

Peter S. Turner

Curriculum Vitae



Address: School of Physics and
 Department of Electrical & Electronic Engineering
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GoogleScholar: [lWiq1o0AAAAJ](https://scholar.google.com/citations?user=lWiq1o0AAAAJ)

ResearcherID: [E-9197-2010](https://orcid.org/0000-9197-2010)

Citizenship: Canadian

Education

| | | |
|---------------------------------------|--|--|
| 09/2000 - 04/2005 Awarded: 06/2005 | Ph.D. Physics | University of Toronto , Toronto, Canada Thesis: <i>The algebraic collective nuclear model and SO(5)</i> Supervisor: Prof. David J. Rowe |
| 09/1999 - 09/2000 Awarded: 11/2000 | M.Sc. Physics | University of Toronto , Toronto, Canada |
| 09/1995 - 04/1999 Awarded: 05/1999 | B.Sc. Combined Honours Physics and Mathematics | Dalhousie University , Halifax, Canada |
| 09/2015 - ongoing | Fellow | Higher Education Academy University of Bristol CREATE programme |

Employment

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|--------------------------|--|---|
| 01/2016 - present | Lecturer | Quantum Engineering University of Bristol |
| 01/2015 - 12/2015 | Associated Lecturer | Quantum Engineering University of Bristol |
| 09/2013 - 12/2014 | Research Associate | School of Physics and Centre for Quantum Photonics University of Bristol |
| 06/2011 - present | Affiliate member | Centre for Quantum Information and Quantum Control University of Toronto |
| 02/2008 - 03/2013 | Assistant Professor | Department of Physics University of Tokyo |
| 07/2005 - 11/2007 | Alberta Ingenuity Postdoctoral Fellow | Institute for Quantum Information Science University of Calgary |

Competitive research grants secured

| <i>Year</i> | <i>Project</i> | <i>Scheme</i> | <i>Role</i> | <i>Approx. value</i> |
|----------------------|--|---|---------------------------|----------------------|
| 04/2016 - 03/2020 | Quantum Technology Enterprise Centre | EPSRC Quantum Technologies Skills | Co- investigator | GBP 4 million |
| 01/2016 - 12/2017 | Randomness Resources for Quantum Technologies | EPSRC First Grant | Principal investigator | GBP 125,000 |
| 09/2014 - 09/2015 | South West Quantum Technologies Group | GW4 Building Communities Programme Initiator Fund | Co- applicant | GBP 20,000 |
| 04/2014 - 03/2019 | Photonic Quantum Characterization, Verification and Validation | US Army Research Office, Research in quantum computing program | Co- investigator | USD 5 million |
| 11/2012 - 03/2013 | Controlled Noise in Quantum Photonics | Building Global Engagements in Research: Internal Responsive Mode Fund | Co- applicant | GBP 6,700 |
| 08/2012 - 10/2012 | Institutional medium-term travel grant | University of Tokyo Wakatehake | Applicant | JPY 800,000 |
| 01/2011 - 12/2012 | Characterising Quantum Interference in Multimode Integrated Photonic Devices | Royal Society International Joint Project | Co- applicant | GBP 12,000 |
| 07/2011 - 09/2011 | Institutional medium-term travel grant | University of Tokyo Wakatehake | Applicant | JPY 800,000 |
| 08/2008 - 03/2011 | Efficient Tomography for Operationally Indistinguishable Multipartite Quantum States | Japan Society for the Promotion of Science KAKENHI for Scientific Research | Principal investigator | JPY 3 million |
| 08/2005 - 08/2007 | Requirements for Long Distance Quantum Computing | Alberta Ingenuity Fund, Informatics Circle of Research Excellence | Principal investigator | CAD 110,000 |

Awards*National Awards*

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|----------------|---|
| 2005 | Alberta Ingenuity Fund Postdoctoral Fellowship |
| 2002 & 2003 | Sumner Fellowship |
| 2001 | NSERC Postgraduate Scholarship B |
| 1999 | NSERC Postgraduate Scholarship A |
| 1999 | Canadian Association of Physicists Prize Examination (9 th in Canada) |
| 1998 | JDS Fitel Scholarship |

Institutional Awards

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|----------------|--|
| 2007 | University of Calgary Graduate Teaching Excellence nomination |
| 2003 | Lachlan Gilchrist Fellowship |
| 2000 & 2001 | Reginald Blyth Fellowship |
| 1999 & 2002 | University of Toronto Fellowship |
| 1998 | Charles and Cecelia Zwerling Scholarship |
| 1998 | H. McInnes Memorial Scholarship |
| 1997 | W. A. MacKay Alumni Scholarship |
| 1997 | R. S. Smith Scholarship |
| 1996 | Dalhousie University Scholarship |
| 1996 | J. G. MacGregor Memorial Prize |

Teaching experience

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|-------------------|---------------------------------|---|----------------------------|
| 01/2017 - 05/2017 | Lecturer and examiner | Methods in theoretical physics, undergraduate 2 nd &3 rd year | University of Bristol |
| 09/2014 - 01/2017 | Designer, lecturer and examiner | Quantum optics, graduate | University of Bristol |
| 09/2014 - 01/2017 | Designer and instructor | Topics in quantum engineering, graduate | University of Bristol |
| 09/2014 - 01/2017 | Designer and instructor | Quantum platforms, graduate | University of Bristol |
| 04/2012 - 07/2012 | Instructor | Quantum mechanics, undergraduate 3 rd year | University of Tokyo |
| 04/2008 - 01/2013 | Instructor | Quantum information theory, undergraduate 4 th year | University of Tokyo |
| 10/2009 - 01/2012 | Instructor | Quantum mechanics seminar, undergraduate 4 th year | University of Tokyo |
| 09/2006 - 12/2006 | Designer, lecturer and examiner | Applied group theory, graduate | University of Calgary |
| 09/1999 - 12/2004 | Teaching assistant and examiner | Engineering physics, undergraduate 1 st year | University of Toronto |
| 07/2002 | Guest lecturer | Advanced physics, Senior high school | Mississauga Private School |
| 09/1998 - 12/1998 | Instructor | Physics for nonscientists, undergraduate 1 st year | Dalhousie University |

Service

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|----------------|--|---|
| 2014 - present | Deputy Director , Programme Coordinator, Admissions panel and interviewer, Examinations officer | Quantum Engineering Centre for Doctoral Training University of Bristol |
| 2016 | Hiring committee and panel member | Quantum Engineering, Computer Science University of Bristol |
| 2015 - 2016 | Internal examiner | Ph.D. vivas Russel (observer), Mendoza, Sibson University of Bristol |
| 2015 - 2016 | Annual progress reviewer | 24 Ph.D. students University of Bristol |
| 2014 | Programme committee | TQC2014, Singapore |
| 2013 | M.Res. thesis external examiner | Imperial College London |
| 2012 | Ph.D. thesis external examiner | University of Sydney |
| 2010 - 2013 | Entrance examiner | University of Tokyo |
| 2008 - 2010 | QuLink seminar committee | University of Tokyo/National Institute of Informatics |
| 2008 - 2013 | Library acquisitions | University of Tokyo |
| 2006 - 2007 | IQIS seminar committee | University of Calgary |
| 2004 - present | Referee | Physical Review A, Physical Review Letters, New Journal of Physics, Progress on Theoretical Physics, Canadian Journal of Physics, Nature Communications |
| 2000 - 2001 | Vice President | Physics Graduate Student Association, U of Toronto |

Supervisory experience

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|-------------------|------------------------------|--------------------|----------------------|--------------------------|
| 10/2016 - 09/2019 | Supervisor | PhD | D. Moylett | University of Bristol |
| 10/2016 - 05/2017 | Supervisor | MSci | S. Dilkes | |
| 10/2016 - 05/2017 | Supervisor | MSci | B. Parr | |
| 10/2016 - 05/2017 | Co-supervisor (Dr Mahler) | MSci | H. Lander | |
| 10/2016 - 05/2017 | Co-supervisor (Dr Mahler) | MSci | J. Mills | |
| 10/2015 - 09/2018 | Supervisor | PhD | S. Stanasic | |
| 10/2015 - 05/2016 | Supervisor | MSci | S. Hadfield | |
| 02/2015 - 05/2015 | Supervisor | MRes project | S. Pallister | |
| 06/2014 - 05/2015 | Supervisor | MSci | A. Titterton | |
| 02/2014 - 05/2014 | Co-supervisor (Prof O'Brien) | MSci | D. Wise | |
| 02/2014 - 05/2014 | Co-supervisor (Prof O'Brien) | MSci | H. Wright | |
| 10/2013 - 05/2014 | Co-supervisor (Dr Matthews) | BSc | T. Roberts | |
| 10/2013 - 05/2014 | Co-supervisor (Dr Matthews) | BSc | R. Sach | |
| 03/2010 - 01/2013 | Co-supervisor (Prof Murao) | PhD | Y. Nakata | University of Tokyo |
| 03/2010 - 01/2013 | Co-supervisor (Prof Murao) | PhD | T. Sugiyama | |
| 03/2010 - 01/2012 | Co-supervisor (Prof Murao) | MSc | E. Wakakuwa | |
| 06/2010 - 08/2010 | Co-supervisor (Prof Murao) | BSc summer student | U. Ponsukcharoen | |
| 03/2009 - 01/2011 | Co-supervisor (Prof Murao) | MSc | Y. Kinjo | |
| 03/2009 - 01/2011 | Co-supervisor (Prof Murao) | MSc | S. Nakayama | |
| 03/2008 - 01/2010 | Co-supervisor (Prof Murao) | PhD | A. Soeda | |
| 03/2008 - 01/2010 | Co-supervisor (Prof Murao) | MSc | T. Sugiyama | |
| 03/2008 - 01/2010 | Co-supervisor (Prof Murao) | MSc | M. Someya | |
| 03/2008 - 01/2009 | Co-supervisor (Prof Murao) | MSc | L. Sakashita | |
| 06/2006 - 08/2007 | Co-supervisor (Prof Sanders) | MSc | Z. Shaterzadeh Yazdi | University of Calgary |

Publications

Five most cited publications [Google Scholar, 24 September 2016.]

110 citations:

- I. T. Rudolph, R. W. Spekkens, and P. S. Turner, “Unambiguous discrimination of mixed states,” *Phys. Rev. A* **68**, 010301(R) (2003).

82 citations:

- II. D. J. Rowe, P. S. Turner and G. Rosensteel, “Scaling Properties and Asymptotic Spectra of Finite Models of Phase Transitions as They Approach Macroscopic Limits,” *Phys. Rev. Lett.* **93**, 232502 (2004).

III. 72 citations:

- D. J. Rowe and P. S. Turner, “The algebraic collective model,” *Nuc. Phys. A* **753**, 94 (2005).

63 citations:

- IV. P. S. Turner and D. J. Rowe, “Phase transitions and quasidynamical symmetry in nuclear collective models: II. The spherical vibrator to gamma soft rotor phase transition in an $SO(5)$ invariant Bohr model,” *Nuc. Phys. A* **756**, 333 (2005).

59 citations:

- V. D. J. Rowe, P. S. Turner, J. Repka, “Spherical harmonics and basic coupling coefficients for the group $SO(5)$ in an $SO(3)$ basis,” *J. Math. Phys.* **45**, 2761 (2004).

Letters and Rapid Communications

1. P. S. Turner, “Postselective quantum interference of distinguishable particles,” [arXiv:1608.05720](https://arxiv.org/abs/1608.05720)
2. P. S. Turner and D. Markham, “Derandomizing quantum circuits with measurement-based unitary designs,” *Phys. Rev. Lett.* **116**, 200501 (2016). [1] [arXiv:1511.00714](https://arxiv.org/abs/1511.00714)
3. J. C. F. Matthews, B. Whittaker, J. L. O'Brien and P. S. Turner, “Testing randomness with photons,” *Phys. Rev. A* **91**, 020301(R) (2015). [2] [arXiv:1312.1940](https://arxiv.org/abs/1312.1940)
4. L. A. Rozema, D. Mahler, A. Hayat, P. S. Turner and A. M. Steinberg, “Quantum data compression of a qubit ensemble,” *Phys. Rev. Lett.* **113**, 160504 (2014). [8] [arXiv:1410.3941](https://arxiv.org/abs/1410.3941)
5. R. Blume-Kohout and P. S. Turner, “The curious non-existence of Gaussian 2-designs,” *Comm. Math. Phys.* **326**, 755 (2014). [3] [arXiv:1110.1042](https://arxiv.org/abs/1110.1042)
6. T. Sugiyama, P. S. Turner and M. Muraio, “Precision-guaranteed quantum tomography,” *Phys. Rev. Lett.*, **111**, 160406 (2013). [13] [arXiv:1306.4191](https://arxiv.org/abs/1306.4191)
7. A. Soeda, P. S. Turner and M. Muraio, “Entanglement Cost of Implementing Controlled-Unitary Operations,” *Phys. Rev. Lett.* **107**, 180501 (2011). [17] [arXiv:1008.1128](https://arxiv.org/abs/1008.1128)
8. D. J. Rowe, P. S. Turner and G. Rosensteel, “Scaling Properties and Asymptotic Spectra of Finite Models of Phase Transitions as They Approach Macroscopic Limits,” *Phys. Rev. Lett.* **93**, 232502 (2004). [82]
9. T. Rudolph, R. W. Spekkens and P. S. Turner, “Unambiguous discrimination of mixed states,” *Phys. Rev. A* **68**, 010301(R) (2003). [110] [arXiv:quant-ph/0303071](https://arxiv.org/abs/quant-ph/0303071)

Regular articles

10. R. N. Alexander, P. S. Turner and S. D. Bartlett, “Randomized benchmarking in measurement-based quantum computing,” *Phys. Rev. A* **94**, 032303 (2016). [arXiv:1605.08053](#)
11. T. Sugiyama, P. S. Turner and M. Muraio, “Effect of non-negativity on estimation errors in one-qubit state tomography with finite data,” *New J. Phys.* **14**, 085005 (2012). [8] [arXiv:1205.2976](#)
12. Y. Nakata, P. S. Turner and M. Muraio, “Phase-random states: Ensembles of states with fixed amplitudes and uniformly distributed phases in a fixed basis,” *Phys. Rev. A* **86**, 012301 (2012). [10] [arXiv:1111.2747](#)
13. T. Sugiyama, P. S. Turner and M. Muraio, “Adaptive experimental design for one-qubit state estimation with finite data based on a statistical update criterion,” *Phys. Rev. A* **85**, 052107 (2012). [17] [arXiv:1203.3391](#)
14. A. Soeda, Y. Kinjo, P. S. Turner and M. Muraio, “Quantum computation over the butterfly network,” *Phys. Rev. A* **84**, 012333 (2011). [10] [arXiv:1010.4350](#)
15. T. Sugiyama, P. S. Turner and M. Muraio, “Error probability analysis in quantum tomography: a tool for evaluating experiments,” *Phys. Rev. A* **83**, 012105 (2011). [10] [arXiv:1009.2164](#)
16. G. Gour, B. C. Sanders and P. S. Turner, “Time reversal frameness and superselection,” *J. Math. Phys.* **50**, 102105 (2009). [6] [arXiv:0811.3980](#)
17. S. D. Bartlett, T. Rudolph, R. W. Spekkens and P. S. Turner, “Quantum communication using a bounded-size quantum reference frame,” *New J. Phys.* **11**, 063013 (2009). [34] [arXiv:0812.5040](#)
18. R. B. Adamson, P. S. Turner, M. W. Mitchell and A. M. Steinberg, “Detecting hidden differences via permutation symmetries,” *Phys. Rev. A* **78**, 033832 (2008). [20] [arXiv:quant-ph/0612081](#)
19. Z. Shaterzadeh Yazdi, P. S. Turner and Sanders, B. C., “SU(1,1) symmetry of multimode squeezed states.” *J. Phys. A: Math. Theor.* **41**, 055309 (2008). [13] [arXiv:0710.3205](#)
20. S. D. Bartlett, T. Rudolph, B. S. Sanders and P. S. Turner, “Degradation of a quantum directional reference frame as a random walk,” *J. Mod. Optics* **54**, 2211 (2007). [15] [arXiv:quant-ph/0607107](#)
21. S. D. Bartlett, T. Rudolph, R. W. Spekkens and P. S. Turner, “Degradation of a quantum reference frame,” *New J. Phys.* **8**, 58 (2006). [57] [arXiv:quant-ph/0602069](#)
22. P. S. Turner, D. J. Rowe and J. Repka, “Vector coherent state theory of the generic representations of so(5) in an so(3) basis,” *J. Math. Phys.* **47**, 023507 (2006). [13] [arXiv:math-ph/0511052](#)
23. P. S. Turner and D. J. Rowe, “Phase transitions and quasidynamical symmetry in nuclear collective models: II. The spherical vibrator to gamma soft rotor phase transition in an SO(5) invariant Bohr model,” *Nuc. Phys. A* **756**, 333 (2005). [63]
24. D. J. Rowe and P. S. Turner, “The algebraic collective model,” *Nuc. Phys. A* **753**, 94 (2005). [72]
25. D. J. Rowe, P. S. Turner, J. Repka, “Spherical harmonics and basic coupling coefficients for the group SO(5) in an SO(3) basis,” *J. Math. Phys.* **45**, 2761 (2004). [59]

Other refereed contributions

26. P. S. Turner, “On t-designs and generalised coherent states,” Proceedings of The XXIXth International Colloquium on Group-Theoretical Methods in Physics, Nankai Series in Pure, Applied Mathematics and

Theoretical Physics **11**, Eds. C. Bai, J.-P. Gazeau, M.-L. Ge. World Scientific 2013, pp. 635-638.

27. M. Mhalla, M. Murao, S. Perdix, M. Someya and P. S. Turner, “Which graph states are useful for quantum information processing,” Theory of Quantum Comp., Comm., Crypto, pp.174-187 (2014).
[arXiv:1006.2616](https://arxiv.org/abs/1006.2616)
28. P. S. Turner, T. Sugiyama and T. Rudolph, “Testing for multipartite indistinguishability,” Proceedings of The 10th International Conference on Quantum Communication, Measurement and Computing (QCMC 2010), T. Ralph and P. K. Lom, eds.; AIP Conf. Proc. **1363**, (2011), pp. 77-80.
29. Z. Shaterzadeh-Yazdi, P. S. Turner and B. C. Sanders, “Three-mode squeezing: SU(1,1) symmetry,” 7 June 2007, Proceedings of SPIE: Noise and Fluctuations in Photonics, Quantum Optics, and Communications **6603**: 660317 (11 pp.), SPIE Publications, Bellingham, USA.
30. S. D. Bartlett, T. Rudolph, B. C. Sanders and P. S. Turner, “Quantum and semiclassical approaches to quantum reference frame degradation,” Proceedings of The 8th International Conference on Quantum Communication, Measurement and Computing (QCMC 2006), O. Hirota, J. H. Shapiro and M. Sasaki, eds. Published by NICT, Tokyo, Japan. pp. 335-342.

Non-refereed contributions

- i. P. S. Turner, “The algebraic collective nuclear model and SO(5),” Ph.D. thesis, Department of Physics, University of Toronto 2005.
http://www.eve.phys.s.utokyo.ac.jp/pturner/PSTurner_Thesis.pdf
- ii. P. S. Turner, “On the correspondence of classical and quantal mechanics,” Master's report, Department of Physics, University of Toronto 2000.
- iii. P. S. Turner, “Scalar field cosmologies with positive spatial curvature: a dynamical systems approach,” undergraduate honours thesis, Department of Physics, Dalhousie University 1999.

Presentations (Not including work given by collaborators. Invited in **bold**.)

1. "Postselective quantum interference of distinguishable particles," talk presented at the University of Glasgow, Glasgow, September 2016.
2. "Measurement-based t-designs and (de)randomized benchmarking," talk presented at Photon16 conference, Leeds, September 2016.
3. "Randomized benchmarking in measurement-based quantum computing," talk presented at the QO/AMO seminar, University of Toronto, Toronto, July 2016.
4. "Derandomizing quantum circuits with measurement based unitary designs," poster presented at the Quantum Information Processing conference, Banff, Canada, January 2016.
5. "Measurement based t-designs," talk presented at the CQP QNIX workshop, Bristol, UK, July 2015.
6. "Measurement based t-designs," talk presented at the University of Sydney, Sydney, Australia, May 2015.
7. "Measurement based t-designs," talk presented at Telecom ParisTech, Paris, France, February 2015.
8. "Experimental Demonstration of Quantum Data Compression," talk presented at NTT, Atsugi, January 2015.
9. "Quantum Engineering Centre for Doctoral Training at Bristol," talk presented at Ochanomizu University, Tokyo, January 2015.
10. "Quantum estimation," GW4 Southwest Quantum Technologies Group kick-off meeting, University of Exeter, Exeter, UK, November 2014.
11. "Decoupling distinguishability," **invited talk** presented at Last Frontiers in Quantum Information Science II, Fairbanks, Alaska, USA, July 2014.
12. "Quantum tomography in quantum information theory," talk presented at the University of Exeter, Exeter, UK, June 2014.
13. "The curious nonexistence of Gaussian 2-designs," talk presented at the Bristol theory group meeting, Bristol, UK, April 2014.
14. "Verifying pseudorandomness with photons," **invited talk** presented at the Paris Centre for Quantum Computation, Institut Henri Poincaré, Paris, France, March 2014.
15. "Precision guaranteed quantum tomography," talk presented at the Centre for Quantum Photonics, University of Bristol, Bristol, UK, October 2013.
16. "Quantum optical t-designs," talk presented at the Quantum Malawi 2013 workshop, Mulanje, Malawi, April 2013.
17. "Experimental Demonstration of Quantum Data Compression," talk presented at the Quantum Computation and Information group, University of Bristol, Bristol, UK, February 2013.
18. "From optimal tomography to mimicking randomness: quantum t-designs," **invited talk** presented at the Workshop on Mathematical Methods of Quantum Tomography, Fields Institute, Toronto, Canada, February 2013.
19. "From optimal tomography to mimicking randomness: quantum t-designs," talk presented at BBN Technologies, Boston, USA, 14 February 2013.
20. "From optimal tomography to mimicking randomness: quantum t-designs," talk presented at the Physics Faculty lunch meeting, University of Tokyo, Tokyo, Japan, October 2012.
21. "Tomography in quantum information theory," talk presented at the Joint Chemistry/Physics and Astronomy Seminar, Trent University, Peterborough, Canada, October 2012.

22. “Quantum tomography and its use in quantum information theory,” talk presented at the Physics Colloquium, Ryerson University, Toronto, Canada, September 2012.
23. “The curious nonexistence of Gaussian 2-designs,” talk presented at the Theory Seminar, Paris Université 7 – Denis Diderot, Paris, France, September 2012.
24. “The curious nonexistence of Gaussian 2-designs,” talk presented at CNRS FEMTO-ST, Université de Franche-Comté, Besancon, France, September 2012.
25. “The curious nonexistence of Gaussian 2-designs,” poster presented at the XXIX International Colloquium on Group-Theoretical Methods in Physics, Chern Institute of Mathematics, Tianjin, China, August 2012.
26. “2-designs in quantum mechanics,” talk presented at the Quantum Computation group meeting, University of Sydney, Sydney, Australia, August 2012.
27. “Improving quantum estimation for finite-dimensional systems, and a curious distinction for infinite ones,” talk presented at the School of Chemical and Physical Sciences, Victoria University, Wellington, New Zealand, August 2012.
28. “The curious nonexistence of Gaussian 2-designs,” talk presented at the Quantum Computation and Information group, University of Bristol, Bristol, UK, March 2012.
29. “Multipartite indistinguishability,” talk presented at the Centre for Quantum Photonics, University of Bristol, Bristol, UK, February 2012.
30. “Gaussian 2-designs,” **invited talk** presented at the Workshop on Quantum Tomography, Centre for Quantum Technologies, National University of Singapore, November 2011.
31. “Multipartite indistinguishability,” talk presented at the Joint Centre for Quantum Information and Quantum Control & Quantum Optics/Atomic, Molecular, Optics Seminar, University of Toronto, Canada, August 2011.
32. “The curious nonexistence of Gaussian 2-designs,” talk presented at the Conference on Quantum Information and Quantum Control, Fields Institute, Toronto, Canada, August 2011.
33. “The curious nonexistence of Gaussian 2-designs,” talk presented at Lakehead University, Thunder Bay, Canada, August 2011.
34. “Testing for multipartite indistinguishability,” talk presented at the International Conference on Quantum Information and Technology, Tokyo, Japan, October 2010.
35. “Testing for multipartite indistinguishability,” poster presented at the Quantum Communication, Measurement and Computation conference, Brisbane, Australia, July 2010.
36. “Distinguishability and quantum tomography,” **invited talk** presented at the NII-CNRS workshop, National Institute for Informatics, Tokyo, Japan, March 2010.
37. “Quantum tomography with applications,” talk presented at the Quantum Information and Geometric Statistics seminar, University of Guelph, Guelph, Canada, August 2009.
38. “Comparison of maximum-likelihood and linear reconstruction schemes in quantum measurement tomography,” poster presented at the Conference on Quantum Information and Quantum Control, Fields Institute, Toronto, Canada, August 2009.
39. “Comparison of maximum-likelihood and linear reconstruction schemes in quantum measurement tomography,” **invited talk** presented at the Workshop on Mathematics in Experimental Quantum Information Processing, Institute for Quantum Computing, Waterloo, Canada, August 2009.
40. “Continuous variable 2-designs,” poster presented at the Symposium on the Physics of Quantum Technology, Nara, Japan, November 2008.

41. "Overcoming time reversal superselection," talk presented at the Quantum Computation & Information (QCI) seminar, ERATO-SORST, Tokyo, Japan, November 2008.
42. "Continuous variable 2-designs," **invited talk** presented at the GSIS workshop on quantum information theory, Tohoku University, Sendai, Japan, November 2008.
43. "Continuous variable 2-designs," **invited talk** presented at the Quantum Estimation: Theory and Practice workshop, Perimeter Institute, Waterloo, Canada, August 2008.
44. "Effective decoherence from bounded quantum reference frames," talk presented at the QuLink seminar, University of Tokyo, Tokyo, Japan, May 2008.
45. "Hidden degrees of freedom, distinguishability, and quantum reference frames," talk presented at the PI Quantum Discussions series, Perimeter Institute, Waterloo, Canada, April 2008.
46. "Hidden degrees of freedom, distinguishability, and quantum reference frames," talk presented to the Rowe group, University of Toronto, Toronto, Canada, December 2007.
47. "Hidden degrees of freedom, distinguishability and quantum reference frames," talk presented to the Quantum Information Group, University of Tokyo, Tokyo, Japan, October 2007.
48. "Distinguishability as a resource," talk presented at the iCORE summit, Banff, Canada, August 2007.
49. "Hidden degrees of freedom and distinguishability," talk presented at the DAMOP/DAMP ϕ conference, Calgary, Canada, June 2007.
50. "Multimode squeezing in quantum networks," **invited talk** presented at the 10th International Conference on Squeezed States and Uncertainty Relations, University of Bradford, Bradford, UK, April 2007.
51. "Hidden degrees of freedom and distinguishability," talk presented at the quantum computation and information seminar, University of Bristol, Bristol, UK, March 2007.
52. "Quantal and semi-classical approaches to quantum reference frame degradation," poster presented at the Quantum Communication, Measurement and Computation conference, Tsukuba, Japan, December 2006.
53. "Quantal and semi-classical approaches to the degradation of quantum reference frames," talk presented at the Toronto quantum information seminar, University of Toronto, Canada, August 2006.
54. "A three boson SU(1,1) realisation for linear optical quantum information," talk presented to the Rowe group, University of Toronto, Toronto, Canada, July 2006.
55. "Quantal and semi-classical approaches to the degradation of quantum reference frames," talk presented at Griffith University, Brisbane, Australia, June 2006.
56. "Quantal and semi-classical approaches to the degradation of quantum reference frames," talk presented at Macquarie University, Sydney, Australia, May 2006.
57. "Degradation of quantum reference frames," talk presented at the Institut Henri Poincaré, Ecole Normale Supérieure, Paris, France, February 2006.
58. "The problem of quantum gravity," talk presented to the World Presidents Organisation, Calgary, Canada, October 2005.
59. "Degradation of a directional quantum reference frame," talk presented at the QIS colloquium, University of Calgary, Calgary, Canada, September 2005.
60. "State discrimination" and "Quantal reference frames," two talks presented to the IQIS group at the iCORE annual meeting, Banff, Canada, September 2005.

61. "Degradation of quantum reference frames," poster presented at the workshop on reference frames and superselection rules, Perimeter Institute, Waterloo, Canada, July 2004.
62. "SO(5) spherical harmonics for nuclear collective models," talk presented at the Western Regional Nuclear and Particle Physics Conference, Lake Louise, Canada, February 2004.
63. "Unambiguous discrimination of mixed states," talk presented at the physics theory group meeting, University of Queensland, Australia, December 2003.
64. "Unambiguous discrimination of mixed states," talk presented at the Toronto quantum information seminar, University of Toronto, Canada, November 2003.
65. "A state estimation problem," talk presented at CAP Congress, York University, Toronto, Canada, June 2000.