

Daniella Morrone

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I am a 4th year undergraduate student at the University of Toronto, pursuing an Astronomy & Physics Specialist and minors in both Mathematics and French Language. I am an aspiring early career researcher who is passionate about astronomy and has significant experience and skills to support a career in research. My research interests include exoplanets, galaxy formation and evolution, and cosmology.

Education

University of Toronto

H.B.Sc. Astronomy & Physics Specialist, Minors in Mathematics and French Language

2018 – 2023

- 88% average in astronomy courses (3.80 GPA on 4 point scale)
- 84% average in upper level courses (3.64 GPA on 4 point scale)

Bishop Allen Academy Catholic Secondary School

OSSD

2014 – 2018

- Ontario Scholar with 92% average in top six grade 12 courses
- Completed 12 courses and 4 examinations in the Advanced Placement program

Research Experience

Undergraduate Thesis

Mapping the Mass-Light Evolution of Galaxies in the Hubble eXtreme Deep Field (XDF) and SIMBA Simulations

University of Toronto

Fall 2021 & Winter 2022

Advisors: Dr. Kartheik Iyer & Dr. Lamiya Mowla

Super-advisor: Dr. Yanqin Wu

- Measures morphological parameters of galaxies in the XDF and SIMBA suite of simulations
- Applied and optimized previously developed pipeline to yield the mass-light relationship of observed and simulated galaxies
- Participated in 3 interim talks and a final report delivered to Super-advisor

Summer Research

Measuring Galaxy Morphology in Simulations and Observations

University of Toronto

Supervisors: Dr. Kartheik Iyer & Dr. Lamiya Mowla

Summer 2021

- Measured morphological parameters of galaxies in the SIMBA suite of simulations
- Developed a pipeline to measure morphological characteristics of simulated and observed galaxies
- Participated in midterm and final presentations, created an academic poster and a research summary delivered to Faculty and interested public

Behavioural and Pathological Characterization of Prodromal Alzheimer's Disease in TgF344-AD Rat Model

Sunnybrook Research Institute

Supervisor: Dr. JoAnne McLaurin

Summer 2019

- Performed experiments and data analysis in a laboratory setting
- Characterized behaviour and pathology of prodromal Alzheimer's Disease in a rat model
- Participated in a final presentation, created an academic poster and a research summary

Scholarships, Awards & Honours

Walter John Helm Scholarship in Astronomy and Astrophysics

University of Toronto, \$1,763.43

2021

Summer Undergraduate Research Program (SURP) Fellowship

Dunlap Institute for Astronomy & Astrophysics, \$9,595

2021

SURP Student Spotlight

Dunlap Institute for Astronomy & Astrophysics 2021

Sunnybrook Research Institute (SRI) Summer Student Research Program

Sunnybrook Research Institute, \$6,978 2019

Ontario Scholar

Toronto Catholic District School Board 2018

- Distinction for graduating students with an average of 80% or greater in top six grade 12 courses

Advanced Placement with Honor Award

Advanced Placement College Board 2018

- Recognition for attaining an average score of at least 3.25 (on a 4 point scale) on all AP Exams taken and scores of 3.0 or higher on four or more exams

Subject Award in Grade 12 Religious Education

Bishop Allen Academy Catholic Secondary School 2018

Extended French Certificate with Specialization

Toronto Catholic District School Board 2018

- Distinction for graduating students having taken a minimum of seven Extended French credits, of which four are French Language credits and three are other credits in French

Instrumental Music Certificate with High Distinction

Bishop Allen Academy Catholic Secondary School 2018

- Completed four years of Instrumental Music Courses with Distinction

Presentations

Invited & Public Talks

SDSS-V 2021 Collaboration Meeting

Decoding galaxy evolution through the lens of galaxy morphology.

Johns Hopkins University/Online

August 2021

SURP Midterm Presentation

What does morphology tell us? Understanding galaxy evolution through the lens of galaxy shapes and sizes.

University of Toronto/Online

July 2021

Vitrine de savoirs 2021 - Sprint-présentations de la relève en recherche

Que nous dit la morphologie des galaxies? Procédure pour identifier les lacunes dans nos simulations actuelles.

L'Acfas/Online

June 2021

Conference Posters

SURP Poster Presentation

What does morphology tell us? Employing galaxy morphology to decode galaxy evolution.

University of Toronto/Online

August 2021

SDSS-V 2021 Collaboration Meeting

What does morphology tell us? Employing galaxy morphology to decode galaxy evolution.

Johns Hopkins University/Online

August 2021

407 ETR Summer Student Poster Competition

Behavioural and Pathological Characterization of Prodromal Alzheimer's Disease in TgF344-AD Model.

Sunnybrook Research Institute

August 2019

Teaching Experience

Teaching Assistant

AST201: Stars and Galaxies

University of Toronto

Winter 2022

Teaching Assistant

AST101: The Sun and Its Neighbours

University of Toronto

Fall 2021

Other Relevant Work & Volunteer Experience

AstroTours

Volunteer

- Gave a virtual tour of New Horizons Space Probe
- Discussed the science motivation and different instruments of the probe

University of Toronto

December 2021

St. Mike's Grad Week

Panel Moderator

- Graduate program panels and alumni panels regarding life after graduation
- Moderated the Math & Physical Sciences Alumni Panel

University of Toronto

October 2021

USMC Student Union Mental Health & Accessibility Committee

Committee Member

- Work alongside the St. Michael's College (USMC) Student Union VP Mental Health & Accessibility
- Promote and develop mental health & accessibility initiative; plan events, socials and workshops
- Collaborate with other students groups to increase the visibility of mental health & accessibility resources

University of Toronto

Fall 2021 & Winter 2022

USMC Mentorship Program

Mentor, Academic Representative

- Help mentees in a similar program/faculty/study-area regarding program-specific concerns
- Help to organize Professional Development Seminars in the Program
- Leaders in a Registered Study Group & Learning communities project within the program

University of Toronto

Fall 2021 & Winter 2022

USMC Orientation

Leader

- Orient first years into university life, run and moderate events online and in-person
- In 2021, moderated an academic panel (online) and lead a campus tour (in-person)

University of Toronto

Summer 2019, 2020, 2021

USMC Student Union Formal Committee

Member

- Work alongside the VP Community Life on the USMC Student Union to plan and execute the USMC Formal
- Worked specifically on promotional aspects of planning the event

University of Toronto

Winter 2020

Mentorship

Mentor.....

Ruchira Ray Verma – Mentee

USMC Mentorship Program

University of Toronto

Fall 2021 & Winter 2022

Erica Rose – Mentee

USMC Mentorship Program

University of Toronto

Summer 2021 - Winter 2022

Jing-Zu Tate Li – Mentee

USMC Mentorship Program

University of Toronto

Summer 2021 - Winter 2022

Joshua Thoppil – Mentee

USMC Mentorship Program

University of Toronto

Summer 2021 - Winter 2022

Jou Glasheen – Mentee

USMC Mentorship Program

University of Toronto

Summer 2021 - Winter 2022

Megh Agarwal – Mentee

USMC Mentorship Program

University of Toronto

Summer 2021

Mentee.....

Simran Nerval – Mentor

Astronomy & Astrophysics Undergraduate Mentorship Program

University of Toronto

Fall 2021 & Winter 2022

Jacob Taylor – Mentor

Astronomy & Astrophysics Undergraduate Mentorship Program

University of Toronto

Fall 2020 & Winter 2021

Workshops, Training, & Professional Development

Teaching Assistants' Training Program

University of Toronto

Trainee - Teaching Assistant

September 2021

- Completed modules in Grading, Quercus Training, Policies & Procedures
- Topics covered include instructional techniques, general online/remote teaching strategies, time management, communicating with students, effective student support.

SURP Astro 101 Lecture Series

University of Toronto

Attendee - Summer Research Student

Summer 2021

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

SURP Professional Development Series

University of Toronto

Attendee - Summer Research Student

Summer 2021

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

Call it out: racism, racial discrimination & human rights

Ontario Human Rights Commission

Trainee - Orientation Leader, Mentor

July 2021

- Foundation for learning about race, racial discrimination and human rights protections under Ontario's Human Rights Code.
- Historical overview of racism and racial discrimination, explains what "race," "racism" and "racial discrimination" mean, and provides approaches to preventing and addressing racial discrimination.

LivingWorks Start

LivingWorks

Trainee - Orientation Leader, Mentor

July 2020, 2021

- Teaches how to recognize suicidal behaviours and refer others to help and support.
- Series of real life scenarios and interactive modules.

Identify, Assist, Refer Education Module

University of Toronto

Trainee - Orientation Leader, Mentor

July 2020, 2021

- Addresses identification of mental illnesses and methods of assisting and referring to resources.

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.
- Included presentations, discussions, and activities such as researching and letter-writing.

Introduction to Computational Astrophysics

University of Toronto

Student

May 2021

- 2-week intensive introductory course to coding and data analysis with Python, instructed by Dr. Norman Murray.
- Covered topics such as advanced plotting, statistical analysis, and machine learning.

Equity & Diversity Training

University of Toronto

Trainee - Orientation Leader

July 2020

- Learned how to create virtual and physical spaces that are inclusive and equitable for all.
- Explored ways to become advocates for one another in seeking equity.

Relevant Coursework

- **Astronomy:** Astronomy Research, Computational Astrophysics, Introduction to Astrophysics
- **Physics:** Classical & Quantum Mechanics, Electricity & Magnetism, Thermal Physics
- **Mathematics:** Ordinary & Partial Differential Equations, Complex Variables, Multivariable Calculus
- **Computer Programming:** Introduction to Computational Astrophysics

Technical & Personal Skills

- **Programming Languages:** Python, HTML
- **Software:** L^AT_EX, Git
- **Operating Systems:** macOS, Windows
- **Spoken Languages:** English (Native or bilingual proficiency), French (Working proficiency)

Extracurricular Activities

Pair-A-Dice Board Game Club

General Member

University of Toronto

Fall 2019 & Winter 2020

Vocal & Instrumental Jazz Bands

1st & 2nd Trumpet

Bishop Allen Academy

Winter 2014 - Winter 2018

Concert Band

1st & 2nd Trumpet

Bishop Allen Academy

Winter 2014 - Winter 2018

Media Appearances

SURP Project Showcase

Poster & Research Summary

2021

SURP Student Spotlight

Student of the Week interview

2021

Meet the SMC Mentorship Team 2021-2022

Facebook & Instagram

2021

Abstract for *Vitrine des savoirs 2021*

Event program

2021