# Ann Berlinsky Kallin

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## Personal

Born on September 11, 1985 in Vancouver, BC.

Canadian and American citizen.

## Education

Ph.D. in Physics, University of Waterloo, Ontario (In Progress)

M.Sc. in Physics, University of Waterloo, Ontario (2010)

B.Sc. in Honours Physics, McMaster University, Hamilton, Ontario (2008)

## Awards and Honours

Ontario Graduate Scholarship (2013-2014)

J. Alan George Student Leadership Award (2011)

Alumni Gold Medal Award (2011)

NSERC Postgraduate Scholarship (PGS D) (2011-2013)

Outstanding Achievement in Graduate Studies Award (M.Sc.) (2010)

Ontario Graduate Scholarship (2010) (Declined)

CAM Graduate Student Physics Conference Presenter Scholarship (2009)

NSERC Postgraduate Scholarship (PGS M) (2008-2010)

Ontario Graduate Scholarship (2008) (Declined)

NSERC Undergraduate Student Research Award (2008)

McMaster University Futures Fund Graduand Award (2008)

Harry Lyman Hooker Scholarship (2007)

The Boyd McLay Scholarship in Physics (2007)

NSERC Undergraduate Student Research Award (2007)

Dean's Honour List each undergraduate term, graduated with distinction (2004-2008)

The McMaster Honour Entrance Award (2004 - 2005)

## International Workshops

**CECAM Summer School** on Quantum Spin Liquids: from theory to numerical simulations, SISSA, Trieste, Italy (2013)

**KITP Affiliate** for the program Disentangling Quantum Many-body Systems: Computational and Conceptual Approaches (2010)

**Boulder Summer School** on Computational and Conceptual Approaches to Quantum Many-Body Systems (2010)

## Conference Talks and Posters

CECAM Summer School on Quantum Spin Liquids, Trieste, Italy (2013)
Poster – *Measuring Entanglement at a Quantum Critical Point with Numerical Linked Cluster Expansion*

CAP Congress, Montreal, Quebec (2013)
Talk – *The Numerical Linked Cluster Expansion Method*

APS March Meeting, Baltimore, Maryland (2013)
Talk – *Measuring Entanglement at a Quantum Critical Point with Numerical Linked Cluster Expansion*

APS March Meeting, Boston, Massachusetts (2012)
Talk – *Scaling of Entanglement Entropy in the 2D Heisenberg Ground State*

Workshop on Quantum Information in Quantum Many-Body Physics, Université de Montréal (2011)
Talk – *Entanglement Scaling in the 2D Heisenberg Model*

KITP program on Disentangling Quantum Many-body Systems, Santa Barbara, California (2010)
Talk – *Computing Entanglement Scaling in Condensed Matter Ground States*

Boulder Summer School for Condensed Matter and Materials Physics, Boulder, Colorado (2010)
Poster – *Measuring Renyi Entanglement Entropy in Quantum Monte Carlo Simulations*

APS March Meeting, Portland, Oregon (2010)
Talk – *Measuring Renyi Entanglement Entropy with Quantum Monte Carlo*

Waterloo Graduate Student Research Conference, Waterloo, Ontario (2010)
Talk – *Measuring Renyi Entanglement Entropy with Quantum Monte Carlo*

Canadian-American-Mexican Graduate Student Physics Conference, Acapulco, Mexico (2009)
Talk – *Valence Bond and von Neumann Entanglement Entropy in Quantum Monte Carlo*

SHARCNET Research Day, Waterloo, Ontario (2009)
Poster – *Entanglement Entropy in Quantum Monte Carlo*

Canadian Undergraduate Physics Conference, Frederickton, New Brunswick (2006)
Poster – *Crystal Growth: In the Zone*

Canadian Undergraduate Physics Conference, London, Ontario (2005)
Poster – *Floating Zone Crystal Growth of High-$T_c$ Superconductors*

# Publications

1. *Two Dimensional Incommensurate and Three Dimensional Commensurate Magnetic Order and Fluctuations in $La_{2-x}Ba_xCuO_4$*
   J.J. Wagman, G. Van Gastel, K.A. Ross, Z. Yamani, Y. Zhao, Y. Qiu, J.R.D. Copley, A.B. Kallin, E. Mazurek, J. P. Carlo, H.A. Dabkowska, B.D. Gaulin
   Phys. Rev. B **88**, 014412 (2013)

2. *Detecting Classical Phase Transitions with Renyi Mutual Information*
   Jason Iaconis, Stephen Inglis, Ann B. Kallin, and Roger G. Melko
   Phys. Rev. B **87**, 195134 (2013)

3. *Entanglement at a Two-Dimensional Quantum Critical Point: a Numerical Linked Cluster Expansion Study*
   Ann B. Kallin, Katharine Hyatt, Rajiv R. P. Singh, Roger G. Melko
   Phys. Rev. Lett. **110**, 135702 (2013)

4. *Entanglement scaling in two-dimensional gapless systems*
   Hyejin Ju, Ann B. Kallin, Paul Fendley, Matthew B. Hastings, and Roger G. Melko
   Phys. Rev. B **85**, 165121 (2012)

5. *Anomalies in the Entanglement Properties of the Square-Lattice Heisenberg Model*
   Ann B. Kallin, Matthew B. Hastings, Roger G. Melko, and Rajiv R. P. Singh
   Phys. Rev. B **84**, 165134 (2011)

6. *Finite-Temperature Critical Behavior of Mutual Information*
   Rajiv R. P. Singh, Matthew B. Hastings, Ann B. Kallin, and Roger G. Melko
   Phys. Rev. Lett. **106**, 135701 (2011)

7. *Finite-size scaling of mutual information in Monte Carlo simulations: Application to the spin-1/2 XXZ model*
   Roger G. Melko, Ann B. Kallin, and Matthew B. Hastings
   Phys. Rev. B **82**, 100409(R) (2010)

8. *Measuring Renyi Entanglement Entropy in Quantum Monte Carlo*
   Matthew B. Hastings, Ivan Gonzalez, Ann B. Kallin, and Roger G. Melko
   Phys. Rev. Lett. **104**, 157201 (2010)

9. *Valence Bond and von Neumann Entanglement Entropy in Heisenberg Ladders*
   Ann B. Kallin, Ivan Gonzalez, Matthew B Hastings, and Roger G. Melko
   Phys. Rev. Lett. **103**, 117203 (2009)

10. *Diagonal and collinear incommensurate spin structures in underdoped $La_{2-x}Ba_xCuO_4$*
    S.R. Dunsiger, Y. Zhao, B.D. Gaulin, Y. Qiu, P. Bourges, Y. Sidis, J.R.D. Copley, A.B. Kallin, E.M. Mazurek, and H.A. Dabkowska
    Phys. Rev. B **78**, 092507 (2008)

## Work Experience

Sept 2008 - Present **University of Waterloo - Graduate Student**

Summers of 2005, 2006, 2008 **McMaster University Research Assistantship - Crystal Growth**

- Grew crystal samples for neutron scattering experiments
- Participated in a neutron scattering experiment
- Trained/supervised 3 undergraduate students & one high school student

Summer 2007 **McMaster University Research Assistantship - Neuroscience**

- Analyzed EEG data using MATLAB

## Service

**Outreach**

- Presenter at Wilfrid Laurier LEAP Camp (for grade 7-8 girls) visit to the Perimeter Institute (July 2013)
- Instructor for UW DIRECTIONS ESTEEM Conference, an Aboriginal High School Enrichment Program (May 2012)
- Volunteer/Instructor at a Canadian Association for Girls in Science (CAGIS) event hosted by the IQC (April 2012)
- Volunteer Judge for Centennial Public School Science Fair (March 2012)
- Instructor for UW DIRECTIONS ESTEEM Conference (March 2011)

**Conference Organizer** for the Waterloo DMRG Winter School, Waterloo (2011)

**Referee** for Physical Review Letters, Physical Review A, Physical Review B, Physica A

## Extracurricular Activities

Member of Toastmasters International (2013 - Present)

Member of the KW Women's Recreational Hockey League - Team Aardvark (2013 - Present)

Captain of the UW Physics intramural ice hockey team - Spin Ice (2012 - Present)

Member of Perimeter Institute Monday morning hockey league (2011 - Present)

Member of the UW Physics intramural ice hockey team - Spin Ice (2008 - Present)

Member of the UW Physics Tough Mudder obstacle course team - The Jason Iaconis Experience (2012)

Member of LOCO Roller Derby - Kitchener Chapter (2011)

Volunteer for the Tri-City Roller Girls (2011)