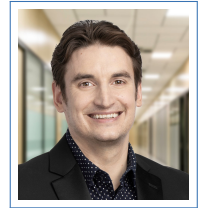


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PhD

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Research Interests

Hybrid Spin-Cavity Quantum Dynamics
Quantum Control
Superconducting Resonators
Solid-State Quantum Information Processing
Electron Spin Resonance
Biological Magnetic Resonance
Thin Film Samples
Microwave Electronics
Electron Spin Resonance Spectrometers
Cryogenic Measurement Systems

Industry Positions

- Jan. 2022 – present **Senior Scientist**, *High Q Technologies, Inc.*, Waterloo, ON, Canada
- Mar. 2016 – Jan. 2022 **Research Scientist**, *High Q Technologies, Inc.*, Waterloo, ON, Canada
- Mar. 2014 – Feb. 2016 **Mitacs Elevate Postdoctoral Research Fellow**, *High Q Technologies, Inc.*, Waterloo, ON, Canada

Academic Positions

- Mar. 2014 – Feb. 2016 **Mitacs Elevate Postdoctoral Research Fellow**, *Institute for Quantum Computing, University of Waterloo*, Waterloo, ON, Canada
- Jan. 2013 – Feb. 2014 **Postdoctoral Research Fellow**, *Institute for Quantum Computing, University of Waterloo*, Waterloo, ON, Canada

Education

- Sep. 2006 – Dec. 2012 **PhD, Nuclear Science and Engineering**, *Massachusetts Institute of Technology*, Cambridge, MA, USA
- Thesis: Techniques for Noise Suppression and Robust Control in Spin-Based Quantum Information Processors
- Advisor: Prof. David G. Cory

Sep. 2001 – **BS, Electrical Engineering**, Tufts University, Medford, MA, USA
June 2005 Second Major: Applied Physics

Selected Publications

8. L.G. Gunderman, A. Stasiuk, M.E. Mandouh, T.W. Borneman, and D.G. Cory, *Lamb Shift Statistics in Mesoscopic Quantum Ensembles*, Quantum Information Processing **21**, 1 (2022).
7. I.N. Hincks, C.E. Granade, T.W. Borneman, and D.G. Cory, *Controlling Quantum Devices with Nonlinear Hardware*, Physical Review Applied **4**, 024012 (2015).
6. S. Mandal, T.W. Borneman, V.D.M. Koroleva, and M.D. Hurlimann, *Direct Optimization of Signal-to-Noise Ratio of CPMG-Like Sequences in Inhomogeneous Fields*, Journal of Magnetic Resonance **247**, 54 (2014).
5. C.J. Wood, T.W. Borneman, and D.G. Cory, *Cavity Cooling of an Ensemble Spin System*, Physical Review Letters **112**, 050501 (2014).
4. S. Mandal, V.D.M. Koroleva, T.W. Borneman, Y.-Q. Song, and M.D. Hurlimann, *Axis-Matching Excitation Pulses for CPMG-Like Sequences in Inhomogeneous Fields*, Journal of Magnetic Resonance **237**, 1 (2013).
3. T.W. Borneman, and D.G. Cory, *Bandwidth-Limited Control and Ringdown Suppression in High-Q Resonators*, Journal of Magnetic Resonance **225**, 120 (2012).
2. T.W. Borneman, C.E. Granade, and D.G. Cory, *Parallel Information Transfer in a Multinode Quantum Information Processor*, Physical Review Letters **108**, 140502 (2012).
1. T.W. Borneman, M.D. Hurlimann, and D.G. Cory, *Application of Optimal Control to CPMG Refocusing Pulse Design*, Journal of Magnetic Resonance **207**, 220 (2010).

Selected Patents

6. *Model-insensitive control of nonlinear resonators*, US Patent App. 17/122,120 (2021)
5. *Generating a control sequence for quantum control*, US Patent 10,587,277 (2020).
4. *Efficient spin polarization*, US Patent 10,371,767 (2019).
3. *Using a cavity to polarize a spin ensemble*, US Patent 10,197,641 (2019).
2. *Nuclear magnetic resonance refocusing pulses for inhomogeneous magnetic fields*, US Patent 10,001,578 (2018).
1. *Processing quantum information*, US Patent 9,663,358 (2017).