



Steven T. Flammia

Highlights

- 30+ published articles in peer-reviewed journals since first publishing in 2005, including 10 papers in *Physical Review Letters* and 6 highly cited papers (100+ citations).
- 2100+ total citations, with more than 1900+ citations in the last 5 years, and an h-index of 21, increasing more than +2 per year on average (source: [Google Scholar](#)).
- Several theoretical results leading to breakthrough experimental progress, such as experiments performed [here](#), [here](#) and [here](#), with additional experiments in progress.
- Principal Investigator on an ARO grant worth US \$1.6M over the next five years. Co-PI on several other grants comprising both theoretical and experimental efforts.
- Recipient and current holder of a prestigious [ARC Future Fellowship](#).
- Coverage in the popular press, including research highlights in *Nature* and *Science*, and professional broad-interest press like *Physics Viewpoint* (twice).

Education

May '02 **B.S. Physics**, *Pennsylvania State University*.

May '02 **B.S. Mathematics**, *Pennsylvania State University*.

May '07 **Ph.D. Physics**, *University of New Mexico*.
with Distinction

Thesis *Informationally Complete Quantum Measurements and Entanglement Bounds*

Advisor Carlton M. Caves

GPA 4.0 (= A)

Research Experience and Employment

Jan '14–present **ARC Future Fellow**, Four-year prize fellowship for outstanding researchers.

Oct '12–present **Senior Lecturer**, *University of Sydney*, Sydney, New South Wales, Australia.

Aug '11–Sep '12 **Principal Research Scientist**, *University of Washington*, Seattle, Washington, USA.

Oct '10–Aug '11 **Postdoctoral Researcher**, *California Institute of Technology*, Pasadena, California, USA.

Oct '07–Sep '10 **Postdoctoral Researcher**, *Perimeter Institute for Theoretical Physics*, Waterloo, Ontario, Canada.

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

Prizes & Fellowships

- 2005 **National Science Foundation EAPSI fellowship.**
2014–2017 **Australian Research Council Future Fellowship.**

Teaching Experience

- Jul ‘15–Sep ‘15 **Statistical Mechanics, a Computational Approach.**
3rd year core-subject course
- Apr ‘15–Jun ‘15 **Quantum Information Theory.**
Postgraduate course covering quantum error correction and quantum Shannon theory
- Jul ‘14–Sep ‘14 **Statistical Mechanics, a Computational Approach.**
3rd year core-subject course
- Jul ‘13–Sep ‘13 **Statistical Mechanics, a Computational Approach.**
3rd year core-subject course
- Apr ‘10–May ‘10 **Topological Quantum Order.**
Informal class taught at Perimeter Institute jointly with Alioscia Hamma
- Mar ‘10 **Quantum Data Compression.**
Invited tutorial lectures at the University of Maryland RIT seminar series “Quantum Information and Computation”
- Jun ‘06–Jul ‘06 **Topological Quantum Computing.**
Invited Lecturer for a short introductory course consisting of 4 lectures at the University of Queensland

Refereed Publications

36. J. Wallman, C. Granade, R. Harper, and S. T. Flammia, *Estimating the Coherence of Noise*, New J. Phys. **17**, 113020 (2015), [arXiv:1503.07865](#).
35. A. O’Brien, S. D. Bartlett, A. C. Doherty, S. T. Flammia, *Symmetry-respecting real-space renormalization for the quantum Ashkin-Teller model*, Phys. Rev. E **92** 042163 (2015), [arXiv:1507.00038](#).
34. M. A. Fogarty, M. Veldhorst, R. Harper, H. Yang, S. D. Bartlett, S. T. Flammia and A. S. Dzurak, *Non-exponential Fidelity Decay in Randomized Benchmarking with Low-Frequency Noise*, Phys. Rev. A **92** 022326 (2015), [arXiv:1502.05119](#).
33. C. Cesare, A. J. Landahl, D. Bacon, S. T. Flammia and A. Neels, *Adiabatic Topological Quantum Computing*, Phys. Rev. A **92** 012336 (2015), [arXiv:1406.2690](#).
32. J. J. Wallman and S. T. Flammia, *Randomized Benchmarking with Confidence*, New J. Phys. **14** 103032 (2014), [arXiv:1404.6025](#)
31. C. G. Brell, S. Burton, G. Dauphinais, S. T. Flammia, and D. Poulin, *Thermalization, Error-Correction, and Memory Lifetime for Ising Anyon Systems*, Phys. Rev. X, **4** 031058 (2014), [arXiv:1311.0019](#)
30. D. Hayes, S. T. Flammia, and M. Biercuk, *Programmable quantum simulation by dynamic Hamiltonian engineering*, New J. Phys., **16** 083027 (2014), [arXiv:1309.6736](#)
29. Y.-C. Lee, M.-H. Hsieh, S. T. Flammia, and R.-K. Lee, *Local PT symmetry violates the no-signaling principle*, Phys. Rev. Lett., **106** 230501 (2014), [arXiv:1312.3395](#)

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

28. D. Bacon, S. T. Flammia and G. M. Crosswhite, *Adiabatic Quantum Transistors*, Phys. Rev. X **3** 021015 (2013), [arXiv:1207.2769](#)
27. S. T. Flammia and A. W. Harrow, *Counterexamples to Kalai's Conjecture C*, Quant. Info. Comp. **13** 1 (2013), [arXiv:1204.3404](#)
26. S. T. Flammia, D. Gross, Y.-K. Liu and J. Eisert, *Quantum Tomography via Compressed Sensing: Error Bounds, Sample Complexity, and Efficient Estimators*, New J. Phys. **14** 095022 (2012), [arXiv:1205.2300](#)
25. B. Brown, S. T. Flammia and N. Schuch, *Computational Difficulty of Computing the Density of States*, Phys. Rev. Lett. **107** 040501 (2011), [arXiv:1010.3060](#)
24. S. T. Flammia and Y.-K. Liu, *Direct Fidelity Estimation from Few Pauli Measurements*, Phys. Rev. Lett. **106** 230501 (2011), [arXiv:1104.4695](#)
23. C. G. Brell, S. T. Flammia, S. D. Bartlett and A. C. Doherty, *Toric Codes and Quantum Doubles from Two-body Hamiltonians*, New J. Phys. **13** 053039 (2011), [arXiv:1011.1942](#)
22. N. C. Menicucci, S. T. Flammia, P. van Loock, *Graphical calculus for Gaussian pure states*, Phys. Rev. A **83**, 042335 (2011), [arXiv:1007.0725](#)
21. D. M. Appleby, S. T. Flammia and C. A. Fuchs, *The Lie Algebraic Significance of Symmetric Informationally Complete Measurements*, J. Math. Phys. **52** 022202 (2011), [arXiv:1001.0004](#)
20. M. Cramer, M. B. Plenio, S. T. Flammia, R. Somma, D. Gross, S. D. Bartlett, O. Landon-Cardinal, D. Poulin, and Y.-K. Liu, *Efficient quantum state tomography*, Nat. Commun. **1**(9), 2010. [arXiv:1101.4366](#)
19. D. Gross, Y.-K. Liu, S. T. Flammia, S. Becker and J. Eisert, *Quantum state tomography via compressed sensing*, Phys. Rev. Lett. **105** 150401 (2010). [arXiv:0909.3304](#)
18. D. Bacon and S. T. Flammia, *Adiabatic Cluster State Quantum Computing*, Phys. Rev. A **82** 030303(R) (2010), [arXiv:0912.2098](#)
17. S. T. Merkel, C. A. Riofrío, S. T. Flammia and I. H. Deutsch, *Random unitary maps for quantum state reconstruction*, Phys. Rev. A **81** 032126 (2010). [arXiv:0912.2101](#)
16. S. T. Flammia, A. Hamma, T. L. Hughes and X.-G. Wen, *Topological entanglement Rényi entropy and reduced density matrix structure*, Phys. Rev. Lett. **103** 261601 (2009). [arXiv:0909.3305](#)
15. D. Bacon and S. T. Flammia, *Adiabatic Gate Teleportation*, Phys. Rev. Lett. **103** 120504 (2009). [arXiv:0905.0901](#)
14. S. T. Flammia, N. C. Menicucci and O. Pfister, *The Optical Frequency Comb as a One-Way Quantum Computer*, J. Phys. B **42** 114009, (2009). [arXiv:0811.2799](#)
13. D. Gross, S. T. Flammia and J. Eisert, *Most Quantum States Are Too Entangled To Be Useful As Computational Resources*, Phys. Rev. Lett. **102** 190501 (2009). [arXiv:0810.4331](#)
12. S. T. Flammia and S. Severini, *Weighing matrices and optical quantum computing*, J. Phys. A: Math. Theor. **42** 065302, (2009). [arXiv:0808.2057](#)
11. N. C. Menicucci, S. T. Flammia and O. Pfister, *One-way quantum computing in the optical frequency comb*, Phys. Rev. Lett. **101** 130501, (2008). [arXiv:0804.4468](#)

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

10. S. Boixo, A. Datta, M. J. Davis, S. T. Flammia, A. Shaji and C. M. Caves, *Quantum Metrology: Dynamics vs. Entanglement*, Phys. Rev. Lett. **101** 040403, 2008. [arXiv:0805.2180](https://arxiv.org/abs/0805.2180)
9. H. Zaidi, N. C. Menicucci, S. T. Flammia, R. Bloomer, M. Pysher and O. Pfister, *Entangling the optical frequency comb: simultaneous generation of multiple 2×2 and 2×3 continuous-variable cluster states in a single optical parametric oscillator*, Laser Phys. **18** 659, 2008. [arXiv:0710.4980](https://arxiv.org/abs/0710.4980)
8. D. E. Browne, M. B. Elliott, S. T. Flammia, S. T. Merkel, A. Miyake, and A. J. Short, *Phase transition of computational power in the resource states for one-way quantum computation*, New J. Phys. **10**, 023010 (2008). [arXiv:0709.1729](https://arxiv.org/abs/0709.1729)
7. S. Boixo, A. Datta, S. T. Flammia, A. Shaji, E. Bagan, and C. M. Caves, *Quantum-limited metrology with product states*, Phys. Rev. A **77** 012317, (2007). [arXiv:0710.0285](https://arxiv.org/abs/0710.0285)
6. N. C. Menicucci, S. T. Flammia, H. Zaidi, and O. Pfister, *Ultracompact generation of continuous-variable cluster states*, Phys. Rev. A **76** 010302, 2007. [arXiv:quant-ph/0703096](https://arxiv.org/abs/quant-ph/0703096)
5. A. Datta, S. T. Flammia, A. Shaji, and C. M. Caves, *Constrained bounds on measures of entanglement*, Phys. Rev. A **75** 062117, 2007. [arXiv:quant-ph/0612049](https://arxiv.org/abs/quant-ph/0612049)
4. S. Boixo, S. T. Flammia, C. M. Caves, and J. Geremia, *Generalized limits for single-parameter quantum estimation*, Phys. Rev. Lett. **98** 090401, 2007. [arXiv:quant-ph/0609179](https://arxiv.org/abs/quant-ph/0609179)
3. S. T. Flammia, *On SIC-POVMs in prime dimensions*, J. Phys. A: Math. Gen. **39** 13483, 2006. [arXiv:quant-ph/0605050](https://arxiv.org/abs/quant-ph/0605050)
2. S. T. Flammia, A. Silberfarb, and C. M. Caves, *Minimal informationally complete measurements for pure states*, Found. Phys. **35** 1985, 2005. [arXiv:quant-ph/0404137](https://arxiv.org/abs/quant-ph/0404137)
1. A. Datta, S. T. Flammia, and C. M. Caves, *Entanglement and the power of one qubit*, Phys. Rev. A **72** 042316, 2005. [arXiv:quant-ph/0505213](https://arxiv.org/abs/quant-ph/0505213)

Refereed Conference Proceedings

4. D. Bacon, S. T. Flammia, A. W. Harrow and J. Shi, *Sparse Quantum Codes from Quantum Circuits*, Proceedings of the 47th ACM Symposium on Theory of Computing (STOC 2015), [arXiv:1411.3334](https://arxiv.org/abs/1411.3334).
3. O. Pfister, N. C. Menicucci, S. T. Flammia, H. Zaidi, R. Bloomer, and M. Pysher, *Playing the quantum harp: multipartite squeezing and entanglement of harmonic oscillators* in Quantum Electronics Metrology, A. E. Craig and S. M. Shahriar eds., (SPIE, San Jose, CA, USA), **6906**(1) 690603+, (2008).
2. S. Boixo, A. Datta, M. J. Davis, S. T. Flammia, A. Shaji, A. B. Tacla and C. M. Caves, *Quantum metrology with Bose-Einstein condensates*, in Quantum Communication, Measurement And Computing (QCMC): Ninth International Conference on QCMC, A. Lvovsky, ed., (AIP, Calgary, Canada), **1110**(1) 423–426, (2009).
1. S. Boixo, A. Datta, M. J. Davis, S. T. Flammia, A. Shaji, A. B. Tacla and C. M. Caves, *Quantum metrology from an information theory perspective*, in Quantum Communication, Measurement And Computing (QCMC): Ninth International Conference on QCMC, A. Lvovsky, ed., (AIP, Calgary, Canada), **1110**(1) 427–432, (2009).

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

Preprints Submitted to Peer-Reviewed Journals

1. C. T. Chubb and S. T. Flammia, *Computing the Degenerate Ground Space of Gapped Spin Chains in Polynomial Time*, submitted, [arXiv:1502.06967](#).
2. E. Mount, C. Kabytayev, S. Crain, R. Harper, S.-Y. Baek, G. Vrijsen, S. Flammia, K. R. Brown, P. Maunz, J. Kim, *Error Compensation of Single-Qubit Gates in a Surface Electrode Ion Trap Using Composite Pulses*, submitted, [arXiv:1504.01440](#).
3. H. Ball, T. M. Stace, S. T. Flammia and M. J. Biercuk, *The Effect of Noise Correlations on Randomized Benchmarking*, submitted, [arXiv:1504.05307](#).
4. S. Burton, C. G. Brell and S. T. Flammia, *Classical Simulation of Quantum Error Correction in a Fibonacci Anyon Code*, submitted, [arXiv:1506.03815](#).
5. R. Kueng, D. M. Long, A. C. Doherty and S. T. Flammia, *Comparing Experiments to the Fault-Tolerance Threshold*, submitted, [arXiv:1510.05653](#).

Edited Volumes

1. 9th Conference on the Theory of Quantum Computation, Communication, and Cryptography (TQC 2014), Steven T. Flammia and Aram W. Harrow, Eds., (Schloss Dagstuhl 2014), <http://www.dagstuhl.de/dagpub/978-3-939897-73-6>.

Invited Book Reviews

1. B. Schumacher and M. Westmoreland, “Quantum Processes, Systems, and Information” (Oxford U. Press 2010). *Amer. J. Phys.* **79** 239 (2011), doi:[10.1119/1.3531951](#).

Invited Talks & Selected Contributed Talks

(* = competitive refereeing process for talk acceptance)

Ribbon Operators for Topological Order.

- Jun ‘15 Seminar, Massachusetts Institute of Technology, Cambridge, USA.
- Jun ‘15 JQI/QuICS Seminar, University of Maryland, College Park, USA.
- May ‘15 Topological Phases and Quantum Computation Workshop, Mo’orea, French Polynesia.

Sparse Quantum Codes from Quantum Circuits.

- Sep ‘15 Frontiers of Quantum Computer Science, University of Maryland, College Park, USA.
- Jun ‘15 Seminar, National Institute of Standards and Technology (NIST), Gaithersburg, USA.
- Jun ‘15 *STOC 2015: Symposium on Theory of Computing, Portland, USA.
- May ‘15 Quantum Information Seminar, Macquarie University, Sydney, Australia.
- Apr ‘15 Colloquium, University of Queensland, Brisbane, Australia.
- Dec ‘14 Quantum Error Correction 2014, ETH, Zürich, Switzerland.

Randomized Benchmarking with Confidence.

- Oct ‘15 IPDF Collaboration Meeting 2015, Sydney, Australia.
- Aug ‘15 Workshop on Designs and Systems of Lines, Worcester Polytechnic Institute, Worcester, USA.
- Jan ‘15 *Quantum Information Processing 2015, Sydney, Australia.

Thermalization, Error Correction, and Memory Lifetime for Ising Anyons.

- Jul ‘14 Quantum LDPC Codes Workshop, Perimeter Institute, Waterloo, Canada.

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

- Jul '14 Seminar, Max Planck Institute for Quantum Optics, Garching, Germany.
Jul '14 Quantum Information Workshop, Seefeld, Austria.
May '14 Seminar, Sandia National Laboratories, Albuquerque, USA.
Jul '13 Online Seminar, Q+ Hangout. Broadcast worldwide and posted on YouTube.

The sample complexity of tomography.

- Mar '13 Research Seminar, Duke University, Durham, USA.
Mar '13 American Physical Society March Meeting, Baltimore, USA.
Feb '13 Mathematical Methods of Quantum Tomography, Fields Institute, Toronto, Canada.
Jan '13 MCQO Workshop, San Diego, USA.

Direct fidelity estimation from few Pauli measurements.

- Aug '12 Discovery 2020 Workshop, Santa Fe, USA.
Jul '12 Seminar, Free University of Berlin, Berlin, Germany.
Mar '12 Seminar, University of Sherbrooke, Sherbrooke, Canada.
Feb '12 Seminar, Massachusetts Institute of Technology, Cambridge, USA.
Feb '12 *SQuInT Workshop 2012, Albuquerque, USA.
Jan '12 PIQuDos Seminar, Perimeter Institute for Theoretical Physics, Waterloo, Canada.
Oct '11 Colloquium, University of Sydney, Sydney, Australia.
Jun '11 Seminar, University of New Mexico, Albuquerque, USA.
Jun '11 Seminar, Sandia National Labs, Albuquerque, USA.
Jun '11 Seminar, University of Washington, Seattle, USA.
May '11 Seminar, Massachusetts Institute of Technology, Cambridge, USA.
May '11 Seminar, Lincoln Labs, Cambridge, USA.
May '11 Seminar, HRL Labs, Malibu, USA.
Apr '11 Seminar, University of Queensland, Brisbane, Australia.

Quantum Doubles from two-body Hamiltonians.

- Jan '12 Institute for Quantum Computing Colloquium, IQC, Waterloo, Canada.
Feb '11 Quantum Information Seminar, University of Southern California, Los Angeles, USA.
Nov '10 CoQuIT Workshop, Hanover, Germany.

Lie algebras and symmetric informationally complete measurements.

- Mar '11 American Physical Society March Meeting, Dallas, USA.

Adiabatic Quantum Transistors.

- Jan '11 Workshop on Hamiltonians and Quantum Information, Coogee, Australia.
Sep '10 Workshop on Hamiltonians and Gaps, Cambridge, UK.
Jul '10 Workshop on Quantum Algorithms, Computational Models and Foundations of Quantum Mechanics, Vancouver, Canada.

Adiabatic Gate Teleportation.

- Jan '10 *Quantum Information Processing, Zürich, Switzerland.

Ultra fast quantum state tomography.

- May '11 Seminar, Massachusetts Institute of Technology, Cambridge, USA.
Feb '11 *SQuInT Workshop 2011, Boulder, USA.
Dec '10 *Workshop on Low-rank Methods for Large-Scale Machine Learning, NIPS 2010, Whistler, Canada.
Jun '10 Seminar, University of Innsbruck, Innsbruck, Austria.
Apr '10 CQIQC Seminar, University of Toronto, Toronto, Canada.

- Mar '10 JQI Seminar, University of Maryland, Maryland, USA.
- Feb '10 Quantum Measurement and Control Workshop, Coogee, Australia.
- Jan '10 *Quantum Information Processing, Zürich, Switzerland.
- Nov '09 CQIC Seminar, University of New Mexico, Albuquerque, USA.
- Nov '09 CQIL Seminar, McGill University, Montreal, Canada.
- Nov '09 IQIS Seminar, University of Calgary, Calgary, Canada.
- Aug '09 *Conference on Quantum Information and Quantum Control III, Toronto, Canada.
- May '09 *Theory of Quantum Computing, Waterloo, Canada.
- Apr '09 IQI Seminar, California Institute of Technology, Pasadena, California, USA.
- Feb '09 Sydney Quantum Information Theory Workshop, Coogee, Australia.
-
- Most quantum states are too entangled for measurement-based computation.**
- Jan '09 *Quantum Information Processing, Santa Fe, NM, USA.
-
- One-way quantum computing in the optical frequency comb.**
- Nov '08 Laurier Seminar Series in Computational Science and Applied Statistical Modeling, Wilfrid Laurier University, Waterloo, ON, Canada.
- Sep '08 Institute for Quantum Computing Colloquium, IQC, Waterloo, ON, Canada.
- Aug '08 Quantum Lunch, Los Alamos National Laboratory, USA.
- May '08 Quantum Information and Graph Theory: Emerging Connections, Perimeter Institute, Waterloo, Ontario, Canada.
- Feb '08 *SQuInT Workshop 2008, Santa Fe, New Mexico, USA.
-
- Generalized Limits for Quantum Single-Parameter Estimation.**
- Feb '07 *SQuInT Workshop 2007, Pasadena, California, USA.
-
- What's Entanglement Good For?.**
- Jan '07 Seminar, University of Innsbruck, Innsbruck, Austria.
- Nov '06 IQI Seminar, California Institute of Technology, Pasadena, California, USA.
- Sep '06 PIQuDos Seminar, Perimeter Institute for Theoretical Physics, Waterloo, Canada.
-
- Entanglement and the Power of One Qubit.**
- Apr '05 Emmy Nother Research Group Seminar, University of Erlangen-Nurnberg, Erlangen, Germany.
- Feb '05 *SQuInT Workshop 2005, Tucson, Arizona, USA.

Funding

- Aug '15–Jan '16 **IARPA MQCO Capstone, US\$105,000**, co-PI.
Capstone grant that bridges funding until the successor program of the MQCO program by IARPA. Activities will follow on from the MUSIQC grant.
- May '15–May '16 **Topology and Algebra in Quantum Nanoscience, A\$75,000**, co-PI.
Proposal for jumpstarting an effort in the mathematics and physics of strongly correlated 2D systems with topological order. Given through the AINST Accelerator scheme at the University of Sydney.
- Jan '14–Dec'18 **ARC Future Fellowship, A\$625,000**.
Prize fellowship for outstanding researchers; sponsored by the Australian government.
- Feb'14–Jan'19 **Robust and Device-Independent Benchmarking for Fault-Tolerant Quantum Computation, US\$1,600,000**, PI.
This theoretical proposal investigates new protocols for testing and certifying meso-scale quantum devices.

- Feb'14–Jan'19 **Certified Topological Quantum Computation**, US\$5,300,000, co-PI.
Part of an experimental collaboration with the Blatt group in Innsbruck, this effort seeks to implement a small-scale topological quantum error-correcting code in an ion trap.
- Aug '10–Aug '15 **Modular Universal Scalable Ion-trap Quantum Computer (MUSIQC)**, US\$14,600,000, co-PI.
The goal is to build a hierarchical design for an ion trap quantum computer that can entangle both nearby and nonlocal trapped ion qubits on dozens of ions simultaneously and with high fidelity.

Press

My work on frequency comb quantum computers was featured as a [Physics Viewpoint](#), and as a research highlight in [Nature](#). My work showing that most states are too entangled to be useful was also featured as a [Physics Viewpoint](#), and in popular articles appearing in [Phys Org](#), [Science News](#), [American Scientist](#), [Physics World](#), and [Science](#). Two of my papers have been featured as an [Editor's Suggestion](#), and one as a [Physics Synopsis](#).

Programs

- QT1 Written together with S. Becker. QT1 is a Matlab program for implementing quantum state and process tomography via trace-norm minimization. QT1 is still in development and is currently only available by request.
- Qcircuit Written together with B. Eastin; maintained by T. Scholten. Qcircuit is a macro package for L^AT_EX for typesetting quantum circuit diagrams quickly and efficiently. Available at CTAN (www.ctan.org/pkg/qcircuit) and on GitHub (github.com/CQuIC-GitHub/qcircuit).

Students Supervised

PhD students

- Feb '15–present *Christopher Chubb*, PhD student.
- Feb '15–present *Nic Funai*, PhD student.
- Jul '14–present *Robin Harper*, PhD student.
- Oct '12–present *Simon Burton*, PhD student, co-supervised with Andrew Doherty.

Honours students

- Feb '15–Dec '15 *Alan Robertson*, honours student.
- Feb '15–Dec '15 *Henry Stoke*, honours student.
- Feb '14–Dec '14 *Christopher Chubb*, honours student; university medalist.
- Feb '14–Dec '14 *Nic Funai*, honours student; university medalist.
- Feb '14–Dec '14 *Ishraq Uddin*, honours student.

undergraduate students

- Jun '11–Aug '11 *Adrian Chapman*, undergraduate summer student, now a graduate student at U. of New Mexico.
- May '10–Aug '10 *Brielin Brown*, undergraduate summer student, now a graduate student at UC Berkeley.
- May '08–Jul '08 *Sreraman Muralidharan*, undergraduate summer student, now a graduate student at Yale.

senior project students

- Jul '14–Dec -14 *Alex Murray, Tim Shen*
- Feb '14–Jun '14 *Sean Carnaffan*
- Jul '13–Dec '13 *Robin Harper, Henry Stoke*

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

Feb '13–Jun '13 *Layton Manuel*

[talented students program students](#)

Feb '15–Jun '15 *David Merrick Long*, 1st year TSP student.

Feb '14–Jun '15 *Eric Huang*, 1st year TSP student.

Feb '14–Jun '14 *Paul Webster*, 2nd year TSP student.

Professional Activities, Service, and Outreach

Refereeing and Reviewing.

- Referee for the following journals: Nature, Science, Physical Review Letters, Reviews of Modern Physics, Nature Photonics, Nature Communications, Communications in Mathematical Physics, Physical Review A, Physical Review B, Physical Review X, IEEE Transactions on Information Theory, Journal of Mathematical Physics, Journal of Physics A, Journal of Physics B, New Journal of Physics, European Physical Journal D, European Physical Journal Quantum Technology, Physica Scripta, Cryptography and Communications, Quantum Information and Computation, International Journal of Quantum Information, Entropy, Optics Express.
- Reviewer for competitive grant funding for the following agencies: US National Science Foundation (NSF), Australian Research Council (ARC), US-Israel Binational Science Foundation (BSF).

Conference Program Committees.

- Program Committee member, Theory of Quantum Computation, May '11.
- Program Committee member, Quantum Information Processing, Feb '14.
- Co-Chair of Program Committee, Theory of Quantum Computation, May '14.
- Program Committee, Asian Quantum Information Science, Aug '15.
- Program Committee, International Conference on Quantum Communication, Measurement and Computing (QCMC), Jul '16.

University Service and Conference Organizing.

- Talented Students Program Coordinator (jointly with Helen Johnston), at the University of Sydney, Oct'12–present.
- PIQuDos Seminar Series coordinator, Fall 2008.
- Organizer for the conference *Seeking SICs: An Intense Workshop on Quantum Frames and Designs* at Perimeter Institute, 2008.
- Organizer (2013 till present) for the annual Coogee Quantum Information conference.
- Organizer for the Sydney Quantum Information Theory Workshop 2014.
- Local Organizer for Quantum Information Processing (QIP) 2015.

Outreach and Community.

- Co-author of the popular blog “[The Quantum Pontiff](#)” which is a major source of news, information, commentary, and outreach for the quantum information science community. To give an idea of the traffic volume, the blog had over **4,400** unique visitors in Jan–Mar '14.
- Moderator, administrator, and co-developer for the website [Scirate](#), where users vote and comment on papers of interest to the quantum information science community.

Intellectual Property

- US Patent #8,513,647: *Quantum computational device employing multi-qubit structures and associated systems and methods*, DM Bacon, GM Crosswhite, ST Flammia

School of Physics A28, University of Sydney – NSW 2006

☎ +61 0431 414 447 • 📞 +61 02 9351 5115

✉ sflammia@physics.usyd.edu.au • 🌐 www.physics.usyd.edu.au/~sflammia

Professional References

Carlton Caves

Distinguished Professor
University of New Mexico
ccaves@unm.edu

Jens Eisert

Professor
Freie Universität Berlin
jense@qipc.org

Eddie Farhi

Professor
Massachusetts Institute of Technology
farhi@mit.edu

Rainer Blatt

University Professor
University of Innsbruck
rainer.blatt@uibk.ac.at

John Preskill

Feynman Professor
California Institute of Technology
preskill@theory.caltech.edu

Stephen Bartlett

Professor
University of Sydney
stephen.bartlett@sydney.edu.au

Andrew Doherty

Associate Professor
University of Sydney
andrew.doherty@sydney.edu.au

Gerard Milburn

Professor
University of Queensland
milburn@physics.uq.edu.au

Professor Blatt is an experimentalist and can testify to the impact of my work toward current experimental efforts, while the others are theorists who can additionally comment on my theoretical achievements and abilities.