Terry Rudolph, Curriculum Vitae

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Employment (dates run over the academic year)

2012: Professor of Quantum Physics, Department of Physics, Imperial College
2009-2011: Reader in the Department of Physics & Institute for Mathematical Sciences, Imperial College.
2008-2009: Lecturer in the Department of Physics & Institute for Mathematical Sciences, Imperial College.
2003-2008: Advanced Fellow, Department of Physics, Imperial College London.
2001-2003: Research Fellow, Bell Labs, Murray Hill, New Jersey.
2000-2001: Postdoctoral Research Fellow, Institute for Experimental Physics, University of Vienna.
1998-2000: Lecturer (2 year fixed term appointment), Department of Physics, University of Toronto.

Education

1998: Doctor of Philosophy, York University, Canada.
1994: Honours (First Class, physics), University of Queensland, Australia.
1993: Bachelor of Science (mathematics/physics), University of Queensland, Australia.

Funding

2001-2003: Co-Investigator, *Quantum Search and Beyond*. Grant DAAGG55-98-C0040, United States National Security Agency and Army Research Office.Value: USD$450,000
2003-2008: Principal Investigator (Advanced Fellowship), *Local and extended-party quantum information processing*. Engineering and Physical Sciences Research Council. Value: £203,000
2005-2009: Co-investigator, *Optical Quantum Information*. Quantum Computing Concept Maturation project, United States Advanced Research and Development Activity. PI: Prof. Paul Kwiat. Value: US$5M
2006: Principal Investigator, Visiting Research Fellowship. University of Sydney. Value: AUD$9,000
2008-2010: Principal Investigator, International Program Development Fund. University of Sydney. Value: AUD$20,000
3/1/09-2/7/12: Principal Investigator, *Foundations of Quantum Information Processing*. Engineering and Physical Sciences Research Council. Value: £381,000
1/10/09-31/3/18: Co-Director and principal author: *Controlled Quantum Dynamics - The CQD-DTC.* Engineering and Physical Sciences Research Council. Value: £6,719,954M
1/7/10-31/3/11: Imperial College/EPSRC Strategic Fund. Value: £26,435
13/6/11-12/6/14: Co-investigator, *Multi-scale Dynamical Community Detection for the Digital Economy*. PI: Prof. Sophia Yaliraki. Engineering and Physical Sciences Research Council. Value: £723,052
1/10/11-30/9/12: Co-investigator, *The solid state quantum network (CHIST-ERA*). PI: Prof. John Rarity. Engineering and Physical Sciences Research Council. Value: £188,894
16/6/14-15/6/19: Co-investigator, *Engineering Photonic Quantum Technologies*. PI: Prof. Jeremy O'Brien. Engineering and Physical Sciences Research Council. Value: £4,875,659
1/4/14-30/9/22: Co-Director, *EPSRC Centre for Doctoral Training in Controlled Quantum Dynamics*. Value: £4,161,029
2014-2018: Co-Investigator, *Photonic Quantum Characterization, Verification, and Validation.* PI: Prof. Jeremy O'Brien. United States Army Research Office, Value: US$3.2M

Leadership

2009-present: Co-Director, *Centre for Doctoral Training in Controlled Quantum Dynamics* (http://www.controlledquantumdynamics.com - considered the "flagship" CDT by the EPSRC)
2009-2011: Program Director, Quantum Information Science program, Institute for Mathematical Sciences Imperial College.
2007-2012: Founding Member of the Imperial College Physics Department's *JUNO* (equal opportunities oversight) committee.
2013-2015: Member of Imperial College's Faculty of Natural Sciences' *Education Futures Group*.
2014-present: Organiser, Imperial College Faculty of Natural Science's *Make-A-Difference* competition.

Teaching

1998-2000: *Special Topics in Quantum Optics I and II (Quantum Information)*, Graduate students. University of Toronto. 20 lectures each course.
1998-2000: *The magic of Physics*. 1st year humanities undergradutes. University of Toronto. 20 lectures.
2005-2010: *Advanced Quantum Information*, Masters Program in Quantum Fields and Fundamental Forces, Imperial College. 25 lectures.
2009-2011: *Quantum Information*, 4th year undergraduates, Imperial College. 25 lectures.
20011-2013: *Introduction to Quantum Information,* 3rd and 4th year undergraduates, Imperial College. 25 lectures.

2014-2015: *Foundations of Quantum Mechanics*, 3rd year undergraduates, Imperial College. 25 lectures. Teaching evaluations are overwhelmingly positive and available on request.

PhD Students

Primary Supervisor: *Current:* Simmons, Nutz, Milne, Lostaglio, Korzekwa, Frenzel, Encisco-Dominguez, Dale. *Graduated:* Cable, Harrigan, Varnava, Ahmadi, Herrera-Marti, Jevtic, Pusey, Lewis, Gimeno-Segovia
Secondary Supervisor, *Current:* Sparrow, Self, Selby, Richens, Ranchin, Mitchison, Nickerson, Hughes, Deesuwan, Cirstoiu. *Graduated:* Watson, Cao, Iles-Smith, Blunden-Codd

Research

Papers: http://scholar.google.co.uk/citations?user=Y8cRR70AAAAJ My research interests span quantum theory, from the very applied issue of optimizing architectural designs for photonic quantum computing, to abstract questions at foundations of quantum mechanics.

Outreach

My inaugural lecture, *Quantum Theory, Its Unreal* (http://www.youtube.com/watch?v=JKGZDhQoR9E) was viewed more than 700000 times in the first year it was on YouTube. I am line manager of a full time outreach officer and have given public presentations at the Cheltenham Science Festival and multiple other specialized events for the general public, such as *Quantum Envoy* at the Museum of Natural History in Oxford. I obtained funding from the Leverhulme Foundation to host an Artist in Residence (www.geraldinecox.com), leading to numerous ongoing collaborations.

Media Coverage

- My work in quantum foundations was featured by *Nature News* in the pair of articles *Quantum theorem shakes foundations* (17/11/11) and later *A boost for quantum reality* (8/5/12), with several hundred other media outlets carrying similar articles. *New Scientist* created a video *Ghosts in the atom: Unmasking the quantum phantom* to accompany their 2/8/12 cover story on this work.
- I have written about new results in quantum foundations for the News and Views sections of both *Nature* [Nature **454**, 831-832 (2008)] and *Nature Physics* [N. Phys. **8**, 860-861 (2012)] resulting in many (mis)quotations of me in the popular press.
- My proposal for a radically new type of quantum dot photonic source - a "photon machine-gun" generated considerable interest, including articles in *New Scientist* (26 Sept. 2009 issue), *Wired* and *SlashDot.*
- *New Scientist* featured my work prominently in an article on the emerging field of reference frames and quantum communication in the article *Which way is up?*, in the 2/10/04 issue.
- My discovery of cheat sensitive weak-coin flipping was featured by *Nature* as a Research Highlight of the Week, Nov. 2002.
- My work on experimental quantum process discrimination was featured in *Quantum Ghosts are Helpful* in April 2009 by ScienceDaily.com, subsequently picked up by multiple other online media outlets and blogs.

Impact on experimental physics:

In addition to co-authoring 8 experimental papers, most photonic experiments generating entangled states use some variant of my fusion gate ideas. Experimental research by other groups impacted by my work include: my loss tolerant quantum codes were verified[1]; some of the two-party protocols I proposed have been implemented[2]; my proposal for classical and quantum communication without shared reference frames has been demonstrated for both the classical[2] and quantum[4] cases; my idea of state estimation of relational properties was demonstrated for two qubits[5]; my realization that entanglement is not necessary to beat the standard quantum limit for reference frame alignment was developed into a phase estimation experiment published in Nature[6]; and very recently a first demonstration of the photonic cluster state machine gun has recently been performed in the Gershoni group at the Technion (submitted to Nature).

[1]C.-Y. Lu et al, Proc. Nat. Aca. Sci. **105**, 11050 (2008); [2]N. K. Langford et al, Phys. Rev. Lett. **93**, 053601 (2004)
[3]K. Banaszek, et al, Phys. Rev. Lett. 92, 257901 (2004) [4]M. Bourennane, et al, Phys. Rev. Lett. 92, 107901 (2004)
[5]G. J. Pryde et al, Phys. Rev. Lett. 94, 220406 (2005) [6]B. Higgins et al, Nature 450, 393 (2007)

PHOTONIC QUANTUM INFORMATION PROCESSING

Theory

1. M. Gimeno-Segovia, P. Shadbolt, D. E. Browne, and T. Rudolph, *From Three-Photon Greenberger-Horne-Zeilinger States to Ballistic Universal Quantum Computation*, Physical review letters **115**, 020502 (2015)
2. H. A. Zaidi, C. Dawson, P. van Loock, and T. Rudolph, *Near-deterministic creation of universal cluster states with probabilistic Bell measurements and three-qubit resource states*, Physical Review A **91**, 042301 (2015)
3. A. Lund, A. Laing, S. Rahimi-Keshari, T. Rudolph, J. O'Brien, and T. Ralph, *Boson sampling from a Gaussian state*, Physical review letters **113**, 100502 (2014)
4. J. Joo, T. Rudolph, and B. C. Sanders, *A heralded two-qutrit entangled state*, Journal of Physics B: Atomic, Molecular and Optical Physics **42**, 114007 (2009)
5. M. Varnava, D. E. Browne, and T. Rudolph, *How good must single photon sources and detectors be for efficient linear optical quantum computation?*, Physical Review Letters **100**, 060502 (2008)
6. M. Varnava, D. E. Browne, and T. Rudolph, *Loss tolerant linear optical quantum memory by measurement-based quantum computing*, New Journal of Physics **9**, 203 (2007)
7. K. Kieling, T. Rudolph, and J. Eisert, *Percolation, renormalization, and quantum computing with nondeterministic gates*, Physical Review Letters **99**, 130501 (2007)
8. M. Varnava, D. E. Browne, and T. Rudolph, *Loss tolerance in one-way quantum computation via counterfactual error correction*, Physical review letters **97**, 120501 (2006)
9. D. E. Browne and T. Rudolph, *Resource-efficient linear optical quantum computation*, Physical Review Letters **95**, 010501 (2005)
10. T. Rudolph and J.-W. Pan, *A simple gate for linear optics quantum computing*, arXiv preprint quant-ph/0108056

Experiment

11. J. Carolan, J. D. Meinecke, P. J. Shadbolt, N. J. Russell, N. Ismail, K. Wörhoff, T. Rudolph, M. G. Thompson, J. L. O'Brien, J. C. Matthews, et al., *On the experimental verification of quantum complexity in linear optics*, Nature Photonics **8**, 621 (2014)
12. A. Peruzzo, A. Laing, A. Politi, T. Rudolph, and J. L. O'Brien, *Multimode quantum interference of photons in multiport integrated devices*, Nature communications **2**, 224 (2011)
13. D. N. Biggerstaff, R. Kaltenbaek, D. Hamel, G. Weihs, T. Rudolph, and K. J. Resch, *Cluster-state quantum computing enhanced by high-fidelity generalized measurements*, Physical review letters **103**, 240504 (2009)
14. A. Laing, T. Rudolph, and J. L. O'Brien, *Experimental quantum process discrimination*, Physical review letters **102**, 160502 (2009)
15. Q. Zhang, X.-H. Bao, C.-Y. Lu, X.-Q. Zhou, T. Yang, T. Rudolph, and J.-W. Pan, *Demonstration of a scheme for the generation of "event-ready" entangled photon pairs from a single-photon source*, Physical Review A **77**, 062316 (2008)
16. P. Walther, K. J. Resch, T. Rudolph, E. Schenck, H. Weinfurter, V. Vedral, M. Aspelmeyer, and A. Zeilinger, *Experimental one-way quantum computing*, Nature **434**, 169 (2005)
17. S. Gasparoni, J.-W. Pan, P. Walther, T. Rudolph, and A. Zeilinger, *Realization of a photonic controlled-NOT gate sufficient for quantum computation*, Physical review letters **93**, 020504 (2004)

FOUNDATIONS OF QUANTUM MECHANICS

18. D. Nigg, T. Monz, P. Schindler, E. A. Martinez, M. Hennrich, R. Blatt, M. F. Pusey, T. Rudolph, and J. Barrett, *Can different quantum state vectors correspond to the same physical state? An experimental test*, New Journal of Physics **18**, 013007 (2015)
19. S. Jevtic and T. Rudolph, *How Einstein and/or Schrödinger should have discovered Bell's theorem in 1936*, JOSA B **32**, A50 (2015)
20. A. Karanjai, E. G. Cavalcanti, S. D. Bartlett, and T. Rudolph, *Weak values in a classical theory with an epistemic restriction*, New Journal of Physics **17**, 073015 (2015)
21. K. Korzekwa, D. Jennings, and T. Rudolph, *Operational constraints on state-dependent formulations of quantum error-disturbance trade-off relations*, Physical Review A **89**, 052108 (2014)
22. K. Korzekwa, M. Lostaglio, D. Jennings, and T. Rudolph, *Quantum and classical entropic uncertainty relations*, Physical Review A **89**, 042122 (2014)
23. M. F. Pusey, J. Barrett, and T. Rudolph. *Testing the reality of the quantum state reply* (2014)
24. P. G. Lewis, D. Jennings, J. Barrett, and T. Rudolph, *Distinct quantum states can be compatible with a single state of reality*, Physical review letters **109**, 150404 (2012)
25. T. Rudolph, *How Einstein and/or Schroedinger should have discovered Bell's theorem in 1936*, arXiv preprint arXiv:1206.0004
26. M. F. Pusey, J. Barrett, and T. Rudolph, *On the reality of the quantum state*, Nature Physics **8**, 475 (2012)
27. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Reconstruction of Gaussian quantum mechanics from Liouville mechanics with an epistemic restriction*, Physical Review A **86**, 012103 (2012)
28. N. Harrigan and T. Rudolph, *Ontological models and the interpretation of contextuality*, arXiv preprint arXiv:0709.4266
29. N. Harrigan, T. Rudolph, and S. Aaronson, *Representing probabilistic data via ontological models*, arXiv preprint arXiv:0709.1149
30. T. Rudolph, *Ontological models for quantum mechanics and the Kochen-Specker theorem*, arXiv preprint quant-ph/0608120

QUANTUM THERMODYNAMICS

31. M. F. Frenzel, D. Jennings, and T. Rudolph, *Quasi-autonomous quantum thermal machines and quantum to classical energy flow*, New Journal of Physics **18**, 023037
32. M. Lostaglio, D. Jennings, and T. Rudolph, *Description of quantum coherence in thermodynamic processes requires constraints beyond free energy*, Nature communications **6**, 6383 (2015)
33. S. Jevtic, T. Rudolph, D. Jennings, Y. Hirono, S. Nakayama, and M. Murao, *Exchange fluctuation theorem for correlated quantum systems*, Physical Review E **92**, 042113 (2015)
34. M. Lostaglio, K. Korzekwa, D. Jennings, and T. Rudolph, *Quantum coherence, time-translation symmetry, and thermodynamics*, Physical Review X **5**, 021001 (2015)
35. S. Jevtic, D. Newman, T. Rudolph, and T. Stace, *Single-qubit thermometry*, Physical Review A **91**, 012331 (2015)
36. M. Lostaglio, D. Jennings, and T. Rudolph, *Thermodynamic resource theories, non-commutativity and maximum entropy principles*, arXiv preprint arXiv:1511.04420
37. M. F. Frenzel, D. Jennings, and T. Rudolph, *Reexamination of pure qubit work extraction*, Physical Review E **90**, 052136 (2014)
38. S. Jevtic, D. Jennings, and T. Rudolph, *Maximally and minimally correlated states attainable within a closed evolving system*, Physical review letters **108**, 110403 (2012)
39. S. Jevtic, D. Jennings, and T. Rudolph, *Quantum mutual information along unitary orbits*, Physical Review A **85**, 052121 (2012)
40. D. Jennings and T. Rudolph, *Comment on "Quantum resolution to the arrow of time dilemma"*, Physical Review Letters **104**, 148901 (2010)
41. D. Jennings and T. Rudolph, *Entanglement and the thermodynamic arrow of time*, Physical Review E **81**, 061130 (2010)

REFERENCE FRAMES/THE RESOURCE THEORY OF ASYMMETRY

42. M. Ahmadi, D. Jennings, and T. Rudolph, *The Wigner–Araki–Yanase theorem and the quantum resource theory of asymmetry*, New Journal of Physics **15**, 013057 (2013)
43. M. Ahmadi, D. Jennings, and T. Rudolph, *Dynamics of a quantum reference frame undergoing selective measurements and coherent interactions*, Physical Review A **82**, 032320 (2010)
44. Y.-C. Liang, N. Harrigan, S. D. Bartlett, and T. Rudolph, *Nonclassical correlations from randomly chosen local measurements*, Physical review letters **104**, 050401 (2010)
45. R. Kennedy, L. Horstmeyer, A. Dragan, and T. Rudolph, *Qubit initialization and readout with finite coherent amplitudes in cavity QED*, Physical Review A **82**, 054302 (2010)
46. F. Costa, N. Harrigan, T. Rudolph, and Č. Brukner, *Entanglement detection with bounded reference frames*, New Journal of Physics **11**, 123007 (2009)
47. S. D. Bartlett, T. Rudolph, R. W. Spekkens, and P. S. Turner, *Quantum communication using a bounded-size quantum reference frame*, New Journal of Physics **11**, 063013 (2009)
48. S. D. Bartlett, T. Rudolph, B. C. Sanders, and P. S. Turner, *Degradation of a quantum directional reference frame as a random walk*, Journal of Modern Optics **54**, 2211 (2007)
49. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Reference frames, superselection rules, and quantum information*, Reviews of Modern Physics **79**, 555 (2007)
50. S. D. Bartlett, T. Rudolph, R. W. Spekkens, and P. S. Turner, *Degradation of a quantum reference frame*, New Journal of Physics **8**, 58 (2006)
51. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Dialogue concerning two views on quantum coherence: factist and fictionist*, International Journal of Quantum Information **4**, 17 (2006)
52. M. R. Dowling, S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Observing a coherent superposition of an atom and a molecule*, Physical Review A **74**, 052113 (2006)
53. H. Cable, P. L. Knight, and T. Rudolph, *Measurement-induced localization of relative degrees of freedom*, Physical Review A **71**, 042107 (2005)
54. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Decoherence-full subsystems and the cryptographic power of a private shared reference frame*, Physical Review A **70**, 032307 (2004)
55. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Optimal measurements for relative quantum information*, Physical Review A **70**, 032321 (2004)
56. S. D. Bartlett, T. Rudolph, and R. W. Spekkens, *Classical and quantum communication without a shared reference frame*, Physical review letters **91**, 027901 (2003)
57. S. Van Enk and T. Rudolph, *On the continuousvariable entanglement with and without phase reference*, arXiv preprint quant-ph/0303096
58. B. C. Sanders, S. D. Bartlett, T. Rudolph, and P. L. Knight, *Photon-number superselection and the entangled coherent-state representation*, Physical Review A **68**, 042329 (2003)
59. T. Rudolph and L. Grover, *Quantum communication complexity of establishing a shared reference frame*, Physical review letters **91**, 217905 (2003)
60. T. Rudolph and B. C. Sanders, *Comment on" The Quantum State of a Propagating Laser Field"*, arXiv preprint quant-ph/0112020

61. T. Rudolph and B. C. Sanders, *Requirement of optical coherence for continuous-variable quantum teleportation*, Physical review letters **87**, 077903 (2001)
62. T. Rudolph. *Quantum Information is physical too*. Tech. rep. (1999)
63. T. Rudolph, *Quantum Triangulation and Violation of Conservation of Trouble*, arXiv preprint quant-ph/9902010

QUANTUM DOTS AND THE PHOTON MACHINE GUN

64. D. P. McCutcheon, N. H. Lindner, and T. Rudolph, *Error distributions on large entangled states with non-Markovian dynamics*, Physical review letters **113**, 260503 (2014)
65. A. Pineiro-Orioli, D. P. McCutcheon, and T. Rudolph, *Noise effects and tomography of remote entangled spins in quantum dots*, Physical Review B **88**, 035315 (2013)
66. I. Schwarz and T. Rudolph, *Efficient entanglement-length measurements for photonic-cluster-state sources*, Physical Review A **85**, 050306 (2012)
67. S. E. Economou, N. Lindner, and T. Rudolph, *Optically generated 2-dimensional photonic cluster state from coupled quantum dots*, Physical review letters **105**, 093601 (2010)
68. D. A. Herrera-Martí, A. G. Fowler, D. Jennings, and T. Rudolph, *Photonic implementation for the topological cluster-state quantum computer*, Physical Review A **82**, 032332 (2010)
69. N. H. Lindner and T. Rudolph, *Proposal for pulsed on-demand sources of photonic cluster state strings*, Physical review letters **103**, 113602 (2009)

QUANTUM ALGORITHMS

70. H. Dale, D. Jennings, and T. Rudolph, *Provable quantum advantage in randomness processing*, Nature communications **6**, 8203 (2015)
71. L. Grover and T. Rudolph, *How significant are the known collision and element distinctness quantum algorithms?*, arXiv preprint quant-ph/0309123
72. L. Grover and T. Rudolph, *Creating superpositions that correspond to efficiently integrable probability distributions*, arXiv preprint quant-ph/0208112
73. T. Rudolph and L. Grover, *Quantum searching a classical database (or how we learned to stop worrying and love the bomb)*, arXiv preprint quant-ph/0206066

TWO-PARTY QUANTUM CRYPTOGRAPHY

74. T. Rudolph and R. W. Spekkens, *Quantum state targeting*, Physical Review A **70**, 052306 (2004)
75. S. van Enk and T. Rudolph, *Quantum communication protocols using the vacuum*, Quantum Information and Computation **3**, 423 (2003)
76. R. W. Spekkens and T. Rudolph, *Optimization of coherent attacks in generalizations of the BB84 quantum bit commitment protocol*, Quantum Information and Computation **2**, 66 (2002)
77. R. W. Spekkens and T. Rudolph, *Quantum protocol for cheat-sensitive weak coin flipping*, Physical Review Letters **89**, 227901 (2002)
78. T. Rudolph, *The laws of physics and cryptographic security*, arXiv preprint quant-ph/0202143
79. R. W. Spekkens and T. Rudolph, *Degrees of concealment and bindingness in quantum bit commitment protocols*, Physical Review A **65**, 012310 (2001)

ALTERNATIVE ARCHITECTURES/REQUIREMENTS FOR QUANTUM COMPUTATION

80. J. F. Goodwin, B. J. Brown, G. Stutter, H. Dale, R. C. Thompson, and T. Rudolph, *Trapped-ion quantum error-correcting protocols using only global operations*, Physical Review A **92**, 032314 (2015)
81. V. Giovannetti, L. Maccone, T. Morimae, and T. G. Rudolph, *Efficient universal blind quantum computation*, Physical review letters **111**, 230501 (2013)
82. D. A. Herrera-Martí and T. Rudolph, *Loss tolerance with a concatenated graph state*, Quantum Information and Computation **13**, 0995 (2013)
83. J. Joo, P. L. Knight, J. L. O'Brien, and T. Rudolph, *One-way quantum computation with four-dimensional photonic qudits*, Physical Review A **76**, 052326 (2007)
84. T. Rudolph and S. S. Virmani, *A relational quantum computer using only two-qubit total spin measurement and an initial supply of highly mixed single-qubit states*, New Journal of Physics **7**, 228 (2005)
85. T. Rudolph and L. Grover, *A 2 rebit gate universal for quantum computing*, arXiv preprint quant-ph/0210187

MANY-BODY PHYSICS & QUANTUM INFORMATION

86. D. Jennings, A. Dragan, S. D. Barrett, S. D. Bartlett, and T. Rudolph, *Quantum computation via measurements on the low-temperature state of a many-body system*, Physical Review A **80**, 032328 (2009)
87. S. D. Barrett, S. D. Bartlett, A. C. Doherty, D. Jennings, and T. Rudolph, *Transitions in the computational power of thermal states for measurement-based quantum computation*, Physical Review A **80**, 062328 (2009)
88. S. D. Bartlett and T. Rudolph, *Simple nearest-neighbor two-body Hamiltonian system for which the ground state is a universal resource for quantum computation*, Physical Review A **74**, 040302 (2006)
89. N. Vats and T. Rudolph, *Quantum information processing in localized modes of light within a photonic band-gap material*, Journal of Modern Optics **48**, 1495 (2001)

STEERING ELLIPSOIDS & THE GEOMETRY OF QUANTUM STATE SPACE

90. A. Milne, S. Jevtic, D. Jennings, H. Wiseman, and T. Rudolph, *Corrigendum: Quantum steering ellipsoids, extremal physical states and monogamy (2014 New J. Phys. 16 083017)*, New Journal of Physics **17**, 019501 (2015)
91. A. Milne, D. Jennings, and T. Rudolph, *Geometric representation of two-qubit entanglement witnesses*, Physical Review A **92**, 012311 (2015)
92. A. Milne, S. Jevtic, D. Jennings, H. Wiseman, and T. Rudolph, *Quantum steering ellipsoids, extremal physical states and monogamy*, New Journal of Physics **16**, 083017 (2014)
93. A. Milne, D. Jennings, S. Jevtic, and T. Rudolph, *Quantum correlations of two-qubit states with one maximally mixed marginal*, Physical Review A **90**, 024302 (2014)
94. S. Jevtic, M. Pusey, D. Jennings, and T. Rudolph, *Quantum steering ellipsoids*, Physical review letters **113**, 020402 (2014)

MISCELLANEOUS QUANTUM INFORMATION

95. M. F. Pusey and T. Rudolph, *Quantum lost property: A possible operational meaning for the Hilbert-Schmidt product*, Physical Review A **86**, 044301 (2012)
96. J. Eisert, T. Tyc, T. Rudolph, and B. C. Sanders, *Gaussian quantum marginal problem*, Communications in Mathematical Physics **280**, 263 (2008)
97. Č. BRUKNER, N. PAUNKOVIĆ, T. Rudolph, and V. Vedral, *Entanglement-assisted orientation in space*, International Journal of Quantum Information **4**, 365 (2006)
98. T. Rudolph, R. W. Spekkens, and P. S. Turner, *Unambiguous discrimination of mixed states*, Physical Review A **68**, 010301 (2003)
99. T. Rudolph, *Better schemes for quantum interrogation in lossy experiments*, Physical review letters **85**, 2925 (2000)

GRAPH THEORY

100. T. Rudolph, *Simple encoding of a quantum circuit amplitude as a matrix permanent*, Physical Review A **80**, 054302 (2009)
101. K. Audenaert, C. Godsil, G. Royle, and T. Rudolph, *Symmetric squares of graphs*, arXiv preprint math/0507251
102. T. Rudolph, *Constructing physically intuitive graph invariants*, arXiv preprint quant-ph/0206068

NONLINEAR SPECTROSCOPY OF MULTICHROMATICALLY DRIVEN ATOMS

103. Z. Ficek, H. Freedhoff, and T. Rudolph, *Dressing dressed states*, Optics and Spectroscopy **87**, 670 (1999)
104. Y. Ben-Aryeh, H. Freedhoff, and T. Rudolph, *Photon correlations in the fluorescence from a bichromatically driven atom*, Journal of Optics B: Quantum and Semiclassical Optics **1**, 624 (1999)
105. Z. Ficek and T. Rudolph, *Quantum interference in a driven two-level atom*, Physical Review A **60**, R4245 (1999)
106. T. Rudolph, H. Freedhoff, and Z. Ficek, *Multiphoton ac Stark effect in a bichromatically driven two-level atom*, Physical Review A **58**, 1296 (1998)
107. T. Rudolph, H. Freedhoff, and Z. Ficek, *Shift of the subharmonic resonances and suppression of fluorescence in a two-level atom driven by a bichromatic field*, JOSA B **15**, 2325 (1998)
108. T. Rudolph, Z. Ficek, and H. Freedhoff, *The multiphoton AC Stark effect*, Optics communications **147**, 78 (1998)

CO-OPERATIVE ATOMIC EFFECTS IN SPECTROSCOPY

109. T. Rudolph, I. Yavin, and H. Freedhoff, *Evolution in time of an N-atom system. II. Calculation of the eigenstates*, Physical Review A **69**, 013815 (2004)
110. T. Rudolph and Z. Ficek, *Interference pattern with a dark center from two atoms driven by a coherent laser field*, Physical Review A **58**, 748 (1998)
111. T. Rudolph, Z. Ficek, and B. Dalton, *Two-atom resonance fluorescence in running-and standing-wave laser fields*, Physical Review A **52**, 636 (1995)

NON-RESEARCH ARTICLES

112. T. Rudolph, *Quantum causality: Information insights*, Nature Physics **8**, 860 (2012)