

Gabriel Sasseville

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Research and Education

PhD in Computer Science — Mila (supervised by Pierre-Luc Bacon)

Sep 2025 – Present

Research focus : *Improving the safety and reliability of LLM-based coding agents via RLHF, rule-based reasoning, and post-training alignment methods for secure code generation.*

Topics : *LLM alignment, code safety, secure code generation, reasoning models, adversarial prompting, RLHF*

Relevant coursework : *Reinforcement Learning and Optimal Control, Autonomous Vehicles, Adversarial Learning*

AI Research Scientist — Environment and Climate Change Canada

Jan 2025 – Aug 2025

Project : *LSTM for Streamflow Forecasting in the Great Lakes Region*

M.Sc. in Astrophysics — University of Montreal & McGill University (GPA : 4.10/4.30)

Sep 2023 – Aug 2025

Project : *Continuous Stochastic Process Diffusion for Asynchronous Time Series Interpolation of Black Hole Data*

Relevant coursework : *Machine Learning, Modern Data Analysis, Advanced Statistical Mechanics, Data Structures, Advanced Object-Oriented Programming*

B.Sc. in Computer Science and Physics — University of Montreal (GPA : 4.14/4.30)

Sep 2020 – May 2023

Technical Skills

Programming Languages : Python, Java, Bash, R, Stan, C

AI & ML : Large Language Models (LLM post-training, alignment, safety), Reinforcement Learning (RLHF, policy optimization, reward modeling), Time Series Modeling (Transformers, Latent SDEs, Mamba), Generative Models (Diffusion Models), Computer Vision (CNNs, Vision Transformers)

Tools : PyTorch, TensorFlow, Git, Linux

Publications

Conference Proceedings : Gaborit, E., Sasseville, G., Fortin, V., Dimitrijevic, M. Application of the LSTM Model for Streamflow Forecasting in the Great Lakes Region. American Geophysical Union. 2025

Paper : Sasseville, G., Hlavacek-Larrondo, J., Haggard, D., Adam, D., Paugnat, H., Witzel, G. Probabilistic Interpolation of Sagittarius A*'s Multi-Wavelength Light Curves Using Diffusion Models. Accepted. 2025

Paper : Sasseville, G., Hlavacek-Larrondo, J., Berek, S. C., Eadie, G. M., Lee Rhea, C., Springford, A., Mezcuca, M., Haggard, D. A Novel Approach to Understanding the Link Between Supermassive Black Holes and Host Galaxies. The Astrophysical Journal, 978, 48. DOI:10.3847/1538-4357/ad93d4 2025

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

Conference : Machine Learning for Asynchronous Time Series Interpolation of Sagittarius A* Data. Harvard Video link 2024

Conference : AI for Understanding the Supermassive Black Hole at the Center of the Milky Way. IVADO Video link 2024

Conference : Applying a New Bayesian Statistical Model to Better Understand Supermassive Black Holes. Video link ACFAS 2023

Honors and Awards

Richard J. Schmeelk Canada Fellowship - Schmeelk Canada Foundation	\$ 30,000	2025-2028
Doctoral Research Scholarship - NSERC	\$ 120,000	2025-2028
Doctoral Research Scholarship - FRQNT - Declined	\$ 100,000	2025-2029
Graduate Studies Excellence Scholarship - J.A. DeSève	\$ 5000	2024
Excellence Scholarship for applied AI research in Science - Hydro-Québec	\$10,000	2024
Excellence Scholarship - Department of Computer Science, University of Montreal	\$1,000	2023
Master's Research Scholarship - FRQNT	\$40,000	2023-2025
Canada Graduate Scholarships for Master's - NSERC	\$17,500	2023-2024
Excellence Scholarship - Department of Computer Science, University of Montreal	\$1,000	2022
Excellence Scholarship - Department of Computer Science, University of Montreal	\$2,000	2022
Undergraduate Student Research Awards - NSERC	\$6,000	2022
Laureate of the Undergraduate Introduction to Research Scholarship - IVADO	\$6,500	2022

Additional Trainings and Summer Schools ---

Machine Learning in Astrophysics Summer School - CRAQ	June 2024
AI in Astrophysics Workshop - Harvard	June 2024
Generative Flow Networks Workshop - Mila by Yoshua Bengio	November 2023
Summer School on Advanced Research Computing - SHARCNET	June 2021
Summer School on Data Science and Parallel Computing - Compute Canada	May 2021