

GABRIEL SASSEVILLE

PhD student in Computer Science at Mila

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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 PhD in Computer Science at Mila where I am developing symbolic reasoning methods for symbolic regression in the context of scientific equation discovery. I am currently leveraging LLM reasoning capabilities for this task.

EDUCATION

PhD in Computer Science - Symbolic Regression by Reinforcement Learning with Human Feedback

Supervised by Pierre-Luc Bacon at Mila Institute - University of Montreal (GPA X/4.30)

 September 2025 - Present

Relevant courses:

- IFT 6162 - Reinforcement Learning and Optimal Control
- IFT 6757 - Autonomous Vehicles, Introduction to Robotics

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

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

Artificial Intelligence Research Internship - LSTM for Hydrology

Environment and Climate Change Canada

 January 2025 – August 2025

 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

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

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

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

- Sasseville, G., Hlavacek-Larrondo, J., Berek, S. C., Eadie, G. M., Rhea, C. L., Springford, A., ... Haggard, D. (2024). A Novel Approach to Understanding the Link between Supermassive Black Holes and Host Galaxies. *The Astrophysical Journal*, 978(1), 48. Publisher: The American Astronomical Society. doi:10.3847/1538-4357/ad93d4
- 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
- Hlavacek-Larrondo, J. (PI), Rhea, C. (Col), ..., Sasseville, G. (Col), ... 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

 Computer Science PhD Entrance Scholarship - 2500\$	2025
Department of Computer Sciences and Operations Research (DIRO), University of Montreal	
 Richard J. Schmeelk Canada Fellowship - 10 000\$	2025
Schmeelk Canada Foundation	
 PhD Research Scholarship - 120 000\$ CAD	2025-2028
Natural Sciences and Engineering Research Council of Canada (NSERC)	
 Recipient of Doctoral Research Scholarship - 100 000\$ CAD - Declined	2025-2029
Fonds de Recherche Du Québec (FRQNT)	
 Excellence Scholarship for Graduate Studies - 5000\$ CAD	2024
J.A. DeSève	
 Excellence Scholarship for Artifical Intelligence Research - 10 000\$ CAD	2024
Hydro-Quebec	
 Excellence Scholarship for DIRO graduates - 1000\$ CAD	2023
Department of Computer Sciences and Operations Research (DIRO), University of Montreal	
 Master's Research Scholarship - 40 000\$ CAD	2023-2025
Fonds de Recherche Du Québec (FRQNT)	
 Canada Graduate Scholarships for Master's - 17 500\$ CAD	2023-2024
Natural Sciences and Engineering Research Council of Canada (NSERC)	
 Recipient of the Bursary of Excellence - 1000\$ CAD	2022
Department of Computer Science and Operations Research (DIRO), University of Montreal	
 Excellence Scholarship from DIRO Graduates and Professors - 2000\$ CAD	2022
Department of Computer Science and Operations Research (DIRO), University of Montreal	
 Supplements of the NSERC Undergraduate Student Research Awards bursary - 1500\$ CAD	2022
Natural Sciences and Engineering Research Council of Canada (NSERC)	
 Undergraduate Student Research Awards bursary - 6000\$ CAD	2022
Natural Sciences and Engineering Research Council of Canada (NSERC)	
 Laureate of the Undergraduate Introduction to Research Scholarship - 6500\$ CAD	2022
Institute for Data Valorization (IVADO)	
 Excellence Mention	2020-2023
University of Montreal	

SCIENTIFIC COMMUNICATION

 Scientific Talk  Posters

-  Talk entitled "Probabilistic Interpolation of Sagittarius A*'s Multi-Wavelength Light Curves Using Machine Learning" June 2025
IAUS 397, Athens, Greece
-  Talk entitled "Probabilistic Interpolation of Sagittarius A*'s Multi-Wavelength Light Curves Using Machine Learning" February 2025
University of Amsterdam, Anton Pannekoek Institute
-  E-Poster entitled "Understanding the link between supermassive black holes and their host galaxies" July 2024
European Astronomical Society
-  Talk entitled "Interpolating Sagittarius A* multi-wavelength data using machine learning" June 2024
Harvard CfA. Click here for the video.
-  Talk entitled "Understanding the link between supermassive black holes and their host galaxies" May 2024
Centre for Research in Astrophysics of Quebec annual meeting
-  Presentation entitled "AI for understanding the supermassive black hole at the center of the Milky Way" March 2024
IVADO Digital Futures event. Click here for the video.
-  Interview on Black Hole Physics and Hawking Radiation December 2023
Quebec Science magazine, interviewed by Marine Corniou
-  Presenting the scientific paper: First Detection of an Over-Massive Black Hole Galaxy: UHZ1 – Evidence for Heavy Black Hole Seeds From Direct Collapse? October 2023
Depqpartment of Physics, University of Montreal
-  Video presentation entitled "Applying a new Bayesian statistical model to better understand supermassive black holes" May 2023
Association Francophone pour le Savoir (ACFAS). Click here to view the video.
-  Poster presentation on fitting the M-sigma relation with a Bayesian lognormal hurdle model March 2023
Annual Symposium of Physics for a Future in Research and Industry (SAPHARI)
-  Presentation on fitting the M-sigma relation with a Bayesian lognormal hurdle model September 2022
Daryl Haggard's research group

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	Organize activities to welcome new students in Physics at University of Montreal	August 2021 and August 2022
 Volunteering for the Hundredth Anniversary of Physics at University of Montreal event	Help with the organization of the event, including activities and conferences	October 2021

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

