Guillaume Payeur

Physics Graduate Student at McGill University
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About me

I am a Physics Master's student at McGill University, working under the supervision of Robert Brandenberger and Evan McDonough. I love learning, I'm hardworking and committed to my dream of becoming a physicist, and I'm an easy-going and playful person. I've conducted research in theoretical cosmology and in applications of machine learning to physics.

Degrees

- **Champlain College (CEGEP)**
  Pure and Applied Science *2017 - 2019*
- **McGill University (BSc)**
  Honours Math & Physics *2019 - 2023*
  - GPA: 3.98/4

Publications

- Edward W. Kolb, Andrew J. Long, Evan McDonough, and Guillaume Payeur. Completely dark matter from rapid-turn multifield inflation. *Journal of High Energy Physics*, 2023(2):181, February 2023 `https://link.springer.com/article/10.1007/JHEP02(2023)181`
- Guillaume Payeur, Étienne Artigau, Laurence Perreault Levasseur, and René Doyon. Correlated read noise reduction in infrared arrays using deep learning. *The Astronomical Journal*, 163(6):292, may 2022 `https://iopscience.iop.org/article/10.3847/1538-3881/ac69d2`

Academic Awards & Research Funding

FRQNT Master's Training Scholarship		McGill University
Amount: 40000$		*Fall 2023 - Winter 2025*
NSERC Canada Graduate Scholarship – Master's program		McGill University
Amount: 17500$		*Fall 2023 - Winter 2024*
Trottier Space Institute Graduate Fellowship		McGill University
Amount: 2000$		*Fall 2023 - Winter 2025*
First Class Honours in Mathematics and Physics		McGill University
		Fall 2019 - Winter 2023
Research Assistant Salary		University of Winnipeg
Amount: 6500$		*Summer 2022*
Research Assistant Salary		University of Victoria
Amount: 4000$		*Summer 2021*
NSERC Undergraduate Student Research Award		University of Victoria
Amount: 6000$		*Summer 2021*

Wing Hing Chang Scholarship in Science	McGill University
Amount: 800$	*Fall 2021 - Winter 2022*
Dean's Honour List	McGill University
	Fall 2020 - Winter 2021
Bourse Hors UdeM	University of Montreal
Amount: 4000$	*Summer 2020*
Faculty of Science Scholarship	McGill University
Amount: 700$	*Fall 2020 - Winter 2021*
Dean's Honour List	McGill University
	Fall 2019 - Winter 2020
Dean's List	Champlain College
	Winter 2018
Dean's List	Champlain College
	Fall 2018

Talks

Readout Noise & Machine Learning	Montreal
IREX End-of-Summer Presentations	*Summer 2020*
Completely Dark Matter & the de Sitter Swampland Conjecture	Winnipeg
WITP Summer Symposium	*Summer 2022*

Events

Astromatic 2022	Montreal
Classified in second place	*Summer 2022*

Research Experience

- **Correlated Read Noise Reduction in Infrared Arrays Using Deep Learning**
  Summer 2020-Summer 2022

  For two years starting at the summer of 2020, I've been working under the supervision of Laurence Perreault-Levasseur (University of Montreal) and alongside René Doyon (University of Montreal). We have developed a deep learning algorithm to eliminate time correlated noise from stellar spectroscopy data collected by infrared arrays. See our paper on the topic.

- **Application of Simulation Based Inference to Stellar Spectroscopy**
  Summer 2021-Summer 2022

  During the summer of 2021, I've been working under the supervision of Kim Venn (University of Victoria) and Sébastien Fabbro (University of Victoria). We have worked on a simulation based inference algorithm capable of obtaining probability density functions for stellar parameters and elemental abundances of stars from their spectra.

- **Completely Dark Matter from Rapid-Turn Multifield Inflation**
  Summer 2022-Fall 2022

During the summer of 2022, I've been working under the supervision of Evan McDonough (University of Winnipeg), along with Edward W. Kolb (University of Chicago) and Andrew Long (Rice University). We have been studying the gravitational production of dark matter during the inflation of the universe, for a family of inflationary models known as rapid-turn multi field inflation. These models are special in that they can be made to satisfy a conjecture known as the de-Sitter swampland conjecture from quantum gravity. See our paper on the topic