Christopher J. Wood

PERSONAL DETAILS

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EDUCATION

Ph.D. Physics (Quantum Information), Jan 2011 – August 2015
Institute for Quantum Computing, Waterloo, ON, Canada.
University of Waterloo, Waterloo, ON, Canada.
Thesis: *Initialization and Characterization of Open Quantum Systems*

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.*

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

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

RESEARCH EXPERIENCE

Postdoctoral Researcher
IBM T.J. Watson Research Center, Jan 2016 – Present

Research Associate
Macquarie University, Feb 2009 —Apr 2009

Researcher Assistant
Macquarie University, Jan 2008 – Feb 2008
University of Newcastle, Dec 2006 – Feb 2007

TEACHING EXPERIENCE

Lecturer

- *Practical Decoherence*, USEQIP Summer School, May 2014
- *Quantum mechanics for quantum information processing*, USEQIP Summer School, May 2013

Teaching Assistant

- *Open Quantum Systems*, University of Waterloo, Jan 2013 – Apr 2013
- *Explorations in Quantum Information*, Perimeter Institute, Mar 2011

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.

PUBLICATIONS

1. **C.J. Wood**, D.G. Cory. *Cavity cooling to the ground state of an ensemble quantum system.* Phys. Rev. A **93**, 023414 (2016).
2. 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).

3. **C. J. Wood**, J. D. Biamonte, D. G. Cory. *Tensor networks and graphical calculus for open quantum systems.* Quant. Inf. Comp. **15**, 0759-0811 (2015).
4. **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).
5. **C. J. Wood**, T. W. Borneman, D. G. Cory. *Cavity cooling of an ensemble spin system.* Phys. Rev. Lett. **112**, 050501 (2014).
6. **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)
7. 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).
8. A. Brodutch, A. Gilchrist, D. Terno, **C. J. Wood**. *Quantum discord and quantum computation.* J. Phys.: Conf. Ser. **306** 012030 (2011)
9. A. Gilchrist, D. Terno, **C. J. Wood**. *Vectorization of quantum operations and its use.* ArXiv:0911.2539 [quant-ph].

Talks

1. Cavity cooling of an ensemble spin quantum information processor
   Harvard University, Cambridge MA, USA (Dec 17, 2015)
2. Initialization and characterization of open quantum systems
   Macquarie University, Sydney, Australia (Dec 3, 2015)
3. Cavity cooling of an ensemble spin quantum information processor
   RMIT, Melbourne, Australia (Nov 5, 2015)
4. Initialization and characterization of open quantum systems
   University of Sydney, Sydney, Australia (Nov 16, 2015)
5. Initialization and characterization of open quantum systems
   IBM T.J. Watson Research Center, Yorktown Heights NY, USA (Oct 28, 2014)
6. Quantum correlations in a noisy neutron interferometer
   American Conference on Neutron Scattering, Knoxville TN, USA (Jun 3, 2014)
7. Cavity cooling of an ensemble spin system
   Quantronics Group, Saclay, France (May 28, 2015)
8. Cavity cooling of an ensemble spin system
   Invited: Quantum control in the solid-state workshop, Cape Cod MA, USA (Apr 28-30, 2014)
9. Cavity cooling of an ensemble spin system
   University of Queensland, Brisbane, Australia (Mar 25, 2014)
10. Cavity cooling of an ensemble spin system
    University of NSW, Sydney, Australia (Mar 20, 2014)
11. Cavity cooling of an ensemble spin system
    University of Sydney, Sydney, Australia (Mar 19, 2014)
12. Cavity cooling of an ensemble spin system
    Macquarie University, Sydney, Australia (Mar 4, 2014)
13. Cavity cooling of an ensemble spin system
    Monash University, Frankston, Australia (Feb 18, 2014)
14. Cavity cooling of an ensemble spin system
    University of Melbourne, Melbourne, Australia (Feb 17, 2014)
15. Tensor networks and graphical calculus for open quantum systems
    Invited: Tensor network states and algebraic geometry workshop, ISI Foundation, Torino, Italy (Nov 6-8, 2012)

References

David G. Cory
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University of Waterloo, Waterloo, ON, Canada.

Joseph Emerson
Email: jemerson@uwaterloo.ca
Associate Professor
University of Waterloo, Waterloo, ON, Canada.

Debbie Leung
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University of Waterloo, Waterloo, ON, Canada.

Robert W. Spekkens
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Faculty
Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada.

Daniel R. Terno
Email: daniel.terno@mq.edu.au
Associate Professor
Macquarie University, NSW, Australia.

Alexei Gilchrist
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