

CONTACT INFORMATION	BQP Solutions Pty Ltd P.O. Box 407 Elsternwick VIC 3185 AUSTRALIA	<i>Phone:</i> +61 412 996 288 <i>Email:</i> bentoner@bentoner.com <i>Web:</i> http://bentoner.com	
NATIONALITY	Australian		
CURRENT ACTIVITIES	Founder, BQP Solutions Pty Ltd		2008 –
	(Honorary) Fellow, School of Physics, The University of Melbourne		2008 –
PREVIOUS EMPLOYMENT	<b>Centrum voor Wiskunde en Informatica</b> , Amsterdam, The Netherlands (Dutch National Centre for Mathematics and Computer Science) Scientific Staff Member (postdoc) in group of Prof. Dr. Harry Bruhman		2006 – 2008
EDUCATION	<b>California Institute of Technology</b> , Pasadena, California, USA Ph.D. in Physics (conferred 8 June, 2007) <ul style="list-style-type: none"> <li>• Thesis: <i>Quantifying quantum nonlocality</i></li> <li>• Advisor: Prof. John Preskill</li> </ul> M.S. in Physics (conferred 11 June, 2004)		2001 – 2006
	<b>The University of Melbourne</b> , Melbourne, Australia B.Sc. (Hons.) in Physics and Mathematics (conferred 7 March, 2001) <ul style="list-style-type: none"> <li>• Honours thesis: <i>Topics in Higgs boson physics</i></li> <li>• Supervisor: Prof. Ray Volkas</li> </ul>		1998 – 2000
AWARDS	<b>Netherlands Organization for Scientific Research</b> Veni grant, Innovational Research Incentives Scheme (€208,000; declined)		2008
	<b>California Institute of Technology</b> John Stager Stemple Memorial Prize in Physics Freshman Summer Institute Outstanding Research Award (mentor) Graduate Fellowship		2003 2003 2001 – 2002
	<b>The University of Melbourne</b> The Thomas H. Laby medal; Dixson Research Scholarship Rowden White Prize; Wyselaskie Natural Science Scholarship William Sutherland Prize in Physics II; Dean's Prize List Dixson Scholarships in Physics II, Pure Mathematics II, and Physics III Melbourne National Scholarship; Dean's Honours List		2000 1999 1998 1998 – 1999 1998 – 2000
	Victoria Day Award for Community and Public Service by a Younger Victorian (unable to accept due to absence overseas)		1999
	<b>International Physics Olympiad</b> Gold medal, Sudbury, Canada Bronze medal, Oslo, Norway		1997 1996

## Melbourne Grammar School

Academic Head (Dux) of the School; Maximum Tertiary Entrance Rank (99.95) **1997**  
Premier's VCE Awards in Chemistry, Mathematics, and Physics **1996 – 1997**  
Gold Medal, Australian Chemistry Olympiad **1997**

## PUBLICATIONS

15. **Experimental demonstration of preparation contextuality and parity-oblivious multiplexing**  
R. W. Spekkens, D. H. Buzacott, A. J. Keehn, B. Toner, and G. J. Pryde  
To appear in *Phys. Rev. Lett.*
14. **Entanglement in cooperative quantum games and quantum interactive proofs**  
D. Leung, B. Toner, and J. Watrous  
arXiv:0804.4118 [quant-ph]
13. **Nonclassicality without entanglement enables bit commitment**  
H. Barnum, O. Dahlsten, M. Leifer, and B. Toner  
*Proc. 2008 IEEE Information Theory Workshop*, pages 386–390, 2008
12. **Finite de Finetti theorem for conditional probability distributions describing physical theories**  
M. Christandl and B. Toner  
arXiv:0712.0916 [quant-ph]
11. **The quantum moment problem and bounds on entangled multi-prover games**  
A. C. Doherty, Y.-C. Liang, B. Toner, and S. Wehner  
*Proc. 23rd IEEE Conf. on Computational Complexity*, pages 199–210, 2008
10. **Unique games with entangled provers are easy**  
J. Kempe, O. Regev, and B. Toner  
*Proc. 49th IEEE Symp. on Foundations of Computer Science*, pages 457–466, 2008
9. **Simulating quantum correlations with finite communication**  
O. Regev and B. Toner  
*Proc. 48th IEEE Symp. on Foundations of Computer Science*, pages 384–394, 2007
8. **Entangled games are hard to approximate**  
J. Kempe, H. Kobayashi, K. Matsumoto, B. Toner, and T. Vidick  
*Proc. 49th IEEE Symp. on Foundations of Computer Science*, pages 447–456, 2008
7. **Monogamy of Bell correlations and Tsirelson's bound**  
B. F. Toner and F. Verstraete  
arXiv:quant-ph/0611001
6. **Grothendieck's constant and local models for noisy entangled quantum states**  
A. Acín, N. Gisin, and B. Toner  
*Phys. Rev. A* 73(6), 062105, 2006
5. **Monogamy of nonlocal quantum correlations**  
B. Toner  
*Proc. R. Soc. A* 465, 59–69, 2009
4. **Consequences and limits of nonlocal strategies**  
R. Cleve, P. Høyer, B. Toner, and J. Watrous  
*Proc. 19th IEEE Conf. on Computational Complexity*, pages 236–249, 2004

3. **Communication cost of simulating Bell correlations**

B. F. Toner and D. Bacon  
*Phys. Rev. Lett.* 91, 187904, 2003

2. **Bell inequalities with auxiliary communication**

D. Bacon and B. F. Toner  
*Phys. Rev. Lett.* 90, 157904, 2003

1. **Clash of symmetries on the brane**

A. Davidson, B. F. Toner, R. R. Volkas, and K. C. Wali  
*Phys. Rev. D* 65(12), 125013, 2002

Authors in 2, 3, and 15 are ordered by contribution; in other papers the ordering is alphabetical.

INVITED  
CONFERENCE  
TALKS

6. **Unique games with entangled provers are easy**

Workshop on Quantum Algorithms and Complexity Theory  
Centre for Quantum Technologies, National University of Singapore, 20 November, 2008

5. **Coherent state exchange in multi-prover quantum interactive proof systems**

Workshop on Information Primitives and Laws of Nature  
ETH Zürich, Switzerland, 13 May, 2008

4. **Simulating quantum correlations with finite communication**

Conference on New Directions in the Foundations of Physics  
College Park, MD, USA, 26 April, 2008

3. **The unique games conjecture with entangled provers is false**

CIFAR Workshop  
Newport, RI, USA, 27 October, 2007

2. **Simulating quantum correlations with finite communication**

Dagstuhl Seminar on Algebraic Methods in Complexity Theory  
Schloss Dagstuhl, Germany, 12 October, 2007

1. **De Finetti theorems for conditional probability distributions**

Workshop: Operational Probabilistic Theories as Foils to Quantum Theory  
University of Cambridge, UK, 9 July, 2007

OTHER TALKS

13. **Symmetry and global independence in classical and quantum theories**

Perimeter Institute, 7 November, 2007

12. **Unique games with entangled provers are easy**

49th IEEE Symposium on Foundations of Computer Science, Philadelphia, PA, USA, 27  
October, 2008

IQC Colloquium, University of Waterloo, 29 October, 2007

11. **Simulating quantum correlations with finite communication**

48th IEEE Symposium on Foundations of Computer Science, Providence, RI, USA, 22 October,  
2007

10. **Monogamy of Bell correlations and Tsirelson's bound**

QIP 2007, Brisbane, Australia, 30 January, 2007

9. **De Finetti theorems for conditional probability distributions**

Theory of Computation Seminar, Computer Science Dept., Tel-Aviv University, 15 May, 2007  
QAP workshop, Bristol, 20 April, 2007

Laboratoire de Recherche en Informatique, Université Paris-Sud, 7 December, 2006  
University of Queensland, 1 September, 2006

8. **How to simulate quantum correlations with classical communication**  
Trimester on quantum information, computation and complexity, Institute Henri Poincaré,  
Paris, 21 February, 2006
7. **Quantifying quantum nonlocality**  
Perimeter Institute, 1 February, 2006
6. **Monogamy of nonlocal quantum correlations**  
QIP 2006, Paris, 19 January, 2006  
IQI/CPI Workshop on classical and quantum information security, Caltech, 17 December, 2005
5. **Local models for noisy quantum states**  
QiSci Seminar, University of Queensland, 6 September, 2005
4. **Generalizing and quantifying the Kochen-Specker theorem**  
QiSci Seminar, University of Queensland, 1 October, 2004  
DIRO Seminar, Université de Montréal, 15 and 16 April, 2004
3. **Entanglement and cooperative games with incomplete information**  
SQuInT, San Diego, CA, 20 February, 2004
2. **Quantifying quantum nonlocality**  
Quantum Science & Technologies Group, Jet Propulsion Laboratory, 5 September, 2003  
Institute for Quantum Information Science, University of Calgary, 3 July, 2003
1. **The communication cost of quantum correlations**  
Department of Physics, University of Melbourne, 17 June, 2003  
QIP 2003, MSRI, Berkeley, CA, 18 December, 2002

PROFESSIONAL  
SERVICE

Referee for journals: Annals of Physics, European Physical Journal D, Journal of Physics A: Mathematical and Theoretical, New Journal of Physics, Quantum Information and Computation, Physical Review A, Physical Review Letters

Referee for conferences: IEEE Conference on Computational Complexity (CCC), ERATO conference on Quantum Information Science (EQIS), European Symposium on Algorithms (ESA), IEEE Symposium on Foundations of Computer Science (FOCS), International Colloquium on Automata, Languages and Programming (ICALP), IEEE International Symposium on Information Theory (ISIT), ACM Symposium on Theory of Computing (STOC), Quantum Information Processing (QIP)

Opposed at Ph.D. defence of Robert Špalek **2006**

Committee member, Victorian Branch of the Australian Institute of Physics **1999 – 2000**

OTHER ACADEMIC  
EXPERIENCE

**California Institute of Technology**, Pasadena, CA, USA

Teaching Assistant for:

- Ph/CS 219: Quantum Computation **2003 – 2004**
- Ph12: Waves, quantum physics, and statistical mechanics **2002 – 2003**

Freshman Summer Institute Research Mentor **2003**

**The University of Melbourne**, Melbourne, Australia

Laboratory Demonstrator, Part I Laboratories, School of Physics **2000 – 2001**

**The Australian National University**, Canberra, Australia

Summer Research Scholar at Mount Stromlo Observatory **1999 – 2000**

**Australian Science Olympiads, Canberra, Australia**

Senior Tutor, Examiner, and Victorian Convenor (Physics programme)

**1997 – 1999**