

Alicia Savelli

✉ aliciasavelli@gmail.com • 🌐 aliciasavelli.github.io

I am an undergraduate student currently in my final year of a Physics degree at Brock University with previous Bachelor's degrees in Mathematics and Education. I am extremely passionate about astronomy, physics, mathematics, research, and teaching, and have significant experience and skills to support me in a career in science. I am interested in the fields of cosmology, galaxy formation and evolution, and relativity.

Education

Brock University

B.Sc. Physics (Honours) 2020 – 2022

- 92% average in upper level courses (4.0 GPA on 4 point scale)
- 89% cumulative average (4.0 GPA on 4 point scale)
- Top 15% of faculty

Brock University

B.Sc. Mathematics (Honours), minor in Physics 2014 – 2019

- 93% average in upper level courses (4.0 GPA on 4 point scale)
- 88% cumulative average (4.0 GPA on 4 point scale)
- Top 15% of faculty

Brock University

B.Ed. 2014 – 2019

- Intermediate/Senior qualifications
- Straight P1s(As); 94% cumulative average (4.0 GPA on 4 point scale)

Notre Dame Catholic Secondary School

OSSD 2010 – 2014

- Ontario Scholar with 90% average in top six grade 12 courses

Research Experience

Undergraduate Thesis.....

Exploring the Possibility of Faster-than-Light Travel in Our Universe

Brock University

Supervisor: Prof. Barak Shoshany

2020 – 2021

- Using Mathematica and General Relativity to investigate the possibility of faster-than-light travel
- Extending the Alcubierre and Natario Warp Drive metrics to 5 spacetime dimensions
- Proposal, midterm, and final presentations to faculty and interested public along with written thesis submission

Research Projects.....

Galactic Archaeology using Milky Way Survey Data and Simulations

University of Toronto

Supervisors: Dr. Ted Mackereth & Dr. Josh Speagle

January – August 2022

Analogues of the Milky Way in Cosmological Simulations

University of Toronto

Supervisors: Dr. Ted Mackereth & Dr. Josh Speagle

Summer 2021

- Used Python and data from the EAGLE suite of cosmological simulations to identify and analyze Milky Way Analogues
- Determined a "Milky Way-ness" parameter and studied its effect on various properties of the MWAs both at present-day and throughout their formation histories
- Midterm and final presentations, academic poster, and research summary delivered to faculty and interested public

Publications

Warp drives without negative energy in 5 dimensions

Alicia Savelli & Barak Shoshany

In prep.

The connection between red spiral galaxies and Milky Way analogues in the EAGLE simulations

Alicia Savelli, Ted Mackereth & Josh Speagle

In prep.

Scholarships, Awards & Honours

Summer Undergraduate Research Program (SURP) Fellowship

Canadian Institute for Theoretical Astrophysics; Dunlap Institute for Astronomy & Astrophysics, \$9,595

2021

SURP Student Spotlight

Canadian Institute for Theoretical Astrophysics; Dunlap Institute for Astronomy & Astrophysics

2021

SURP Poster Contest – Runner Up

Canadian Institute for Theoretical Astrophysics; Dunlap Institute for Astronomy & Astrophysics

2021

Dean's Honour List

Brock University

2015, 2016, 2017, 2018, 2021

- Awarded to students with an 80% average or greater each academic year
- Received every year of B.Sc. (Math) & B.Sc. (Physics) degrees
- Additional distinction of top 15% of the faculty

Brock Scholars Award

Brock University, \$8,000

2014, 2015, 2016, 2017

- Entrance scholarship for incoming averages of 90% or greater
- \$2,000/year for a maximum of 4 years, renewed if average is maintained at 80% or greater

Ontario Scholar

Halton Catholic District School Board

2014

- Distinction for graduating students with an average of 79.5% or greater in top six grade 12 courses

Top Hat Marching Orchestra Scholarship

Top Hat Marching Orchestra, \$1,000

2014

French Second Language Award

Halton Catholic District School Board, \$50

2014

- Awarded to graduating student with the highest mark in a grade 12 French course

Conference Talks

SDSS-V 2021 Collaboration Meeting
Analogues of the Milky Way in Cosmological Simulations

Johns Hopkins University/Online
August 2021

AAS 239th Meeting [Expected]
Analogues of the Milky Way in Cosmological Simulations

Salt Lake City, UT
January 2022

Conference Posters

SDSS-V 2021 Collaboration Meeting
Analogues of the Milky Way in Cosmological Simulations

Johns Hopkins University/Online
August 2021

Teaching Experience

Secondary Teacher.....

Wembley High Technology College **London, UK**
Secondary Maths Teacher *September 2019 – July 2020*

- Taught five maths classes from the GCSE Foundation and Higher curricula to Key Stage 3 and Key stage 4 learners at various levels of academic achievement
- Developed and delivered engaging and differentiated lessons, managed classroom behaviour, regularly assigned and marked homework
- Year 9 form tutor
- Volunteered to participate in and organize extra curricular activities such as a tutoring club, a puzzles club, a maths news letter, and UKMT national maths challenges

St. John Henry Newman Catholic Secondary School (HWCD SB) **Stoney Creek, ON**
Physics Student Teacher *March – May 2019*

- B.Ed. Practicum
- Taught one SPH3U grade 11 university level physics class and two SPH4U grade 12 university level physics classes
- Entirely responsible for creating notes and lessons that delivered the curriculum, and developing and marking tests, quizzes, assignments, and lab experiments/reports
- Volunteered with the school's concert band and lunchtime and after-school tutoring/homework clubs

Cathedral High School (HWCD SB) **Hamilton, ON**
Math Student Teacher *November – December 2018*

- B.Ed. Practicum
- Taught one MPM1D grade 9 academic level math class and one MCR3U grade 11 university level math class
- Entirely responsible for creating notes and lessons that delivered the curriculum, and developing and marking tests, quizzes, and assignments
- Volunteered with the after-school homework club

Primary Teacher.....

Prince of Wales South Public School (NDSB) **Thorold, ON**
Student Teacher *October 2015 – March 2016*

- B.Ed. Practicum
- Delivered Levelled Literacy Intervention (LLI) program

- Helped students of all ages advance their reading levels in small groups of three to four students

Professional Primary, Secondary, & Post-Secondary Tutor.....

Oxford Learning Centres Inc.

Burlington & Stoney Creek, ON

Teacher

May 2017 – Present

- Tutor in groups of one to three high school students, and occasionally students at the college or primary levels
- Specialize in intermediate and senior level math, calculus, data management, and physics, but also tutor students in chemistry, general science, English, French, and more

Private Tutor

Independent Private Tutor

2014 – Present

- One-on-one private tutoring in all levels and categories of secondary math and science and first-year math and physics

Other.....

Education Quality and Accountability Office (EQAO)

Etobicoke, ON

Scorer

July 2019

- Scored academic- and applied-level grade 9 math EQAO tests

Bay Area Science and Engineering Fair (BASEF)

Hamilton, ON

Judge

March 2019

- Interviewed students and scored projects

Brock University Mathematics Department

St. Catharines, ON

Exam Proctor

2015-2016

- Proctored first-year math midterms and final exams

Other Relevant Work Experience

McDonalds Canada

Burlington, ON

Team Leader, Crew

2013 – 2019

- Responsibilities included area and shift management, customer service, order taking & filling, and birthday parties
- Transferable skills to research and education include strong leadership & team management, collaboration, time management, stress management, organization, and communication

ArcelorMittal Dofasco

Hamilton, ON

Data Analyst

Summer 2018

- Developed and enhanced queries and data reports to improve company efficiency, wrote macros to supplement reports
- Enhanced technical skills with Visual Basic, SQL, MS Excel, and MS Access

Workshops, Training, & Professional Development

Introduction to Python

University of Toronto

Student

May 2021

- 2-week intensive introductory course to coding and data analysis with Python
- Covered topics such as advanced plotting, statistical analysis, and machine learning

SURP Astro 101 Lecture Series

University of Toronto

Summer Research Student

Summer 2021

- Summer series of weekly introductory astronomy lectures
- Topics covered included planets & exoplanets, galaxy formation & evolution, instrumentation, statistics, cosmology, and black holes

SURP Professional Development Series

University of Toronto

Summer Research Student

Summer 2021

- Summer series of weekly professional development workshops and seminars
- Topics covered included careers in astronomy, grad school applications and experiences, and presenting research

Shutdown STEM

University of Toronto

Attendee

July 2021

- Day-long workshop within the Astronomy & Astrophysics department pertaining to action against racism with a special focus on Indigenous peoples
- Workshop included presentations, discussions, and activities such as researching and letter-writing

SAFETALK Mental Health Training

Brock University

Attendee

March 2018

- Training in speaking to young people about their mental health and the best ways to be available and offer support
- Awarded certificate

Relevant Coursework

- **Astronomy:** Introduction to Astronomy
- **Physics:** Classical Mechanics, Electromagnetism, Quantum Mechanics, Statistical Mechanics & Thermal Physics, Optics, Special & General Relativity, Experimental Physics
- **Mathematics:** Calculus, Vector Calculus, Differential Equations, Linear Algebra, Statistics, Mathematical Physics, Differential Geometry
- **Computer Programming:** Mathematics Integrated with Computers and Applications I/II/III, Introduction to Scientific Computing
- **Education:** Mathematics, Physics, Diversity, Special Education

Technical & Personal Skills

- **Programming Languages:** Python, Visual Basic, SQL, Physica, Extrema
- **Software:** Maple, Mathematica, L^AT_EX, Git
- **Operating Systems:** Windows, Linux
- **Professional Skills:** Teaching, writing, presenting
- **Personal Skills:** Enthusiasm, organization, communication, time management, leadership, collaboration, perseverance, diligence

Professional Memberships

Ontario College of Teachers (OCT)

Member ID: 698209

2019 – Present

Extracurricular Activities

Burlington Concert Band <i>1st Clarinet</i>	Burlington, ON 2018-2019
Brock University Winds Ensemble <i>2nd Clarinet</i>	St. Catharines, ON 2014-2018
Brock Intramural Sports <i>Soccer, Softball, Volleyball</i>	Brock University 2016-2018

Media Appearances

SURP Project Showcase <u><i>Poster, Research Summary</i></u>	2021
SURP Student Spotlight <u><i>Student of the Week interview</i></u>	2021
A university mathematics department's adoption of constructionist math courses <u><i>MICA Project interview</i></u>	2017