

# Kyle R. Bryenton

## Curriculum Vitae: March 21, 2024

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Halifax, NS, Canada  
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### EDUCATION

**Doctor of Philosophy - Ph.D Candidate, Physics** 2020 - present

Department of Physics & Atmospheric Science (Chemical Physics / Density-Functional Theory)  
Dalhousie University, Halifax, NS

Thesis: *Improved Calculation of XDM Dispersion Forces, with Application to Surfaces and Interfaces*  
Supervisor: Dr. Erin Johnson

**AARMS Summer School: Dynamical Systems, DEs, and Special Functions** 2019

UPEI School of Mathematical and Computational Sciences  
University of Prince Edward Island, Charlottetown, PE

*The Mathematics and Science of Chaos*

Instructor: Dr. James Yorke, University of Maryland

*q-Series in Analysis, Combinatorics, and Number Theory*

Instructor: Dr. Mourad Ismail, University of Central Florida

**Master of Science - M.Sc, Physics** 2016 - 2018

Guelph-Waterloo Physics Institute (Condensed Matter Physics / Quantum Materials)  
University of Guelph, Guelph, ON

Thesis: *Optical Properties of the  $\alpha$ - $T_3$  Semi-Dirac Model*

Supervisor: Dr. Elisabeth Nicol

**Bachelor of Science** 2011 - 2016

UPEI Department of Physics: Honours in Physics with Co-operative Education

UPEI School of Mathematical and Computational Sciences: Major in Mathematics

University of Prince Edward Island, Charlottetown, PE

Thesis: *Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem*

Supervisors: Dr. Nasser Saad, Dr. Sheldon Opps

*First-Class Standing*

### UNIVERSITY PROFESSIONAL SERVICES

- Member, American Chemical Society 2022 - present
- Member, Canadian Association of Physicists 2014 - present
- Member, Canadian Mathematical Society 2014 - present
- Coordinator, UPEI Mathematics Enrichment Camp 2014 - 2017
- Member, UPEI SMCS - Financial Mathematics Hiring Committee 2015 - 2016
- Physics Representative, Regional Astronomical Society 2012 - 2016
- External Physics Consultant, Confidential Medical Technology Company 2015
- Coordinator, UPEI SU Get Out The Vote Campaign 2015
- Coordinator, UPEI Science Undergraduate Research Conference 2015

### UNIVERSITY SOCIAL SERVICES

- Dalhousie Graduate Physics Society 2020 - present
  - Treasurer* 2022 - 2024
- UPEI Mathematics Society 2011 - 2016
  - President* 2013 - 2016
  - Second-Year Representative* 2012 - 2013
- UPEI Physics Society 2011 - 2016
  - Vice President* 2014 - 2015
  - Third-Year Representative* 2013 - 2014
  - Second-Year Representative* 2012 - 2013
- UPEI RA 2011 - 2016
  - Administrative Assistant* 2012 - 2013
- UPEI Computer Science Society 2011 - 2016

## AWARDS & HONOURS

University	Program	Award Name	Value	Year
Dalhousie University	Ph.D	IBM-Zerner Graduate Student Award	\$674	2024
Dalhousie University	Ph.D	CCAM Physics Conference Feedback Award	\$30	2022
Dalhousie University	Ph.D	Killam Predoctoral Scholarship	\$90,000	2020
Dalhousie University	Ph.D	Nova Scotia Graduate Scholarship	\$60,000	2020
Dalhousie University	Ph.D	Dalhousie President's Award	\$12,294	2020
Dalhousie University	Ph.D	Walter C. Sumner Memorial Fellowship	\$16,400	2020
Dalhousie University	Ph.D	Canadian Mathematical Society President's Award	\$100	2019
University of Guelph	M.Sc	NSERC Canada Graduate Scholarship - Masters	\$17,500	2017
University of Guelph	M.Sc	Ontario Graduate Scholarship (Declined)	\$15,000	2017
University of Guelph	M.Sc	Ontario Graduate Fellowship	\$9,000	2017
University of PEI	B.Sc	Jeff Praught Award in Mathematics	\$500	2016
University of PEI	B.Sc	Physics Department Graduation Prize	\$200	2016
University of PEI	B.Sc	George Coles Graduate Scholarship	\$1,400	2016
University of PEI	B.Sc	UPEI Diamond Award in Educational Leadership	\$500	2016
University of PEI	B.Sc	UPEI Student/Alumnus of the Month	N/A	2016
University of PEI	B.Sc	Robert Haines Memorial Science Award of Merit	N/A	2015
University of PEI	B.Sc	Dr. John H. Maloney Scholarship in Science/Business	\$390	2015
University of PEI	B.Sc	MacLauchlan Prize for Effective Writing	\$500	2015
University of PEI	B.Sc	Dr. Terry McCormack Award	\$500	2015
University of PEI	B.Sc	UPEI Academic Excellence Award	\$2,000	2015
University of PEI	B.Sc	NSERC Undergraduate Student Research Award	\$4,500	2014
University of PEI	B.Sc	UPEI Academic Excellence Award	\$1,000	2014
University of PEI	B.Sc	Island Student Award - Fourth Year	\$600	2014
University of PEI	B.Sc	Chin-Hai Lin Memorial Award	\$120	2013
University of PEI	B.Sc	Physics Co-operative Education Student of the Year	\$500	2013
University of PEI	B.Sc	Physics Department Prize in Modern Physics	\$200	2013
University of PEI	B.Sc	Island Student Award - Third Year	\$600	2013
University of PEI	B.Sc	Austin A. Scales Scholarship	\$2,000	2012
University of PEI	B.Sc	Island Student Award - Second Year	\$400	2012
University of PEI	B.Sc	Inspiring Excellence Award	\$1,000	2011
University of PEI	B.Sc	Access PEI: Community Service Bursary	\$500	2011
University of PEI	B.Sc	George Coles Bursary	\$2,000	2011

### IBM-Zerner Graduate Student Award

2024

*Award: \$30*

The awards were awarded at the Sixty-Third Sanibel Symposium, February 25th – March 1st, 2024. Sanibel has a long history of giving awards to deserving undergraduate students, graduate students, postdoctoral researchers, and young investigators. Depending upon the quality of the applicants, up to six awards will be granted among those four categories. Each award consists of a \$500USD travel reimbursement to attend the meeting.

### CCAM Physics Conference Feedback Award

2022

*Award: \$30*

Awarded to deserving participants at the 2022 Canadian-Cuban-American-Mexican Graduate Student Physics Conference (C<sup>2</sup>AM).

### Killam Predoctoral Scholarship

2020-2022

*Award: \$30,000/yr for 3 years*

Dalhousie awards Killam Predoctoral Scholarships on a competitive basis to outstanding graduate students planning to enroll or already enrolled in thesis-based programs (Master's or Doctoral level) in any discipline in the sciences, engineering, humanities, and social sciences. This scholarship is open to both Canadians and non-Canadians.

### Nova Scotia Graduate Scholarship

2020-2023

*Award: \$15,000/yr for 4 years*

The Nova Scotia Graduate Scholarship program provides funding to research graduates at Dalhousie for innovative work aligned with or advancing Nova Scotia priorities. The objectives of this award are to attract and retain top-quality research graduates, as well as to encourage exploration, discovery, and innovation in research priority areas for Nova Scotia.

- Dalhousie President's Award** 2020-2021  
*Award: Full-Tuition Scholarship for 2 years*  
 The President's Awards are for students starting PhD programs who have a full doctoral scholarship to cover their full costs of tuition.
- Walter C. Sumner Memorial Fellowship** 2020  
*Award: \$8,200/yr for 2 years*  
 Up to 40 Walter C. Sumner Memorial Fellowships will be awarded nationally to doctoral students who are registered or about to commence studies in Chemistry, Physics, Electrical Engineering, or Computer Science. Candidates must be nominated by one of the participating universities. Recommendations for the award of fellowships will be made to the Foundation by a selection committee of senior scientists who are not from the participating universities.
- Canadian Mathematical Society President's Award** 2019  
*Award: \$100*  
 Awarded to a deserving student based on their research quality and presentation skills at the 2019 CMS Winter Meeting.
- NSERC Canada Graduate Scholarship - Masters** 2017  
*Award: \$17,500*  
 The objective of the Canada Graduate Scholarships-Master's (CGS M) Program is to help develop research skills and assist in the training of highly qualified personnel by supporting students who demonstrate a high standard of achievement in undergraduate and early graduate studies.
- Ontario Graduate Scholarship** 2017  
*Award: \$15,000 (Declined)*  
 The Ontario Graduate Scholarship (OGS) Program recognizes academic excellence in graduate studies at the master's and doctoral levels in all disciplines of academic study. The ministry contributes two-thirds of the value of the award and the university provides one-third. A recipient will be awarded \$5,000 per semester for up to three semesters.
- Ontario Graduate Fellowship** 2016  
*Award: \$9,000*  
 The Ontario Graduate Fellowships (OGF) Program recognizes academic excellence in graduate studies at the master's and doctoral levels in all disciplines of academic study. The OGF is valued at \$3,000 per semester for two to three semesters of study. Selection criteria is based on academic excellence as defined by a combination of grades, research, demonstrated leadership and publications.
- Jeff Praught Award in Mathematics** 2016  
*Award: \$500*  
 Awarded to a deserving graduating student who has been involved in student life at UPEI and/or the community. Preference will be given to those not been in receipt of a scholarship or bursary of more than \$2,000 during his/her undergraduate degree and is not receiving another graduation award.
- Physics Department Graduation Prize** 2016  
*Award: \$200*  
 Awarded to a graduating physics student, referred by the physics department.
- George Coles Graduate Scholarship** 2016  
*Award: \$1,400*  
 Awarded to Island residents graduating from UPEI or Maritime Christian College in their first undergraduate degree.
- UPEI Diamond Award in Educational Leadership** 2016  
*Award: \$500*  
 This award is presented to full-time students in good academic standing who impart knowledge and experience to others to support their current and future success. These students are dedicated to creating and sustaining vibrant learning communities and assisting other students and community members to reach their full potential.
- UPEI Student/Alumnus of the Month, February 2016** 2016  
*Award: Prestigious Recognition*  
 Recognition for creating the nonprofit educational program, UPEI Mathematics Achievement Program, which taught grade 3-6 PEI students math during the 2015-2016 academic year. The full profile may be found here:  
<https://web.archive.org/web/20160304210544/https://www.upei.ca/science/notice/2016/02/studentalumnus-profile-month-february-2016>
- Robert Haines Memorial Science Award of Merit** 2015  
*Award: Prestigious Recognition*  
 A prestigious award where nominees are judged for excellence in two categories: academic standing and service and leadership either within the academic community or the community at large. The Chair of each Science Department submits a letter of nomination with supporting documents to the Dean of Science, on behalf of a student within their respective department for consideration.

**Dr. John H. Maloney Scholarship in Science/Business** 2015

*Award: \$390*

Awarded to an undergraduate student in the School of Business or Faculty of Science who has expressed inquisitiveness and desire to learn, shows leadership, is a team player, contributes to UPEI or the general community in a meaningful manner.

**MacLauchlan Prize for Effective Writing** 2015

*Award: \$500*

Awarded to returning UPEI undergraduate students who have produced an outstanding written work during the previous academic year. Writing is a natural extension of human life and plays a tremendous role in personal and professional growth. Success as a knowledge-based society depends on a population that is able to communicate effectively. By celebrating writing excellence, these awards send a powerful signal regarding the collective importance of writing.

**Dr. Terry McCormack Award** 2015

*Award: \$500*

Awarded to a student entering third-year or fourth-year from rural PEI who has expressed an interest in health care; the student must have maintained at least an 80% average in the last two semesters of study.

**UPEI Academic Excellence Award** 2015

*Award: \$2,000*

Awarded to UPEI students who demonstrated high academic standing in their past year of studies.

**NSERC Undergraduate Student Research Award** 2014

*Award: \$4,500*

Awarded to Canadian undergraduate students currently enrolled in a bachelor's degree program at an eligible university who have high academic standing. The purpose is to stimulate undergraduate students' interest in research in the natural sciences and engineering.

**UPEI Academic Excellence Award** 2014

*Award: \$1,000*

Awarded to UPEI students who demonstrated high academic standing in their past year of studies.

**Island Student Award - Fourth Year** 2014

*Award: \$600*

Awarded to eligible Island students enrolled in full-time studies at UPEI or Maritime Christian College, offered by the Government of Prince Edward Island. Available to fourth-year students only.

**Chin-Hai Lin Memorial Award** 2013

*Award: \$120*

Awarded to the student majoring in Physics who achieved the highest overall average in second year.

**Physics Co-operative Education Student of the Year** 2013

*Award: \$500*

Awarded to a deserving student in the Physics Co-operative Education program based on academic achievement, community involvement, contribution to their previous employer, and the impact the co-operative education program has had on their professional development.

**Physics Department Prize in Modern Physics** 2013

*Award: \$200*

Awarded to the student ranking highest in Physics 221 based on the recommendation of the chair of the Physics Department.

**Island Student Award - Third Year** 2013

*Award: \$600*

Awarded to eligible Island students enrolled in full-time studies at UPEI or Maritime Christian College, offered by the Government of Prince Edward Island. Available to third-year students only.

**Austin A. Scales Scholarship** 2012

*Award: \$2,000*

Awarded to students from rural PEI, one from each county, based on financial need and achievement in the first year of a university program. Available to second-year students only.

**Island Student Award - Second Year** 2012

*Award: \$400*

Awarded to eligible Island students enrolled in full-time studies at UPEI or Maritime Christian College, offered by the Government of Prince Edward Island. Available to second-year students only.

**Inspiring Excellence Award** 2011

*Award: \$1,000*

Awarded to all students entering UPEI from high school who have a cumulative average of 85% based on the five courses used for admission to UPEI.

<b>Access PEI: Community Service Bursary</b>	2011
<i>Award: \$500</i>	
Awarded to students entering post secondary studies who have completed and recorded over 100 hours of community service.	
<b>George Coles Bursary</b>	2011
<i>Award: \$2,000</i>	
The George Coles Bursary is available to first time, first year student residents of Prince Edward Island enrolled in full-time studies at the University of Prince Edward Island, Holland College, Collège Acadie ÎPE or the Maritime Christian College, who do not have any previous post-secondary education.	

**PROJECT  
FUNDING**

University of Prince Edward Island	2015
<i>Award: \$2,000</i>	
Awarded to the UPEI Mathematics Achievement Program 2015-2016 school year pilot project.	
PEI, Department of Workforce and Advanced Learning: Skills PEI	2015
<i>Award: \$5,600</i>	
Shared award between the PEI Volunteers for Literacy Program, and the UPEI Mathematics Achievement Program 2015-2016 school year pilot project.	
Atlantic Association for Research in the Mathematical Sciences	2015
<i>Award: \$5,000</i>	
Awarded to the UPEI Mathematics Achievement Program 2015-2016 school year pilot project.	
Atlantic Association for Research in the Mathematical Sciences	2015
<i>Award: \$5,000 (Declined)</i>	
Offered to the UPEI Mathematics Achievement Program 2015 summer program.	

**RESEARCH  
EXPERIENCE**

**Current**

Dalhousie University Department of Physics and Atmospheric Science	2020 - present
<i>Improved Calculation of XDM Dispersion Forces, with Application to Surfaces and Interfaces</i>	
Research Lead: Dr. Erin Johnson	

**Previous**

UPEI School of Mathematical and Computational Sciences	2019
<i>On Polynomial Solutions of Linear Differential Equations</i>	
<i>Exactly Solvable Anharmonic Potentials with Variable Bumps and Depths</i>	
<i>Generalized Heun Equation and Associated Orthogonal Polynomials</i>	
Research Lead: Dr. Nasser Saad	
Guelph-Waterloo Physics Institute	2016 - 2018
<i>Optical Properties of the <math>\alpha</math>-<math>T_3</math> Semi-Dirac Model</i>	
Research Lead: Dr. Elisabeth Nicol	
UPEI School of Mathematical and Computational Sciences	2016
<i>Generation of New Non-Linear Harmonic-Like Classes of Exceptionally Orthogonal Polynomials</i>	
Research Lead: Dr. Nasser Saad	
UPEI School of Mathematical and Computational Sciences	2015 - 2016
<i>Explicit Evaluation of the Polynomial Solutions of Differential Equations with Polynomial Coefficients</i>	
Research Lead: Dr. Nasser Saad	
UPEI Mathematics Department, UPEI Physics Department	2014 - 2015
<i>Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem</i>	
Research Leads: Dr. Nasser Saad & Dr. Sheldon Opps	
UPEI Mathematics Department	2015
<i>Generalizing the Shifted Non-Linear Oscillator using Supersymmetric Quantum Mechanics</i>	
Research Lead: Dr. Nasser Saad	
UPEI Mathematics Department	2014
<i>An Investigation of the Darboux-Crum Transformation and its Applications to Eigenvalue Problems</i>	
Research Lead: Dr. Nasser Saad	
UPEI Mathematics Department	2014
<i>Finding Fast Matrix Multiplication Methods Using Genetic Algorithms</i>	
Research Lead: Dr. Gordon MacDonald	

	PEI Cancer Treatment Centre <i>Finding the Mechanical Isocentre of Medical Linear Accelerators using MATLAB Image Processing</i> Research Leads: Dr. John Andrew & Grant MacNevin	2013
	UPEI Mathematics Department <i>The Pochhammer Symbol, and Related Identities</i> Research Lead: Dr. Nasser Saad	2012
ACADEMIC WORK EXPERIENCE	Department of Physics, Dalhousie University, NS <i>PHYC 3640 — Quantum Mechanics — Lecturer / Tutorial Instructor / Marker</i>	2022
	Department of Physics, Dalhousie University, NS <i>PHYC 2140 — Physics-Tools: Theory — Tutorial Instructor</i>	2020
	Department of Physics, Dalhousie University, NS <i>First-Year Physics — Lecturer / Tutorial Instructor / Resource Centre Tutor</i>	2020
	Department of Physics, University of Guelph, ON <i>First-Year Physics — Help Room / Laboratory Instructor / Marker / Exam Invigilator</i>	2016 - 2018
	UPEI Mathematics Achievement Program, UPEI, PE <i>Founder &amp; Director</i>	2015 - 2016
	Physics Department, UPEI, PE <i>Observatory Technician</i>	2012 - 2016
	Physics Department, UPEI, PE <i>PHYS 251/252 — Introductory Astronomy — Teaching Assistant</i>	2012 - 2016
	English Language School Board, Stratford, PE <i>Registered Tutor</i>	2012 - 2016
	Physics Department, UPEI, PE <i>PHYS 312 — Electromagnetism I — Tutorial Instructor</i>	2015
	Physics Department, UPEI, PE <i>First-Year Physics — Teaching Assistant / Laboratory Assistant</i>	2013 - 2014
	School of Mathematical and Computational Sciences, UPEI, PE <i>Math Help Centre Tutor</i>	2013

## RESEARCH CONTRIBUTIONS

### Peer-Reviewed Articles

- [09] C. J. Nickerson, **K. R. Bryenton**, A. J. Price, E. R. Johnson, *Comparison of DFT Dispersion Corrections for the DES15K Database*. J. Phys. Chem. **127**, 41, 8712–8722 (2023). doi: 10.1021/acs.jpca.3c04332
- [08] **K. R. Bryenton**, E. R. Johnson, *Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening*, J. Chem. Phys. **158**, 204110 (2023). doi: 10.1063/5.0142465
- [07] **K. R. Bryenton**, A. A. Adeleke, S. G. Dale, E. R. Johnson, *Delocalization Error: The Greatest Outstanding Challenge in Density-functional Theory*, WIREs Comput. Mol. Sci. **13** e1631, (2023). doi: 10.1002/wcms.1631
- [06] A. J. Price, **K. R. Bryenton**, E. R. Johnson, *Requirements for an Accurate Dispersion-corrected Density Functional*, J. Chem. Phys. **154**, 23, 230902, (2021). doi: 10.1063/5.0050993
- [05] **K. R. Bryenton**, N. Saad, *Exactly Solvable Schrödinger Eigenvalue Problems for New Anharmonic Potentials with Variable Bumps and Depths*, Eur. Phys. J. Plus. **135**, 369, (2020). doi: 10.1140/epjp/s13360-020-00378-9
- [04] **K. R. Bryenton**, A. R. Cameron, K. L. A. Kirk, N. Saad, P. Strongman, N. Volodin, *On the Solutions of Second-Order Differential Equations with Polynomial Coefficients: Theory, Algorithm, Application, Algorithms*. **13**, 286, (2020). doi: 10.3390/a13110286
- [03] J. Carbotte, **K. R. Bryenton**, E. J. Nicol, *Optical Properties of a Semi-Dirac Material*, Phys. Rev. B. **99**, 115406, (2019). doi: 10.1103/PhysRevB.99.115406
- [02] R. L. Hall, N. Saad, **K. R. Bryenton**, *The D-Dimensional Softcore Coloumb Potential and the Generalized Confluent Heun Equation*, J. Math. Phys. **59**, 102105, (2018). doi: 10.1063/1.5035357
- [01] K. L. A. Kirk, **K. R. Bryenton**, N. Saad, *A Note on the Generalized and Universal Associated Legendre Equations*, Commun. Theor. Phys. **70**, (2018). doi: 10.1088/0253-6102/70/1/19

### Theses

- [02] **K. R. Bryenton**, *Optical Properties of the  $\alpha$ - $T_3$  Semi-Dirac Model*, M.Sc. Thesis, Guelph-Waterloo Physics Institute, University of Guelph, Guelph, Ontario, Canada, (2018). doi: 10.13140/RG.2.2.17048.24325
- [01] **K. R. Bryenton**, *Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem*, B.Sc. Hons. Thesis, Department of Physics, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, (2016). doi: 10.13140/RG.2.2.23129.98408

### Poster Presentations

- Sixty-Third Sanibel Symposium - St. Augustine Beach, FL 2024  
*Adding Correlation to the Exchange-Hole Dipole Moment Model*
- FHI-aims Developers Meeting - Hamburg, Germany 2023  
*Improved Forces for the Exchange-Hole Dipole Moment Model*
- Canadian Association of Physicists (CAP) Congress - Fredericton, NB 2023  
*Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening*
- American Chemical Society Spring Meeting - Indianapolis, IN 2023  
*Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening*
- Canadian Mathematical Society Winter Meeting - Toronto, ON 2019  
*Exactly Solvable Anharmonic Potentials with Variable Bumps and Depths*

### Conference Presentations

- Canadian Association of Physicists (CAP) Congress - Fredericton, NB 2023  
*Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening*
- American Chemical Society Spring Meeting - Indianapolis, IN 2023  
*Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening*
- Canadian-Cuban-American-Mexican (C2AM) Graduate Student Physics Conference 2022  
*Capturing Many-Body Dispersion with Exchange-Hole Dipoles*
- Canadian Mathematical Society (CMS) Winter Meeting - Toronto, ON 2019  
*Exactly Solvable Anharmonic Potentials with Variable Bumps and Depths*
- Atlantic Universities Physics and Astronomy Conference (AUPAC) - St. John's, NL 2016  
*Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem*
- UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE 2015  
*Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem*
- Canadian Mathematical Society (CMS) Summer Meeting - Charlottetown, PE 2015  
*On the Darboux-Crum Transformation and Supersymmetric Quantum Mechanics*
- Atlantic Universities Physics and Astronomy Conference (AUPAC) - Sackville, NB 2015  
*On the Darboux-Crum Transformation and Supersymmetric Quantum Mechanics*
- Science Atlantic Math and Computer Science Conference - St. John, NB 2014  
*Finding Fast Matrix Multiplication Methods Using Genetic Algorithms*
- UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE 2014  
*Finding Fast Matrix Multiplication Methods Using Genetic Algorithms*
- Science Atlantic Math and Computer Science Conference - Sackville, NB 2012  
*On the Pochhammer Symbol, and its Generalization*
- UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE 2012  
*On the Pochhammer Symbol, and its Generalization*

### Technical Reports

- PEI Cancer Treatment Centre - Charlottetown, PE 2013  
*Finding the Mechanical Isocentre of Medical Linear Accelerators Using MATLAB Image Processing*

## Invited Talks

University of Guelph Master of Science Presentations - Thesis Defence <i>Optical Properties of the <math>\alpha</math>-<math>\mathcal{T}_3</math> Semi-Dirac Model</i>	2018
UPEI School of Mathematical and Computational Sciences - Public Seminar <i>Explicit Evaluation of the Polynomial Solutions of Differential Equations with Polynomial Coefficients</i>	2016
UPEI Physics Honours Presentations - Thesis Defence <i>Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem</i>	2015
UPEI Physics Co-op Research Presentations <i>An Investigation of the Darboux-Crum Transformation and its Applications to Eigenvalue Problems</i>	2015
UPEI Physics Co-op Research Presentations <i>On Finding the Mechanical Isocentre of Medical Linear Accelerators</i>	2014

## TECHNICAL EXPERIENCE

<b>Mathematical Systems:</b>	Mathematica	MATLAB	Maple				
<b>Markup Languages:</b>	L <sup>A</sup> T <sub>E</sub> X/T <sub>E</sub> X	HTML	XML	YAML	CSS		
<b>Tools &amp; Applications:</b>	Git	Critic2	SLURM	Capstone	QTGrace	SDSM	
<b>Programming Languages:</b>	Python	Fortran	Bash	Octave	C++	C	
	Javascript	Java					

## ACHIEVEMENTS

- Erdős Number of 4: (Nasser Saad → Mourad Ismail → Joseph Gillis → Paul Erdős)
- Passed the Canadian Association of Physicists professional practice exam
- Represented UPEI at the 2014 Science Atlantic Mathematics Competition
- Competed in the 2010 Canadian Swimming Championships

## CERTIFICATIONS AND COURSES

• ACENET - Molecular Dynamics	2023
• ACENET - Using Git Tools to Manage File Changes and Collaborate: Collaboration	2022
• ACENET - Modern FORTRAN for scientific programming	2022
• ACENET - Introduction to Advanced Computing	2020
• Dalhousie University - WHMIS	2020
• AODA - Accessibility Service Provision	2016
• AODA - Making Education Accessible	2016
• EHS - Worker Health and Safety Awareness	2016
• GPS - Academic and Research Integrity	2016
• GPS - Understanding and Avoiding Plagiarism	2016
• University of Guelph - WHMIS	2016
• University of Guelph - Academic Integrity	2016
• University of Guelph - Sexual Violence Referral and Support Training	2016
• National Lifesaving Society - Lifesaving Instructor	2014
• Government of Canada - Nuclear Energy Worker	2013
• University of Prince Edward Island - WHMIS	2012
• National Lifesaving Society - National Lifeguard Service	2010
• National Lifesaving Society - Swim for Life Instructor	2010
• Canadian Red Cross - Water Safety Instructor	2009
• Canadian Red Cross - Assistant Water Safety Instructor	2008
• CPR First Aid & Safety Services - CPR & Basic Life Services Level C	2008
• CPR First Aid & Safety Services - Standard Care First Aid	2008
• National Lifesaving Society - Bronze Cross	2007
• National Lifesaving Society - Bronze Medallion	2006

## OTHER WORK EXPERIENCE

Elections Canada, PE <i>Central Poll Supervisor</i>	2019
Cornwall Poolside Park, PE <i>Aquatics Supervisor</i>	2014
Cornwall Poolside Park, PE <i>Lifeguard and Swimming Instructor</i>	2010 - 2014
Safety First Training Services, Cornwall, PE <i>Swimming Instructor</i>	2011



**COMMUNITY  
SERVICE**

- Telescope Operator, Out of This World with Colonel Chris Hadfield: Charlottetown 2014
- Coordinator, Muscular Dystrophy Canada, Walk for Muscular Dystrophy 2012
- Coordinator, Canada-Wide Science Fair: Charlottetown 2012
- Torchbearer, International Olympic Committee: Vancouver 2010
- Member, Friendship Program, Prince Edward Island Newcomers Association 2010
- Coordinator, Horse Canada: Gingerwood Charity Horse Show 2010