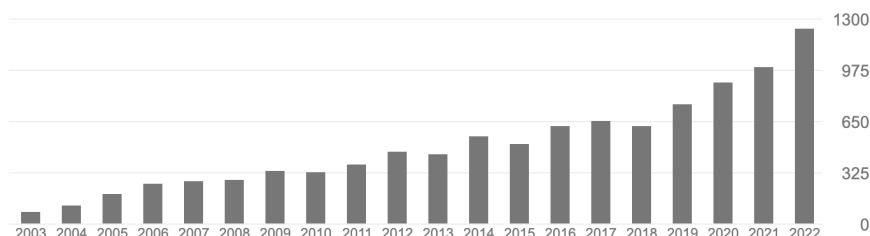
	JL O'Brien GJ Pryde			
Relative Quantum Information	SD Bartlett RW Spekkens DR Terno	ARC Linkage International – Awards	\$ 30 500 + matching funds	2004- 2006
Quantum Properties of Distributed Systems (QUPRODIS) – part of European Fifth Framework project	BC Sanders SD Bartlett D Berry	IAP – International S&T Competitive Grants	\$ 45 000	2003- 2005
Optical realisations of continuous-variable quantum information	SD Bartlett	ARC Discovery (inc. APD Fellowship)	\$ 208 035	2003- 2005

Successful Competitive Research Grants - Internal

Project Title	Investigators	Scheme	Value	Year
Foundations of Quantum Computing	SD Bartlett R Harper ST Flammia	USyd Education Innovation Grant	\$ 12 000	2019
New topological quantum physics on an integrated photonic chip	W Zhang X Jin SD Bartlett + 4 others	OGE Partnership Collaboration Awards - SJTU	\$ 20 000	2019
Algebra and Topology in Quantum Nanoscience	SD Bartlett B Goldys + 7 others	AINST Accelerator	\$ 70 000	2015
USyd-ICL collaboration on quantum computation in spin systems	SD Bartlett	International Program Development Fund	\$ 10 000	2009
USyd International Visiting Research Fellowship for Prof J O'Brien	SD Bartlett JL O'Brien	USyd International Visiting Research Fellow	\$ 11 500	2008
Quantum-enhanced Reference Systems	SD Bartlett	USydney Bridging Support	\$ 70 000	2007
USyd Short-Term Visiting Fellowship for Dr T Rudolph	SD Bartlett T Rudolph	USyd Short-Term Visiting Fellowship	\$ 9 000	2006
Quantum-enhanced Reference Systems	SD Bartlett	USydney R&D Grant-ECR	\$ 23 000	2006
Reference Frames, Superselection Rules, and Quantum Information Theory	SD Bartlett	Selby Research Award	\$ 6 500	2005
Sydney Quantum Info. Theory Workshop	SD Bartlett	Denison Small Grant	\$ 9 000	2005
Creating new resources for optical quantum information processing	SD Bartlett	UQ New Staff Research Start-Up Fund	\$ 11 950	2004
Discriminating photon detectors and applications to quantum computation	SD Bartlett	Macquarie University New Staff Scheme	\$ 5 439	2002
Applications of Group Theory to Quantum Networks	SD Bartlett	Macquarie University Research Fellowship	\$ 57 622 \$ 57 622 \$ 57 622	2001 2002 2003

Research performance

Citation report



Total citations: 12205 as of 14 July 2024 [source: Google Scholar]
h-index: 56 (56 publications with at least 55 citations)
Field-weighted citation impact: 1.94 average for 5-year period 2019-2023

Most-cited publications

1. Stephen D. Bartlett, Terry Rudolph, and Robert W. Spekkens,
“Reference frames, superselection rules, and quantum information,”
Reviews of Modern Physics **79**, 555 (2007).
1027 citations
2. Marcus Cramer, Martin B Plenio, Steven T Flammia, David Gross, Stephen D Bartlett,
Rolando Somma, Olivier Landon-Cardinal, Yi-Kai Liu, and David Poulin,
“Efficient quantum state tomography,”
Nature Communications **1**, 149 (2010).
859 citations
3. B. L. Higgins, D. W. Berry, S. D. Bartlett, H. M. Wiseman, and G. J. Pryde,
“Entanglement-free Heisenberg-limited phase estimation,”
Nature **450**, 393 (2007).
770 citations
4. Stephen D. Bartlett, Barry C. Sanders, Samuel L. Braunstein, and Kae Nemoto,
“Efficient Classical Simulation of Continuous Variable Quantum Information,”
Physical Review Letters **88**, 097904 (2002).
452 citations
5. Nathan K. Langford, Rohan B. Dalton, Michael D. Harvey, Jeremy L. O'Brien,
Geoff J. Pryde, Alexei Gilchrist, Stephen D. Bartlett, Andrew G. White,
“Entangled qutrits: production and characterisation,”
Physical Review Letters **93**, 053601 (2004).
452 citations

Invited expert commentary in *Nature* and *Science*

1. Andre Saraiva and Stephen D. Bartlett,
“The dawn of error correction with spin qubits,” – News and Views
Nature Materials **22**, 157 (2023).
2. Stephen D. Bartlett,
“Programming a quantum phase of matter,” – Perspectives
Science **374**, 1200 (2021).

3. Stephen D. Bartlett,
“Atomic Physics: A milestone in quantum computing,” – News and Views
Nature **536**, 35 (2016).
4. Stephen D. Bartlett,
“Quantum Metrology: The sensitive side of a spin,” – News and Views
Nature Nanotechnology **11**, 215 (2016).
5. Stephen D. Bartlett,
“Quantum Computing: Powered by magic,” – News and Views
Nature **510**, 345 (2014).

Accepted talks at Quantum Information Processing (QIP) workshops

The QIP workshop is the premiere annual conference in quantum information theory. It is highly selective, with a talk acceptance rate of ~20%.

1. Pablo Bonilla Ataides, David Tuckett, Stephen Bartlett, Steve Flammia, Ben Brown,
The XZZX surface code,
Plenary, QIP 2021, Munich, Germany, 1-6/02/2021.
2. Hakop Pashayan, Oliver Reardon-Smith, Kamil Korzekwa, Stephen Bartlett,
Fast estimation of outcome probabilities for quantum circuits,
QIP 2021, Munich, Germany, 1-6/02/2021.
3. Stephen Bartlett, Sergey Bravyi, Benjamin Brown, Christopher Chubb, Andrew Darmawan,
Steven Flammia, David Tuckett and Dominic Williamson
High thresholds from symmetries of quantum codes,
QIP 2020, Shenzhen, China, 6-10/01/2020.
4. Sam Roberts, Beni Yoshida, Aleksander Kubica, and Stephen D. Bartlett
Symmetry protected topological order at nonzero temperature,
QIP 2017, Seattle, WA, USA, 16-20/01/2017.
5. Dominic V. Else, Stephen D. Bartlett, and Andrew C. Doherty,
Symmetry protection of measurement based quantum computation in ground states,
QIP 2013, Beijing, China, 23-27/01/2013.

Invited Research Talks and Lectures - Selected

1. *Dawn in the Age of Quantum Fault Tolerance*,
Invited talk at *Near-Term Quantum Computers: Fault Tolerance, Benchmarking, Quantum Advantage, Quantum Algorithms*, Simons Institute for the Theory of Computing, Berkeley CA, 22-26/04/2024.
2. *Making Quantum Error Correction Practical*,
Colloquium at School of Physics, University of Melbourne, Australia, 22/05/2023.
3. *Making Quantum Error Correction Practical*,
Invited talk at *SFB BeyondC Conference 2022 – Frontiers of Quantum Information Science*, Vienna, Austria 4-9/09/2022.
4. *Quantum Error Correction: The Academic Perspective*,
Invited tutorial talk at *ESSCIRC – ESSDERC 2020*, Grenoble, France (online due to COVID-19), 14-15/09/2020.
5. *Symmetry, topology, and thermal stability*,
Invited research talk at *Symmetry, phases of matter, and resources for quantum computing*, Perimeter Institute, Canada, 26-29/11/2019.
6. *Quantum memories and Schrödinger’s cat*,
Invited research talk at *SOQUTE*, Fudan University, China, 4-8/10/2019.

7. *Self-correction, symmetry, and Schrödinger's cat*,
Invited research talk at *LFIQIS*, Talkeetna, AK, USA, 18/07/2019.
8. *Topological quantum memories and computational phases*,
Invited summer school lectures Fudan University, China, 10-11/07/2019.
9. *Quantum memories and Schrödinger's cat*,
Colloquium at IQC, University of Waterloo, Canada, 10/06/2019.
10. *Quantum memories and Schrödinger's cat*,
Colloquium at School of Physics, UNSW, Australia, 9/04/2019.
11. *Longitudinal coupling of spin qubits*,
Invited research talk at *Spin Qubits 4*, Konstanz, 10-14/09/2018.
12. *Spin-qubit quantum computing: Benchmarking, error correction, and fault-tolerance*,
Invited tutorial lecture at *Spin Qubits 4*, Konstanz, 10-14/09/2018.
13. *New directions in the theory of fault-tolerant quantum computing*,
Invited research talk at *Spin Qubits 3*, Sydney, 6-10/11/2017.
14. *Contextuality and quantum simulation*,
Invited research talk at *Contextuality: Conceptual Issues, Operational Signatures, and Applications*, Perimeter Institute, Waterloo, 24-27/7/2017.
15. *Quantum computational phases of matter*,
Invited lectures at *Canadian Quantum Information Summer School*, Orford, Quebec, 29/5-7/6/2017.
16. *Uncertainty in quantum physics*,
Invited panel session speaker at 'Peace and Security Under Uncertainty' CISS Global Forum, Q Station Sydney, 28/4/2017.
17. *Topological phases and quantum information*,
Invited research talk at *IGA/AMSI Workshop – Topological Matter, Strings, K-theory and related areas*, Adelaide, Australia, 26-30/09/2016.
18. *Quantum mechanics*,
Invited lecture course in the Perimeter Scholars International (PSI) program at the Perimeter Institute, Waterloo, Canada, 7-23/09/2016.
19. *Topological phases and quantum information*,
Invited lecture series at *NBI/QDev 2016 Summer School – Quantum Information in Condensed Matter Physics*, Copenhagen, Denmark, 3-8/07/2016.
20. *Stabilizers, Negativity, Contextuality, and Ontological Models*,
Invited research talk at *Contextuality as a Resource for Quantum Computation* workshop, UCL, London, UK, 20-22/06/2016.
21. *Physics and information in quantum matter: letting the cat out of the box*,
Invited talk and panel session speaker at *Q3: Q Symposium 2016, 'Peace and Security in a Quantum Age: Moment, Matter, Mind and Metaphysics'*, Q Station Sydney, 11-13/2/2016.
22. *Topological phases and quantum information*,
Invited research talk at *Gordon Godfrey Workshop on Spins and Strong Electron Correlations 2015*, UNSW, Sydney, Australia, 2-6/11/2015.
23. *Estimating outcome probabilities of quantum circuits using quasiprobabilities*,
Invited research talk at *Foundations of Quantum Information*, Kelona, B.C., Canada, 6-10/07/2015.
24. *Calibration and Verification of Quantum Gates*,
Invited research talk at *Spin Qubits 2014*, Konstanz, Germany, 18-22/08/2014.
25. *Suppressing noise with real-time Hamiltonian estimation*,
Invited research talk at *CIFAR Quantum Information Science Program Meeting*, Quebec, Canada, 03-06/06/2014.

26. *Quantum computational matter*,
Invited research talk at *Progress towards Practical Quantum Information Processing*, Royal Society, UK, 18/10/2013.
27. *Quantum computational matter*,
Invited research talk at *UBC-MPG workshop on Quantum Information & Foundations of Quantum Mechanics*, UBC, Vancouver, Canada, 01/07/2013-05/07/2013.
28. *Quantum computational matter*,
Invited research talk at *Last Frontiers in Quantum Information Science*, Fairbanks, Alaska, USA, 17/06/2013-21/06/2013.
29. *Quantum tomography of spin qubits*,
Invited research talk at *IARPA workshop on Quantum Characterisation, Verification and Validation*, La Jolla, CA, USA, 30/01/2013-31/01/2013.
30. *Quantum computational matter*,
Invited research talk at workshop on *Quantum-Photonic Hardware*, Rottnest Island, Australia, 22/10/2012-25/10/2012.
31. *Quantum tomography of spin qubits*,
Invited research talk at *LPS workshop on Quantum Characterisation, Verification and Validation*, Washington D.C., USA, 30/04/2012-01/05/2012.
32. *Quantum computational matter*,
Colloquium at the Perimeter Institute for Theoretical Physics, Waterloo, Canada, 12/10/2011.
33. *Quantum computational matter*,
Colloquium at the School of Physics and Mathematics, University of Queensland, Brisbane, Australia, 23/9/2011.
34. *Quantum computational phases of matter*,
Invited research talk at *JQI Workshop – From Quantum Information and Complexity to Post-Quantum Information Security*, Joint Quantum Institute, Maryland, USA, 27/10/2010-29/10/2010.
35. *Epistemic vs ontic interpretations of the state of quantum systems in the presence of closed timelike curves*,
Invited research talk at *PIAF'09 – New Perspectives on the Quantum State*, Perimeter Institute for Theoretical Physics, Waterloo, Canada, 27/9/2009-2/10/2009.
36. *Quantum computers: A new phase of matter?*,
Invited research talk at *LPHYS'09*, Barcelona, Spain, 13/07/09 - 17/07/09.
37. *Quantum computers: A new phase of matter?*,
Invited research talk at *Quantum Frontiers Symposium*, Brisbane, Australia, 02/04/09 - 03/04/09.
38. *Quantum reference frames and relationalism in quantum theory*,
Invited research talk at *The Clock and The Quantum*, Perimeter Institute for Theoretical Physics, Waterloo, Canada, 28/9/2008-2/10/2008.
39. *Identifying Phases of Matter that are Universal for Quantum Computation*,
Keynote research talk at *Theory Canada 4*, Montreal, Canada, 04/06/08 – 07/06/08.
40. *Encoding a Cartesian frame using clouds of spins*,
Invited research talk at *Advanced Quantum Measurement* workshop, Leiden, the Netherlands 05/11/07 – 09/11/07.
41. *Universal Control of Optical Quantum Information*,
Invited research talk at *Frontiers in Optics 2007* (OSA Annual Meeting), San Jose, CA, 16/09/07 - 20/09/07.



42. *Quantum-computational universality and quantum phase transitions in the ground states of spin lattices*,
Invited research talk at *Iran International Conference on Quantum Information*, Kish Island, Iran, 07/09/07 - 10/09/07.
43. *Optimal eavesdropping strategies in quantum cryptography using photonic quantum control*,
Invited research talk *Quantum Communications and Quantum Imaging V, SPIE International Symposium on Optics and Photonics*, San Diego, CA, 26/08/07 - 30/08/07.
44. *Quantum operations and measurements on a qubit using feedback control*,
Invited research talk at *Principles and Applications of Control in Quantum Systems (PRACQSYS 2007)*, Sydney, Australia, 09/07/07 - 13/07/07.
45. *Techniques for group parameter estimation which maximize the likelihood*,
Invited research talk at *Quantum Algorithms & Applications*, Blue Mountains, Australia, 27/05/2007 - 02/06/2007.
46. *Quantum Control of a Single Qubit*,
Invited research talk at Workshop on *Quantum - Classical Transition and Quantum Information*, Benasque, Spain, 18/06/2006 – 30/06/2006.
47. *Quantum Resources: Entanglement, Secret Bits & Reference Frames*,
Three invited lectures at the *TSL Expository Lecture Series*, Theoretical Studies Laboratory, Institute of Advanced Technology, Malaysia, 29/11/2005 – 02/12/2005.
48. *Quantum Computing*,
Invited tutorial at the *2005 IEEE International Symposium on Information Theory*, Adelaide, Australia, 4-8/9/2005.
49. *Finding Optimal Measurements for State Estimation*,
Invited research talk at the *MAQIS Workshop: Mathematical Aspects of Quantum Information Science*, University of Queensland, Australia, 27-28/01/2005.
50. *Decoherence-full subsystems and the cryptographic power of a private shared reference frame*,
Invited research talk at the *1st Asia-Pacific Conference on Quantum Information Science*, Tainan, Taiwan, 10-13/12/2004.
51. *Introduction to Quantum Algorithms*,
Invited tutorial talk at the *Workshop on Quantum Information and Computation*, NTU, Taipei, Taiwan, 14-15/12/2004.
52. *Mixed State Entanglement in the Light of Pure State Entanglement Constrained by Superselection Rules*,
Invited research talk at *Reference Frames and Superselection Rules in Quantum Information Theory*, Perimeter Institute for Theoretical Physics, Waterloo, Canada, 12-16/7/2004.
53. *Restrictions in Quantum Information Processing*,
Invited research talk at *Quantum Theory: Reconsideration of Foundations-2*, Växjö, Sweden, 1-6/6/2003.
54. *Introduction to Quantum Information and Quantum Computation*,
Five invited lectures at the *NITP Summer School*, Centre for the Subatomic Structure of Matter, Adelaide, Australia, 28-31/1/2003.
55. *Introduction to Quantum Algorithms*,
Invited lecture for short course at *2002 Conference on Optoelectronic and Microelectronic Materials and Devices (COMMAD)*, University of NSW, Australia, 10/12/2002.
56. *From qubits to continuous variables*,
Invited research talk, *Quantum Information and Computation Summer School*, University of Queensland, Australia, 15/2/2002.



Research outputs – publications

Up-to-date publication details are maintained on the following sites:

arXiv: http://arxiv.org/a/bartlett_s_1.html

Google Scholar: <https://scholar.google.com.au/citations?user=eL6Y11wAAAAJ&hl=en>

ORCID: <http://orcid.org/0000-0003-4387-670X>

- [1] Lee, Seok-Hyung, Thomsen, Felix, Fazio, Nicholas, Brown, Benjamin J. & Bartlett, Stephen D. 2025, 'Low-overhead magic state distillation with color codes', PRX Quantum, accepted 30/5/2025, doi:10.1103/ch5r-cnfq.
- [2] Su, R. Y., Huang, J. Y., Stuyck, N. Dumoulin, Feng, M. K., Gilbert, W., Evans, T. J., Lim, W. H., Hudson, F. E., Chan, K. W., Huang, W., Itoh, Kohei M., Harper, R., Bartlett, S. D., Yang, C. H., Laucht, A., Saraiva, A., Dzurak, A. S. & Tantt, T. 2025, 'Characterizing non-Markovian quantum processes by fast Bayesian tomography', Physical Review A, vol. 111, no. 5, doi:10.1103/physreva.111.052425.
- [3] Lee, Seok-Hyung, Li, Andrew & Bartlett, Stephen D. 2025, 'Color code decoder with improved scaling for correcting circuit-level noise', Quantum, vol. 9, pp. 1609, doi:10.22331/q-2025-01-27-1609.
- [4] Fazio, Nicholas, Harper, Robin & Bartlett, Stephen D. 2025, 'Logical Noise Bias in Magic State Injection', Quantum, vol. 9, pp. 1779, doi:10.22331/q-2025-06-24-1779.
- [5] Jonathan Y. Huang, Rocky Y. Su, Wee Han Lim, MengKe Feng, Barnaby van Straaten, Brandon Severin, Will Gilbert, Nard Dumoulin Stuyck, Tuomo Tantt, Santiago Serrano, Jesus D. Cifuentes, Ingvild Hansen, Amanda E. Seedhouse, Ensar Vahapoglu, Ross C. C. Leon, Nikolay V. Abrosimov, Hans-Joachim Pohl, Michael L. W. Thewalt, Fay E. Hudson, Christopher C. Escott, Natalia Ares, Stephen D. Bartlett, Andrea Morello, Andre Saraiva, Arne Laucht, Andrew S. Dzurak, & Chi Hwan Yang 2024, 'High-fidelity spin qubit operation and algorithmic initialization above 1 K', Nature, vol. 627, no. 8005, pp. 772–777, doi:10.1038/s41586-024-07160-2.
- [6] Markus S. Kesselring, Julio C. Magdalena de la Fuente, Felix Thomsen, Jens Eisert, Stephen D. Bartlett, & Benjamin J. Brown 2024, 'Anyon Condensation and the Color Code', PRX Quantum, vol. 5, no. 1, doi:10.1103/prxquantum.5.010342.
- [7] Tantt, Tuomo, Lim, Wee Han, Huang, Jonathan Y., Dumoulin Stuyck, Nard, Gilbert, Will, Su, Rocky Y., Feng, MengKe, Cifuentes, Jesus D., Seedhouse, Amanda E., Seritan, Stefan K., Ostrove, Corey I., Rudinger, Kenneth M., Leon, Ross C. C., Huang, Wister, Escott, Christopher C., Itoh, Kohei M., Abrosimov, Nikolay V., Pohl, Hans-Joachim, Thewalt, Michael L. W., Hudson, Fay E., Blume-Kohout, Robin, Bartlett, Stephen D., Morello, Andrea, Laucht, Arne, Yang, Chih Hwan, Saraiva, Andre & Dzurak, Andrew S. 2024, 'Assessment of the errors of high-fidelity two-qubit gates in silicon quantum dots', Nature Physics, doi:10.1038/s41567-024-02614-w.
- [8] Thomsen, Felix, Kesselring, Markus S., Bartlett, Stephen D. & Brown, Benjamin J. 2024, 'Low-overhead quantum computing with the color code', Physical Review Research, vol. 6, no. 4, doi:10.1103/physrevresearch.6.043125.
- [9] Smith, Samuel C., Brown, Benjamin J. & Bartlett, Stephen D. 2024, 'Mitigating errors in logical qubits', Communications Physics, vol. 7, no. 1, doi:10.1038/s42005-024-01883-4
- [10] Markus Frembs, Sam Roberts, Earl T Campbell & Stephen D Bartlett 2023, 'Hierarchies of resources for measurement-based quantum computation', New Journal of Physics, vol. 25, no. 1, pp. 013002, doi:10.1088/1367-2630/acae2.
- [11] Samuel C. Smith, Benjamin J. Brown & Stephen D. Bartlett 2023, 'Local Predecoder to Reduce the Bandwidth and Latency of Quantum Error Correction', Physical Review Applied, vol. 19, no. 3, doi:10.1103/physrevapplied.19.034050.
- [12] Aditya Jain, Pavithran Iyer, Stephen D. Bartlett, & Joseph Emerson 2023, 'Improved quantum error correction with randomized compiling', Physical Review Research, vol. 5, no. 3, doi:10.1103/physrevresearch.5.033049.
- [13] Mark A. Webster, Armanda O. Quintavalle, & Stephen D. Bartlett 2023, 'Transversal diagonal logical operators for stabiliser codes', New Journal of Physics, vol. 25, no. 10, pp. 103018, doi:10.1088/1367-2630/acfc5f.

- [14] Paul Webster, Michael Vasmer, Thomas R. Scruby & Stephen D. Bartlett 2022, 'Universal fault-tolerant quantum computing with stabilizer codes', *Physical Review Research*, vol. 4, no. 1, doi:10.1103/physrevresearch.4.013092.
- [15] Cooper Doyle, Wei-Wei Zhang, Michelle Wang, Bryn A. Bell, Stephen D. Bartlett, & Andrea Blanco-Redondo 2022, 'Biphoton entanglement of topologically distinct modes', *Physical Review A*, vol. 105, no. 2, doi:10.1103/physreva.105.023513.
- [16] T.J. Evans, W. Huang, J. Yoneda, R. Harper, T. Tanttu, K. W. Chan, F. E. Hudson, K. M. Itoh, A. Saraiva, C. H. Yang, A. S. Dzurak, & S. D. Bartlett 2022, 'Fast Bayesian Tomography of a Two-Qubit Gate Set in Silicon', *Physical Review Applied*, vol. 17, no. 2, doi:10.1103/physrevapplied.17.024068.
- [17] C. G. L. Böttcher, S. P. Harvey, S. Fallahi, G. C. Gardner, M. J. Manfra, Uri Vool, S. D. Bartlett, & Amir Yacoby 2022, 'Parametric longitudinal coupling between a high-impedance superconducting resonator and a semiconductor quantum dot singlet-triplet spin qubit', *Nature Communications*, vol. 13, no. 1, doi:10.1038/s41467-022-32236-w.
- [18] Mark A. Webster, Benjamin J. Brown & Stephen D. Bartlett 2022, 'The XP Stabiliser Formalism: a Generalisation of the Pauli Stabiliser Formalism with Arbitrary Phases', *Quantum*, vol. 6, pp. 815, doi:10.22331/q-2022-09-22-815.
- [19] Pavithran Iyer, Aditya Jain, Stephen D. Bartlett & Joseph Emerson 2022, 'Efficient diagnostics for quantum error correction', *Physical Review Research*, vol. 4, no. 4, doi:10.1103/physrevresearch.4.043218.
- [20] Lawrence Z. Cohen, Isaac H. Kim, Stephen D. Bartlett & Benjamin J. Brown 2022, 'Low-overhead fault-tolerant quantum computing using long-range connectivity', *Science Advances*, vol. 8, no. 20, doi:10.1126/sciadv.abn1717.
- [21] Hakop Pashayan, Oliver Reardon-Smith, Kamil Korzekwa & Stephen D. Bartlett 2022, 'Fast Estimation of Outcome Probabilities for Quantum Circuits', *PRX Quantum*, vol. 3, no. 2, doi:10.1103/prxquantum.3.020361.
- [22] Y. Kojima, T. Nakajima, A. Noiri, J. Yoneda, T. Otsuka, K. Takeda, S. Li, S. D. Bartlett, A. Ludwig, A. D. Wieck, & S. Tarucha 2021, 'Probabilistic teleportation of a quantum dot spin qubit', *npj Quantum Information*, vol. 7, no. 1, doi:10.1038/s41534-021-00403-4
- [23] J. Yoneda, W. Huang, M. Feng, C. H. Yang, K. W. Chan, T. Tanttu, W. Gilbert, R. C. C. Leon, F. E. Hudson, K. M. Itoh, A. Morello, S. D. Bartlett, A. Laucht, A. Saraiva, & A. S. Dzurak 2021, 'Coherent spin qubit transport in silicon', *Nature Communications*, vol. 12, no. 1, doi:10.1038/s41467-021-24371-7
- [24] J. Pablo Bonilla Ataides, David K. Tuckett, Stephen D. Bartlett, Steven T. Flammia & Benjamin J. Brown 2021, 'The XZZX surface code', *Nature Communications*, vol. 12, no. 1, doi:10.1038/s41467-021-22274-1.
- [25] Hakop Pashayan, Stephen D. Bartlett & David Gross 2020, 'From estimation of quantum probabilities to simulation of quantum circuits', *Quantum*, vol. 4, pp. 223, doi:10.22331/q-2020-01-13-223.
- [26] David K. Tuckett, Stephen D. Bartlett, Steven T. Flammia & Benjamin J. Brown 2020, 'Fault-Tolerant Thresholds for the Surface Code in Excess of 5% Under Biased Noise', *Physical Review Letters*, vol. 124, no. 13, doi:10.1103/physrevlett.124.130501.
- [27] Paul Webster & Stephen D. Bartlett 2020, 'Fault-tolerant quantum gates with defects in topological stabilizer codes', *Physical Review A*, vol. 102, no. 2, doi:10.1103/physreva.102.022403.
- [28] Sam Roberts & Stephen D. Bartlett 2020, 'Symmetry-Protected Self-Correcting Quantum Memories', *Physical Review X*, vol. 10, no. 3, doi:10.1103/physrevx.10.031041.
- [29] Thomas B. Smith, Maja C. Cassidy, David J. Reilly, Stephen D. Bartlett & Arne L. Grimsmo 2020, 'Dispersive Readout of Majorana Qubits', *PRX Quantum*, vol. 1, no. 2, doi:10.1103/prxquantum.1.020313.

- [30] Filip K. Malinowski, Frederico Martins, Thomas B. Smith, Stephen D. Bartlett & Andrew C. Doherty et al. 2019, 'Fast spin exchange across a multielectron mediator', *Nature Communications*, vol. 10, no. 1, doi:10.1038/s41467-019-09194-x.
- [31] Yurui Ming, Chin-Teng Lin, Stephen D. Bartlett & Wei-Wei Zhang 2019, 'Quantum topology identification with deep neural networks and quantum walks', *npj Computational Materials*, vol. 5, no. 1, doi:10.1038/s41524-019-0224-x.
- [32] C. H. Yang, K. W. Chan, R. Harper, W. Huang & T. Evans et al. 2019, 'Silicon qubit fidelities approaching incoherent noise limits via pulse engineering', *Nature Electronics*, vol. 2, no. 4, pp. 151–158, doi:10.1038/s41928-019-0234-1.
- [33] David K. Tuckett, Andrew S. Darmawan, Christopher T. Chubb, Sergey Bravyi & Stephen D. Bartlett et al. 2019, 'Tailoring Surface Codes for Highly Biased Noise', *Physical Review X*, vol. 9, no. 4, doi:10.1103/physrevx.9.041031.
- [34] Markus Frems, Sam Roberts & Stephen D Bartlett 2018, 'Contextuality as a resource for measurement-based quantum computation beyond qubits', *New Journal of Physics*, vol. 20, no. 10, pp. 103011, doi:10.1088/1367-2630/aac3ad.
- [35] S. P. Harvey, C. G. L. Böttcher, L. A. Orona, S. D. Bartlett & A. C. Doherty et al. 2018, 'Coupling two spin qubits with a high-impedance resonator', *Physical Review B*, vol. 97, no. 23, doi:10.1103/physrevb.97.235409.
- [36] Paul Webster & Stephen D. Bartlett 2018, 'Locality-preserving logical operators in topological stabilizer codes', *Physical Review A*, vol. 97, no. 1, doi:10.1103/physreva.97.012330.
- [37] S. N. Saadatmand, S. D. Bartlett & I. P. McCulloch 2018, 'Phase diagram of the quantum Ising model with long-range interactions on an infinite-cylinder triangular lattice', *Physical Review B*, vol. 97, no. 15, doi:10.1103/physrevb.97.155116.
- [38] Filip K. Malinowski, Frederico Martins, Thomas B. Smith, Stephen D. Bartlett & Andrew C. Doherty et al. 2018, 'Spin of a Multielectron Quantum Dot and Its Interaction with a Neighboring Electron', *Physical Review X*, vol. 8, no. 1, doi:10.1103/physrevx.8.011045.
- [39] David K. Tuckett, Stephen D. Bartlett & Steven T. Flammia 2018, 'Ultrahigh Error Threshold for Surface Codes with Biased Noise', *Physical Review Letters*, vol. 120, no. 5, doi:10.1103/physrevlett.120.050505.
- [40] Stephen D Bartlett, Gavin K Brennen & Akimasa Miyake 2017, 'Robust symmetry-protected metrology with the Haldane phase', *Quantum Science and Technology*, vol. 3, no. 1, pp. 014010, doi:10.1088/2058-9565/aa9c56.
- [41] Andrew W Simmons, Joel J Wallman, Hakop Pashayan, Stephen D Bartlett & Terry Rudolph 2017, 'Contextuality under weak assumptions', *New Journal of Physics*, vol. 19, no. 3, pp. 033030, doi:10.1088/1367-2630/aa5f72.
- [42] Samuel J. Elman, Stephen D. Bartlett & Andrew C. Doherty 2017, 'Long-range entanglement for spin qubits via quantum Hall edge modes', *Physical Review B*, vol. 96, no. 11, doi:10.1103/physrevb.96.115407.
- [43] Sam Roberts, Beni Yoshida, Aleksander Kubica & Stephen D. Bartlett 2017, 'Symmetry-protected topological order at nonzero temperature', *Physical Review A*, vol. 96, no. 2, doi:10.1103/physreva.96.022306.
- [44] Alan Robertson, Christopher Granade, Stephen D. Bartlett & Steven T. Flammia 2017, 'Tailored Codes for Small Quantum Memories', *Physical Review Applied*, vol. 8, no. 6, doi:10.1103/physrevapplied.8.064004.
- [45] Cihan Okay, Sam Roberts, Stephen D. Bartlett, & Robert Raussendorf 2017, 'Topological Proofs of Contextuality in Quantum Mechanics', *Quantum Information & Computation*, vol. 17, no. 13-14, pp. 1135-1166.
- [46] Jacob C. Bridgeman, Stephen D. Bartlett & Andrew C. Doherty 2017, 'Tensor networks with a twist: Anyon-permuting domain walls and defects in projected entangled pair states', *Physical Review B*, vol. 96, no. 24, doi:10.1103/physrevb.96.245122.

- [47] Andrew S. Darmawan & Stephen D. Bartlett 2016, 'Spectral properties for a family of two-dimensional quantum antiferromagnets', *Physical Review B*, vol. 93, no. 4, doi:10.1103/physrevb.93.045129.
- [48] Tomas Jochym-O'Connor & Stephen D. Bartlett 2016, 'Stacked codes: Universal fault-tolerant quantum computation in a two-dimensional layout', *Physical Review A*, vol. 93, no. 2, doi:10.1103/physreva.93.022323.
- [49] Rafael N. Alexander, Peter S. Turner & Stephen D. Bartlett 2016, 'Randomized benchmarking in measurement-based quantum computing', *Physical Review A*, vol. 94, no. 3, doi:10.1103/physreva.94.032303.
- [50] Hakop Pashayan, Joel J. Wallman & Stephen D. Bartlett 2015, 'Estimating Outcome Probabilities of Quantum Circuits Using Quasiprobabilities', *Physical Review Letters*, vol. 115, no. 7, doi:10.1103/physrevlett.115.070501.
- [51] Jacob C. Bridgeman, Aroon O'Brien, Stephen D. Bartlett & Andrew C. Doherty 2015, 'Multiscale entanglement renormalization ansatz for spin chains with continuously varying criticality', *Physical Review B*, vol. 91, no. 16, doi:10.1103/physrevb.91.165129.
- [52] M. A. Fogarty, M. Veldhorst, R. Harper, C. H. Yang & S. D. Bartlett et al. 2015, 'Nonexponential fidelity decay in randomized benchmarking with low-frequency noise', *Physical Review A*, vol. 92, no. 2, doi:10.1103/physreva.92.022326.
- [53] Dominic J Williamson & Stephen D Bartlett 2015, 'Symmetry-protected adiabatic quantum transistors', *New Journal of Physics*, vol. 17, no. 5, pp. 053019, doi:10.1088/1367-2630/17/5/053019.
- [54] Aroon O'Brien, Stephen D. Bartlett, Andrew C. Doherty & Steven T. Flammia 2015, 'Symmetry-respecting real-space renormalization for the quantum Ashkin-Teller model', *Physical Review E*, vol. 92, no. 4, doi:10.1103/physreve.92.042163.
- [55] Paul Webster, Stephen D. Bartlett & David Poulin 2015, 'Reducing the overhead for quantum computation when noise is biased', *Physical Review A*, vol. 92, no. 6, doi:10.1103/physreva.92.062309.
- [56] Angela Karanjai, Eric G Cavalcanti, Stephen D Bartlett & Terry Rudolph 2015, 'Weak values in a classical theory with an epistemic restriction', *New Journal of Physics*, vol. 17, no. 7, pp. 073015, doi:10.1088/1367-2630/17/7/073015.
- [57] Matthew C. Palmer, Florian Girelli & Stephen D. Bartlett 2014, 'Changing quantum reference frames', *Physical Review A*, vol. 89, no. 5, doi:10.1103/physreva.89.052121.
- [58] Andrew S Darmawan & Stephen D Bartlett 2014, 'Graph states as ground states of two-body frustration-free Hamiltonians', *New Journal of Physics*, vol. 16, no. 7, pp. 073013, doi:10.1088/1367-2630/16/7/073013.
- [59] Courtney G Brell, Stephen D Bartlett & Andrew C Doherty 2014, 'Perturbative 2-body parent Hamiltonians for projected entangled pair states', *New Journal of Physics*, vol. 16, no. 12, pp. 123056, doi:10.1088/1367-2630/16/12/123056.
- [60] M. D. Shulman, S. P. Harvey, J. M. Nichol, S. D. Bartlett & A. C. Doherty et al. 2014, 'Suppressing qubit dephasing using real-time Hamiltonian estimation', *Nature Communications*, vol. 5, no. 1, doi:10.1038/ncomms6156.
- [61] G Sentís, B Gendra, S D Bartlett & A C Doherty 2013, 'Decomposition of any quantum measurement into extremals', *Journal of Physics A: Mathematical and Theoretical*, vol. 46, no. 37, pp. 375302, doi:10.1088/1751-8113/46/37/375302.
- [62] Dominic V. Else, Stephen D. Bartlett & Andrew C. Doherty 2013, 'Hidden symmetry-breaking picture of symmetry-protected topological order', *Physical Review B*, vol. 88, no. 8, doi:10.1103/physrevb.88.085114.
- [63] Joseph M Renes, Akimasa Miyake, Gavin K Brennen & Stephen D Bartlett 2013, 'Holonomic quantum computing in symmetry-protected ground states of spin chains', *New Journal of Physics*, vol. 15, no. 2, pp. 025020.

- [64] J. Medford, J. Beil, J. M. Taylor, S. D. Bartlett & A. C. Doherty et al. 2013, ‘Self-consistent measurement and state tomography of an exchange-only spin qubit’, *Nature Nanotechnology*, vol. 8, no. 9, pp. 654–659, doi:10.1038/nnano.2013.168.
- [65] Maki Takahashi, Stephen D. Bartlett & Andrew C. Doherty 2013, ‘Tomography of a spin qubit in a double quantum dot’, *Physical Review A*, vol. 88, no. 2, doi:10.1103/physreva.88.022120.
- [66] Benjamin J. Brown, Stephen D. Bartlett, Andrew C. Doherty & Sean D. Barrett 2013, ‘Topological Entanglement Entropy with a Twist’, *Physical Review Letters*, vol. 111, no. 22, doi:10.1103/physrevlett.111.220402.
- [67] Andrew S Darmawan, Gavin K Brennen & Stephen D Bartlett 2012, ‘Measurement-based quantum computation in a two-dimensional phase of matter’, *New Journal of Physics*, vol. 14, no. 1, pp. 013023, doi:10.1088/1367-2630/14/1/013023.
- [68] Joel J. Wallman & Stephen D. Bartlett 2012, ‘Non-negative subtheories and quasiprobability representations of qubits’, *Physical Review A*, vol. 85, no. 6, doi:10.1103/physreva.85.062121.
- The correction of a mathematical error was published as an Erratum, following journal policies:*
- Joel J. Wallman & Stephen D. Bartlett 2012, ‘Erratum: Non-negative subtheories and quasiprobability representations of qubits [Phys. Rev. A 85, 062121 (2012)]’, *Physical Review A*, vol. 86, no. 3, doi:10.1103/PhysRevA.86.039901.
- [69] Joel J. Wallman & Stephen D. Bartlett 2012, ‘Observers can always generate nonlocal correlations without aligning measurements by covering all their bases’, *Physical Review A*, vol. 85, no. 2, doi:10.1103/physreva.85.024101.
- [70] Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2012, ‘Reconstruction of Gaussian quantum mechanics from Liouville mechanics with an epistemic restriction’, *Physical Review A*, vol. 86, no. 1, doi:10.1103/physreva.86.012103.
- [71] Joel J. Wallman & Stephen D. Bartlett 2012, ‘Revisiting Consistency Conditions for Quantum States of Systems on Closed Timelike Curves: An Epistemic Perspective’, *Foundations of Physics*, vol. 42, no. 5, pp. 656–673, doi:10.1007/s10701-012-9635-y.
- [72] Dominic V Else, Stephen D Bartlett & Andrew C Doherty 2012, ‘Symmetry protection of measurement-based quantum computation in ground states’, *New Journal of Physics*, vol. 14, no. 11, pp. 113016, doi:10.1088/1367-2630/14/11/113016.
- [73] Dominic V. Else, Ilai Schwarz, Stephen D. Bartlett & Andrew C. Doherty 2012, ‘Symmetry-Protected Phases for Measurement-Based Quantum Computation’, *Physical Review Letters*, vol. 108, no. 24, doi:10.1103/physrevlett.108.240505.
- [74] Alexandr Sergeevich, Anushya Chandran, Joshua Combes, Stephen D. Bartlett & Howard M. Wiseman 2011, ‘Characterization of a qubit Hamiltonian using adaptive measurements in a fixed basis’, *Physical Review A*, vol. 84, no. 5, doi:10.1103/physreva.84.052315.
- [75] Joel J. Wallman, Yeong-Cherng Liang & Stephen D. Bartlett 2011, ‘Generating nonclassical correlations without fully aligning measurements’, *Physical Review A*, vol. 83, no. 2, doi:10.1103/physreva.83.022110.
- [76] B. L. Higgins, A. C. Doherty, S. D. Bartlett, G. J. Pryde & H. M. Wiseman 2011, ‘Multiple-copy state discrimination: Thinking globally, acting locally’, *Physical Review A*, vol. 83, no. 5, doi:10.1103/physreva.83.052314.
- [77] Courtney G Brell, Steven T Flammia, Stephen D Bartlett & Andrew C Doherty 2011, ‘Toric codes and quantum doubles from two-body Hamiltonians’, *New Journal of Physics*, vol. 13, no. 5, pp. 053039, doi:10.1088/1367-2630/13/5/053039.

- [78] Marcus Cramer, Martin B. Plenio, Steven T. Flammia, Rolando Somma & David Gross et al. 2010, 'Efficient quantum state tomography', *Nature Communications*, vol. 1, no. 1, doi:10.1038/ncomms1147
- [79] G. G. Gillett, R. B. Dalton, B. P. Lanyon, M. P. Almeida & M. Barbieri et al. 2010, 'Experimental Feedback Control of Quantum Systems Using Weak Measurements', *Physical Review Letters*, vol. 104, no. 8, doi:10.1103/physrevlett.104.080503
- [80] Yeong-Cherng Liang, Nicholas Harrigan, Stephen D. Bartlett & Terry Rudolph 2010, 'Nonclassical Correlations from Randomly Chosen Local Measurements', *Physical Review Letters*, vol. 104, no. 5, doi:10.1103/physrevlett.104.050401
- [81] Rainer Kaltenbaek, Jonathan Lavoie, Bei Zeng, Stephen D. Bartlett & Kevin J. Resch 2010, 'Optical one-way quantum computing with a simulated valence-bond solid', *Nature Physics*, vol. 6, no. 11, pp. 850–854, doi:10.1038/nphys1777
- [82] Andrew S. Darmawan & Stephen D. Bartlett 2010, 'Optical spin-1 chain and its use as a quantum-computational wire', *Physical Review A*, vol. 82, no. 1, doi:10.1103/physreva.82.012328
- [83] Stephen D. Bartlett, Gavin K. Brennen, Akimasa Miyake & Joseph M. Renes 2010, 'Quantum Computational Renormalization in the Haldane Phase', *Physical Review Letters*, vol. 105, no. 11, doi:10.1103/physrevlett.105.110502
- [84] H.M. Wiseman, D.W. Berry, S.D. Bartlett, B.L. Higgins & G.J. Pryde 2009, 'Adaptive Measurements in the Optical Quantum Information Laboratory', *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 15, no. 6, pp. 1661–1672, doi:10.1109/jstqe.2009.2020810
- [85] B L Higgins, D W Berry, S D Bartlett, M W Mitchell & H M Wiseman et al. 2009, 'Demonstrating Heisenberg-limited unambiguous phase estimation without adaptive measurements', *New Journal of Physics*, vol. 11, no. 7, pp. 073023, doi:10.1088/1367-2630/11/7/073023
- [86] D. W. Berry, B. L. Higgins, S. D. Bartlett, M. W. Mitchell & G. J. Pryde et al. 2009, 'How to perform the most accurate possible phase measurements', *Physical Review A*, vol. 80, no. 5, doi:10.1103/physreva.80.052114
- [87] Andrew C. Doherty & Stephen D. Bartlett 2009, 'Identifying Phases of Quantum Many-Body Systems That Are Universal for Quantum Computation', *Physical Review Letters*, vol. 103, no. 2, doi:10.1103/physrevlett.103.020506
- [88] B. L. Higgins, B. M. Booth, A. C. Doherty, S. D. Bartlett & H. M. Wiseman et al. 2009, 'Mixed State Discrimination Using Optimal Control', *Physical Review Letters*, vol. 103, no. 22, doi:10.1103/physrevlett.103.220503
- [89] Stein Olav Skrovseth & Stephen D. Bartlett 2009, 'Phase transitions and localizable entanglement in cluster-state spin chains with Ising couplings and local fields', *Physical Review A*, vol. 80, no. 2, doi:10.1103/physreva.80.022316
- [90] Stephen D Bartlett, Terry Rudolph, Robert W Spekkens & Peter S Turner 2009, 'Quantum communication using a bounded-size quantum reference frame', *New Journal of Physics*, vol. 11, no. 6, pp. 063013, doi:10.1088/1367-2630/11/6/063013
- [91] David Jennings, Andrzej Dragan, Sean D. Barrett, Stephen D. Bartlett & Terry Rudolph 2009, 'Quantum computation via measurements on the low-temperature state of a many-body system', *Physical Review A*, vol. 80, no. 3, doi:10.1103/physreva.80.032328
- [92] Sean D. Barrett, Stephen D. Bartlett, Andrew C. Doherty, David Jennings & Terry Rudolph 2009, 'Transitions in the computational power of thermal states for measurement-based quantum computation', *Physical Review A*, vol. 80, no. 6, doi:10.1103/physreva.80.062328
- [93] J.-C. Boileau, L. Sheridan, M. Laforest & S. D. Bartlett 2008, 'Quantum reference frames and the classification of rotationally invariant maps', *Journal of Mathematical Physics*, vol. 49, no. 3, pp. 032105, doi:10.1063/1.2884583

- [94] Tom Griffin & Stephen D. Bartlett 2008, 'Spin lattices with two-body Hamiltonians for which the ground state encodes a cluster state', *Physical Review A*, vol. 78, no. 6, doi:10.1103/physreva.78.062306
- [95] Stephen D. Bartlett, Terry Rudolph, Barry C. Sanders & Peter S. Turner 2007, 'Degradation of a quantum directional reference frame as a random walk', *Journal of Modern Optics*, vol. 54, no. 13-15, pp. 2211–2221, doi:10.1080/09500340701289254
- [96] B. L. Higgins, D. W. Berry, S. D. Bartlett, H. M. Wiseman & G. J. Pryde 2007, 'Entanglement-free Heisenberg-limited phase estimation', *Nature*, vol. 450, no. 7168, pp. 393–396, doi:10.1038/nature06257
- [97] Agata M. Brańczyk, Paulo E. M. F. Mendonça, Alexei Gilchrist, Andrew C. Doherty & Stephen D. Bartlett 2007, 'Quantum control of a single qubit', *Physical Review A*, vol. 75, no. 1, doi:10.1103/physreva.75.012329
- [98] Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2007, 'Reference frames, superselection rules, and quantum information', *Reviews of Modern Physics*, vol. 79, no. 2, pp. 555–609, doi:10.1103/revmodphys.79.555
- [99] Bartlett, SD, Rudolph, T, Spekkens, RW 2006, 'Dialogue concerning two views on quantum coherence: Factist and fictionist', *International Journal of Quantum Information*, vol. 4, no. 1, pp. 17-43
- [100] S. J. Jones, H. M. Wiseman, S. D. Bartlett, J. A. Vaccaro & D. T. Pope 2006, 'Entanglement and symmetry: A case study in superselection rules, reference frames, and beyond', *Physical Review A*, vol. 74, no. 6, doi:10.1103/physreva.74.062313
- [101] Stephen D. Bartlett, Andrew C. Doherty, Robert W. Spekkens & H. M. Wiseman 2006, 'Entanglement under restricted operations: Analogy to mixed-state entanglement', *Physical Review A*, vol. 73, no. 2, doi:10.1103/physreva.73.022311
- [102] Mark R. Dowling, Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2006, 'Observing a coherent superposition of an atom and a molecule', *Physical Review A*, vol. 74, no. 5, doi:10.1103/physreva.74.052113
- [103] T. C. Ralph, S. D. Bartlett, J. L. O'Brien, G. J. Pryde & H. M. Wiseman 2006, 'Quantum nondemolition measurements for quantum information', *Physical Review A*, vol. 73, no. 1, doi:10.1103/physreva.73.012113
- [104] Stephen D. Bartlett & Terry Rudolph 2006, 'Simple nearest-neighbor two-body Hamiltonian system for which the ground state is a universal resource for quantum computation', *Physical Review A*, vol. 74, no. 4, doi:10.1103/physreva.74.040302
- [105] Stephen D Bartlett, Terry Rudolph, Robert W Spekkens & Peter S Turner 2006, 'Degradation of a quantum reference frame', *New Journal of Physics*, vol. 8, no. 4, pp. 58–58, doi:10.1088/1367-2630/8/4/058
- [106] G. J. Pryde, J. L. O'Brien, A. G. White & Stephen D. Bartlett 2005, 'Demonstrating Superior Discrimination of Locally Prepared States Using Nonlocal Measurements', *Physical Review Letters*, vol. 94, no. 22, doi:10.1103/physrevlett.94.220406
- [107] Mark de Burgh & Stephen D. Bartlett 2005, 'Quantum methods for clock synchronization: Beating the standard quantum limit without entanglement', *Physical Review A*, vol. 72, no. 4, doi:10.1103/physreva.72.042301
- [108] Stephen D. Bartlett, Patrick Hayden & Robert W. Spekkens 2005, 'Random subspaces for encryption based on a private shared Cartesian frame', *Physical Review A*, vol. 72, no. 5, doi:10.1103/physreva.72.052329
- [109] Stephen D. Bartlett & Daniel R. Terno 2005, 'Relativistically invariant quantum information', *Physical Review A*, vol. 71, no. 1, doi:10.1103/physreva.71.012302
- [110] Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2004, 'Decoherence-full subsystems and the cryptographic power of a private shared reference frame', *Physical Review A*, vol. 70, no. 3, doi:10.1103/physreva.70.032307

- [111] Edo Waks, Eleni Diamanti, Barry C. Sanders, Stephen D. Bartlett & Yoshihisa Yamamoto 2004, 'Direct Observation of Nonclassical Photon Statistics in Parametric Down-Conversion', *Physical Review Letters*, vol. 92, no. 11, doi:10.1103/physrevlett.92.113602
- [112] Mark R. Dowling, Andrew C. Doherty & Stephen D. Bartlett 2004, 'Energy as an entanglement witness for quantum many-body systems', *Physical Review A*, vol. 70, no. 6, doi:10.1103/physreva.70.062113
- [113] G. J. Pryde, J. L. O'Brien, A. G. White, S. D. Bartlett & T. C. Ralph 2004, 'Measuring a Photonic Qubit without Destroying It', *Physical Review Letters*, vol. 92, no. 19, doi:10.1103/physrevlett.92.190402
- [114] N. K. Langford, R. B. Dalton, M. D. Harvey, J. L. O'Brien & G. J. Pryde et al. 2004, 'Measuring Entangled Qutrits and Their Use for Quantum Bit Commitment', *Physical Review Letters*, vol. 93, no. 5, doi:10.1103/physrevlett.93.053601
- [115] Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2004, 'Optimal measurements for relative quantum information', *Physical Review A*, vol. 70, no. 3, doi:10.1103/physreva.70.032321
- [116] Stephen D. Bartlett, Terry Rudolph & Robert W. Spekkens 2003, 'Classical and Quantum Communication without a Shared Reference Frame', *Physical Review Letters*, vol. 91, no. 2, doi:10.1103/physrevlett.91.027901
- [117] Stephen D. Bartlett & H. M. Wiseman 2003, 'Entanglement Constrained by Superselection Rules', *Physical Review Letters*, vol. 91, no. 9, doi:10.1103/physrevlett.91.097903
- [118] Karl-Peter Marzlin, Stephen D. Bartlett & Barry C. Sanders 2003, 'Entanglement gauge and the non-Abelian geometric phase with two photonic qubits', *Physical Review A*, vol. 67, no. 2, doi:10.1103/physreva.67.022316
- [119] Barry C. Sanders, Stephen D. Bartlett, Terry Rudolph & Peter L. Knight 2003, 'Photon-number superselection and the entangled coherent-state representation', *Physical Review A*, vol. 68, no. 4, doi:10.1103/physreva.68.042329
- [120] Barry C. Sanders, Stephen D. Bartlett, Ben Tregenna & Peter L. Knight 2003, 'Quantum quincunx in cavity quantum electrodynamics', *Physical Review A*, vol. 67, no. 4, doi:10.1103/physreva.67.042305
- [121] Stephen D. Bartlett & William J. Munro 2003, 'Quantum Teleportation of Optical Quantum Gates', *Physical Review Letters*, vol. 90, no. 11, doi:10.1103/physrevlett.90.117901
- [122] Stephen D. Bartlett & Barry C. Sanders 2003, 'Requirement for quantum computation', *Journal of Modern Optics*, vol. 50, no. 15-17, pp. 2331–2340, doi:10.1080/0950034032000120795
- [123] Stephen D. Bartlett & David J. Rowe 2003, 'Classical dynamics as constrained quantum dynamics', *Journal of Physics A: Mathematical and General*, vol. 36, no. 6, pp. 1683–1704, doi:10.1088/0305-4470/36/6/312
- [124] Tyler J. Johnson, Stephen D. Bartlett & Barry C. Sanders 2002, 'Continuous-variable quantum teleportation of entanglement', *Physical Review A*, vol. 66, no. 4, doi:10.1103/physreva.66.042326
- [125] Stephen D. Bartlett, Barry C. Sanders, Samuel L. Braunstein & Kae Nemoto 2002, 'Efficient Classical Simulation of Continuous Variable Quantum Information Processes', *Physical Review Letters*, vol. 88, no. 9, doi:10.1103/physrevlett.88.097904
- [126] Stephen D. Bartlett & Barry C. Sanders 2002, 'Efficient Classical Simulation of Optical Quantum Information Circuits', *Physical Review Letters*, vol. 89, no. 20, doi:10.1103/physrevlett.89.207903
- [127] Stephen D. Bartlett, Hubert de Guise & Barry C. Sanders 2002, 'Quantum encodings in spin systems and harmonic oscillators', *Physical Review A*, vol. 65, no. 5, doi:10.1103/physreva.65.052316
- [128] S. D. Bartlett, D. J. Rowe & J. Repka 2002, 'Vector coherent state representations, induced representations and geometric quantization: I. Scalar coherent state representations', *Journal of Physics A: Mathematical and General*, vol. 35, no. 27, pp. 5599–5623, doi:10.1088/0305-4470/35/27/306

- [129] S D Bartlett, D J Rowe & J Repka 2002, 'Vector coherent state representations, induced representations and geometric quantization: II. Vector coherent state representations', *Journal of Physics A: Mathematical and General*, vol. 35, no. 27, pp. 5625–5651, doi:10.1088/0305-4470/35/27/307
- [130] T D Mackay, S D Bartlett, L T Stephenson & B C Sanders 2002, 'Quantum walks in higher dimensions', *Journal of Physics A: Mathematical and General*, vol. 35, no. 12, pp. 2745–2753, doi:10.1088/0305-4470/35/12/304
- [131] Stephen D. Bartlett & Barry C. Sanders 2002, 'Universal continuous-variable quantum computation: Requirement of optical nonlinearity for photon counting', *Physical Review A*, vol. 65, no. 4, doi:10.1103/physreva.65.042304
- [132] S. D. Bartlett, D. A. Rice, B. C. Sanders, J. Daboul & H. de Guise 2001, 'Unitary transformations for testing Bell inequalities', *Physical Review A*, vol. 63, no. 4, doi:10.1103/physreva.63.042310
- [133] Barry C. Sanders, Hubert de Guise, Stephen D. Bartlett & Weiping Zhang 2001, 'Geometric Phase of Three-Level Systems in Interferometry', *Physical Review Letters*, vol. 86, no. 3, pp. 369–372, doi:10.1103/physrevlett.86.369
- [134] D.J. Rowe, S. Bartlett & C. Bahri 2000, 'Angular-momentum projection of rotational model wave functions', *Physics Letters B*, vol. 472, no. 3-4, pp. 227–231, doi:10.1016/s0370-2693(99)01448-3

Research student supervision

Current postgraduate students

Name	Supervisor	Degree	Start Date
Stuart Nicholls	Principal	Ph.D.	2023
Maiyuren Srikumar	Principal	Ph.D.	2023
Rebecca Radebold	Principal	Ph.D.	2024
Lucas English	Principal	Ph.D.	2024
Andrew Li	Principal	Ph.D.	2025

Completed postgraduate and Honours students

Name	Supervisor	Degree	Completed
Nouédyn Baspin	Principal	Ph.D.	2025
Nicholas Fazio	Principal	Ph.D.	2025
Felix Thomsen	Principal	Ph.D.	2025
Samuel Smith	Principal	Ph.D.	2024
Lawrence Cohen	Principal	Ph.D.	2024
Mark Webster	Principal	Ph.D.	2023
Samuel Elman	Principal	Ph.D.	2023
Paul Webster	Principal	Ph.D.	2021
David Tuckett	Principal	Ph.D.	2020
Zach Cristina	Principal	Ph.D.	2020
Hakop Pashayan	Principal	Ph.D.	2019
Angela Karanjai	Principal	Ph.D.	2019
Sam Roberts	Principal	Ph.D.	2019
Zixin Huang	Principal	Ph.D.	2018
Jacob Bridgeman	Principal	Ph.D.	2017
Samuel Elman	Coprincipal	M.Phil.	2017
Rafael Alexander	Principal	Ph.D.	2016
Courtney Brell	Principal	Ph.D.	2015
Andrew Darmawan	Principal	Ph.D.	2014
Dominic Williamson	Principal	M.Sc.	2014
Maki Takahashi	Principal	Ph.D.	2013
Matthew Palmer	Principal	Ph.D.	2013
Joel Wallman	Principal	Ph.D.	2012
Alexandr Sergeevich	Principal	Ph.D.	2012
Andrew Li	Principal	Honours	2024
Ren Li	Principal	Honours	2023
Danny Chacko	Principal	Honours	2022
Pablo Bonilla Ataidés	Principal	Honours (*)	2021
Jack Berry	Principal	Honours	2020
Nicholas Fazio	Principal	Honours	2020
Anthony O'Rourke	Principal	Honours	2020
Angad Bedi	Principal	Honours	2020
Samuel Smith	Principal	Honours (*)	2019
Edgar Tanuarta	Coprincipal	Honours	2019
Ben Macintosh	Coprincipal	Honours	2019
Nicholas Bosch	Principal	Honours	2018

Matthew Winnel	Coprincipal	Honours	2018
Taiga Adair	Principal	Honours (*)	2017
Mitchell Hannah	Principal	Honours	2017
Campbell McLachlan	Principal	Honours (*)	2017
Paul Webster	Principal	Honours (*)	2016
Thomas Smith	Coprincipal	Honours	2016
Hakop Pashayan	Principal	Honours	2015
Matthew Allen	Principal	Honours	2015
Sam Roberts	Principal	Honours (*)	2014
Chris Wykes	Principal	Honours	2013
Jacob Bridgeman	Coprincipal	Honours (*)	2012
Dylan Griffith	Principal	Honours	2012
Dominic Williamson	Principal	Honours (*)	2012
Dominic Else	Coprincipal	Honours (*)	2011
Jessica Bloom	Principal	Honours	2011
Graham White	Principal	Honours (*)	2010
Massoud Aghili	Principal	Honours	2009
Thomas Chung	Principal	Honours	2008
Andrew Darmawan	Principal	Honours (*)	2008
Joel Wallman	Principal	Honours (*)	2008
Tom Griffin	Principal	Honours (*)	2007
Matthew Palmer	Principal	Honours	2007
Lisa Torlina	Principal	Honours (*)	2007
Alex Gray	Principal	Honours	2007
Daniel Yardley	Principal	Honours	2006
Agata Branczyk	Principal	Honours	2005

(*) denotes University Medalist

Success stories in research student supervision

The PhD students I have supervised have taken up postdoctoral positions at top international research groups in quantum information, including the Perimeter Institute (Pashayan, Bridgeman, Brell), Hannover (Brell), and Sherbrooke (Darmawan); others have established research careers within the quantum computing industry (Roberts and Tuckett at PsiQuantum, Alexander at Xanadu). My first PhD completion (Wallman) is an assistant professor at the University of Waterloo and co-founder of the successful quantum computing start-up company *Quantum Benchmark* recently acquired by Keysight Technologies.

Of the Honours students I have supervised, 13 have won University medals. These students have been widely successful; past Honours students have gone on to pursue their PhD research at UC Berkeley, Cambridge, Stanford, UCSB, Vienna, with others continuing at Sydney under my supervision with full scholarships.

Undergraduate research supervision

Dalyell project (Sydney):

- Sepehr Saryazdi, Charles Lilley (2021)
- Jonathan Skelton (2020)
- Maria Djuric, Martine Illing-Kelly, Pablo Ataides (2019)

Senior research project (Sydney):



- Nicholas Fazio, Mackenzie Shaw (2019)
- Jack Davis, Naris Rangsiyawaranon, Samuel Smith, Edgar Tanuarta (2018)
- Edric Wang (2017)
- Taiga Adair, Sean Dawson, James Leung, Campbell McLachlan (2016)
- Paul Webster, Zara Gough, Eric Hester (2015)
- Matthew Allen, Sean Carnaffan, Tyrone Pollard, Diana Nguyen (2014)
- Hakop Pashayan, Sam Roberts, Chris Ryba, Sam Chorzay (2013)
- Jacob Bridgeman, Rafael Alexander (2011)
- Dominic Else (2010)
- Gene Polovy (2009)
- Phillip Lathourakis, Michael Sun, Duncan Sutherland (2007)
- Anthony Krensel, Tristan Randall, Matthew Palmer, Felix Lawrence (2006)
- Tom Griffin (2005)

Special Studies Program / Talented Student Program project (Sydney):

- Christian Canete, Dion Marks, Justin Brown, Lewis Watts, Maria Djuric (2019)
- Dennis Chen, Benjamin Fan, Sam Jakes, Will Stewart (2018)
- Edric Wang (2016)
- Paul Webster (2014)
- Ishraq Uddin (2013)
- Hakop Pashayan (2012)
- Laura McKemmish, Graham White (2008)
- Julian Gibbons, John Sun (2005)

Vacation Scholarship project (Sydney):

- Jack Davis, Will Stewart (2019)
- Ethan Cross, Ethan Ryan, Keith Chambers (2018)
- Taiga Adair, Huang Bao, Sean Dawson, Edric Wang (2017)
- Paul Webster, Edric Wang, Sean Dawson (2016)
- Paul Webster (2015)
- Hakop Pashayan, Sam Roberts (2014)
- Cleo Loi, Hakop Pashayan, Jacob Bridgeman, Dominic Williamson (2013)
- Harry Wood, Dominic Else, Jacob Bridgeman, Rafael Alexander (2012)
- Graham White, Dominic Else, Jacob Bridgeman, Rafael Alexander (2011)
- Graham White, Joel Wallman (2008)
- Matthew Palmer (2007)
- John Truong (2006)

Other

- Raymond Limpus (Masters research project, QUT, 2003 and 2004)
- Agata Branczyk (Vacation scholarship, UQ, 2004)



University lecturing

Course	Uni	Years	# Hours Lecture
FIRST YEAR			
PHYS1901 –Physics 1A (Advanced), Mechanics module	Sydney	2010-2017	15
PHYS1902 –Physics 1B (Advanced), Electromagnetism module	Sydney	2005-2011	20
PHYS1004 –Physics 1B (Env and Life Sciences), Radiation module	Sydney	2006-2008	28
ENGG1050 – Engineering Thermodynamics	UQ	2004	18
PHYS1002 – Electromagnetism, Optics, Relativity and Quantum Physics I	UQ	2004	15
SECOND YEAR			
PHYS2012/2912 – Quantum Physics	Sydney	2012-2021	19
THIRD YEAR			
PHYS 3090/3990/3991 – Statistical Mechanics	Sydney	2013-2023	19
PHYS 3051, etc. – Thermodynamics	Sydney	2007-2012	19
PHYS304 – Quantum Physics	Macquarie	2001-2002	18
FOURTH YEAR / GRADUATE			
Honours Quantum Nanoscience	Sydney	2014-2019	20
Honours Advanced Quantum Mechanics	Sydney	2005-2013	20
PHYS440 – Quantum Computing	Macquarie	2002	6
PHYS1435 – Symmetry in Physics	Toronto	1998	18

Professional Service

Service to the University

Senior roles in service and management

- Director, University of Sydney Nano Institute (2023-2028)
- Associate Dean Research for the Faculty of Science (2020-2023)
- Associate Head (Research) for School of Physics (2016-2019)
- Domain Leader, Quantum Domain, University of Sydney Nano Institute (2017)
- Member, School Executive Committee, School of Physics (2016- ongoing)
- Member, Sydney Quantum Academy Establishment Committee (2019)

Service on School's Teaching Programs

- Honours Coordinator (2007- 2015)
- Postgraduate research courses working group (2011- ongoing)

Chairing School/Faculty/University Committees

- Chair, Academic Advisory Committee – Research & Prototyping Foundry (2020-)
- Chair, Faculty of Science Research Committee (2020-)
- Chair, Research Infrastructure Steering Committee (2021-)
- Chair, Research and Prototyping Foundry Academic Advisory Committee (2021-)
- Chair, Faculty of Science Level D Local Promotions Committee (2020, 2021)
- Chair, Faculty of Science Level E Local Promotions Committee (2018, 2019)
- Chair, School committee to review undergraduate quantum syllabus (2006)

Service on School/Faculty/University Committees

- Member, UE Research Committee (2020-)
- Board Member, Research Excellence PCB (2021-2022)
- Member, UE Research Subcommittee – Enterprise and Engagement (2020-2023)
- Member, Research Risk Operations Group (2021-2023)
- Member, Faculty of Science Dean's Executive Committee (2020-2023)
- Member, Faculty of Science Board (2020-2023)
- Core member, Faculty of Science Level E Local Promotions Committee (2016, 2017)
- Member, Faculty of Science Research Committee (2016- 2019)
- Deputy Chair, School of Physics Research Committee (2008)
- Member, School of Physics Research Committee (2006-2009)
- Member, School of Physics Teaching and Learning Committee (2007- 2015)
- Member, Student Recruitment Taskforce (2008)
- Library representative, School of Physics (2005- 2010)

Service to the Discipline

Service to Industry

- Foundation Director, Quantum Australia industry growth centre (2024-2027)
- Transport for NSW Quantum Expert Advisory Panel member (2021-2023)
- Executive Board, Sydney Quantum Academy (2020-)
- Advisory Board, Quantum Benchmark Inc. (2018-2021)

Service on Journals

- Lead Editor, *PRX Quantum* (2020-2026)
- Editorial Board, *Physical Review X* (2019-2020)

Service on Professional Societies

- Convenor, Australian Institute of Physics (AIP) Topical Group QUICC (2010- 2014)

- Vice-convenor, AIP Topical Group QUICC (2008,2009)
- Secretary, AIP Topical Group QUICC (2006, 2007)
- Interim Secretary, AIP Topical Group QUICC (2005)

Refereeing for international journals

- Nature, Nature Physics, Nature Communications, Physical Review (A, B, X, Letters), New Journal of Physics, Journal of Physics (A, B), Journal of Optics (B), Physics Letters (A), Optics Letters, Optics Express, Foundations of Physics, Quantum Information and Computation, Quantum, npj Quantum Information

Refereeing for competitive grant applications

- Referee for ARC Discovery Projects
- Referee for ARC Laureate Fellowships, Future Fellowships, Federation Fellowships, DECRA Fellowships
- Referee for U.S. Department of Energy Quantum Testbed Program
- Referee for NWO (The Netherlands) competitive grants
- Referee for US-Israel Binational Science Foundation
- Referee for FQXi (Foundational Questions Institute) large grant scheme
- Referee for Research Corporation (USA) competitive grants
- Referee for NSERC (Canada) competitive grants
- Referee for Austrian Science Fund (Austria) competitive grants
- Referee for A*STAR (Singapore) competitive grants
- Referee for Foundation for Polish Science (Poland) competitive grants
- Referee for New Zealand Endeavor Fund research programs
- Referee for Swiss National Science Foundation competitive grants

Conference and workshop organisation

- Founder and principal organiser, Sydney Quantum Information Theory, workshop series - Sydney, Feb 2006, Jan 2008, Jan 2009, Jan 2010, Jan 2011, Jan 2012, Jan 2013, Jan 2014, Jan 2015, Feb 2016, Feb 2017, Feb 2018, Feb 2019, Feb 2020, Feb 2021, Feb 2022, Feb 2023
- Chair, Local Organizing Committee, Sixth International Conference on Quantum Error Correction, Sydney, Oct 2023.
- Program committee, Quantum Information Processing – QIP 2022, Pasadena, Mar 2022.
- Program chair, AQIS (Asian Conference on Quantum Information Science), 2020.
- Co-organiser, “QUSENT – Quantum Simulation and Enabling Technologies”, University of Sydney, 3-4 October 2019.
- Program committee, AQIS (Asian Conference on Quantum Information Science), 2016.
- General co-chair, Quantum Information Processing – QIP 2015, Sydney, Jan 2015.
- Program committee, Australian Institute of Physics Congress, Sydney, Dec 2012.
- Program committee, Quantum Information Processing – QIP 2011, Singapore, Jan 2011.
- Organizing committee, QCMC’2010, Brisbane, July 2010.
- Organizing committee, Iran International Conference on Quantum Information, Sept 2010.
- Organizing committee, 5th Conference on the Theory of Quantum Computation, Communication and Cryptography, University of Leeds, UK, April 2010
- Advisory Committee, The Clock and the Quantum, Waterloo, Canada, Sept 2008.
- Principal local organizer, Principles and Applications of Control in Quantum Systems 2007, Sydney, July 2007.
- Co-organiser, “Reference Frames and Superselection Rules in Quantum Information Theory,” Perimeter Institute, Waterloo, Canada, 12-16 July 2004 (with R. W. Spekkens).

Professional Affiliations

- Fellow, Australian Institute of Physics
- Fellow, Royal Society of New South Wales (elected 2020)
- Fellow, American Physical Society (elected 2020)