

## PhD Candidate

McMaster University  
Department of Physics and Astronomy

## Contact information

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## Current Activities

**PhD Student, McMaster University, Hamilton, ON**

**November 2014 - Present**

My thesis studies involve neutron and x-ray scattering investigations of the structural and dynamical properties of frustrated rare-earth titanates and double perovskite magnets which are based on  $4d$  and  $5d$  transition metal ions. The overarching objective of my research is to elucidate the nature of the magnetic interactions which are responsible for stabilizing novel and exotic magnetic ground states in these materials.

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## Education

**McMaster University, Hamilton, ON Canada – MSc, Physics**

**November 2014**

Supervisor: Prof. B. D. Gaulin

Thesis title: "*Neutron Scattering of the Frustrated Magnets  $Ba_2YO_6$  and  $Yb_2Ti_2O_7$* "

**University of Toronto, Toronto, ON Canada – Hon. BSc, Physics**

**August 2012**

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## Professional Activities

**Teaching Assistant, McMaster University, Hamilton, ON**

**Sept. 2012 to May 2018**

During my Master and PhD programs at McMaster University I was a teaching assistant to both undergraduate and graduate students. I undertook numerous roles which are described briefly, below.

- As a laboratory demonstrator, I assisted undergraduate students with the course material and helped troubleshoot their experiments during their practical sessions in the laboratory.
- I prepared and lead lectures for undergraduate course tutorials.
- I graded undergraduate laboratory work, mid-term and final examinations.
- I invigilated undergraduate mid-term and final examinations.
- I was a teaching assistant for a graduate course in Advanced Quantum Mechanics and graded students' assignments and examinations.

**Chair (Nominated), Neutron Scattering Gordon Research Seminar (GRS)**

**August 2017**

*Location:* University of Science and Technology, Hong Kong, SAR, China

- Organized meeting agenda for two day workshop geared towards graduate students, postdoctoral fellows and early career scientists from the neutron scattering community.
- Selected and invited keynote speakers, session chairs and student presentations.
- Applied for funding to support attendees' travel costs to Hong Kong.
- Arranged a career panel for attendees, which comprised of individuals from a variety of backgrounds to answer questions from attendees.

**Tutor (Invited), The Croucher Summer Course on Neutron Scattering**

**August 2016**

*Location:* City University of Hong Kong, Hong Kong, SAR, China

- Presented a three hour lecture outlining the time-of-flight inelastic neutron scattering technique and data analysis methods.
- Assisted attendees during afternoon work sessions with data analysis of 2D and 4D time-of-flight inelastic neutron scattering data sets.

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## Awards

**The International Excellence Award**

**2013 - 2014**

Awarded by McMaster University

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## Scientific Development

### *NIST Neutron Summer School*

**June 2013**

*Location:* Center for Neutron Research, Baltimore, MD

- Participated in an intensive week long course on neutron scattering techniques and analysis methods.
- Delivered group presentation on a ferromagnet which was studied utilizing the triple-axis instrument BT7.

### *National School on Neutron and X-Ray Scattering*

**August 2013**

*Location:* Oak Ridge National Laboratory, Oak Ridge TN & Argonne National Laboratory, Argonne, IL

- Attended lectures on the principles of neutron and x-ray scattering.
- Gained hands-on experience with numerous scattering techniques.
- Partook in group presentations which were delivered at the end of the summer school, based on a high pressure diffraction experiments on water which were conducted at the beamline, SNAP, located at the Spallation Neutron Source.

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## Research Positions

### **Research Project Course, PHY 471Y, University of Toronto**

**Oct. 2011 - May 2012**

Supervisor: Prof. S. Julian

Performed magnetic susceptibility measurements of rare-earth pyrochlores.

### **Research Assistant**

**Oct. 2010 - Aug. 2011**

*Location:* Centre for Free Electron Laser Science, DESY, Hamburg, Germany

Supervisors: Prof. R. J. Dwayne Miller & Dr. Regis Gengler

Conducted materials synthesis and produced thin films of functionalized graphene using the Langmuir-Blodgett technique for femtosecond electron diffraction studies.

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## Presentations

### *CINS Annual General Meeting*

**October 2019**

*Location:* McMaster University, Hamilton ON Canada

*Role:* Presenter

### *Gordon Research Conference (GRC) on Neutron Scattering*

**August 2017**

*Location:* Hong Kong University Science and Technology, Hong Kong, SAR, China

*Role:* Poster Presenter

### *American Conference on Neutron Scattering*

**August 2016**

*Location:* Long Beach, CA, USA

*Role:* Poster Presenter

### *APS March Meeting*

**March 2016**

*Location:* Baltimore, MD, USA

*Role:* Speaker

### *Gordon Research Conference (GRC) on Neutron Scattering*

**June 2015**

*Location:* The Chinese University of Hong Kong, Hong Kong, SAR China

*Role:* Poster Presenter

### *APS March Meeting*

**March 2015**

*Location:* San Antonio, TX, USA

*Role:* Speaker

### *American Conference on Neutron Scattering*

**June 2014**

*Location:* Knoxville, TN, USA - June 2014

*Role:* Poster Presenter

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## Languages

- English - Fluent
- German - Intermediate written and oral skills
- French - Basic written and oral skills

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## Programming Experience

- MATLAB
- Python

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## References

- Prof. Bruce D. Gaulin  
Institution: McMaster University, Department of Physics & Astronomy  
Relationship: Graduate Advisor  
E-mail: [gaulin@mcmaster.ca](mailto:gaulin@mcmaster.ca)
- Prof. Arun Paramekanti  
Institution: University of Toronto, Department of Physics  
Relationship: Research Collaborator  
E-mail: [arunp@physics.utoronto.ca](mailto:arunp@physics.utoronto.ca)
- Dr. Matthew B. Stone  
Institute: Oak Ridge National Laboratory, Spallation Neutron Source  
Relationship: Research Collaborator/Local Contact During Experiments  
E-mail: [mbstone@ornl.gov](mailto:mbstone@ornl.gov)

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## Publications

- [1] D. D. Maharaj, G. Sala, M. B. Stone, E. Kermarrec, C. Ritter, F. Fauth, C. A. Marjerrison, J. E. Greedan, A. Paramekanti, B. D. Gaulin, arXiv:1909.03113v3 [cond-mat.str-el] (2019).
- [2] A. Paramekanti, D. D. Maharaj, and B. D. Gaulin, arXiv:1909.03089v2 [cond-mat.str-el] (2019).
- [3] L. Clark, G. Sala, D. D. Maharaj, M. B. Stone, K. S. Knight, M. T. F. Telling, X. Wang, X. Xu, J. Kim, Y. Li, S.-W. Cheong, and B. D. Gaulin, *Nature Physics*. doi:10.1038/s41567-018-0407-2 (2019).
- [4] D. D. Maharaj, G. Sala, C. A. Marjerrison, M. B. Stone, J. E. Greedan, and B. D. Gaulin, *Phys. Rev. B* **98**, 104434 (2018).
- [5] G. Sala, D. D. Maharaj, M. B. Stone, H. A. Dabkowska, and B. D. Gaulin. *Phys. Rev. B* **97**, 224409 (2018).
- [6] C. M. Thompson, C. A. Marjerrison, A. Z. Sharma, C. R. Wiebe, D. D. Maharaj, G. Sala, R. Flacau, A. M. Hallas, Y. Cai, B. D. Gaulin, G. M. Luke, and J. E. Greedan. *Phys. Rev. B*, **93**, 014431, (2016).
- [7] C. A. Marjerrison, C. M. Thompson, G. Sala, D. D. Maharaj, E. Kermarrec, Y. Cai, A. M. Hallas, M. N. Wilson, T. J. S. Munsie, G. E. Granroth, R. Flacau, J. E. Greedan, B. D. Gaulin, and G. M. Luke. *Inorg. Chem*, **55**, 10701-10713, (2016).
- [8] J. Gaudet, A. M. Hallas, D. D. Maharaj, C. R. C. Buhariwalla, E. Kermarrec, N. P. Butch, T. J. S. Munsie, H. A. Dabkowska, G. M. Luke, and B. D. Gaulin. *Phys. Rev. B*, **94**, 060407, (2016).

**Publications (continued)**

[9] E. Kermarrec, C. A. Marjerrison, C. M. Thompson, D. D. Maharaj, K. Levin, S. Kroeker, G. E. Granroth, R. Flacau, Z. Yamani, J. E. Greedan, and B. D. Gaulin. *Phys. Rev. B*, **91**, 075133, (2015).

[10] J. Gaudet, D. D. Maharaj, G. Sala, E. Kermarrec, K. A. Ross, H. A. Dabkowska, A. I. Kolesnikov, G. E. Granroth, and B. D. Gaulin. *Phys. Rev. B*, **92**, 134420 (2015).

[11] E. Kermarrec, D. D. Maharaj, J. Gaudet, K. Fritsch, D. Pomaranski, J. B. Kycia, Y. Qiu, J. R. D. Copley, M. M. P. Couchman, A. O. R. Morningstar, H. A. Dabkowska, and B. D. Gaulin. *Phys. Rev. B*, **92**, 245114, (2015).

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