



# Nicolas C. Menicucci

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## Career Highlights

- 28 peer-reviewed journal articles, with 7 published in high-impact journals (6 in *Physical Review Letters* and 1 in *Nature Photonics*)
- 1,300+ total citations (including 3 papers with 100+ citations), h-index of 19. (Source: [Google Scholar](#))
- Highly cited theoretical breakthroughs and revolutionary experimental designs leading to world record-breaking experimental achievements—see [here](#) and [here](#). The latter implements my [single-author proposal](#).
- Research expertise and recognized international standing in a diverse combination of subfields of physics, including quantum computing, quantum optics, and relativistic quantum information.
- 70+ invited talks internationally at research seminars, colloquia, workshops and conferences.
- Recipient of a prestigious ARC Discovery Early Career Researcher Award ([DECRA](#)).
- Senior Lecturer and current holder of a prestigious Vice-Chancellor’s Senior Research [Fellowship](#) from RMIT University.
- Popular press coverage includes highlights in [Nature](#), professional broad-interest press such as a Viewpoint in [Physics](#), and popular news articles reporting on the [world record-breaking experiment](#).

## Education

- Sep 2008 **Ph.D. Physics (Theoretical)**, *Princeton University*, Princeton, NJ, USA.
- Visiting scholar, The University of Queensland 2005–2008 (dissertation research)
  - Dissertation: *Studies in Quantum Information Theory*
  - Supervisors: Shivaji Sondhi (Princeton), Michael Nielsen (UQ), Gerard Milburn (UQ)
- May 2002 **B.S. Physics (Hons.)**, *The University of New Mexico*, Albuquerque, NM, USA.
- Departmental Honors, thesis work published: *Phys. Rev. Lett.* **88**, 167901 (2002)
  - *summa cum laude* in University Honors
  - *summa cum laude* for cumulative GPA 4.14 (4.0 = A, 4.33 = A+)

## Main Research Interests

### Quantum technology development.

- *Theory*: [quantum computing](#) using [continuous-variable systems](#)
- *Experimental proposals*: [scalable quantum computing with laser light](#)
- *Experimental outcomes*: [world record-breaking technological advances](#)

### Relativistic quantum information.

- *Theory*: [entanglement in quantum fields](#) and [applications](#)
- *Experimental proposals*: [laboratory simulations](#) and [satellite-based experiments](#)

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*Last updated November 17, 2015*

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## Fellowship and Scholarship Funding

### Faculty

Sep '15–present **Vice-Chancellor's Senior Research Fellowship**, *RMIT University*, <2% successful, \$694,000.

### Postdoctoral

Jun '12–Aug '15 **Discovery Early Career Researcher Award (DECRA) Fellowship**, *Australian Research Council*, 12% successful, \$375,000.

Sep '11–Jun '12 **Deputy Vice-Chancellor Research Fellowship**, *The University of Sydney*, 10% successful, \$368,000 (3 years, relinquished in Jun 2012 to take up DECRA).

Sep '08–Aug '11 **Postdoctoral Fellowship**, *Perimeter Institute for Theoretical Physics*, <5% successful, \$250,000.

### Postgraduate

Sep '04–Aug '07 **National Defense Science and Engineering Graduate Fellowship**, *U.S. Department of Defense*, 10% successful, \$223,050.

Sep '04–Aug '09 **Graduate Research Fellowship**, *U.S. National Science Foundation*, 10% successful, \$179,110.

Sep '03–Aug '04 **First-year Fellowship in Science and Engineering**, *Princeton University*, \$19,150.

Sep '03–Aug '04 **Golden Key Scholar Award**, *Golden Key International Honour Society*, 10% successful, \$11,270.

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## Research Experience and Employment

### Faculty

from Sep '15 **Senior Lecturer (Tenured) and Vice-Chancellor's Senior Research Fellow**, *RMIT University, School of Applied Sciences*, Melbourne, VIC, Australia.

### Postdoctoral

Jan '15–Aug '15 **ARC DECRA Senior Research Fellow**, *The University of Sydney, School of Physics*, Sydney, NSW, Australia.

Jun '12–Dec '14 **ARC DECRA Research Fellow**, *The University of Sydney, School of Physics*, Sydney, NSW, Australia.

Sep '11–Jun '12 **Deputy Vice-Chancellor Research Fellow**, *The University of Sydney, School of Physics*, Sydney, NSW, Australia.

Sep '08–Aug '11 **Postdoctoral Fellow**, *Perimeter Institute for Theoretical Physics*, Waterloo, ON, Canada.

### Postgraduate

Jul '05–Aug '08 **Visiting Scholar**, *The University of Queensland, Quantum Information Science Initiative*, Brisbane, QLD, Australia.  
Performing dissertation research.

Sep '04–Mar '05 **Visiting Scholar**, *The University of New Mexico, Department of Physics and Astronomy*, Albuquerque, NM, USA.

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June 2004 **Summer Student**, *Massachusetts Institute of Technology, NECSI Summer School in Complex Systems*, Cambridge, MA, USA.  
 Sep '03–Aug '08 **Ph.D. Student**, *Princeton University, Department of Physics*, Princeton, NJ, USA.  
 Jun '02–Aug '03 **Research Assistant**, *The University of New Mexico, Physics and Astronomy*, Albuquerque, NM, USA.

## Publication Highlights

Notes

- Listed in reverse chronological order.
- Citation data from [Google Scholar](#) (Jan 2015).
- ‘IF’ = ISI impact factor of the journal.

10. **N. C. Menicucci**, “Fault-tolerant measurement-based quantum computing with continuous-variable cluster states,” *Phys. Rev. Lett.* **112**, 120504 (2014).  
 — This single-author Letter answers a seven-year-old open question about whether continuous-variable cluster states can be used for fault-tolerant quantum computation. The answer is yes.  
**19 citations, IF=7.9**
9. M. Chen, **N. C. Menicucci**, and O. Pfister, “Experimental realization of multipartite entanglement of 60 modes of the quantum optical frequency comb,” *Phys. Rev. Lett.* **112**, 120505 (2014).  
 — This experiment now holds the world record for the largest number of simultaneously available quantum systems entangled into a fully inseparable state.  
**22 citations, IF=7.9**
8. S. Yokoyama, R. Ukai, S. C. Armstrong, C. Sornphiphatphong, T. Kaji, S. Suzuki, J. Yoshikawa, H. Yonezawa, **N. C. Menicucci**, and A. Furusawa, “Ultra-large-scale continuous-variable cluster states multiplexed in the time domain,” *Nature Photonics* **7**, 982 (2013).  
 — Implementing my single-author proposal (#6 below), this experiment holds the world record for the largest entangled state: a 10,000-mode continuous-variable cluster state.  
**47 citations, IF=27.2**
7. D. Rideout, T. Jennewein, G. Amelino-Camelia, T. F. Demarie, B. L. Higgins, A. Kempf, A. Kent, R. Laflamme, X. Ma, R. B. Mann, E. Martín-Martínez, **N. C. Menicucci**, J. Moffat, C. Simon, R. Sorkin, L. Smolin, and D. R. Terno, “Fundamental quantum optics experiments conceivable with satellites: reaching relativistic distances and velocities,” *Classical and Quantum Gravity* **29**, 224003 (2012).  
 — This article proposes a host of possible experiments to test fundamental quantum optics using satellites. Both near-term and far-term proposals are considered.  
**41 citations, IF=3.6**
6. **N. C. Menicucci**, “Temporal-mode continuous-variable cluster states using linear optics,” *Phys. Rev. A* **83**, 062314 (2011).  
 — This single-author article proposes a method of using temporal-mode continuous-variable cluster states for computation, leading to a world record-breaking experiment (#8 above).  
**29 citations, IF=3.0**

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5. **N. C. Menicucci**, X. Ma, and T. C. Ralph, “Arbitrarily Large Continuous-Variable Cluster States from a Single Quantum Nondemolition Gate,” *Phys. Rev. Lett.* **104**, 250503 (2010).  
— This Letter introduces the innovation of temporal-mode continuous variable cluster states, minimising optical hardware and allowing the states to be extended as they are used for computation.  
**34 citations, IF=7.9**
4. G. Ver Steeg and **N. C. Menicucci**, “Entangling Power of an Expanding Universe,” *Phys. Rev. D* **79**, 044027 (2009).  
— Published as a PhD student with another student and no supervision, this article demonstrates that entanglement can be used to detect expansion of the universe.  
**53 citations, IF=4.7**
3. **N. C. Menicucci**, S. T. Flammia, and O. Pfister, “One-Way Quantum Computing in the Optical Frequency Comb,” *Phys. Rev. Lett.* **101**, 130501 (2008).  
— This Letter proposes a method to generate large continuous-variable cluster states with toroidal topology using a single optical parametric oscillator.  
**138 citations, IF=7.9**
2. **N. C. Menicucci**, P. van Loock, M. Gu, C. Weedbrook, T. C. Ralph, and M. A. Nielsen, “Universal Quantum Computation with Continuous-Variable Cluster States,” *Phys. Rev. Lett.* **97**, 110501 (2006).  
— This Letter introduces continuous-variable cluster states as a new resource for quantum computing, opening the doors to an entirely new research program with many experimental and theoretical achievements.  
**266 citations, IF=7.9**
1. **N. C. Menicucci** and C. M. Caves, “Local Realistic Model for the Dynamics of Bulk-Ensemble NMR Information Processing,” *Phys. Rev. Lett.* **88**, 167901 (2002).  
— Reporting on work as an undergraduate, this Letter shows the limits of liquid-state nuclear magnetic resonance for quantum computing.  
**38 citations, IF=7.9**

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## All Publications

- Online Resources
- Google Scholar citations: [bit.ly/NCMScholar](http://bit.ly/NCMScholar)
  - ResearcherID citations: [www.researcherid.com/rid/N-2883-2013](http://www.researcherid.com/rid/N-2883-2013)
  - All articles (including preprints): [arxiv.org/a/menicucci\\_n\\_1.html](http://arxiv.org/a/menicucci_n_1.html)

### Refereed Journal Articles

28. G. Salton, R. B. Mann, and **N. C. Menicucci**, “Acceleration-assisted entanglement harvesting and rangefinding,” *New J. Phys.* **17**, 035001 (2015).
27. R. N. Alexander, S. C. Armstrong, R. Ukai, and **N. C. Menicucci**, “Noise analysis of single-mode Gaussian operations using continuous-variable cluster states,” *Phys. Rev. A* **90**, 062324 (2014).
26. E. G. Brown, W. Donnelly, A. Kempf, R. B. Mann, E. Martín-Martínez, and **N. C. Menicucci**, “Quantum Seismology,” *New J. Phys.* **16**, 105020 (2014).
25. E. Martín-Martínez and **N. C. Menicucci**, “Entanglement in curved spacetimes and cosmology,” *Classical and Quantum Gravity* **31**, 214001 (2014).
24. P. Wang, M. Chen, **N. C. Menicucci**, and O. Pfister, “Weaving quantum optical frequency combs into continuous-variable hypercubic cluster states,” *Phys. Rev. A* **90**, 032325 (2014).

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23. T. F. Demarie, T. Linjordet, **N. C. Menicucci**, and G. K. Brennen, “Detecting topological entanglement entropy in a lattice of quantum harmonic oscillators,” *New J. Phys.* **16**, 085011 (2014).
22. **N. C. Menicucci**, “Fault-tolerant measurement-based quantum computing with continuous-variable cluster states,” *Phys. Rev. Lett.* **112**, 120504 (2014).
21. M. Chen, **N. C. Menicucci**, and O. Pfister, “Experimental realization of multipartite entanglement of 60 modes of the quantum optical frequency comb,” *Phys. Rev. Lett.* **112**, 120505 (2014).
20. S. Yokoyama, R. Ukai, S. C. Armstrong, C. Sornphiphatphong, T. Kaji, S. Suzuki, J. Yoshikawa, H. Yonezawa, **N. C. Menicucci**, and A. Furusawa, “Ultra-large-scale continuous-variable cluster states multiplexed in the time domain,” *Nature Photonics* **7**, 982 (2013).
19. E. G. Brown, E. Martín-Martínez, **N. C. Menicucci**, and R. B. Mann, “Detectors for probing relativistic quantum physics beyond perturbation theory,” *Phys. Rev. D* **87**, 084062 (2013).
18. E. Martín-Martínez and **N. C. Menicucci**, “Cosmological quantum entanglement,” *Classical and Quantum Gravity* **29**, 224003 (2012).
17. D. Rideout, T. Jennewein, G. Amelino-Camelia, T. F. Demarie, B. L. Higgins, A. Kempf, A. Kent, R. Laflamme, X. Ma, R. B. Mann, E. Martín-Martínez, **N. C. Menicucci**, J. Moffat, C. Simon, R. Sorkin, L. Smolin, and D. R. Terno, “Fundamental quantum optics experiments conceivable with satellites: reaching relativistic distances and velocities,” *Classical and Quantum Gravity* **29**, 224011 (2012).
16. **N. C. Menicucci**, “Temporal-mode continuous-variable cluster states using linear optics,” *Phys. Rev. A* **83**, 062314 (2011).
15. **N. C. Menicucci**, S. T. Flammia, and P. van Loock, “Graphical calculus for Gaussian pure states,” *Phys. Rev. A* **83**, 042335 (2011).
14. C. D. Hill, A. P. Flitney, and **N. C. Menicucci**, “A competitive game whose maximal Nash-equilibrium payoff requires quantum resources for its achievement,” *Phys. Lett. A* **374**, 3619 (2010).
13. **N. C. Menicucci**, X. Ma, and T. C. Ralph, “Arbitrarily Large Continuous-Variable Cluster States from a Single Quantum Nondemolition Gate,” *Phys. Rev. Lett.* **104**, 250503 (2010).
12. **N. C. Menicucci**, S. J. Olson, and G. J. Milburn, “Simulating quantum effects of cosmological expansion using a static ion trap,” *New J. Phys.* **12**, 095019 (2010).
11. 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).
10. M. Gu, C. Weedbrook, **N. C. Menicucci**, T. C. Ralph, and P. van Loock, “Quantum Computing with Continuous-Variable Clusters,” *Phys. Rev. A* **79**, 062318 (2009).
9. G. Ver Steeg and **N. C. Menicucci**, “Entangling Power of an Expanding Universe,” *Phys. Rev. D* **79**, 044027 (2009).
8. **N. C. Menicucci**, S. T. Flammia, and O. Pfister, “One-Way Quantum Computing in the Optical Frequency Comb,” *Phys. Rev. Lett.* **101**, 130501 (2008).
7. H. Zaidi, **N. C. Menicucci**, S. T. Flammia, R. Bloomer, M. Pysher, and O. Pfister, “Entangling the optical frequency comb: simultaneous generation of multiple 2x2 and 2x3 continuous-variable cluster states in a single optical parametric oscillator,” *Laser Phys.* **18**, 659 (2008).
6. **N. C. Menicucci**, S. T. Flammia, H. Zaidi, and O. Pfister, “Ultracompact generation of continuous-variable cluster states,” *Phys. Rev. A* **76**, 010302(R) (2007).

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5. **N. C. Menicucci** and G. J. Milburn, “Single trapped ion as a time-dependent harmonic oscillator,” *Phys. Rev. A* **76**, 052105 (2007).
4. **N. C. Menicucci**, P. van Loock, M. Gu, C. Weedbrook, T. C. Ralph, and M. A. Nielsen, “Universal Quantum Computation with Continuous-Variable Cluster States,” *Phys. Rev. Lett.* **97**, 110501 (2006).
3. Z. Xie, **N. C. Menicucci**, S. T. P. Boyd, D. A. Sergatskov, and R. V. Duncan, “Dynamic Simulation of the Superfluid/Normal Fluid Interface Motion in  $^4\text{He}$ ,” *J. Low Temp. Phys.* **138**, 79 (2005).
2. S. Prasad and **N. C. Menicucci**, “Fisher information with respect to cumulants,” *IEEE Trans. Inf. Theory* **50**, 638 (2004).
1. **N. C. Menicucci** and C. M. Caves, “Local Realistic Model for the Dynamics of Bulk-Ensemble NMR Information Processing,” *Phys. Rev. Lett.* **88**, 167901 (2002).

### Conference Proceedings

1. 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).

### Invited talks

Summary 70+ invited talks at research seminars, colloquia, workshops and conferences

#### **Fault-tolerant quantum computing with continuous-variable cluster states**

- Dec '14 \*Australian Institute of Physics Congress (Canberra, Australia)
- Oct '14 Physics Seminar, University of New South Wales (Sydney, Australia)
- Oct '14 CQC<sup>2</sup>T Seminar, University of New South Wales (Sydney, Australia)
- Sep '14 Sydney Quantum Information Workshop (Sydney, Australia)
- Dec '13 Seminar, University of Queensland (Brisbane, Australia)

#### **Continuous-variable cluster states**

- Apr '14 Seminar, University of Waterloo (Waterloo, Canada)
- Nov '11 Seminar, University of Queensland (Brisbane, Australia)
- Jun '08 Seminar, Griffith University (Brisbane, Australia)
- Feb '08 Teach at The Beach Workshop (Stradbroke Island, Australia)
- Sep '07 Seminar, California Institute of Technology (Pasadena, CA, USA)

#### **Optical continuous-variable cluster states**

- Nov '12 Seminar, McGill University (Montreal, Canada)
- Feb '11 Seminar, University of British Columbia (Vancouver, Canada)
- Feb '11 Seminar, California Institute of Technology (Pasadena, CA, USA)
- Aug '11 Seminar, University of Virginia (Charlottesville, VA, USA)
- Mar '09 Teach at The Beach Workshop (Stradbroke Island, Australia)
- Aug '08 Seminar, University of Melbourne (Melbourne, Australia)
- Jul '08 Seminar, University of Sydney (Sydney, Australia)
- Jul '08 Colloquium, University of Western Australia (Perth, Australia)
- Jul '08 Seminar, Australian National University (Canberra, Australia)
- Jul '08 Seminar, University of Auckland (Auckland, New Zealand)
- Jul '08 Quantum Information and Control in Queensland Conference (Cairns, Australia)

#### **Continuous-variable cluster states: theory and experiment**

- Oct '13 Seminar, University of Toronto (Toronto, Canada)

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- Aug '13 Seminar, University of Virginia (Charlottesville, VA, USA)
- Aug '13 Seminar, University of California at Los Angeles (Los Angeles, CA, USA)
- Jul '13 Seminar, University of New Mexico (Albuquerque, NM, USA)

**Gigantic quantum computers made out of laser light**

- Mar '15 Colloquium, Monash University (Melbourne, Australia)
- Mar '15 Colloquium, Macquarie University (Sydney, Australia)
- Jan '15 Seminar, RMIT University (Melbourne, Australia)
- Jan '14 Colloquium, Institute for Quantum Computing (Waterloo, Canada)
- Feb '14 Seminar, University of Mainz (Mainz, Germany)

**Look but don't touch: laser-light quantum computing with measurements alone**

- Mar '12 Research Bite Seminar, University of Sydney (Sydney, Australia)

**Optical continuous-variable cluster states as a collection of spins**

- Jan '13 Seminar, University of British Columbia (Vancouver, Canada)

**One-way quantum computing in the quantum frequency comb**

- Jun '09 \*International Conference on Squeezed States and Uncertainty Relations (Olomouc, Czech Republic)

**Arbitrarily large continuous-variable cluster states from a single QND gate**

- Mar '10 Seminar, University of Auckland (Auckland, New Zealand)
- Apr '10 Seminar, Griffith University (Brisbane, Australia)
- Mar '10 Seminar, Macquarie University (Sydney, Australia)
- Mar '10 Seminar, University of Melbourne (Melbourne, Australia)
- Jul '10 \*Quantum Communication, Measurement and Computation Conference (Brisbane, Australia)
- Sep '10 Seminar, University of New Mexico (Albuquerque, NM, USA)
- Mar '10 Seminar, University of Sydney (Sydney, Australia)

**Entangling power of an expanding universe**

- Oct '12 Seminar, University of Adelaide (Adelaide, Australia)
- May '12 Seminar, University of Sydney (Sydney, Australia)
- Oct '09 Seminar, University of Waterloo (Waterloo, Canada)
- Sep '09 Colloquium, Institute for Quantum Computing (Waterloo, Canada)
- Jul '09 Seminar, Max Planck Institute for the Science of Light (Erlangen, Germany)
- Apr '09 Seminar, University of Sydney (Sydney, Australia)
- Mar '09 Seminar, Griffith University (Brisbane, Australia)
- Mar '09 Colloquium, University of Queensland (Brisbane, Australia)
- Feb '09 Seminar, University of Melbourne (Melbourne, Australia)
- Aug '08 Seminar, University of New Mexico (Albuquerque, NM, USA)
- Jul '08 Seminar, Macquarie University (Sydney, Australia)
- Dec '07 Seminar, Perimeter Institute for Theoretical Physics (Waterloo, Canada)
- Nov '07 Relativistic Quantum Information Workshop (Brisbane, Australia)

**Harvesting entanglement from a quantum field**

- Jul '14 Last Frontiers in Quantum Information Conference (Alaska, USA)
- Mar '14 COST Meeting on Fundamental Problems in Quantum Physics (Rehovot, Israel)

**Quantum seismology**

- Dec '14 Relativistic Quantum Information Workshop (Brisbane, Australia)
- Jul '14 Relativistic Quantum Information Conference (Seoul, Korea)

**Acceleration-assisted entanglement harvesting**

- Dec '13 Relativistic Quantum Information Workshop (Brisbane, Australia)

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- Sep '13 Relativistic Quantum Information Workshop (Banff, Canada)
- Jul '13 Seminar, University of Sydney (Sydney, Australia)
- Dec '12 \*Australian Institute of Physics Congress (Sydney, Australia)
- Nov '12 Relativistic Quantum Information Workshop (Brisbane, Australia)
- Aug '12 Seminar, ETH Zurich (Zurich, Switzerland)
- Jul '12 Seminar, University of Waterloo (Waterloo, Canada)
- Jul '12 Seminar, University of New Mexico (Albuquerque, NM, USA)

**The preparation problem in nonlinear extensions of quantum theory**

- Jun '12 Relativistic Quantum Information Conference, Perimeter Institute (Waterloo, Canada)
- Sep '11 Seminar, University of New Mexico (Albuquerque, NM, USA)
- Feb '11 Seminar, University of British Columbia (Vancouver, Canada)
- Nov '10 Relativistic Quantum Information Workshop (Brisbane, Australia)

**Thermal time hypothesis: Tolman relation without GR**

- Mar '11 Relativistic Quantum Information Conference (Durban, South Africa)
- Dec '09 Relativistic Quantum Information Workshop (Brisbane, Australia)

**The Bloch representation of quantum states for  $D > 2$**

- Sep '07 Seminar, University of Virginia (Charlottesville, VA, USA)
- May '07 Seminar, University of Queensland (Brisbane, Australia)

**Emulating quantum effects of cosmological expansion in a static ion trap**

- Dec '12 \*Australian Institute of Physics Congress (Sydney, Australia)
- Nov '11 Relativistic Quantum Information Workshop (Brisbane, Australia)

**Beyond perturbation theory: oscillator-based detectors**

- Jun '13 \*Relativistic Quantum Information Conference (Nottingham, UK)

**'Gaussian' is not a four-letter word**

- Jun '13 Last Frontiers in Quantum Information Conference (Alaska, USA)
- (\* = competitive refereeing process determined invitations)

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## Teaching Experience

- Oct 2014 **2nd-year quantum physics**, *The University of Sydney*.  
Presented 5 lectures as part of the larger quantum course
- Sep 2014 **1st-year undergraduate physics lectures (Fluids)**, *The University of Sydney*.  
Presented 12 lectures on fluid physics for 1st-year physics students
- Aug–Oct 2014 **1st-year undergraduate physics workshops**, *The University of Sydney*.  
Supervised and tutored weekly in-class problem sessions for 1st-year physics students
- Oct 2013 **2nd-year quantum physics**, *The University of Sydney*.  
Presented 6 lectures as part of the larger quantum course
- Apr–Jun 2013 **1st-year undergraduate physics workshops**, *The University of Sydney*.  
Supervised and tutored weekly in-class problem sessions for 1st-year physics students
- Sep 2012 **1st-year undergraduate physics lectures (Fluids)**, *The University of Sydney*.  
Presented 12 lectures on fluid physics for 1st-year physics students
- Aug '01–May '02 **Physics Tutoring Team Leader**, *The University of New Mexico, Center for Academic Program Support (CAPS)*.  
Managed a team of 6 undergraduate student physics tutors; tutoring 10–15 hours/week
- Aug '00–May '01 **Physics Tutor**, *The University of New Mexico, Center for Academic Program Support (CAPS)*.  
About 10–15 hours/week of tutoring undergraduate physics students

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## Research Student Supervision

### Ph.D. Students

- 2013–present *Rafael Alexander*, primary PhD supervisory duties and research funding
- 2012–present *Simon Burton*, associate PhD supervisor and mentor
- 2014–present *Natasha Gabay*, associate PhD supervisor
- 2015–present *Nicholas Funai*, associate PhD supervisor
- 2013–2014 *Natasha Gabay*, primary PhD supervisory duties and research funding

### Honours Students

- 2014 *Nicholas Funai*, Honours student (graduated First Class, University Medal), awarded APA Scholarship
- 2012 *Rafael Alexander*, Honours student (graduated First Class), awarded APA Scholarship
- 2012 *Natasha Gabay*, Honours student (graduated First Class), awarded APA Scholarship

### Undergraduate and Other Students

- 2015 *Nicholas Funai*, summer student
- 2012 *Rafael Alexander*, summer student
- 2012 *Natasha Gabay*, summer student
- 2012 *Jiro Funamoto*, summer student and senior special project student
- 2009–2010 *Grant Salton*, undergraduate research student at The University of Waterloo

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## Professional Activities, Service, and Outreach

### Refereeing

- Journals Referee for Nature Communications, Physical Review Letters, Physical Review A, Physical Review D, Journal of Physics B, New Journal of Physics, Classical and Quantum Gravity, Optics Express, Physics Letters A
- Funding Reviewer for the Australian Research Council
- Conferences Referee for Quantum Information Processing (QIP) 2014
- Examiner Masters Thesis examiner, Macquarie University

### Service to the University

- Research group Marking undergraduate and Honours students' talks and assessing Honours students' theses (yearly)
- Administration Postgraduate student annual review assessor (yearly)

### Service to the Community and Outreach

- Jun 2014 Outreach seminar for The Sydney Learning Club as an expert on quantum physics
- Jan 2014 Interview with CIO magazine as an expert in quantum computing
- Nov 2013 Interview with The Register (U.K.) for an article on quantum computing
- Nov 2013 Australian national radio interview (station 2UE 954) on quantum computing

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## Press Coverage

Popular press coverage of my work includes highlights in [Nature](#), professional broad-interest press such as a Viewpoint in [Physics](#), and popular news articles reporting on the world record-breaking experiment reported in [Nature Photonics](#), on which I am a co-author and which is based on my [single-author proposal](#).

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## Professional References

### **Professor Stephen Bartlett**

University of Sydney  
theorist and quantum group leader  
[stephen.bartlett@sydney.edu.au](mailto:stephen.bartlett@sydney.edu.au)

### **Professor Gerard Milburn**

University of Queensland  
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Professor Bartlett leads the research group to which I currently belong at The University of Sydney. Professors Milburn, Ralph and Kempf are theorists who can speak to my abilities and to the international impact of my work. Professors Pfister and Furusawa are experimentalists who have implemented my proposals and can comment on the impact of my work on quantum technology development.

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