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   **University of Toronto**
eXtreme Deep Field (XDF) and SIMBA Simulations   *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   **Sunnybrook Research Institute**
Alzheimer's Disease in TgF344-AD Rat Model   *Summer 2019*
Supervisor: Dr. JoAnne McLaurin

- 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

Undergraduate Research Conference   **University of Toronto**
(**UPCOMING**) *Mapping galaxy evolution using morphology.*   *January 2022*

SDSS-V 2021 Collaboration Meeting   **Johns Hopkins University/Online**
Decoding galaxy evolution through the lens of galaxy morphology.   *August 2021*

SURP Midterm Presentation   **University of Toronto/Online**
What does morphology tell us? Understanding galaxy evolution through the   *July 2021*
lens of galaxy shapes and sizes.

Vitrine de savoirs 2021 - Sprint-présentations de la relève en recherche   **L'Acfas/Online**
Que nous dit la morphologie des galaxies? Procédure pour identifier les lacunes   *June 2021*
dans nos simulations actuelles.

Conference Posters

SURP Poster Presentation   **University of Toronto/Online**
What does morphology tell us? Employing galaxy morphology to decode   *August 2021*
galaxy evolution.

SDSS-V 2021 Collaboration Meeting   **Johns Hopkins University/Online**
What does morphology tell us? Employing galaxy morphology to decode   *August 2021*
galaxy evolution.

407 ETR Summer Student Poster Competition   **Sunnybrook Research Institute**
Behavioural and Pathological Characterization of Prodromal Alzheimer's   *August 2019*
Disease in TgF344-AD Model.

Teaching Experience

Teaching Assistant   **University of Toronto**
AST201: Stars and Galaxies   *Winter 2022*

Teaching Assistant   **University of Toronto**
AST101: The Sun and Its Neighbours   *Fall 2021*

Other Relevant Work & Volunteer Experience

AstroTours   **University of Toronto**
Volunteer   *December 2021*
  – Gave a virtual tour of New Horizons Space Probe
  – Discussed the science motivation and different instruments of the probe

St. Mike's Grad Week   **University of Toronto**
Panel Moderator   *October 2021*
  – Graduate program panels and alumni panels regarding life after graduation
  – Moderated the Math & Physical Sciences Alumni Panel

USMC Student Union Mental Health & Accessibility Committee   **University of Toronto**
Committee Member   *Fall 2021 & Winter 2022*
  – Work alongside the St. Micheal'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

USMC Mentorship Program   **University of Toronto**
Mentor, Academic Representative   *Fall 2021 & Winter 2022*
  – 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

USMC Orientation   **University of Toronto**
Leader   *Summer 2019, 2020, 2021*
  – 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)

USMC Student Union Formal Committee   **University of Toronto**
Member   *Winter 2020*
  – Work alongside the VP of Community Life on the USMC Student to plan and execute the USMC Formal event
  – Worked specifically on promotional aspects of planning the event

Mentorship

Mentor

Ruchira Ray Verma – Mentee   **University of Toronto**
USMC Mentorship Program   *Fall 2021 & Winter 2022*

Erica Rose – Mentee   **University of Toronto**
USMC Mentorship Program   *Summer 2021 - Winter 2022*

Jing-Zu Tate Li – Mentee   **University of Toronto**
USMC Mentorship Program   *Summer 2021 - Winter 2022*

Joshua Thoppil – Mentee   **University of Toronto**
USMC Mentorship Program   *Summer 2021 - Winter 2022*

Jou Glasheen – Mentee   **University of Toronto**
USMC Mentorship Program   *Summer 2021 - Winter 2022*

Megh Agarwal – Mentee   **University of Toronto**
USMC Mentorship Program   *Summer 2021*

Mentee

Simran Nerval – Mentor   **University of Toronto**
Astronomy & Astrophysics Undergraduate Mentorship Program   *Fall 2021 & Winter 2022*

Jacob Taylor – Mentor   **University of Toronto**
Astronomy & Astrophysics Undergraduate Mentorship Program   *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:** LaTeX, Git
- **Operating Systems:** macOS, Windows
- **Spoken Languages:** English (Native or bilingual proficiency), French (Working proficiency)

Extracurricular Activities

Pair-A-Dice Board Game Club   **University of Toronto**
General Member   *Fall 2019 & Winter 2020*

Vocal & Instrumental Jazz Bands   **Bishop Allen Academy**
1st & 2nd Trumpet   *Winter 2014 - Winter 2018*

Concert Band   **Bishop Allen Academy**
1st & 2nd Trumpet   *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*