

# Thomas C. Abbott

207, Rutherford Physics Building, Montreal

[thomas.abbott@mail.mcgill.ca](mailto:thomas.abbott@mail.mcgill.ca)

[www.physics.mcgill.ca/~tabbott/](http://www.physics.mcgill.ca/~tabbott/)

## Education

**MSc Physics, McGill**, Sept. 2023 - May 2025

Thesis: *Long-term Radio Monitoring of an Active Repeating Fast Radio Burst, FRB 20220912A*

Graduate Courses: Radiative Processes, Comp. Physics, Galaxies & Cosmology, Astrostatistics

GPA: 3.85/4.00

Awards: Max Stern Fellow (\$5000), Graduate Research Enhancement Award for Travel (2 x \$1000)

**BSc Physics and Mathematics, McGill**, Sept. 2017 - May 2021

Thesis: *GWSkyNet: Deep Learning Classification of LIGO Public Alerts.*

Graduate Courses: Astrophysics, High Energy Astrophysics

Final year GPA: 3.78/4.0

Awards: Tomlinson Engagement Award For Mentoring (\$300)

## Research Experience

**Master's Thesis, supervised by Prof. Victoria Kaspi**, Sept. 2023 - Ongoing

I focused on *Long-term Radio Monitoring of an Active Repeating Fast Radio Burst, FRB 20220912A* (publications [1,3]).

**Research Assistant (Post-BSc), supervised by Prof. Victoria Kaspi**, Jan. 2023 - Aug. 2023

Led the continued development of *frb-voe*, a software package used to generate and distribute public alerts from the CHIME telescope. (see publication [2])

**Research Assistant (Post-BSc), supervised by Prof. Daryl Haggard**, May 2021 - Jan. 2022

Tested and interpreted the predictions of GWSkyNet-Multi on candidates from LIGO-Virgo's O3 observing run (publication [5]).

**Undergraduate Thesis, supervised by Prof. Daryl Haggard**, Aug. 2020 - May 2021

Developed and trained GWSkyNet-Multi, a convolutional neural network that classifies gravitational wave candidates (see publication [6]).

**Independent Research Project**, June 2018 - Ongoing

Independently designing and building a 20m fully-steerable radio telescope, primarily for education & outreach.

## Teaching Experience

**Lab Teaching Assistant, Electromagnetism (PHYS 102)**, Jan. 2024 - May 2024

Led 4 lab sections each containing ~30 first-year physics students. Assisted with experimental set-up and gave 5-10 minute presentations at the start of each lab to offer instructions and guidance for carrying out the experiment. Graded reports on a bi-weekly basis.

**Tutorial Teaching Assistant, Classical Mechanics (PHYS 101)**, Sept. 2023 - Dec. 2023

Co-led the tutorial component of the first-year mechanics course. Managed 13 upper-undergraduate TEAM Mentors who provided interactive tutorials to over 250 students. Substituted when a TEAM mentor was unavailable, otherwise, offered 1v1 assistance to students needing extra help or TEAM mentors in need of help answering/explaining a question.

**TEAM Mentor, Cellular and Molecular Biology (BIOL 112)**, Jan. 2018 - May 2018

Assisted with preparation and procedure of experiments in undergraduate biology labs.

**Private Tutor, Physics and Math**, Sept. 2016 - Ongoing

## Publications

[1\*] **T. C. Abbott**, A. Pearlman, V. Kaspi (2023). *Long-term Radio Monitoring of an Active Repeating Fast Radio Burst, FRB 20220912A*, \*in prep.

[2\*] CHIME/FRB Collaboration (2024). *The Second CHIME/FRB Fast Radio Burst Catalog*, \*in prep.

[3] **T. C. Abbott**, A. Zwaniga, E. Petroff, V. M. Kaspi, P. Scholz, M. Bhardwaj, P. J. Boyle, S. Tendulkar, (2023). *frb-voe: A Standard Real-time VOEvent Alert Service for Fast Radio Bursts*, submitted to AJ (Sept. 2023)

- [4] **T. C. Abbott**, E. Buffaz, N. Vieira, M. Cabero, D. Haggard, A. Mahabal, J. McIver (2022). *GWSkyNet-Multi: A Deep Learning Multi-Class Classifier for LIGO–Virgo Public Alerts*. The Astrophysical Journal, 927:232
- [5] A. Cook, P. Sholz, A. Pearlman, **T. C. Abbott**, M. Cruces (2023). *Contemporaneous X-ray Observations of 30 Bright Radio Bursts from the Prolific Fast Radio Burst Source FRB 20220912A*. The Astrophysical Journal, 974:170.
- [6] U. Giri, et al. (2023). *Comprehensive Bayesian analysis of FRB-like bursts from SGR 1935+2154 observed by CHIME/FRB*.
- [7] N. Raza, M.L. Chan, D. Haggard, A. Mahabal, J. McIver, **T. C. Abbott**, E. Buffaz, N. Vieira (2023). Explaining the GWSkyNet-Multi machine learning classifier predictions for gravitational-wave events. The Astrophysical Journal, 963:2.

## Presentations

- [1] **Invited Talk (15 min)**, *Fast Radio Burst Alerts : frb-voe and the CHIME/FRB Virtual Observatory Event Service*, 3rd Astro-COLIBRI Workshop, Pascal Institute, France. Sept. 2024.
- [2] **Lunch Talk (45 min)**, *Pulsar Timing Arrays : the Search for Gravitational Waves Using a Galaxy-Sized Detector*, Trottier Space Institute, Mar. 2024.
- [3] **Poster + Flash Talk**, *The CHIME/FRB VOEvent Service*, Canadian Astronomical Society AGM
- [4] **Talk (10 min)**, *Radio Monitoring Observations of the Nearby Repeating Fast Radio Burst 20181030A*, Astrophysics Research Center of Quebec (CRAQ), Canada, May 2023
- [2] **Poster + Flash Talk**, frb-voe: A Telescope-Agnostic FRB VOEvent Service, Canadian Astronomical Society AGM
- [3] **Talk (12 min)**, The CHIME/FRB VOEvents Service, FRB Follow-up Workshop at the University of Toronto
- [4] **Poster**, Interpretability Analysis of GWSkyNet-Multi, MSI Summer Research Showcase, McGill Space Institute, Aug. 2021.
- [5] **Poster**, Multi-Class Classification of LIGO-Virgo GW Candidates, WVU Appalachia Research Symposium
- [6] **Flash Talk**, GWSkyNet: a Binary Classifier of LIGO-Virgo GW Candidates, Canadian Astronomical Society AGM
- [7] **Poster**, GWSkyNet: a Binary Classifier of LIGO-Virgo GW Candidates, McGill Undergraduate Poster Showcase

## Accepted Proposals

- [1] Co-I, NICER GO ToO Proposal, Cycle 7, 100 ksec w/ NICER, *Exploring The Origins Of Nearby Repeating Fast Radio Burst Sources With Nicer* (PI: Dr. Aaron Pearlman)
- [2] Co-I, Nancay RT Proposal, Cycle 4, 300 hrs w/ Nancay Radio Telescope, *Co-observing Fast Radio Bursts (FRBs) shadowing CHIME* (PI: Dr. Cherry Ng-Guihéneuf )