Christopher J. Wood

PERSONAL DETAILS

Email: chris@cjwood.com
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Citizenship: Australian

EDUCATION

Ph.D. Physics (Quantum Information), Jan 2011 – July 2015 (expected)
Institute for Quantum Computing, Waterloo, ON, Canada.
University of Waterloo, Waterloo, ON, Canada.
Thesis (in progress): *Initialization and Characterization of Open Quantum Systems*
Advisor: David G. Cory.

M. Sc. (Physics) Perimeter Scholars International, Aug 2009 – Jun 2010
Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada.
University of Waterloo, Waterloo, ON, Canada.
Thesis: *Nonlocal correlations from the perspective of causal Bayesian networks.*
Advisor: Robert W. Spekkens

B. Science (Physics) Honours 1st Class, Mar 2008 - Nov 2008
Macquarie University, Sydney, NSW, Australia.
Thesis: *Non-completely positive maps: properties and applications.*
Advisors: Alexei Gilchrist and Daniel R. Terno.

B. Mathematics, B. Science (Physics), Mar 2004 – Nov 2007
University of Newcastle, Newcastle, NSW, Australia.

PUBLICATIONS

- M. Ringbauer, **C. J. Wood**, K. Modi, A. Gilchrist, A. G. White, A. Fedrizzi. *Characterizing quantum dynamics with initial system-environment correlations.* Phys. Rev. Lett. **114**, 090402 (2015).
- **C. J. Wood**, J. D. Biamonte, D. G. Cory. *Tensor networks and graphical calculus for open quantum systems.* To Appear: Quant. Inf. Comp. **15**, 0759-0811 (2015).
- **C. J. Wood**, R. W. Spekkens. *The lesson of causal discovery algorithms for quantum correlations: Causal explanations of Bell-inequality violations require fine-tuning.* New J. Phys. **17** 033002 (2015).
- **C. J. Wood**, T. W. Borneman, D. G. Cory. *Cavity cooling of an ensemble spin system.* Phys. Rev. Lett. **112**, 050501 (2014).
- **C. J. Wood**, M. O. Abutaleb, M. G. Huber, M. Arif, D. G. Cory, D. A. Pushin. *Quantum correlations in a noisy neutron interferometer.* Phys. Rev. A **90**, 032315 (2014)
- D. A. Pushin, M. G. Huber, M. Arif, C. B. Shahi, J. Nsofini, **C. J. Wood**, D. Sarenac, and D. G. Cory. *Neutron interferometry at National Institute of Standards and Technology.* Adv. H.E.P. **2014**, 687480 (2014).
- A. Brodutch, A. Gilchrist, D. Terno, **C. J. Wood**. *Quantum discord and quantum computation.* J. Phys.: Conf. Ser. **306** 012030 (2011)

PREPRINTS

- A. Gilchrist, D. Terno, **C. J. Wood**. *Vectorization of quantum operations and its use.* ArXiv:0911.2539 [quant-ph].

AWARDS

- Macquarie University Medal - Physics, 2008.
- Australian Institute of Physics Prize for Physics Honours, 2008.
- Ivan Lincon Rose Prize in Applied Mathematics, 2007.
- 3000 Level Mathematics Prize, 2006, 2007.
- Faculty of Science and IT Commendation List, 2004 — 2007.

SCHOLARSHIPS

- Institue for Quantum Computing Entrance Scholarship, 2011.
- Macquarie Higher Study Scholarship, 2008.
- Quantum Information Science Research Group Vacation Scholarship, 2008.

- Shohoku Japanese Exchange Scholarship, 2007.
- Functional Analysis Research Group Summer Vacation Scholarship, 2006.
- Foundation Undergraduate Scholarship, 2004.

Talks

Initialization and characterization of open quantum systems.

- Seminar, IBM TJ Watson Research Center, Yorktown Heights, NY, USA, Oct 28, 2014.

Quantum correlations in a noisy neutron interferometer.

- Contributed talk, American Conference on Neutron Scattering, Knoxville, TN, USA, June 3, 2014.

Cavity cooling of an ensemble spin system.

- Invited talk, Quantum control in the solid-state workshop, Cape Cod, MA, USA, Apr 28-30, 2014.
- Seminar, University of Queensland, Brisbane, QLD, Australia, Mar 25, 2014.
- Seminar, University of New South Wales, Sydney, NSW, Australia, Mar 20, 2014.
- Seminar, University of Sydney, Sydney, NSW, Australia, Mar 19, 2014
- Seminar, Macquarie University, Sydney, NSW, Australia, Mar 4, 2014.
- Seminar, Monash University, Frankston, VIC, Australia, Feb 18, 2014.
- Seminar, University of Melbourne, Melbourne, VIC, Australia, Feb 17, 2014.

Tensor networks and graphical calculus for open quantum systems.

- Invited talk, Tensor network states and algebraic geometry workshop, ISI Foundation, Torino, Italy, Nov 6-8, 2012.
- Seminar, Institute for Quantum Computing, Waterloo, ON, Canada, Mar 2012.

Nonlocal correlations from the perspective of causal bayesian networks.

- Contributed talk, Graduate Student Research Conference, University of Waterloo, Waterloo, ON, Canada, May 2011.

Academic Experience

Lecturer, USEQIP, IQC, University of Waterloo *May 2014*

Lectured the "Practical Decoherence" module for the USEQIP summer school at the Institute for Quantum Computing..

Lecturer, USEQIP, IQC, University of Waterloo *May 2013*

Lectured the "Quantum mechanics for quantum information processing" module for the USEQIP summer school at the Institute for Quantum Computing.

Teaching Assistant, IQC, University of Waterloo *Jan 2013 — Apr 2013*

Graded assignments for the IQC graduate course AMATH876/QIC845 "Open Quantum Systems" lectured by Prof. J. Emerson.

P.S.I. Teaching Assistant, Perimeter Institute *Mar 2011*

Ran tutorials and set and graded assignments for the Perimeter Scholars International graduate course "Explorations in Quantum Information" lectured by Prof. D.G. Cory.

Research Associate, Macquarie University *Feb 2009 — Apr 2009*

Conducted research on experimental quantum tomography and non-completely positive maps with A/Prof. A. Gilchrist and Dr. D. Terno.

Researcher Assistant, Macquarie University *Jan 2008 — Feb 2008*

- Conducted research on dynamics beyond completely positive maps with A/Prof. A. Gilchrist and Dr. D. Terno.

Mathematics Tutor, University of Newcastle *Mar 2007 — Sep 2007*

- Volunteer tutor for first and second year undergraduate mathematics.

Research Assistant, University of Newcastle *Dec 2006 — Feb 2007*

- Conducted research applying the groupoid formalism to characterize local symmetries of directed graphs with A/Prof. G. Willis and Dr. J. Ramagge,