

Stephen D. Bartlett

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 [AT] sydney.edu.au
Web: <http://sydney.edu.au/science/physics/~bartlett>
Citizenships: Australian and Canadian

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.

Employment History

Professor, The University of Sydney, Jan 2012 –

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

Research Grants

Successful Competitive Research Grants - External

Project Title	Investigators	Scheme	Value	Year
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 to Sydney \$ 5.2M total	2017- 2021
Symmetry and topology for robust quantum information	SD Bartlett AC Doherty	ARC Discovery	\$ 117 000 \$ 108 000 \$ 60 000	2017 2018 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 to Sydney \$ 31.9M total	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 to Sydney \$ 514k total	2015- 2016
Photonic Quantum Characterization, Verification, and Validation	JL O'Brien SD Bartlett + 7 internat. PIs	U.S. ARO QCVV	\$ 350 000 to Sydney \$ 4.4M total	2014- 2018
Bulk-boundary correspondence in quantum many-body systems	SD Bartlett AC Doherty	ARC Discovery	\$ 90 000 \$ 90 000 \$ 90 000	2013 2014 2015
ARC Centre of Excellence for Engineered Quantum Systems	GJ Milburn SD Bartlett + 15 Aust. CIs + 16 internat. PIs	ARC Centres of Excellence	\$ 5.6 M to Sydney \$ 24.5 M total	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	\$ 250 000 to Sydney \$ 500 000 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	\$ 4.2 M to Sydney \$ 27.5 M total	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	\$ 150 000 \$ 130 000 \$ 130 000	2009 2010 2011
Quantum-enhanced reference systems <i>ranked A+ (top third of successful grants)</i>	SD Bartlett	ARC Discovery	\$ 100 000 \$ 108 000 \$ 109 000	2008 2009 2010
Optical quantum computing	P Kwiat A Zeilinger AG White SD Bartlett ...	ARDA QCCM	\$ 1.5M \$ 1.5M \$ 1.5M \$ 1.5M	2005 2006 2007 2008
Entanglement as resource for quantum technology	AC Doherty SD Bartlett	ARC Discovery	\$ 100 000 \$ 100 000 \$ 100 000	2005 2006 2007
Controlling quantum technologies	AG White SD Bartlett AC Doherty	ARC Discovery	\$ 260 000 \$ 150 000 \$ 250 000	2005 2006 2007

	A Gilchrist JL O'Brien GJ Pryde			
Relative Quantum Information	SD Bartlett RW Spekkens DR Terno	ARC Linkage International – Awards	\$ 30 500 + matching funds	2004 2005 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	\$ 15 000 \$ 15 000 \$ 15 000	2003 2004 2005
Optical realisations of continuous-variable quantum information	SD Bartlett	ARC Discovery (inc. APD Fellowship)	\$ 69 345 \$ 69 345 \$ 69 345	2003 2004 2005

Successful Competitive Research Grants - Internal

Project Title	Investigators	Scheme	Value	Year
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

Selected Awards and Fellowships

SUPRA Supervisor of the Year Award	2017
Selby Research Award	2005
Australian Research Council Postdoctoral Fellowship	2003-2005
Macquarie University Research Fellowship	2001-2004

Research

Invited expert commentary in *Nature* journals

1. Stephen D. Bartlett,
“Atomic Physics: A milestone in quantum computing,” – News and Views
Nature **536**, 35 (2016).
2. Stephen D. Bartlett,
“Quantum Metrology: The sensitive side of a spin,” – News and Views
Nature Nanotechnology **11**, 215 (2016).
3. 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. 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.
2. 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

1. *New directions in the theory of fault-tolerant quantum computing*,
Invited research talk at *Spin Qubits 3*, Sydney, 6-10/11/2017.
2. *Contextuality and quantum simulation*,
Invited research talk at *Contextuality: Conceptual Issues, Operational Signatures, and Applications*, Perimeter Institute, Waterloo, 24-27/7/2017.
3. *Quantum computational phases of matter*,
Invited lectures at *Canadian Quantum Information Summer School*, Orford, Quebec, 29/5-7/6/2017.
4. *Uncertainty in quantum physics*,
Invited panel session speaker at ‘Peace and Security Under Uncertainty’ CISS Global Forum, Q Station Sydney, 28/4/2017.
5. *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.
6. *Quantum mechanics*,
Invited lecture course in the Perimeter Scholars International (PSI) program at the Perimeter Institute, Waterloo, Canada, 7-23/09/2016.
7. *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.
8. *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.
9. *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.
10. *Quantum computational matter*,
Invited lecture at *Graduate Lecture Series in Quantum Science*, Macquarie University, Sydney, 27/04/2016.
 11. *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.
 12. *Estimating outcome probabilities of quantum circuits using quasiprobabilities*,
Invited research talk at *Foundations of Quantum Information*, Kelona, B.C., Canada, 6-10/07/2015.
 13. *Calibration and Verification of Quantum Gates*,
Invited research talk at *Spin Qubits 2014*, Konstanz, Germany, 18-22/08/2014.
 14. *Suppressing noise with real-time Hamiltonian estimation*,
Invited research talk at *CIFAR Quantum Information Science Program Meeting*, Quebec, Canada, 03-06/06/2014.
 15. *Quantum computational matter*,
Invited research talk at *Progress towards Practical Quantum Information Processing*, Royal Society, UK, 18/10/2013.
 16. *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.
 17. *Quantum computational matter*,
Invited research talk at *Last Frontiers in Quantum Information Science*, Fairbanks, Alaska, USA, 17/06/2013-21/06/2013.
 18. *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.
 19. *Quantum computational matter*,
Invited research talk at workshop on *Quantum-Photonic Hardware*, Rottneest Island, Australia, 22/10/2012-25/10/2012.
 20. *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.
 21. *Quantum computational matter*,
Colloquium at the Perimeter Institute for Theoretical Physics, Waterloo, Canada, 12/10/2011.
 22. *Quantum computational matter*,
Colloquium at the School of Physics and Mathematics, University of Queensland, Brisbane, Australia, 23/9/2011.
 23. *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.
 24. *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.



25. *Quantum computers: A new phase of matter?*,
Invited research talk at *LPHYS'09*, Barcelona, Spain, 13/07/09 - 17/07/09.
26. *Quantum computers: A new phase of matter?*,
Invited research talk at *Quantum Frontiers Symposium*, Brisbane, Australia, 02/04/09 - 03/04/09.
27. *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.
28. *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.
29. *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.
30. *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.
31. *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.
32. *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.
33. *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.
34. *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.
35. *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.
36. *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.
37. *Quantum Computing*,
Invited tutorial at the *2005 IEEE International Symposium on Information Theory*, Adelaide, Australia, 4-8/9/2005.
38. *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.
39. *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.
40. *Introduction to Quantum Algorithms*,
Invited tutorial talk at the *Workshop on Quantum Information and Computation*, NTU, Taipei, Taiwan, 14-15/12/2004.

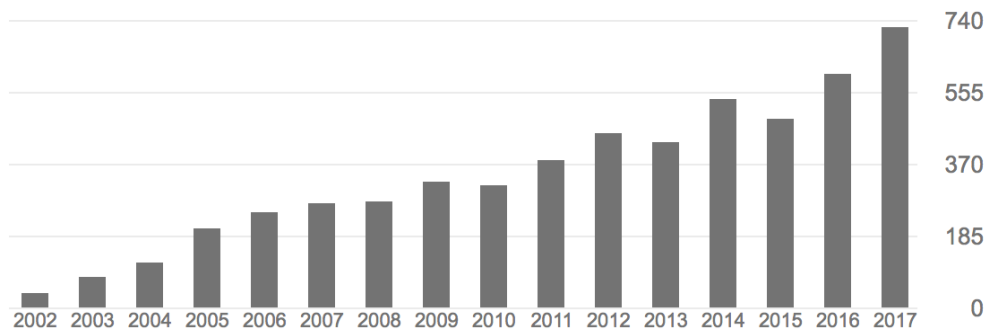


41. *Mixed State Entanglement in the Light of Pure State Entanglement Constrained by Superselection Rules*,
Invited research talk at *Reference Frames and Superselection Rules in Quantum Information Theory*, Perimeter Institute for Theoretical Physics, Waterloo, Canada, 12-16/7/2004.
42. *Restrictions in Quantum Information Processing*,
Invited research talk at *Quantum Theory: Reconsideration of Foundations-2*, Växjö, Sweden, 1-6/6/2003.
43. *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.
44. *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.
45. *From qubits to continuous variables*,
Invited research talk, *Quantum Information and Computation Summer School*, University of Queensland, Australia, 15/2/2002.

Public lectures

1. *Einstein's Unfulfilled Dream*,
Public lecture at *New Scientist 'Instant Expert': Relativity*, Sydney, 20/5/2017.
2. *From Majorana particles towards quantum computing*,
Public lecture at *Pint of Science*, Sydney, 19/5/2014.
3. *Einstein, Entanglement, and the Exotic Quantum World*,
Continuing Education lecture, Sydney, 2010.
4. *AIP Public Lecture on the Nobel Prize in Physics*,
Public lecture series, presented in Sydney, Newcastle and Wollongong, 2006.

Citation report [Google Scholar, 5 January 2018]



Total citations: 5530
h-index: 39 (39 publications with at least 39 citations)

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), 54 pages.
415 citations
2. 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), 4 pages.
361 citations
3. 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), 4 pages.
351 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), 4 pages.
224 citations
5. 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), 4 pages.
196 citations

Research outputs – publications, proceedings, preprints, etc

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

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

GoogleScholar: <https://scholar.google.com.au/citations?user=eL6YI1wAAAAJ&hl=en>

ResearcherID: <http://www.researcherid.com/rid/A-4163-2008>

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

[1] [arXiv:1708.08930](#) [[pdf](#), [other](#)]

Tensor Networks with a Twist: Anyon-permuting domain walls and defects in PEPS

[Jacob C. Bridgeman](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 11 pages, 6 figures, 2 appendices, v2 published version

Journal-ref: Phys. Rev. B 96, 245122 (2017)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[2] [arXiv:1703.08179](#) [[pdf](#), [other](#)]

Tailored codes for small quantum memories

[Alan Robertson](#), [Christopher Granade](#), [Stephen D. Bartlett](#), [Steven T. Flammia](#)

Comments: 6 pages, 2 figures, supplementary material; v2 published version

Journal-ref: Phys. Rev. Applied 8, 064004 (2017)

Subjects: **Quantum Physics (quant-ph)**

[3] [arXiv:1712.02806](#) [[pdf](#), [other](#)]

From estimation of quantum probabilities to simulation of quantum circuits

[Hakop Pashayan](#), [Stephen D. Bartlett](#), [David Gross](#)

Comments: 24 pages, 2 figures, comments welcome

Subjects: **Quantum Physics (quant-ph)**

[4] [arXiv:1608.08221](#) [[pdf](#), [other](#)]

Robust symmetry-protected metrology with the Haldane phase

[Stephen D. Bartlett](#), [Gavin K. Brennen](#), [Akimasa Miyake](#)

Comments: 6 pages, 2 figures; v3 published version

Journal-ref: Quantum Sci. Technol. <https://doi.org/10.1088/2058-9565/aa9c56>

Subjects: **Quantum Physics (quant-ph)**

[5] [arXiv:1710.10012](#) [[pdf](#), [other](#)]

Spin of a multielectron quantum dot and its interaction with a neighboring electron

[Filip K. Malinowski](#), [Frederico Martins](#), [Thomas B. Smith](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#), [Peter D. Nissen](#), [Saeed Fallahi](#), [Geoffrey C. Gardner](#), [Michael J. Manfra](#), [Charles M. Marcus](#), [Ferdinand Kuemmeth](#)

Comments: 20 pages, 13 figures, 2 tables

Subjects: **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**

[6] [arXiv:1701.01888](#) [[pdf](#), [other](#)]

Topological proofs of contextuality in quantum mechanics

[Cihan Okay](#), [Sam Roberts](#), [Stephen D. Bartlett](#), [Robert Raussendorf](#)

Comments: 31 pages, v2: published version

Journal-ref: Quantum Information and Computation 17, 1135–1166 (2017)

Subjects: **Quantum Physics (quant-ph)**

[7] [arXiv:1709.00020](#) [[pdf](#), [other](#)]

Locality-Preserving Logical Operators in Topological Stabiliser Codes

[Paul Webster](#), [Stephen D. Bartlett](#)

Comments: 24 pages, 17 figures, comments welcome; v2 includes various minor improvements

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[8] [arXiv:1708.08474](#) [[pdf](#), [other](#)]

Ultra-high error threshold for surface codes with biased noise

[David K. Tuckett](#), [Stephen D. Bartlett](#), [Steven T. Flammia](#)

Comments: 5 pages, 5 figures, comments welcome; v2 includes minor improvements to the numerical results, additional references, and an extended discussion

Subjects: **Quantum Physics (quant-ph)**

[9] [arXiv:1706.09967](#) [[pdf](#), [other](#)]

Long-range entanglement for spin qubits via quantum Hall edge modes

[Samuel J. Elman](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 14 pages, 7 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. B 96, 115407 (2017)

Subjects: **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**; **Quantum Physics (quant-ph)**

[10] [arXiv:1611.05450](#) [[pdf](#), [other](#)]

Symmetry protected topological order at nonzero temperature



[Sam Roberts](#), [Beni Yoshida](#), [Aleksander Kubica](#), [Stephen D. Bartlett](#)

Comments: 42 pages, 10 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. A 96, 022306 (2017)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[11] [arXiv:1610.06897](#) [[pdf](#), [other](#)]

Contextuality under weak assumptions

[Andrew W. Simmons](#), [Joel J. Wallman](#), [Hakop Pashayan](#), [Stephen D. Bartlett](#), [Terry Rudolph](#)

Comments: 14 Pages, 2 figures, 1 appendix

Journal-ref: New J. Phys. 19 033030, 2017

Subjects: **Quantum Physics (quant-ph)**

[12] [arXiv:1605.08053](#) [[pdf](#), [other](#)]

Randomized benchmarking in measurement-based quantum computing

[Rafael N. Alexander](#), [Peter S. Turner](#), [Stephen D. Bartlett](#)

Comments: 10 pages, 4 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. A 94, 032303 (2016)

Subjects: **Quantum Physics (quant-ph)**

[13] [arXiv:1509.04255](#) [[pdf](#), [other](#)]

Stacked codes: universal fault-tolerant quantum computation in a two-dimensional layout

[Tomas Jochym-O'Connor](#), [Stephen D. Bartlett](#)

Comments: 14 pages, 6 figures, comments welcome. Note our construction is very similar to recent results by Bravyi and Cross reported in [arXiv:1509.03239](#). Version 2 contains minor changes

Journal-ref: Phys. Rev. A 93, 022323 (2016)

Subjects: **Quantum Physics (quant-ph)**

[14] [arXiv:1509.04719](#) [[pdf](#), [other](#)]

Spectral properties for a family of two-dimensional quantum antiferromagnets

[Andrew S. Darmawan](#), [Stephen D. Bartlett](#)

Comments: 14 pages, 6 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. B 93, 045129 (2016)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[15] [arXiv:1509.05032](#) [[pdf](#), [other](#)]

Reducing the overhead for quantum computation when noise is biased

[Paul Webster](#), [Stephen D. Bartlett](#), [David Poulin](#)

Comments: 9 pages, 6 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. A 92, 062309 (2015)

Subjects: **Quantum Physics (quant-ph)**

[16] [arXiv:1507.00038](#) [[pdf](#), [other](#)]

Symmetry-respecting real-space renormalization for the quantum Ashkin-Teller model

[Aroon O'Brien](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#), [Steven T. Flammia](#)

Comments: 8 pages, 5 figures, comments welcome; v2 fixed an error in the analytic expression against which we compare our numerical results, added new references; v3 published version

Journal-ref: Phys. Rev. E 92, 042163 (2015)

Subjects: **Strongly Correlated Electrons (cond-mat.str-el)**; **Quantum Physics (quant-ph)**

[17] [arXiv:1503.07525](#) [[pdf](#), [other](#)]

Estimating outcome probabilities of quantum circuits using quasiprobabilities

[Hakop Pashayan](#), [Joel J. Wallman](#), [Stephen D. Bartlett](#)

Comments: 5 pages + 1 page appendix, 1 figure, comments welcome; v2 published version

Journal-ref: Phys. Rev. Lett. 115, 070501 (2015)

Subjects: **Quantum Physics (quant-ph)**

[18] [arXiv:1503.05203](#) [[pdf](#), [other](#)]

Weak values in a classical theory with an epistemic restriction

[Angela Karanjai](#), [Eric G. Cavalcanti](#), [Stephen D. Bartlett](#), [Terry Rudolph](#)

Comments: 9 pages, 2 figures, comments welcome; v2 added some references; v3 published version

Journal-ref: New J. Phys. 17, 073015 (2015)

Subjects: **Quantum Physics (quant-ph)**

[19] [arXiv:1408.3415](#) [[pdf](#), [other](#)]

Symmetry-protected adiabatic quantum transistors

[Dominic J. Williamson](#), [Stephen D. Bartlett](#)

Comments: 11 pages + 9 page appendix, 12 figures, comments welcome; v2 published version

Journal-ref: New J. Phys. 17, 053019 (2015)

Subjects: **Quantum Physics (quant-ph)**

[20] [arXiv:1501.02817](#) [[pdf](#), [other](#)]

MERA for Spin Chains with Continuously Varying Criticality

[Jacob C. Bridgeman](#), [Aroon O'Brien](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 13 pages, 11 figures, comments welcome; v2 published version



Journal-ref: Phys. Rev. B 91, 165129 (2015)

Subjects: **Strongly Correlated Electrons (cond-mat.str-el)**; Quantum Physics (quant-ph)

[21] [arXiv:1502.05119](#) [[pdf](#), [ps](#), [other](#)]

Non-exponential Fidelity Decay in Randomized Benchmarking with Low-Frequency Noise

[M. A. Fogarty](#), [M. Veldhorst](#), [R. Harper](#), [C. H. Yang](#), [S. D. Bartlett](#), [S. T. Flammia](#), [A. S. Dzurak](#)

Comments: 6 pages, 4 figures

Journal-ref: Phys. Rev. A 92, 022326 (2015)

Subjects: **Quantum Physics (quant-ph)**

[22] [arXiv:1407.4829](#) [[pdf](#), [other](#)]

Perturbative 2-body Parent Hamiltonians for Projected Entangled Pair States

[Courtney G. Brell](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 26 pages, 4 figures, v2 published version

Journal-ref: New J. Phys. 16, 123056 (2014)

Subjects: **Quantum Physics (quant-ph)**; **Strongly Correlated Electrons (cond-mat.str-el)**

[23] [arXiv:1403.2402](#) [[pdf](#), [other](#)]

Graph states as ground states of two-body frustration-free Hamiltonians

[Andrew S. Darmawan](#), [Stephen D. Bartlett](#)

Comments: 16 pages, 5 figures, comments welcome; v2 published version

Journal-ref: New J. Phys. 16, 073013 (2014)

Subjects: **Quantum Physics (quant-ph)**; **Strongly Correlated Electrons (cond-mat.str-el)**

[24] [arXiv:1307.6597](#) [[pdf](#), [other](#)]

Changing quantum reference frames

[Matthew C. Palmer](#), [Florian Girelli](#), [Stephen D. Bartlett](#)

Comments: 21 pages, 6 figures, comments welcome; v2 added some references; v3 published version

Journal-ref: Phys. Rev. A 89, 052121 (2014)

Subjects: **Quantum Physics (quant-ph)**; **General Relativity and Quantum Cosmology (gr-qc)**

[25] [arXiv:1405.0485](#) [[pdf](#), [other](#)]

Suppressing qubit dephasing using real-time Hamiltonian estimation

[Michael D. Shulman](#), [Shannon P. Harvey](#), [John M. Nichol](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#), [Vladimir Umansky](#), [Amir Yacoby](#)

Journal-ref: Nature Communications 5, 5156 (2014)

Subjects: **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**; **Quantum Physics (quant-ph)**

[26] [arXiv:1303.4455](#) [[pdf](#), [other](#)]

Topological Entanglement Entropy with a Twist

[Benjamin J. Brown](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#), [Sean D. Barrett](#)

Comments: 4+3 pages, 4 figures, comments welcome; v2 references added; v3 published version

Journal-ref: Phys. Rev. Lett. 111, 220402 (2013)

Subjects: **Quantum Physics (quant-ph)**; **Strongly Correlated Electrons (cond-mat.str-el)**

[27] [arXiv:1306.0349](#) [[pdf](#), [ps](#), [other](#)]

Decomposition of any quantum measurement into extremals

[G. Sentís](#), [B. Gendra](#), [S. D. Bartlett](#), [A. C. Doherty](#)

Comments: 10 pages

Journal-ref: J. Phys. A: Math. Theor. 46 (2013) 375302

Subjects: **Quantum Physics (quant-ph)**

[28] [arXiv:1306.1013](#) [[pdf](#), [other](#)]

Tomography of a spin qubit in a double quantum dot

[Maki Takahashi](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 10 pages, 5 figures, comments welcome; v2 published version

Journal-ref: Phys. Rev. A 88, 022120 (2013)

Subjects: **Quantum Physics (quant-ph)**; **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**

[29] [arXiv:1304.0783](#) [[pdf](#), [other](#)]

The hidden symmetry-breaking picture of symmetry-protected topological order

[Dominic V. Else](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 11 pages, 1 figure, comments welcome; v2 published version

Journal-ref: Phys. Rev. B 88, 085114 (2013)

Subjects: **Strongly Correlated Electrons (cond-mat.str-el)**; **Quantum Physics (quant-ph)**

[30] [arXiv:1103.5076](#) [[pdf](#), [other](#)]

Holonomic quantum computing in symmetry-protected ground states of spin chains

[Joseph M. Renes](#), [Akimasa Miyake](#), [Gavin K. Brennen](#), [Stephen D. Bartlett](#)

Comments: 19 pages, 4 figures. v2: published version

Journal-ref: New J. Phys. 15, 025020 (2013)

Subjects: **Quantum Physics (quant-ph)**; **Quantum Gases (cond-mat.quant-gas)**; **Strongly Correlated Electrons (cond-mat.str-el)**

[31] [arXiv:1302.1933](#) [[pdf](#), [other](#)]

Self-Consistent Measurement and State Tomography of an Exchange-Only Spin Qubit

[J. Medford](#), [J. Beil](#), [J. M. Taylor](#), [S. D. Bartlett](#), [A. C. Doherty](#), [E. I. Rashba](#), [D. P. DiVincenzo](#), [H. Lu](#), [A. C. Gossard](#), [C. M. Marcus](#)

Comments: contains Supplementary Information

Journal-ref: Nature Nanotechnology 8, 654 (2013)

Subjects: **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**; Quantum Physics (quant-ph)

[32] [arXiv:1207.4805](#) [[pdf](#), [other](#)]

Symmetry protection of measurement-based quantum computation in ground states

[Dominic V. Else](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 20 pages plus appendices, 11 figures, comments very welcome; v2 minor corrections and additional references; v3 published version with minor corrections

Journal-ref: New J. Phys. 14, 113016 (2012)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[33] [arXiv:1203.2652](#) [[pdf](#), [other](#)]

Nonnegative subtheories and quasiprobability representations of qubits

[Joel J. Wallman](#), [Stephen D. Bartlett](#)

Comments: 17 pages, 8 figures, comments very welcome; v2 published version. Note that the statement and proof of Theorem III.2 in the published version are incorrect (an erratum has been submitted), and this arXiv version (v2) presents the corrected theorem and proof. The conclusions of the paper are unaffected by this correction

Journal-ref: Phys. Rev. A 85, 062121 (2012)

Subjects: **Quantum Physics (quant-ph)**

[34] [arXiv:1111.5057](#) [[pdf](#), [other](#)]

Reconstruction of Gaussian quantum mechanics from Liouville mechanics with an epistemic restriction

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 27 pages, 3 figures; v2 published version

Journal-ref: Phys. Rev. A 86, 012103 (2012)

Subjects: **Quantum Physics (quant-ph)**

[35] [arXiv:1201.4877](#) [[pdf](#), [other](#)]

Symmetry-protected phases for measurement-based quantum computation

[Dominic V. Else](#), [Ilai Schwarz](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 5 pages, 1 figure, comments welcome; v2 fixed minor typographic errors; v3 published version

Journal-ref: Phys. Rev. Lett. 108, 240505 (2012)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[36] [arXiv:1206.3830](#) [[pdf](#), [ps](#), [other](#)]

Optimizing qubit Hamiltonian parameter estimation algorithms using PSO

[Alexandr Sergeevich](#), [Stephen D. Bartlett](#)

Comments: 3 pages, 2 figures, presented at 2012 IEEE Congress on Evolutionary Computation, to be published in the proceedings

Journal-ref: Proceedings of 2012 IEEE Conference on Evolutionary Computation (CEC), 10-15 June 2012

Subjects: **Quantum Physics (quant-ph)**

[37] [arXiv:1005.2438](#) [[pdf](#), [ps](#), [other](#)]

Revisiting consistency conditions for quantum states of systems on closed timelike curves: an epistemic perspective

[Joel J. Wallman](#), [Stephen D. Bartlett](#)

Comments: 10 pages, 6 figures, comments welcome; v2 added references and clarified some points; v3 published version

Journal-ref: Found. Phys. 42, 656-673 (2012)

Subjects: **Quantum Physics (quant-ph)**

[38] [arXiv:1111.1864](#) [[pdf](#), [other](#)]

Observers can always generate nonlocal correlations without aligning measurements by covering all their bases

[Joel J. Wallman](#), [Stephen D. Bartlett](#)

Comments: 4 pages, 2 figures. v2: updated reference. v3: published version

Journal-ref: Phys. Rev. A 85, 024101 (2012)

Subjects: **Quantum Physics (quant-ph)**

[39] [arXiv:1108.4741](#) [[pdf](#), [other](#)]

Measurement-based quantum computation in a 2D phase of matter

[Andrew S. Darmawan](#), [Gavin K. Brennen](#), [Stephen D. Bartlett](#)

Comments: 8 pages, 6 figures, comments welcome. v2: published version

Journal-ref: New J. Phys. 14, 013023 (2012)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[40] [arXiv:1102.3700](#) [[pdf](#), [other](#)]

Characterization of a qubit Hamiltonian using adaptive measurements in a fixed basis

[Alexandr Sergeevich](#), [Anushya Chandran](#), [Joshua Combes](#), [Stephen D. Bartlett](#), [Howard M. Wiseman](#)

Comments: 5 pages, 3 figures, 1 table. Published version

Journal-ref: Phys. Rev. A 84, 052315 (2011)

Subjects: **Quantum Physics (quant-ph)**; Mesoscale and Nanoscale Physics (cond-mat.mes-hall)

[41] [arXiv:1011.1942](#) [[pdf](#), [ps](#), [other](#)]

Toric codes and quantum doubles from two-body Hamiltonians

[Courtney G. Brell](#), [Steven T. Flammia](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 10 pages of ideas plus 26 pages of calculations; 8 figures. v2, improved discussion of perturbation theory and relation to other topological subsystem codes; refs added. v3, v4, minor corrections and clarifications; published version

Journal-ref: New J. Phys. 13, 053039 (2011)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[42] [arXiv:1012.3525](#) [[pdf](#), [other](#)]

Multiple-copy state discrimination: Thinking globally, acting locally

[B. L. Higgins](#), [A. C. Doherty](#), [S. D. Bartlett](#), [G. J. Pryde](#), [H. M. Wiseman](#)

Comments: 11 pages, 14 figures

Journal-ref: Phys. Rev. A 83, 052314 (2011)

Subjects: **Quantum Physics (quant-ph)**

[43] [arXiv:1012.1737](#) [[pdf](#), [other](#)]

Generating nonclassical correlations without fully aligning measurements

[Joel J. Wallman](#), [Yeong-Cherng Liang](#), [Stephen D. Bartlett](#)

Comments: v2: Essentially published version (with typos fixed, results updated in Table 2 and Figure 4 replaced); v1: 16 pages, 5 figures, 2 tables, comments welcome

Journal-ref: Phys. Rev. A 83, 022110 (2011)

Subjects: **Quantum Physics (quant-ph)**

[44] [arXiv:1101.4366](#) [[pdf](#), [other](#)]

Efficient quantum state tomography

[Marcus Cramer](#), [Martin B. Plenio](#), [Steven T. Flammia](#), [David Gross](#), [Stephen D. Bartlett](#), [Rolando Somma](#), [Olivier Landon-Cardinal](#), [Yi-Kai Liu](#), [David Poulin](#)

Comments: 9 pages, 4 figures. Combines many of the results in [arXiv:1002.3780](#), [arXiv:1002.3839](#), and [arXiv:1002.4632](#) into one unified exposition

Journal-ref: Nat. Commun., 1 (9) 149, Dec 2010

Subjects: **Quantum Physics (quant-ph)**

[45] [arXiv:1004.4906](#) [[pdf](#), [other](#)]

Quantum computational renormalization in the Haldane phase

[Stephen D. Bartlett](#), [Gavin K. Brennen](#), [Akimasa Miyake](#), [Joseph M. Renes](#)

Comments: v2: 4 pages, 3 figures; improved description of buffering scheme and connection to string operators. v3: final published version

Journal-ref: Phys.Rev.Lett.105:110502,2010

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[46] [arXiv:0809.3308](#) [[pdf](#), [ps](#), [other](#)]

Demonstrating Heisenberg-limited unambiguous phase estimation without adaptive measurements

[B. L. Higgins](#), [D. W. Berry](#), [S. D. Bartlett](#), [M. W. Mitchell](#), [H. M. Wiseman](#), [G. J. Pryde](#)

Comments: Corrected 2 minor typos in hybrid scheme scaling proof; 15 pages, 4 figures

Journal-ref: New J. Phys. 11, 073023 (2009)

Subjects: **Quantum Physics (quant-ph)**

[47] [arXiv:1004.3626](#) [[pdf](#), [other](#)]

Optical spin-1 chain and its use as a quantum computational wire

[Andrew S. Darmawan](#), [Stephen D. Bartlett](#)

Comments: 9 pages, 4 figures, published version

Journal-ref: Phys. Rev. A 82, 012328 (2010)

Subjects: **Quantum Physics (quant-ph)**

[48] [arXiv:1004.3624](#) [[pdf](#), [other](#)]

Optical one-way quantum computing with a simulated valence-bond solid

[Jonathan Lavoie](#), [Rainer Kaltenbaek](#), [Bei Zeng](#), [Stephen D. Bartlett](#), [Kevin J. Resch](#)

Comments: 11 pages, 4 figures, 8 tables – added one reference

Journal-ref: Nature Physics 6, 850–854 (2010)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[49] [arXiv:0911.3698](#) [[pdf](#), [other](#)]

Experimental feedback control of quantum systems using weak measurements

[G. G. Gillett](#), [R. B. Dalton](#), [B. P. Lanyon](#), [M. P. Almeida](#), [M. Barbieri](#), [G. J. Pryde](#), [J. L. O'Brien](#), [K. J. Resch](#), [S. D. Bartlett](#), [A. G. White](#)

Comments: 4 pages, 3 figures. v2 Added extra citation, journal reference and DOI. Minor typographic corrections

Journal-ref: Phys. Rev. Lett. 104, 080503 (2010)

Subjects: **Quantum Physics (quant-ph)**

[50] [arXiv:1002.3839](#) [[pdf](#), [ps](#), [other](#)]

Heralded Polynomial-Time Quantum State Tomography

[Steven T. Flammia](#), [David Gross](#), [Stephen D. Bartlett](#), [Rolando Somma](#)

Comments: 4 pages. (Well... actually, 5). See also closely related work: [arXiv:1002.3780](#)

Subjects: **Quantum Physics (quant-ph)**

[51] [arXiv:0909.0990](#) [[pdf](#), [ps](#), [other](#)]

Nonclassical correlations from randomly chosen local measurements

[Yeong-Cherng Liang](#), [Nicholas Harrigan](#), [Stephen D. Bartlett](#), [Terry Rudolph](#)

Comments: v3 (published version) 7 pages, 4 figures, 1 table, results considerably strengthened, references updated; v2 4 pages, 3 figures, margins tightened, references updated, minor errors fixed, Fig1 and Fig 2 replaced; v1 4+ pages, 3 figures

Journal-ref: Physical Review Letters, vol. 104, art. 050401 (2010)

Subjects: **Quantum Physics (quant-ph)**

[52] [arXiv:0807.4797](#) [[pdf](#), [ps](#), [other](#)]

Transitions in the computational power of thermal states for measurement-based quantum computation

[Sean D. Barrett](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#), [David Jennings](#), [Terry Rudolph](#)

Comments: 9 pages, 2 figures, v4 published version

Journal-ref: Phys. Rev. A 80, 062328 (2009)

Subjects: **Quantum Physics (quant-ph)**

[53] [arXiv:0909.1572](#) [[pdf](#), [other](#)]

Mixed state discrimination using optimal control

[B. L. Higgins](#), [B. M. Booth](#), [A. C. Doherty](#), [S. D. Bartlett](#), [H. M. Wiseman](#), [G. J. Pryde](#)

Comments: Corrected ref 1 date; 4 pages & 4 figures + 2 pages & 3 figures supplementary material

Journal-ref: Phys. Rev. Lett. 103, 220503 (2009)

Subjects: **Quantum Physics (quant-ph)**

[54] [arXiv:0907.0014](#) [[pdf](#), [ps](#), [other](#)]

How to perform the most accurate possible phase measurements

[D. W. Berry](#), [B. L. Higgins](#), [S. D. Bartlett](#), [M. W. Mitchell](#), [G. J. Pryde](#), [H. M. Wiseman](#)

Comments: 23 pages, 10 figures; new general definition of resources

Journal-ref: Phys. Rev. A 80, 052114 (2009)

Subjects: **Quantum Physics (quant-ph)**

[55] [arXiv:0906.3553](#) [[pdf](#), [ps](#), [other](#)]

Quantum computation via measurements on the low-temperature state of a many-body system

[David Jennings](#), [Andrzej Dragan](#), [Sean D. Barrett](#), [Stephen D. Bartlett](#), [Terry Rudolph](#)

Comments: 9 pages, 3 figures; v2 published version

Journal-ref: Phys. Rev. A 80, 032328 (2009)

Subjects: **Quantum Physics (quant-ph)**

[56] [arXiv:0905.1480](#) [[pdf](#), [other](#)]

Phase transitions and localizable entanglement in cluster-state spin chains with Ising couplings and local fields

[Stein Olav Skrøvseth](#), [Stephen D. Bartlett](#)

Comments: 11 pages, 7 figures, comments welcome; v2 gives some further analytic results for the localizable entanglement, and some additional references; v3 published version

Journal-ref: Phys. Rev. A 80, 022316 (2009)

Subjects: **Quantum Physics (quant-ph)**

[57] [arXiv:0802.4314](#) [[pdf](#), [ps](#), [other](#)]

Identifying phases of quantum many-body systems that are universal for quantum computation

[Andrew C. Doherty](#), [Stephen D. Bartlett](#)

Comments: 5 pages, 2 figures, comments welcome; v2 has had many technical details removed, and gives a simplified presentation; v3 published version

Journal-ref: Phys. Rev. Lett. 103, 020506 (2009)

Subjects: **Quantum Physics (quant-ph)**; Strongly Correlated Electrons (cond-mat.str-el)

[58] [arXiv:0812.5040](#) [[pdf](#), [ps](#), [other](#)]

Quantum communication using a bounded-size quantum reference frame

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#), [Peter S. Turner](#)

Comments: 17 pages, 1 figure, comments welcome; v2 published version

Journal-ref: New J. Phys. 11, 063013 (2009)

Subjects: **Quantum Physics (quant-ph)**

[59] [arXiv:0904.2609](#) [[pdf](#), [ps](#), [other](#)]

Characterizing measurement-based quantum gates in quantum many-body systems using correlation functions

[Thomas Chung](#), [Stephen D. Bartlett](#), [Andrew C. Doherty](#)

Comments: 7 pages, 2 figures. Proceedings paper for an invited talk at Theory Canada 4 (2008), published in the Canadian Journal of Physics

Journal-ref: Can. J. Phys., 87, 219 (2009)

Subjects: **Quantum Physics (quant-ph)**

[60] [arXiv:0904.2045](#) [[pdf](#), [other](#)]

Adaptive Measurements in the Optical Quantum Information Laboratory

[H. M. Wiseman](#), [D. W. Berry](#), [S. D. Bartlett](#), [B. L. Higgins](#), [G. J. Pryde](#)

Comments: 12 pages, invited paper to be published in IEEE Journal of Selected Topics in Quantum Electronics: Quantum Communications and Information Science

Journal-ref: IEEE J. Sel. Top. Quantum Electron., 15, 1661–1672 (2009)

Subjects: **Quantum Physics (quant-ph)**

[61] [arXiv:0805.2980](#) [[pdf](#), [ps](#), [other](#)]

Spin lattices with two-body Hamiltonians for which the ground state encodes a cluster state

[Tom Griffin](#), [Stephen D. Bartlett](#)

Comments: 16 pages, 5 figures, comments welcome; v2 added some new results about exact solutions to this model; v3 published version

Journal-ref: Phys. Rev. A 78, 062306 (2008)

Subjects: **Quantum Physics (quant-ph)**

[62] [arXiv:0709.2996](#) [[pdf](#), [other](#)]

Entanglement-free Heisenberg-limited phase estimation

[B. L. Higgins](#), [D. W. Berry](#), [S. D. Bartlett](#), [H. M. Wiseman](#), [G. J. Pryde](#)

Comments: Published in Nature. This is the final version

Journal-ref: Nature.450:393–396,2007

Subjects: **Quantum Physics (quant-ph)**

[63] [arXiv:0709.0142](#) [[pdf](#), [other](#)]

Quantum Reference Frames and the Classification of Rotationally-Invariant Maps

[J.-C. Boileau](#), [L. Sheridan](#), [M. Laforest](#), [S. D. Bartlett](#)

Comments: 18 pages. Accepted in Journal of Mathematical Physics

Journal-ref: J. Math. Phys. 49, 032105 (2008)

Subjects: **Quantum Physics (quant-ph)**

[64] [arXiv:quant-ph/0607107](#) [[pdf](#), [ps](#), [other](#)]

Degradation of a quantum directional reference frame as a random walk

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Barry C. Sanders](#), [Peter S. Turner](#)

Comments: 5 pages, no figures. Comments are welcome. v2: several changes to clarify the key results. v3: journal reference added, acknowledgements and references updated

Journal-ref: J. Mod. Opt., 54, 2211 (2007)

Subjects: **Quantum Physics (quant-ph)**

[65] [arXiv:quant-ph/0610030](#) [[pdf](#), [ps](#), [other](#)]

Reference frames, superselection rules, and quantum information

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 55 pages, published version

Journal-ref: Rev. Mod. Phys. 79, 555 (2007)

Subjects: **Quantum Physics (quant-ph)**

[66] [arXiv:quant-ph/0609002](#) [[pdf](#), [ps](#), [other](#)]

A simple nearest-neighbor two-body Hamiltonian system for which the ground state is a universal resource for quantum computation

[Stephen D. Bartlett](#), [Terry Rudolph](#)

Comments: 5 pages, 1 figure; v2 has a simplified lattice, an extended analysis of errors, and some additional references; v3 published version

Journal-ref: Phys. Rev. A, 74, 040302(R) (2006)

Subjects: **Quantum Physics (quant-ph)**

[67] [arXiv:quant-ph/0608056](#) [[pdf](#), [ps](#), [other](#)]

Entanglement and Symmetry: A Case Study in Superselection Rules, Reference Frames, and Beyond

[S. J. Jones](#), [H. M. Wiseman](#), [S. D. Bartlett](#), [J. A. Vaccaro](#), [D. T. Pope](#)

Comments: 16 pages, 6 figures. v2 updated version published in Phys Rev A

Journal-ref: Phys. Rev. A 74, 062313 (2006)

Subjects: **Quantum Physics (quant-ph)**

[68] [arXiv:quant-ph/0608037](#) [[pdf](#), [ps](#), [other](#)]

Quantum Control of a Single Qubit

[Agata M. Branczyk](#), [Paulo E. M. F. Mendonca](#), [Alexei Gilchrist](#), [Andrew C. Doherty](#), [Stephen D. Bartlett](#)

Comments: 12 pages, 7 figures, v2 includes new references and minor changes

Journal-ref: Phys. Rev. A, 75, 012329 (2007)

Subjects: **Quantum Physics (quant-ph)**



[69] [arXiv:quant-ph/0606128](#) [[pdf](#), [ps](#), [other](#)]

How to observe a coherent superposition of an atom and a molecule

[Mark R. Dowling](#), [Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 17 pages, 1 figure, comments welcome, published version (minor changes)

Journal-ref: Phys. Rev. A, 74, 052113 (2006)

Subjects: **Quantum Physics (quant-ph)**; Other Condensed Matter (cond-mat.other)

[70] [arXiv:quant-ph/0602069](#) [[pdf](#), [ps](#), [other](#)]

Degradation of a quantum reference frame

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#), [Peter S. Turner](#)

Comments: 9 pages plus appendices, 4 figures, published version

Journal-ref: New J. Phys. 8, 58 (2006)

Subjects: **Quantum Physics (quant-ph)**

[71] [arXiv:quant-ph/0410203](#) [[pdf](#)]

Demonstrating quantum nonlocality without entanglement

[G. J. Pryde](#), [J. L. O'Brien](#), [A. G. White](#), [Stephen D. Bartlett](#)

Comments: 4 pages, 3 figures, RevTeX 4

Journal-ref: Phys.Rev.Lett.94:220406,2005

Subjects: **Quantum Physics (quant-ph)**

[72] [arXiv:quant-ph/0507214](#) [[pdf](#), [ps](#), [other](#)]

Dialogue Concerning Two Views on Quantum Coherence: Factist and Fictionist

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 14 pages, Contribution to the Int. J. of Quant. Info. issue dedicated to the memory of Asher Peres; v2 updated summary and critique of prior literature

Journal-ref: International Journal of Quantum Information, Vol. 4, No. 1 (2006) 17-43

Subjects: **Quantum Physics (quant-ph)**

[73] [arXiv:quant-ph/0507175](#) [[pdf](#)]

Reply to "Comment on 'Measuring a Photonic Qubit without Destroying It'"

[G. J. Pryde](#), [J. L. O'Brien](#), [A. G. White](#), [S. D. Bartlett](#), [T. C. Ralph](#)

Comments: 1 page, no figures

Journal-ref: Phys.Rev.Lett.95:048902,2005

Subjects: **Quantum Physics (quant-ph)**

[74] [arXiv:quant-ph/0506260](#) [[pdf](#), [ps](#), [other](#)]

Random subspaces for encryption based on a private shared Cartesian frame

[Stephen D. Bartlett](#), [Patrick Hayden](#), [Robert W. Spekkens](#)

Comments: 9 pages, published version

Journal-ref: Phys. Rev. A, 72, 052329 (2005)

Subjects: **Quantum Physics (quant-ph)**

[75] [arXiv:quant-ph/0505112](#) [[pdf](#), [ps](#), [other](#)]

Quantum methods for clock synchronization: Beating the standard quantum limit without entanglement

[Mark de Burgh](#), [Stephen D. Bartlett](#)

Comments: 9 pages, 1 figure, published version

Journal-ref: Phys. Rev. A, 72, 042301 (2005)

Subjects: **Quantum Physics (quant-ph)**

[76] [arXiv:quant-ph/0412158](#) [[pdf](#), [ps](#), [other](#)]

Entanglement under restricted operations: Analogy to mixed-state entanglement

[Stephen D. Bartlett](#), [Andrew C. Doherty](#), [Robert W. Spekkens](#), [H. M. Wiseman](#)

Comments: 10 pages, 2 figures; published version

Journal-ref: Phys. Rev. A, 73, 022311 (2006)

Subjects: **Quantum Physics (quant-ph)**

[77] [arXiv:quant-ph/0412149](#) [[pdf](#), [ps](#), [other](#)]

Quantum Non-demolition Measurements on Qubits

[T.C.Ralph](#), [S.D.Bartlett](#), [J.L.O'Brien](#), [G.J.Pryde](#), [H.M.Wiseman](#)

Journal-ref: Phys.Rev.A73:012113,2006

Subjects: **Quantum Physics (quant-ph)**

[78] [arXiv:quant-ph/0312072](#) [[pdf](#), [ps](#), [other](#)]

Measuring Entangled Qutrits and Their Use for Quantum Bit Commitment

[Nathan K. Langford](#), [Rohan B. Dalton](#), [Michael D. Harvey](#), [Jeremy L. O'Brien](#), [Geoffrey J. Pryde](#), [Alexei](#)

[Gilchrist](#), [Stephen D. Bartlett](#), [Andrew G. White](#)

Comments: Paper updated to match published version; 5 pages, 4 figures, images have been included at slightly lower quality for the archive

Journal-ref: Phys.Rev.Lett.93:053601,2004

Subjects: **Quantum Physics (quant-ph)**

[79] [arXiv:quant-ph/0408086](#) [[pdf](#), [ps](#), [other](#)]

Energy as an Entanglement Witness for Quantum Many-Body Systems

[Mark R. Dowling](#), [Andrew C. Doherty](#), [Stephen D. Bartlett](#)

Comments: 16 pages, 3 figures, published version

Journal-ref: Phys. Rev. A 70, 062113 (2004)

Subjects: **Quantum Physics (quant-ph)**; Statistical Mechanics (cond-mat.stat-mech)

[80] [arXiv:quant-ph/0403161](#) [[pdf](#), [ps](#), [other](#)]

Decoherence-full subsystems and the cryptographic power of a private shared reference frame

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 13 pages, published version

Journal-ref: Phys. Rev. A 70, 032307 (2004)

Subjects: **Quantum Physics (quant-ph)**

[81] [arXiv:quant-ph/0403014](#) [[pdf](#), [ps](#), [other](#)]

Relativistically invariant quantum information

[Stephen D. Bartlett](#), [Daniel R. Terno](#)

Comments: 5 pages, published version

Journal-ref: Phys. Rev. A 71, 012302 (2005)

Subjects: **Quantum Physics (quant-ph)**

[82] [arXiv:quant-ph/0312177](#) [[src](#)]

Electronic coherence theory

[Stephen D. Bartlett](#), [Barry C. Sanders](#), [William D. Oliver](#), [Yoshihisa Yamamoto](#)

Comments: Withdrawn

Subjects: **Quantum Physics (quant-ph)**; Mesoscale and Nanoscale Physics (cond-mat.mes-hall)

[83] [arXiv:quant-ph/0312048](#) [[pdf](#), [ps](#), [other](#)]

Measuring a photonic qubit without destroying it

[G. J. Pryde](#), [J. L. O'Brien](#), [A. G. White](#), [S. D. Bartlett](#), [T. C. Ralph](#)

Comments: 4 pages, 3 figures

Journal-ref: Phys.Rev.Lett.92:190402,2004

Subjects: **Quantum Physics (quant-ph)**

[84] [arXiv:quant-ph/0310009](#) [[pdf](#), [ps](#), [other](#)]

Optimal measurements for relative quantum information

[Stephen D. Bartlett](#), [Terry Rudolph](#), [Robert W. Spekkens](#)

Comments: 6 pages, 1 figure, published version

Journal-ref: Phys. Rev. A 70, 032321 (2004)

Subjects: **Quantum Physics (quant-ph)**

[85] [arXiv:quant-ph/0309046](#) [[pdf](#), [ps](#), [other](#)]

Ferretting out the Fluffy Bunnies: Entanglement constrained by Generalized superselection rules

[Howard M. Wiseman](#), [Stephen D. Bartlett](#), [John A. Vaccaro](#)

Comments: 8 pages, proceedings paper for an invited talk at 16th International Conference on Laser Spectroscopy (2003)

Subjects: **Quantum Physics (quant-ph)**

[86] [arXiv:quant-ph/0307162](#) [[pdf](#), [ps](#), [other](#)]

Direct observation of non-classical photon statistics in parametric downconversion

[Edo Waks](#), [Eleni Diamanti](#), [Barry C. Sanders](#), [Stephen D. Bartlett](#), [Yoshihisa Yamamoto](#)

Journal-ref: Phys. Rev. Lett. 92, 113602 (2004)

Subjects: **Quantum Physics (quant-ph)**

[87] [arXiv:quant-ph/0306076](#) [[pdf](#), [ps](#), [other](#)]

Photon-number superselection and the entangled coherent-state representation

[Barry C. Sanders](#), [Stephen D. Bartlett](#), [Terry Rudolph](#), [Peter L. Knight](#)

Comments: 9 pages, 3 figures, published version

Journal-ref: Phys. Rev. A 68, 042329 (2003)

Subjects: **Quantum Physics (quant-ph)**

[88] [arXiv:quant-ph/0303140](#) [[pdf](#), [ps](#), [other](#)]

Entanglement constrained by superselection rules

[Stephen D. Bartlett](#), [H. M. Wiseman](#)

Comments: 4 pages, published version

Journal-ref: Phys. Rev. Lett. 91, 097903 (2003)

Subjects: **Quantum Physics (quant-ph)**

[89] [arXiv:quant-ph/0302125](#) [[pdf](#), [ps](#), [other](#)]

Requirement for quantum computation

[Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 11 pages, no figures

Journal-ref: Journal of Modern Optics, Vol. 50, pp. 2331-2340 (2003)

Subjects: **Quantum Physics (quant-ph)**

[90] [arXiv:quant-ph/0302111](#) [[pdf](#), [ps](#), [other](#)]

Classical and quantum communication without a shared reference frame

[Stephen D. Bartlett](#), [Terry Rudolph](#), [R. W. Spekkens](#)

Comments: 4 pages, published version

Journal-ref: Phys. Rev. Lett. 91, 027901 (2003)

Subjects: **Quantum Physics (quant-ph)**

[91] [arXiv:quant-ph/0302063](#) [[pdf](#), [ps](#), [other](#)]

Semigroup techniques for the efficient classical simulation of optical quantum information

[Stephen D. Bartlett](#)

Comments: 4 pages, presented at XXIV International Colloquium on Group Theoretical Methods in Physics (Paris, July 15–20, 2002)

Journal-ref: Proceedings of GROUP 24: Physical and Mathematical Aspects of Symmetries, eds. J-P Gazeau et al, IOP Press (2003)

Subjects: **Quantum Physics (quant-ph)**

[92] [arXiv:quant-ph/0209133](#) [[pdf](#), [ps](#), [other](#)]

Efficient classical simulation of measurements in optical quantum information

[Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 4 pages, presented at QCMC'02 (MIT, Boston, USA, July 22–26, 2002)

Journal-ref: Quantum Communication, Measurement & Computing (QCMC'02), ed. J. H. Shapiro and O. Hirota (Rinton Press, Princeton NJ, 2003), p. 430.

Subjects: **Quantum Physics (quant-ph)**

[93] [arXiv:quant-ph/0209098](#) [[pdf](#), [ps](#), [other](#)]

Entanglement gauge and the non-Abelian geometric phase with two photonic qubits

[Karl-Peter Marzlin](#), [Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 10 pages, 2 figures, published version

Journal-ref: Phys.Rev.A67:022316,2003

Subjects: **Quantum Physics (quant-ph)**

[94] [arXiv:quant-ph/0208168](#) [[pdf](#), [ps](#), [other](#)]

Classical Dynamics as Constrained Quantum Dynamics

[Stephen D. Bartlett](#), [David J. Rowe](#)

Comments: 14 pages, 3 figures

Journal-ref: J. Phys. A: Math. Gen. 36, 1683 (2003)

Subjects: **Quantum Physics (quant-ph)**

[95] [arXiv:quant-ph/0208022](#) [[pdf](#), [ps](#), [other](#)]

Quantum Teleportation of Optical Quantum Gates

[Stephen D. Bartlett](#), [William J. Munro](#)

Comments: 4 pages, 1 figure, published version

Journal-ref: Phys. Rev. Lett. 90, 117901 (2003)

Subjects: **Quantum Physics (quant-ph)**

[96] [arXiv:quant-ph/0208008](#) [[pdf](#), [ps](#), [other](#)]

From Qubits to Continuous-Variable Quantum Computation

[Barry C Sanders](#), [Stephen D. Bartlett](#), [Hubert de Guise](#)

Comments: 7 pages, presented at ICSSUR'01 (Boston, MA, USA, June 2001)

Journal-ref: Proceedings, ICSSUR'01, ed. D. Han, Y. S. Kim, B. E. A. Saleh, A. V. Sergienko, and M. C. Teich (2002)

Subjects: **Quantum Physics (quant-ph)**

[97] [arXiv:quant-ph/0207028](#) [[pdf](#), [ps](#), [other](#)]

Quantum quincunx in cavity quantum electrodynamics

[Barry C. Sanders](#), [Stephen D. Bartlett](#), [Ben Tregenna](#), [Peter L. Knight](#)

Comments: 4 pages, 2 figures, published version

Journal-ref: Phys. Rev. A 67, 042305 (2003)

Subjects: **Quantum Physics (quant-ph)**

[98] [arXiv:quant-ph/0204073](#) [[pdf](#), [ps](#), [other](#)]

Photon counting schemes and performance of non-deterministic nonlinear gates in linear optics

[Stephen D. Bartlett](#), [Eleni Diamanti](#), [Barry C. Sanders](#), [Yoshihisa Yamamoto](#)

Comments: 9 pages, 3 figures

Journal-ref: Proceedings of Free-Space Laser Communication and Laser Imaging II, Vol. 4821, SPIE

International Symposium on Optical Science and Technology (7–11 July 2002), eds. J C Ricklin and D G Voelz (SPIE, Bellingham, WA, 2002)

Subjects: **Quantum Physics (quant-ph)**

[99] [arXiv:quant-ph/0204065](#) [[pdf](#), [ps](#), [other](#)]

Efficient Classical Simulation of Optical Quantum Circuits

[Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 4 pages, published version

Journal-ref: Phys. Rev. Lett. 89, 207903 (2002)

Subjects: **Quantum Physics (quant-ph)**

[100] [arXiv:quant-ph/0204011](#) [[pdf](#), [ps](#), [other](#)]

Continuous-variable quantum teleportation of entanglement

[Tyler J. Johnson](#), [Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 5 pages, 1 figure, published version

Journal-ref: Phys. Rev. A 66, 042326 (2002)

Subjects: **Quantum Physics (quant-ph)**

[101] [arXiv:quant-ph/0201130](#) [[pdf](#), [ps](#), [other](#)]

Vector coherent state representations, induced representations, and geometric quantization: II. Vector coherent state representations

[Stephen D. Bartlett](#), [David J. Rowe](#), [Joe Repka](#)

Comments: 31 pages, part 2 of two papers, published version

Journal-ref: J. Phys. A: Math. Gen. 35, 5625 (2002)

Subjects: **Quantum Physics (quant-ph)**

[102] [arXiv:quant-ph/0201129](#) [[pdf](#), [ps](#), [other](#)]

Vector coherent state representations, induced representations, and geometric quantization: I. Scalar coherent state representations

[Stephen D. Bartlett](#), [David J. Rowe](#), [Joe Repka](#)

Comments: 29 pages, part 1 of two papers, published version

Journal-ref: J. Phys. A: Math. Gen. 35, 5599 (2002)

Subjects: **Quantum Physics (quant-ph)**

[103] [arXiv:quant-ph/0110039](#) [[pdf](#), [ps](#), [other](#)]

Universal continuous-variable quantum computation: Requirement of optical nonlinearity for photon counting

[Stephen D. Bartlett](#), [Barry C. Sanders](#)

Comments: 6 pages, no figures, replaced with published version

Journal-ref: Phys. Rev. A 65, 042304 (2002)

Subjects: **Quantum Physics (quant-ph)**

[104] [arXiv:quant-ph/0109066](#) [[pdf](#), [ps](#), [other](#)]

Quantum Encodings in Spin Systems and Harmonic Oscillators

[Stephen D. Bartlett](#), [Hubert de Guise](#), [Barry C. Sanders](#)

Comments: 4 pages, published version

Journal-ref: Phys. Rev. A 65, 052316 (2002)

Subjects: **Quantum Physics (quant-ph)**

[105] [arXiv:quant-ph/0109047](#) [[pdf](#), [ps](#), [other](#)]

Efficient Classical Simulation of Continuous Variable Quantum Information Processes

[Stephen D. Bartlett](#), [Barry C. Sanders](#), [Samuel L. Braunstein](#), [Kae Nemoto](#)

Comments: 5 pages, replaced with published version

Journal-ref: Phys. Rev. Lett., 88, 097904 (2002)

Subjects: **Quantum Physics (quant-ph)**

[106] [arXiv:quant-ph/0108004](#) [[pdf](#), [ps](#), [other](#)]

Quantum walks in higher dimensions

[Troy D. Mackay](#), [Stephen D. Bartlett](#), [Leigh T. Stephenson](#), [Barry C. Sanders](#)

Comments: 6 pages, 6 figures, published version

Journal-ref: J. Phys. A: Math. Gen. 35, 2745 (2002)

Subjects: **Quantum Physics (quant-ph)**

[107] [arXiv:quant-ph/0104106](#) [[pdf](#), [ps](#), [other](#)]

Geometric Phase in SU(N) Interferometry

[Hubert de Guise](#), [Barry C. Sanders](#), [Stephen D. Bartlett](#), [Weiping Zhang](#)

Comments: 14 pages, 1 figure, presented at the Doppler Institute-CRM meeting, (Prague, Czech Republic, June 18-22 2000)

Journal-ref: Czech. J. Phys. 51, 312 (2001)

Subjects: **Quantum Physics (quant-ph)**

[108] [arXiv:quant-ph/0011080](#) [[pdf](#), [ps](#), [other](#)]

Quantum Computation with Harmonic Oscillators

[Stephen D. Bartlett](#), [Barry C. Sanders](#), [Benjamin T. H. Varcoe](#), [Hubert de Guise](#)

Comments: 4 pages, version as it appears in conference proceedings

Journal-ref: Proceedings of IQC'01, ed. R. G. Clark, Rinton, Princeton NJ (2001) pp. 344-347

Subjects: **Quantum Physics (quant-ph)**

[109] [arXiv:quant-ph/0010068](#) [[pdf](#), [ps](#), [other](#)]

Geometric Phase of Three-level Systems in Interferometry

[Barry C. Sanders](#), [Hubert de Guise](#), [Stephen D. Bartlett](#), [Weiping Zhang](#)

Comments: 4 pages, 3 figures

Journal-ref: Phys. Rev. Lett. 86 (2001), 369



THE UNIVERSITY OF
SYDNEY

PROFESSOR STEPHEN BARTLETT
School of Physics | Faculty of Science

Subjects: **Quantum Physics (quant-ph)**
[110] [arXiv:quant-ph/0010049](https://arxiv.org/abs/quant-ph/0010049) [[pdf](#), [ps](#), [other](#)]
Unitary transformations for testing Bell inequalities
[S. D. Bartlett](#), [D. A. Rice](#), [B. C. Sanders](#), [J. Daboul](#), [H. de Guise](#)
Comments: 3 figures
Journal-ref: Phys. Rev. A 63, 042310 (2001)
Subjects: **Quantum Physics (quant-ph)**



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	2012-2017	19
THIRD YEAR			
PHYS 3090/3990/3991 – Statistical Mechanics	Sydney	2013-2017	19
PHYS 3051, etc. – Thermodynamics	Sydney	2007-2012	19
PHYS304 – Quantum Physics	Macquarie	2001-2002	18
FOURTH YEAR / GRADUATE			
Honours Quantum Nanoscience	Sydney	2014-2017	20
Honours Advanced Quantum Mechanics	Sydney	2005-2013	20
PHYS440 – Quantum Computing	Macquarie	2002	6
PHYS1435 – Symmetry in Physics	Toronto	1998	18

Research student supervision

Current postgraduate students

Name	Supervisor	Degree	Start Date
Zixin Huang	Principal	Ph.D.	2014
Angela Karanjai	Principal	Ph.D.	2014
Sam Roberts	Principal	Ph.D.	2015
Zach Cristina	Principal	Ph.D.	2015
Hakop Pashayan	Principal	Ph.D.	2015
David Tuckett	Principal	Ph.D.	2016
Paul Webster	Principal	Ph.D.	2017
Thomas Smith	Coprincipal	Ph.D.	2017
Campbell McLachlan	Principal	M.Phil.	2017
Nicholas Bosch	Principal	Honours	2018
Matthew Winnel	Coprincipal	Honours	2017

Completed postgraduate students

Name	Supervisor	Degree	Completed
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
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

External postgraduate examinations

PhD, Ish Dhand, University of Calgary (2015)
 PhD, David Wang, University of Melbourne (2011)
 PhD, Sukhbinder Singh, University of Queensland (2011)
 PhD, Robert Pfeifer, University of Queensland (2011)
 PhD, Antonio Lagana, University of Adelaide (2010)
 PhD, Ingo Kamleitner, Macquarie University (2010)
 PhD, Ben Lanyon, University of Queensland (2009)
 PhD, Giulio Chiribella, University of Pavia (2006)
 Honours, Chris Facer, Macquarie University (2006)
 Honours, Leigh Stephenson, Macquarie University (2002)
 Honours, Martin Ams, Macquarie University (2001)

Undergraduate research supervision

Senior research project (Sydney):

- 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 Chorazy (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)

Talented Student Program project (Sydney):

- 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):

- 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)

Professional Service

Service to the University

Senior roles in service and management

- Associate Head (Research) for School of Physics (2016- ongoing)
- Domain Leader, Quantum Domain, University of Sydney Nano Institute (2017)
- Member, School Management Committee for School of Physics (2016- ongoing)

Service on School's Teaching Programs

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

Service on School/University Committees

- Core member, Faculty of Science Level E Local Promotions Committee (2016, 2017)
- Member, Faculty of Science Research Committee (2016- ongoing)
- 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)
- Chair, School committee to review undergraduate quantum syllabus (2006)
- Library representative, School of Physics (2005- 2010)

Service to the Discipline

Service on Professional Societies

- Convenor, 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, Physical Review (A, 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

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

Conference and workshop organisation

- 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.
- 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.
- 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
- Member, American Physical Society

Service to the Community

Outreach Activities

- Speaker, New Scientist *Instant Expert: Relativity* (2017)
- Judge, STEM Showcase, Meriden School (2016)
- Judge, Senior Science Competition, Meriden School (2011-2015)
- Speaker, “Pint of Science” (2014)
- International Science School, lecturer (2011)
- Continuing Education lecture, “Einstein, Entanglement, and the Exotic Quantum World,” (2010)
- “Richard Feynman and QED” dinner mini-lecture, Sydney (2008)
- AIP Public Lecture on Nobel Prize in Physics, at Sydney, Wollongong, Newcastle (2006)
- Science EXPOsed volunteer (2005)
- International Youth Physics Tournament judge (2004)