

Alicia M. Savelli | Curriculum Vitae

✉ alicia.savelli@mail.utoronto.ca • 🌐 aliciasavelli.github.io

Last updated: July 26, 2022

I am a first year graduate student at the University of Toronto in the department of Astronomy & Astrophysics. I come from a unique background as a secondary math and physics teacher before I became an undergraduate research assistant. 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

University of Toronto

PhD Astronomy & Astrophysics

2022 – 2027

Brock University

B.Sc. Physics (Honours)

2020 – 2022

- 93% average in upper year courses (4.0 GPA on 4 point scale)
- 90% cumulative average (4.0 GPA on 4 point scale)
- Top 15% of faculty every year
- Completed as a second degree (10.0 credits transferred from B.Sc. in Mathematics + 10.0 new credits in 2 years)

Brock University

B.Sc. Mathematics (Honours), minor in Physics

2014 – 2019

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

Brock University

B.Ed.

2014 – 2019

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

Research Experience

Undergraduate Thesis

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

Brock University

Supervisor: Prof. Barak Shoshany

October 2020 – February 2022

- Used General Relativity and Mathematica to investigate the possibility of faster-than-light travel
- Extended the Alcubierre Warp Drive metric to 5 spacetime dimensions
- Proposal, midterm, and final presentations to faculty and interested public along with written thesis submission
- Received additional credit for quality and quantity of research

Research Projects

Characterizing Analogues of the Milky Way in Cosmological Simulations

University of Toronto

Supervisors: Dr. Ted Mackereth & Prof. Josh Speagle

Summer 2021, Winter & Summer 2022

- Used Python and data from the EAGLE suite of cosmological simulations and Illustris TNG300 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 in 5 dimensions

Alicia Savelli & Barak Shoshany

In prep. (expected July 2022)

Characterizing Analogues of the Milky Way in Cosmological Simulations

Alicia Savelli, Ted Mackereth & Josh Speagle

In prep.

Scholarships, Awards & Honours

Queen Elizabeth II Graduate Scholarship in Science & Technology

University of Toronto, Department of Astronomy & Astrophysics, \$15,000

2022 – 2023

Summer Undergraduate Research Program (SURP) Fellowship

Dunlap Institute for Astronomy & Astrophysics, \$9,690

2022

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, 2022

- 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

CUPC 2022 [Expected]

Warp Drives in 5 Dimensions

University of Guelph

October 2022

AAS 239th Meeting [Cancelled]

Analogues of the Milky Way in Cosmological Simulations

Salt Lake City, UT

January 2022

Conference Posters

Linking the Galactic and Extragalactic [Expected]
Characterizing Milky Way Analogues in Cosmological Simulations

Wollongong, Australia
December 2022

CASCA 2022
Characterizing Milky Way Analogues in Cosmological Simulations

University of Waterloo/Online
May 2022

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
Secondary Maths Teacher

London, UK
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)
Physics Student Teacher

Stoney Creek, ON
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)
Math Student Teacher

Hamilton, ON
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)
Student Teacher

Thorold, ON
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.
Teacher

Burlington & Stoney Creek, ON
May 2017 – June 2022

- Tutored in groups of one to three high school students, and occasionally students at the college or primary levels

- Specialized in intermediate and senior level math, calculus, data management, and physics, but also tutored 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)

Scorer

Etobicoke, ON

July 2019

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

Brock University Mathematics Department

Exam Proctor

St. Catharines, ON

2015-2016

- Proctored first-year math midterms and final exams

Other Relevant Work Experience

ArcelorMittal Dofasco

Data Analyst

Hamilton, ON

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

Outreach Experience

Scientifically Yours

Project Leader

Brock University

May 2022

- Designed and co-led *Relatively Yours* workshop – an introduction to Special Relativity and spacetime diagrams for high school students
- Led scavenger hunt

Bay Area Science and Engineering Fair (BASEF)

Judge

Hamilton, ON

March 2019

- Interviewed students and scored projects

Selected Workshops, Training, & Professional Development

Introduction to Python

Student

University of Toronto

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

Summer Research Student

University of Toronto

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

Summer Research Student

University of Toronto

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

Attendee

University of Toronto

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, Planetary Science
- **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 (3 part course taken over 3 years), 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, curiosity, 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

1st Clarinet

Burlington, ON

2018-2019

Brock University Winds Ensemble

2nd Clarinet

St. Catharines, ON

2014-2018

Brock Intramural Sports

Soccer, Softball, Volleyball

Brock University

2016-2018

Media Appearances

SURP Project Showcase

Poster, Research Summary

2021

SURP Student Spotlight

Student of the Week interview

2021

