PATRICK JANULEWICZ

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EDUCATION

McGill University *September 2019 - April 2022*
B.Sc. — Joint Honours in Physics and Computer Science
Department of Physics

McGill University *January 2023 - Present*
M.Sc. — Physics (Astronomy)
Department of Physics
Advisors: Tracy Webb, Laurence Perreault-Levasseur

PUBLICATIONS AND OTHER WORKS

Software and Copyrights

1. PyMGal: A Python Package for Generating Optical Mock Observations from Hydrodynamical Simulations. Registered with the Python Package Index (`https://pypi.org/project/pymgal/`), which provides links to the GitHub and documentation pages. Authors: Weiguang Cui, **Patrick Janulewicz**.

Papers and Publications

1. **Patrick Janulewicz**, Laurence Perreault-Levasseur, and Tracy Webb (2024). *Assessing the Viability of Generative Modeling in Simulated Astronomical Observations.* Accepted to the International Conference on Machine Learning 2024 Workshop on Structured Probabilistic Inference & Generative Modeling. Final published version can be found at `https://openreview.net/forum?id=lzLMJ6KkiS`.

2. **Patrick Janulewicz**, Tracy Webb, and Laurence Perreault-Levasseur (2024). *Using Neural Networks to Automate the Identification of Brightest Cluster Galaxies in Large Surveys.* Under review by The Astrophysical Journal. The submitted manuscript can be found at `https://github.com/pjanul/astro_papers/blob/main/BCG_Identification.pdf`.

3. **Patrick Janulewicz** and Weiguang Cui. *PyMGal: A Python Package for Generating Optical Mock Observations from Hydrodynamical Simulations* (draft complete; pending submission). Accompanying paper for the software listed above. To be submitted in the coming weeks. The draft can be found at `https://github.com/pjanul/astro_papers/blob/main/PyMGal_Paper.pdf`.

NOTE: The three papers above are in varying stages of the peer-review process. To maximise quality, I prefer to submit to arXiv only after acceptance. For the latest updates on which papers are publicly available, please see my Google Scholar profile at the top of this document.

RESEARCH INTERESTS

- Galaxy evolution
- Cosmological simulations
- Data-driven approaches to astronomy
- Statistics & machine learning

CONFERENCES, PRESENTATIONS, AND INVITED TALKS

- **Extreme Galaxies in Their Extreme Environments at Extremely Early Epochs Conference** (Reykjavík, Iceland, April-May 2024). Poster presentation regarding work that has now been submitted as Paper 2.
- **International Conference on Machine Learning (ICML) 2024** (Vienna, Austria, May 2024). Invited to give poster presentation on work submitted as Paper 1, but could not attend.
- **The Three Hundred annual collaboration meeting** (Miraflores de la Sierra, Spain, July 2024). Presentation of research and discussion concerning future collaboration endeavours.
- **Invited talk - seminar speaker, University of Waterloo** (Waterloo, Canada, October 2024). $\sim$ 1 hour presentation focusing on galaxy evolution, cosmological simulations, and machine learning techniques. Please see `https://uwaterloo.ca/astrophysics-centre/events/astroseminar-patrick-janulewicz-person` for more details.

MEMBERSHIPS AND COLLABORATIONS

- Ciela Institute for Astrophysics and Machine Learning
- Mila - Quebec Artificial Intelligence Institute
- Trottier Space Institute
- The Three Hundred Collaboration: Modelling Galaxy Clusters and Their Environment

RESEARCH EXPERIENCE (PRIOR TO GRADUATE STUDIES)

Undergraduate researcher, McGill University *January 2022 - April 2022*
Advisor: Derek Ruths
Field(s): Data science, machine learning
Project: To perform a statistical study of the stances of mainstream media outlets' response to climate change. The code and manuscript can be found here, but was not submitted for publication.

Postgraduate researcher, McGill University *April 2022 - August 2022*
Advisor: Tracy Webb
Field(s): Astronomy, galaxy evolution
Project: To implement a machine learning approach to identify brightest cluster galaxies from The Three Hundred project simulations, which eventually became the topic of master's thesis.

AWARDS AND SCHOLARSHIPS

- **Governor General's Academic Medal, Government of Canada, 2017.** Awarded to the student with the highest cumulative average of a graduating class.
- **Class valedictorian, Massey-Vanier High School, 2017.** Awarded to the strongest student of the graduating class.
- **Dean's list, John Abbott College, fall 2017.** Awarded to the 35 highest academic averages at the institution, which had approximately 6000 students at the time.
- **First class honours, McGill University (2022).** Awarded to students with exceptional standing upon completion of undergraduate degree.
- **Research assistantship, McGill University (2022).** Monetary value: $5250 CAD.
- **Co-supervision scholarship, Centre for Research in Astrophysics of Quebec, 2023-2024.** Monetary value: $7500 CAD.

LANGUAGES

Fully fluent and native speaker of both English and French.

PROFESSIONAL EXPERIENCE

Specialised Tutor *September 2018 - Present*

Genesis Tutoring, private practice

Description: Specialised tutoring via an established agency and a private practice. Subjects of expertise include but are not limited to math and science up to the undergraduate level.

Teaching Assistant *January 2022 - Present*

McGill University

Description: Teaching assistantships held throughout master's degree. Tasks vary depending on the course but typically involve invigilating tests, overseeing laboratory work, creating and grading assignments and tests, and organizing course material.