

Kyle R. Bryenton

Curriculum Vitae: January 4, 2026

Halifax, NS, Canada
email: Kyle.Bryenton@dal.ca
website: KyleBryenton.github.io

CURRENT POSITION

Postdoctoral Research Fellow 2026–present
Dalhousie University, Halifax, NS
Department of Chemistry & Industrial Partner: Draslovka
Project Title: *Towards Sustainable Metal Extraction in Mining: Tailoring Glycine Leaching Technologies*
PI: Dr. Erin Johnson & Dr. Luc LeBlanc
My postdoctoral research role is supported by an industrial partnership between Draslovka, Dalhousie University's Department of Chemistry, and collaborators at the University of Cambridge. Building on my PhD work in density-functional theory (DFT) method development and testing, my research focuses on advancing Glycine Leaching Technology (GLT) to make mining more sustainable and economical.

EDUCATION

Doctor of Philosophy 2020–2025
Dalhousie University, Halifax, NS
Department of Physics & Atmospheric Science (Chemical Physics / Density-Functional Theory)
Thesis: *Physics-guided Solutions to Dispersion in Density-functional Theory*
Advisor: Dr. Erin Johnson

AARMS Summer School: Dynamical Systems, DEs, and Special Functions 2019
University of Prince Edward Island, Charlottetown, PE
UPEI School of Mathematical and Computational Sciences
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 2016–2018
University of Guelph, Guelph, ON
Guelph-Waterloo Physics Institute (Condensed Matter Physics / Quantum Materials)
Thesis: *Optical Properties of the α - T_3 Semi-Dirac Model*
Advisor: Dr. Elisabeth Nicol

Bachelor of Science 2011–2016
University of Prince Edward Island, Charlottetown, PE
UPEI Department of Physics: Honours in Physics with Co-operative Education
UPEI School of Mathematical and Computational Sciences: Major in Mathematics
Thesis: *Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem*
Advisor: Dr. Nasser Saad, Dr. Sheldon Opps
First-Class Standing

ACADEMIC PROFESSIONAL SERVICES

- Developer, Fritz Haber Institute *ab initio* Materials Simulations (FHIaims) 2022–present
- 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 | 2020–2025 |
| <i>Treasurer</i> | 2022–2024 |
| • UPEI Mathematics Society | 2011–2016 |
| <i>President</i> | 2013–2016 |
| <i>Second-Year Representative</i> | 2012–2013 |
| • UPEI Physics Society | 2011–2016 |
| <i>Vice President</i> | 2014–2015 |
| <i>Third-Year Representative</i> | 2013–2014 |
| <i>Second-Year Representative</i> | 2012–2013 |
| • UPEI RA | 2011–2016 |
| <i>Administrative Assistant</i> | 2012–2013 |
| • UPEI Computer Science Society | 2011–2016 |

**AWARDS &
HONOURS**

| University | Program | Award Name | Value | Year |
|----------------------|---------|-----------------------------------------------------|----------|------|
| Dalhousie University | Ph.D | CSTCC 2024 Best Contributed Talk Award | \$556 | 2024 |
| Dalhousie University | Ph.D | Mary Margaret Werner Graduate Scholarship | \$5,000 | 2024 |
| 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 |

CSTCC 2024 Best Contributed Talk Award 2024

Award: \$200CAD + £200GBP

Awarded for the best contributed talk at the 2024 Canadian Symposium on Theoretical and Computational Chemistry (CSTCC), decided by vote. The winner was awarded \$200CAD from the American Institute of Physics (AIP) and a £200GBP book voucher from the Royal Society of Chemistry (RSC).

Inaugural Mary Margaret Werner Graduate Scholarship 2024

Award: \$5,000

Awarded to four deserving graduate students from the Dalhousie Faculty of Science, upon recommendation from their departments. These scholarships recognize the students scholarly achievements and exceptional contributions to their research fields and academic community.

IBM-Zerner Graduate Student Award 2024

Award: \$500USD

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 (C²AM).

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 |
| <i>Award: \$120</i> 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 |
| <i>Award: \$500</i> 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 |
| <i>Award: \$200</i> 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 |
| <i>Award: \$600</i> 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 |
| <i>Award: \$2,000</i> 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 |
| <i>Award: \$400</i> 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 |
| <i>Award: \$1,000</i> 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. | |
| Access PEI: Community Service Bursary | 2011 |
| <i>Award: \$500</i> Awarded to students entering post secondary studies who have completed and recorded over 100 hours of community service. | |
| George Coles Bursary | 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 ÎPÉ 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. | |

**PAST
RESEARCH
EXPERIENCE**

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Graduate Research Assistant Dalhousie University, Department of Physics and Atmospheric Science PI: Dr. Erin Johnson <i>Physics-guided Solutions to Dispersion in Density-functional Theory</i> | 2020–2025 |
| Research Fellow UPEI, School of Mathematical and Computational Sciences PI: Dr. Nasser Saad <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> | 2019 |
| Graduate Research Assistant University of Guelph, Guelph-Waterloo Physics Institute PI: Dr. Elisabeth Nicol <i>Optical Properties of the α-T_3 Semi-Dirac Model</i> | 2016–2018 |
| Undergraduate Research Assistant UPEI, School of Mathematical and Computational Sciences PI: Dr. Nasser Saad <i>Generation of New Non-Linear Harmonic-Like Classes of Exceptionally Orthogonal Polynomials</i> | 2016 |
| Undergraduate Research Assistant UPEI, School of Mathematical and Computational Sciences PI: Dr. Nasser Saad <i>Explicit Evaluation of the Polynomial Solutions of Differential Equations with Polynomial Coefficients</i> | 2015–2016 |
| Undergraduate Research Assistant UPEI, Mathematics Department & Physics Department PI: Dr. Nasser Saad & Dr. Sheldon Opps <i>Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem</i> | 2014–2015 |
| Undergraduate Research Assistant UPEI, Mathematics Department PI: Dr. Nasser Saad <i>Generalizing the Shifted Non-Linear Oscillator using Supersymmetric Quantum Mechanics</i> | 2015 |
| Physics Co-op Research Placement UPEI, Mathematics Department PI: Dr. Nasser Saad <i>An Investigation of the Darboux-Crum Transformation and its Applications to Eigenvalue Problems</i> | 2014 |
| Undergraduate Research Assistant UPEI, Mathematics Department PI: Dr. Gordon MacDonald <i>Finding Fast Matrix Multiplication Methods Using Genetic Algorithms</i> | 2014 |
| Physics Co-op Research Placement PEI, Cancer Treatment Centre PI: Dr. John Andrew & Grant MacNevin <i>Finding the Mechanical Isocentre of Medical Linear Accelerators using MATLAB Image Processing</i> | 2013 |
| Physics Co-op Research Placement UPEI, Mathematics Department PI: Dr. Nasser Saad <i>The Pochhammer Symbol, and Related Identities</i> | 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 & 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

Non-Peer-Reviewed Articles

- [13] **K. R. Bryenton**, E. R. Johnson, *The exchange-correlation dipole moment dispersion method*. Submitted to: Phys. Chem. Chem. Phys. (2025). doi: 10.48550/arXiv.2506.02352
- [12] V. Blum, *et al.* (including: **K. R. Bryenton**), *Roadmap on Advancements of the FHI-aims Software Package*. Submitted to: IOP Electronic Structure. (2025). doi: 10.48550/arXiv.2505.00125
- [11] K. Panchagnula, D. Graf, **K. R. Bryenton**, E. R. Johnson, A. J. W. Thom, *Endofullerenes and Dispersion-Corrected Density Functional Approximations: A Cautionary Tale*. (Preparing for Submission). (2025). doi: 10.48550/arXiv.2503.01637

Peer-Reviewed Articles

- [10] **K. R. Bryenton**, E. R. Johnson, *WTMAD-4: A Fair Weighting Scheme for GMTKN55*. Phys. Chem. Chem. Phys. (*Advance Article*) (2025). doi: 10.1039/D5CP03741G
- [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

- [03] **K. R. Bryenton**, *Physics-Guided Solutions to Dispersion in Density-Functional Theory*, Ph.D. Thesis, Department of Physics and Atmospheric Science, Dalhousie University, Halifax, Nova Scotia, Canada, (2025). doi: 10.13140/RG.2.2.21305.84328
- [02] **K. R. Bryenton**, *Optical Properties of the α - \mathcal{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

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| World Association of Theoretical and Computational Chemists (WATOC) - Oslo, Norway <i>The Exchange-correlation Dipole Moment (XCDM) Model and Z-Damping</i> | 2025 |
| Sixty-Third Sanibel Symposium - St. Augustine Beach, FL <i>Adding Correlation to the Exchange-Hole Dipole Moment Model</i> | 2024 |
| FHI-aims Developers Meeting - Hamburg, Germany <i>Improved Forces for the Exchange-Hole Dipole Moment Model</i> | 2023 |
| Canadian Association of Physicists (CAP) Congress - Fredericton, NB <i>Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening</i> | 2023 |
| American Chemical Society Spring Meeting - Indianapolis, IN <i>Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening</i> | 2023 |
| Canadian Mathematical Society Winter Meeting - Toronto, ON <i>Exactly Solvable Anharmonic Potentials with Variable Bumps and Depths</i> | 2019 |

Conference Presentations

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| The Canadian Symposium on Theoretical and Computational Chemistry (CSTCC) - Halifax, NS <i>XCDM: The Exchange-correlation-hole Dipole Moment Model</i> | 2024 |
| Canadian Association of Physicists (CAP) Congress - Fredericton, NB <i>Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening</i> | 2023 |
| American Chemical Society Spring Meeting - Indianapolis, IN <i>Many-Body Dispersion in Model Systems and the Sensitivity of Self-Consistent Screening</i> | 2023 |
| Canadian-Cuban-American-Mexican (C2AM) Graduate Student Physics Conference <i>Capturing Many-Body Dispersion with Exchange-Hole Dipoles</i> | 2022 |
| Canadian Mathematical Society (CMS) Winter Meeting - Toronto, ON <i>Exactly Solvable Anharmonic Potentials with Variable Bumps and Depths</i> | 2019 |
| Atlantic Universities Physics and Astronomy Conference (AUPAC) - St. John's, NL <i>Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem</i> | 2016 |
| UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE <i>Darboux-Crum Transformations, Supersymmetric Quantum Mechanics, and the Eigenvalue Problem</i> | 2015 |
| Canadian Mathematical Society (CMS) Summer Meeting - Charlottetown, PE <i>On the Darboux-Crum Transformation and Supersymmetric Quantum Mechanics</i> | 2015 |
| Atlantic Universities Physics and Astronomy Conference (AUPAC) - Sackville, NB <i>On the Darboux-Crum Transformation and Supersymmetric Quantum Mechanics</i> | 2015 |
| Science Atlantic Math and Computer Science Conference - St. John, NB <i>Finding Fast Matrix Multiplication Methods Using Genetic Algorithms</i> | 2014 |
| UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE <i>Finding Fast Matrix Multiplication Methods Using Genetic Algorithms</i> | 2014 |
| Science Atlantic Math and Computer Science Conference - Sackville, NB <i>On the Pochhammer Symbol, and its Generalization</i> | 2012 |
| UPEI Science Undergraduate Research Conference (USURC) - Charlottetown, PE <i>On the Pochhammer Symbol, and its Generalization</i> | 2012 |

Technical Reports

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

Invited Talks

UPEI School of Mathematical and Computational Sciences - Seminar 2024
Climbing Down the Order of Purity, and the Λ CDM Dispersion Model

UPEI School of Mathematical and Computational Sciences - Public Seminar 2016
Explicit Evaluation of the Polynomial Solutions of Differential Equations with Polynomial Coefficients

TECHNICAL EXPERIENCE

| | | | | | | | |
|----------------------------------|-----------------------------|---------|-------|----------|---------|------|--|
| Mathematical Systems: | Mathematica | MATLAB | Maple | | | | |
| Markup Languages: | $\text{\LaTeX}/\text{\TeX}$ | HTML | XML | YAML | CSS | | |
| Tools & Applications: | Git | Critic2 | SLURM | Capstone | QTGrace | SDSM | |
| Programming Languages: | 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

- | | |
|----------------------------------------------------------------------------------|------|
| • Dalhousie University - Cybersecurity Training | 2024 |
| • Canadian Red Cross - Volunteering in Emergencies | 2024 |
| • Udacity - Discovering Ethical AI | 2024 |
| • 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 |

| | | |
|----------------------------------------------------------|------------------------------------------------------------------------------------|--------------|
| SELECTED NON-ACADEMIC WORK EXPERIENCE | Elections Canada, PE | 2019 |
| | <i>Central Poll Supervisor</i> | |
| | Cornwall Poolside Park, PE | 2014 |
| | <i>Aquatics Supervisor</i> | |
| | Cornwall Poolside Park, PE | 2010–2014 |
| | <i>Lifeguard and Swimming Instructor</i> | |
| | Safety First Training Services, Cornwall, PE | 2011 |
| | <i>Swimming Instructor</i> | |
| COMMUNITY SERVICE | • Volunteer Corps Member, Nova Scotia Guard Humanitarian Aid | 2024–present |
| | • 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 | 2012 |
| | • Torchbearer, International Olympic Committee: Vancouver 2010 | 2010 |
| | • Member, Friendship Program, Prince Edward Island Newcomers Association | 2010 |
| | • Coordinator, Horse Canada: Gingerwood Charity Horse Show | 2010 |