

Sebastian Gherghe

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PERSONAL INFORMATION

Birth: November 26, 1996 in Toronto, Ontario.
Citizenship: Canadian, (Romanian)

RESEARCH INTERESTS

- Mathematical Physics: many-body quantum mechanics, effective theories. Current projects include recovering effective equations via the Born-Oppenheimer approximation, used in quantum chemistry.
- Data Science and machine learning.

EDUCATION

University of Toronto Toronto, Canada
PhD in Mathematics Present

- Topic: Mathematical Physics
- Supervisor: Prof. Israel Michael Sigal

MSc in Mathematics August 2019

- Topic: Existence and Stability of Heisenberg-Poisson System
- Supervisor: Prof. Israel Michael Sigal

Honours BSc, Faculty of Arts and Science May 2018

- Specialist in Mathematics and Physics
- CGPA: 3.46/4.00

TEACHING EXPERIENCE

University of Toronto
Teaching Assistant 2015 - Present

- MAT223 Linear Algebra I
- MAT224 Linear Algebra II
- MAT135 Calculus I
- MAT136 Calculus II
- MAT235 Multivariable Calculus
- MAT244 Ordinary Differential Equations
- APM346 Partial Differential Equations
- MAT1060 Graduate Partial Differential Equations I
- MAT257 Analysis II

PUBLICATIONS

Manipulating Femtosecond Laser Interactions in Bulk Glass and Thin-Film with Spatial Light Modulation
Ehsan Alimohammadian, Stephen Ho, Erden Ertorer, Sebastian Gherghe, Jianzhao Li and Peter R. Herman.
Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications, LA304-59.

RESEARCH
EXPERIENCE

Undergraduate Research Assistant

Stability of Matter and the Ovals Conjecture May – September 2017

- Supervisor: Prof. Almut Burchard, University of Toronto
- Project Description: Study of methods in Mathematical Physics. Formalism of Non-Relativistic Quantum Mechanics. Study and presentation of papers in the literature (proofs of the Stability of Matter by Dyson and Lenard; and by Lieb and Thirring). Calculus of Variations and eigenvalue sums. Lieb-Thirring inequalities and their connection to the Ovals Conjecture. Literature on conjecture, recent attempts and techniques applied. Personal attempt at improving results. Supported by NSERC USRA.

High-powered ultrafast laser materials processing May – Sept 2016

- Supervisor: Prof. Peter Herman, University of Toronto
- Project Description: Correction of aberration effects via phase corrections using a Spatial Light Modulator in the direct-writing of single-mode waveguides deep in glass. Wave-front reconstruction algorithms using data from an in-house developed Shack-Hartmann Sensor.

Lab Work in Voltammetry May - Aug 2015

- Supervisor: Prof. Al-Amin Dhirani, University of Toronto
- Project Description: Construction of an electrochemical apparatus for conducting Cyclic and Differential Pulse Voltammetry measurements to measure resistance of electrode coating. Project posed challenges in electrochemistry, analytical chemistry, hardware, software, and interfacing.

AWARDS

NSERC Undergraduate Student Research Award	2017
George Roderick Fraser Scholar for Mathematical Studies	2014 - 2017
President's Entrance Scholarship	2014

SKILLS

Programming

Proficient in: LaTeX.

Familiar with: Python, HTML, C++.

Languages

Proficient: English, Romanian.

Working knowledge: Spanish.