Abtin Ameri

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EDUCATION

Doctor of Philosophy
Massachusetts Institute of Technology 2020-2025

B. Eng, Honours Mechanical, Physics Minor
McGill University CGPA **3.99/4.00** 2016-2020

TECHNICAL SKILLS

- **Advanced**
  Numerical methods, C, C++, MATLAB, LaTeX, finite element libraries, high performance computing, CAD software, GitHub, working with large code, experimental techniques, 3D printing, electronic equipment, MS Office.
- **Intermediate**
  JAVA, Python, 3D reconstruction, Schlieren videography, Photon Doppler Velocimetry.
- **Beginner**
  HTML, CSS, FORTRAN.

PUBLICATIONS

- A. Rafiee, P. Pirkola, P.B. Hall, N. Galatee, J. Rogerson, and **A. Ameri**. *Vanishing Absorption and Blueshifted Emission in FeLoBAL Quasars*. Monthly Notices of the Royal Astronomical Society Main Journal (2016).

HONOURS AND AWARDS

- **Grant Awards**
  - National Science and Engineering Research Council of Canada Undergraduate Summer Research Award (NSERC-USRA): $13,500 total (2017-2019).
  - Fonds de recherche Nature et technologies (FRQNT): $2,000 (2019).
- **Scholarships**
  - Schulich Leader: $80,000 awarded nationally to 50 students demonstrating academic excellence and leadership (2016-2020).
  - Hatch: $10,000 awarded on the basis of high academic standing and overall contribution to university life (2019).
  - Louis C. Ho: $7,000 awarded to students in high academic standing (2018).
  - Brodeur-Drummond $3,000 awarded to students in the top 5% of faculty (2017).
- **Academic**
  - Dean's Honour List (2017 - Present)

RESEARCH EXPERIENCE

Honours Thesis Candidate
Computational Aerodynamics Group
Jan 2019 – Present McGill University
- Project: Improving the numerical stability of higher order Discontinuous Galerkin (DG) magnetohydrodynamics (MHD) simulations by splitting the convective flux term.
- Using Finite Element Libraries in C++ to implement the discretization of MHD on supercomputers.
- Supervisor: Professor Siva Nadarajah.

Research Assistant
Biomimetics and Advanced Materials Group
May – Aug 2018 McGill University
- Investigated the morphing mechanics of ray-finned fish fins using techniques such as quasi-static loading, 3D reconstruction, and stereolithography (SLA) 3D printing.
- Developed analytical and finite-element models describing the mechanics of the fin.
- Developed a new material with high morphing capacity, applicable to future aircraft wings.
- Best poster award winner in advanced materials among other engineering research students.
- Supervisor: Professor François Barthelat.

Research Assistant
Shockwave Physics Group
May – Aug 2017 McGill University
- Fully designed and built a hypervelocity launcher capable of launching metallic jets up to 15 km/s.
- Worked with class 3R and 4 lasers, powell and convex lenses, filters, and photodetectors to assemble a jet detection mechanism.
- Used techniques such as Photon Doppler Velocimetry (PDV) and Schlieren photography.
- Supervisor: Professor Andrew J. Higgins.

Researcher
Biology Department
Jul – Aug 2016 York University
- Studied the memory and learning of honey bees.
- Performed memory experiments on more than 1,000 bees, and analyzed the data on Excel.
- Supervisor: Professor Amro Zayed.

Research Assistant
Molecular Biology Department
Mar 2016 Lunenfeld-Tanenbaum Research Institute

- Investigated protein signalling and transduction.
- Performed DNA extraction, gel electrophoresis, and cell culture experiments.
- Supervisor: Professor Jeff Wrana.

Research Intern
Physics and Astronomy Department
Jul – Aug 2015 York University
- Studied the spectra of low-ionization iron broad absorption line (FeLoBAL) quasars.
- Wrote a computer code that automated quasar spectra comparison for detecting changes in absorption and emission.
- Supervisor: Professor Patrick B. Hall.

Junior Researcher
Mathematics Department
Jan – May 2015 University of Toronto
- Researched the growth rate of Perron-Frobenius matrices and their relation to directed graphs.
- Worked on developing a lower bound on the growth rate of the matrices.
- Supervisor: Professor Kasra Rafi.

TEACHING EXPERIENCE

Co-Director and Lecturer
McGill Physics Olympiad Program
Sep 2017 – Present McGill University
- Conduct weekly 3-hour-long lectures for high school students covering university-level physics content.
- Provide challenging weekly problems for students to solve.
- Promote physics and STEM education to a diverse community of students.
- Aim to prepare students for prestigious physics competitions.

Course Assistant
MECH 309: Numerical Methods
Jan - Apr 2019 McGill University
- Held office hours and conducted a midterm exam review session.
- Co-wrote the midterm exam for the course.
- Assisted students with the course's coding projects.

Teaching Assistant
MATH 264: Advanced Calculus
Jan - Apr 2018 McGill University
- Held office hours to assist students with course problems.
- Conducted weekly tutorials consisting of problem solving.
- Received the highest teaching rating out of 3 TAs for the course.

Tomlinson Award Teaching Assistant
MECH 210: Mechanics 1
Jan - Dec 2018 McGill University
- Held weekly office hours to assist students with assignments.
- Conducted three two-hour review sessions for the course exams.

EXTRACURRICULARS

Vice President Academic
Engineering Undergraduate Society of McGill
May 2019 – Present McGill University
- Represent more than 3000 engineering undergraduates in faculty meetings.
- Manage over $0.5 million in academic funds and ensure their proper utilization.
- Resolve urgent academic conflicts.
- Delegate tasks to departmental VP Academics.

Vice President Academic
McGill Association of Mechanical Engineers
May 2018 – Apr 2019 McGill University
- Represented the Mechanical Engineering undergraduate students and voiced their academic concerns.
- Sat on curriculum review meetings intended to restructure the Mechanical Engineering undergraduate curriculum.
- Made substansial efforts to push the department for availability of lecture recordings in classes.
- Organized LaTeX and MATLAB workshops for undergraduate students.

Editor and Head of Technology
McGill Science Undergraduate Research Journal
Sep 2016 – Aug 2019 McGill University
- Edited scholarly articles submitted by students and contacted peer reviewers.
- Maintained consistent traffic on the journal's website.
- Used Adobe InDesign to design the layout and format of the journal.
- Organized the annual journal launch event with other editors.

CERTIFICATES

- **Laser Safety**: Able to work safely with class 4 and 3R lasers (2017).
- **Workplace Hazardous Materials Information System (WHMIS)** (2017).

LANGUAGES

- English (fluent).
- Farsi (fluent).
- French (beginner).