GABRIEL SASSEVILLE

Masters student in Astrophysics

@ gabriel.sasseville@umontreal.ca   ● Montreal, Canada   in gabrielsasseville   ◯ GabrielSasseville01
R Gabriel-Sasseville

PROFILE

🎓 Excellent academic and research record   🎤 Scientific teaching and popularization experience   👥 Involved in the academic/non-academic community

An enthusiastic and hardworking student, with a passion for machine learning and its applications to real-world problems. Currently pursuing a Master's Degree in Astrophysics where I am developing machine learning algorithms for asynchronous time series data interpolation.

EDUCATION

M.Sc. in Physics - Machine Learning for Asynchronous Time Series Interpolation of Astrophysical Data

Co-supervision with Julie Hlavacek-Larrondo (University of Montreal) and Daryl Haggard (McGill University) (GPA 4.10/4.30)

📅 August 2023 – August 2025

Relevant courses:
– INF 8245E: Machine Learning

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B.Sc. in Physics and Computer Science

University of Montreal (GPA 4.14/4.30)

📅 Sept 2020 – May 2023

Relevant courses:
– PHY 3051: Modern Data Analysis in Physics
– PHY 3214: Advanced Statistical Mechanics
– PHY 3075: Numerical Modelling in Physics
– IFT 2505: Introduction to Numerical Algorithms
– IFT 2015: Data Structures
– IFT 2505: Linear Optimization
– IFT 1025: Advanced Object-Oriented Programming

RESEARCH EXPERIENCE

Research Internship in High-Energy Astrophysics - Bayesian Inference Problems

Physics Department University of Montreal
Ciela Institute supervised by Julie Hlavacek-Larrondo

📅 May 2022 – August 2022   ● Montreal, Canada

– Defining a hierarchical generalized linear model to fit the M-sigma relation while including upper limits
– Stan programming for Bayesian Inference and MCMC sampling
– Python/R programming for data analysis
– Writing a scientific article for publishing

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Research Internship in Numerical Biophysics - Drug Discovery

Physics Department University of Montreal
Normand Mousseau's Research Group

📅 May 2021 – August 2021   ● Montreal, Canada

– Use of Compute Canada's supercomputers for various calculations
– Molecular dynamics simulations for two projects: SARS-CoV-2 and Alzheimer's disease

- Python/C/Bash programming for numerical simulations and data analysis
- Writing a scientific article for publishing

Research project in Photodynamic Therapy
Mathematics Department of Cégep de l'Outaouais

📅 January 2019 – May 2019   📍 Gatineau, Canada

- Model conceptualization and simulation with CrossLight
- Employing the variation of parameters method
- Model optimization
- Data analysis using MatLab

Astronomical Observation and Instrumentation Assistant
Mont Mégantic Observatory

📅 June 2022 – Now   📍 Notre-Dame-Des-Bois, Canada

- Conducting scientific observations with the 1.6 meter telescope
- Learning to use and analyze data from CPAPIR and PESTO instruments
- Training summer interns to use the instruments

TEACHING EXPERIENCE

Teaching Assistant for Advanced Electromagnetics PHY 2441
University of Montreal

📅 January 2024 - May 2024   📍 Montreal, Canada

- Assist in the development and preparation of course materials such as assignments and practical work
- Provide guidance and support to students in understanding course concepts and solving problems
- Hold office hours to address individual student questions and concerns
- Conduct review sessions and tutorials to reinforce key concepts covered in class
- Assist in grading assignments, exams, and other assessments, providing constructive feedback to students

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Class on Bayesian Inference and MCMC in Astrophysics
Brebeuf College

📅 August 2022   📍 Montreal, Canada

- Preparing a class for high school level physics and computer science

PUBLICATIONS

📄 Peer-Reviewed

- Haddad, M., Gaudreault, R., Sasseville, G., Nguyen, P. T., Wiebe, H., Van De Ven, T., … Ramassamy, C. (2022). Molecular Interactions of Tannic Acid with Proteins Associated with SARS-CoV-2 Infectivity. *International Journal of Molecular Sciences*, *23*(5), 2643. Number: 5 Publisher: Multidisciplinary Digital Publishing Institute. doi:10.3390/ijms23052643

- Sasseville, G., Hlavacek-Larrondo, J., C. Berek, S., M. Eadie, G., Lee Rhea, C., Springford, A., Mezcua, M., Haggard, D. (2024). A novel approach to understanding the link between supermassive black holes and host galaxies. Under review.
- Hlavacek-Larrondo, J. (PI), Rhea, C. (CoI), …, Sasseville, G. (CoI), … Tremblay, G. R. (2024). Mapping a Black Hole Accretion Flow with JWST/NIRSpec. Accepted JWST Cycle 3 Proposal. Link here.

HONORS AND AWARDS

🏛 Research Scholarship 🎓 Academic Excellence 🏆 Award

🎓	**Excellence Scholarship for Graduate Studies - 5000$ CAD** J.A. DeSève	**2024**
🎓	**Excellence Scholarship for Artifical Intelligence Research - 10 000$ CAD** Hydro-Quebec	**2024**
🎓	**Excellence Scholarship for DIRO graduates - 1000$ CAD** Department of Computer Sciences and Operations Research (DIRO), University of Montreal	**2023**
🏛	**Master's Research Scholarship - 40 000$ CAD** Fonds de Recherche Du Québec (FRQNT)	**2023-2025**
🏛	**Canada Graduate Scholarships for Master's - 17 500$ CAD** Natural Sciences and Engineering Research Council of Canada (NSERC)	**2023-2024**
🎓	**Recipient of the Bursary of Excellence - 1000$ CAD** Department of Computer Science and Operations Research (DIRO), University of Montreal	**2022**
🎓	**Excellence Scholarship from DIRO Graduates and Professors - 2000$ CAD** Department of Computer Science and Operations Research (DIRO), University of Montreal	**2022**
🏛	**Supplements of the NSERC Undergraduate Student Research Awards bursary - 1500$ CAD** Natural Sciences and Engineering Research Council of Canada (NSERC)	**2022**
🏛	**Undergraduate Student Research Awards bursary - 6000$ CAD** Natural Sciences and Engineering Research Council of Canada (NSERC)	**2022**
🏛	**Laureate of the Undergraduate Introduction to Research Scholarship - 6500$ CAD** Institute for Data Valorization (IVADO)	**2022**
🎓	**Excellence Mention** University of Montreal	**2020-2023**

SCIENTIFIC COMMUNICATION

🔊 Scientific Talk 🖽 Posters

🖽	**E-Poster entitled "Understanding the link between supermassive black holes and their host galaxies"** European Astronomical Society	**July 2024**
🔊	**Talk entitled "Interpolating Sagittarius A* multi-wavelength data using machine learning"** Harvard CfA. Click here for the video.	**June 2024**
🔊	**Talk entitled "Understanding the link between supermassive black holes and their host galaxies"** Centre for Research in Astrophysics of Quebec annual meeting	**May 2024**
🔊	**Presentation entitled "AI for understanding the supermassive black hole at the center of the Milky Way"** IVADO Digital Futures event. Click here for the video.	**March 2024**
🔊	**Interview on Black Hole Physics and Hawking Radiation** Quebec Science magazine, interviewed by Marine Corniou	**December 2023**
🔊	**Presenting the scientific paper: First Detection of an Over-Massive Black Hole Galaxy: UHZ1 – Evidence for Heavy Black Hole Seeds From Direct Collapse?** Depqartment of Physics, University of Montreal	**October 2023**
🔊	**Video presentation entitled "Applying a new Bayesian statistical model to better understand supermassive black holes"** Association Francophone pour le Savoir (ACFAS). Click here to view the video.	**May 2023**
🖽	**Poster presentation on fitting the M-sigma relation with a Bayesian lognormal hurdle model** Annual Symposium of Physics for a Future in Research and Industry (SAPHARI)	**March 2023**
🔊	**Presentation on fitting the M-sigma relation with a Bayesian lognormal hurdle model** Daryl Haggard's research group	**September 2022**

VOLUNTEERING AND LEADERSHIP ACTIVITIES

👥 Committee Position 🖑 Volunteering

Member of SAPHARI committee   September 2023 - Now
Organization of a 3 day physics event with conferences from academics and companies

Volunteer at Astronomy on Tap   September 2023 - Now
Volunteer and astronomy science presenter for the general public

Volunteer at Cafe Planck   January 2023 - Now
Volunteering at the student cafe

Mentor for the Student Life Mentorship Program   August 2022 - May 2023
Mentoring new students at University of Montreal

Volunteer at La Place Commune   September 2022 - January 2023
Solidarity cooperative cafe aimed at offering a workspace in a low-income neighbourhood

Vice President of Annual Physics Games (JDLP) Committee   August 2022 - January 2023
Participating Universities :
- University of Montreal
- Polytechnique of Montreal
- McGill University
- Concordia University
- Laval University

Volunteer for the Orientation Week   August 2021 and August 2022
Organize activities to welcome new students in Physics at University of Montreal

Volunteering for the Hundredth Annivesary of Physics at University of Montreal event   October 2021
Help with the organization of the event, including activities and conferences

ADDITIONAL TRAININGS AND SUMMER SCHOOLS

Machine Learning in Astrophysics Summer School
📅 June 2024   📍 Center for Research in Astrophysics of Quebec, Montreal, Canada

AstroAI Workshop
📅 June 2024   📍 Center for Astrophysics Harvard and Smithsonian, Boston, USA

Generative Flow Networks (GFlowNets) Workshop by Yoshua Bengio
📅 November 2023   📍 Mila Institute, Montreal, Canada

Centre for Research in Astrophysics of Quebec (CRAQ) Summer School on Cosmology
📅 June 2022   📍 McGill University, Canada

Canadian Astronomical Society (CASCA) Summer School
📅 June 2022   📍 Montreal, Canada

TimeWorld Artificial Intelligence Congress
📅 May 2022   📍 University of Montreal, Canada

Quebec Network for Advanced Materials (RQMP) Summer School on Computing in Materials Science
📅 August 2021   📍 Montreal, Canada

SHARCNET Summer School on Advanced Research Computing

📅 June 2021   📍 Montreal, Canada

Calcul Quebec Summer School on Data Science and Parallel Computing

📅 May 2021   📍 Montreal, Canada

PROJECTS

PolyHacks Hackathon

📅 February 2023   📍 Polytechnique of Montreal, Canada

PolyHacks Hackathon

📅 February 2022   📍 Polytechnique of Montreal, Canada

Click here to view this project

McGill Physics Hackathon

📅 October 2021   📍 McGill University, Canada

Click here to view this project

MyVision McGill and Agorize Case Competition

📅 September 2019 - November 2019   📍 McGill University, Canada

Competition organized by RBC/Microsoft/ITAC on "How to use technology for social good"

LANGUAGES

English
French
Spanish

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