Maxwell A. Fine

US & Canadian citizen | max.fine@student.uva.nl | afinemax.github.io/afinemax1/ | github.com/afinemax

Education

McGill University Sept 2025 – Current
PhD Physics & Astrophysics

University of Amsterdam (UvA) Sept 2023 – July 2025
Master of Science in Astronomy & Astrophysics

University of Toronto (UofT) Sept 2018 – May 2023
Honours Bachelor of Science (HBSc) in Physics & Astrophysics

Publications

Kaitlyn Shin, Alice Curtin, **Maxwell Fine**, Ayush Pandhi et al, (2025). "The CHIME/FRB Discovery of the Extremely Active Fast Radio Burst Source FRB 20240114A." *Submitted to the American Astronomical Society.* arXiv:2505.13297.

Maxwell A. Fine, Cameron L. Van Eck, & Luke Pratley. (2023). "Correcting Bandwidth Depolarization by Extreme Faraday Rotation." *Monthly Notices of the Royal Astronomical Society*. ArXiv: 2302.03134.

Research Experience

Deciphering the Local Environments of Repeating Fast Radio Bursts Using Scintillation Sept 2024 – Present
University of Amsterdam
Master's Thesis; Advisors: Prof. Ziggy Pleunis & Prof. Jason Hessels

- Using scintillation to study the local environments of repeating FRBs detected by CHIME, focusing on their emission size regions and investigating time variations in scintillation to probe local environments, including potential orbital periods.
- Member of the CHIME/FRB collaboration.
- Presented interim results of master's thesis to Prof. Masui's research group at the Massachusetts Institute of Technology (MIT), November 2024

Real-Time Detection Pipeline for Repeating Fast Radio Bursts Using the Dwingeloo Radio Telescope (DRT) June 2024 – August 2024
Astron & JIVE
Astron Summer Graduate Student Research Fellow; Advisors: Dr. Tammo Jan Dijkema & Prof. Jason Hessels

- Operated the 25m Dwingeloo Radio Telescope (DRT) and developed a real-time detection pipeline for repeating FRBs in `Python`; see the project's GitHub repository.
- Achieved data processing rates of $\sim$1 Gb/s.
- Detected a burst from FRB20240619D, showcasing the telescope's enduring scientific capabilities. Telescope is now used in FRB follow-up campagins, and the results will contribute to an upcoming paper.

Multi-wavelength Search for Fast Radio Bursts with Swift/BAT May 2022 – April 2023
AST425 Undergraduate Thesis; Supervisors: Dr. Ziggy Pleunis, Dr. Paul Scholz, & Prof. Bryan Gaensler *University of Toronto*

- Started as a SURP Summer Undergraduate Research Fellow (Summer 2022).
- Conducted a multi-messenger search for X-ray and gamma-ray counterparts to CHIME/FRBs using Swift/BAT.
- Developed a pipeline in `Python` using `HEAsoft` (written in `Bash`), and `XSPEC` for fluence modeling.

Gravitational Waves from Magnetar Giant Flares Dec 2021 – April 2022
PHYD01 Undergraduate Thesis; Advisors: Dr. Sarah Gossan & Prof. Bryan Gaensler *University of Toronto*

- Investigated the detectability of gravitational waves from magnetar giant flares using next-generation detectors.
- Modeled theoretical gravitational wave signals and analyzed telescope sensitivity curves.

Developing Robust Error Analysis for Radio Polarization Surveys May 2021 – August 2021
SURP Summer Undergraduate Research Fellow; Advisor: Dr. Cameron L. Van Eck *University of Toronto*

- Tested an error analysis pipeline for the Polarization Sky Survey of the Universe's Magnetism (POSSUM).
- Identified and implemented a correction for underestimated errors in the error analysis pipeline.
- Member of POSSUM collaboration for this project.

Hunting for Radio Sources in Extreme Magnetized Environments May 2020 – August 2020
SURP Summer Undergraduate Research Fellow; Advisor: Dr. Cameron L. Van Eck *University of Toronto*

- Created a novel Rotation Measure synthesis algorithm in for cases of extreme bandwidth depolarization.
- Contributed to the open-source `Python` package `RM-Tools` and co-authored a first-author paper published in *Monthly Notices of the Royal Astronomical Society*.
- Started as a summer research fellow, continued after as a part-time researcher until the publication of the paper in 2023.

Awards & Fellowships

ASTRON Summer Graduate Research Fellowship 2024
€2,500 + Housing

UofT SURP Research Fellowship 2020, 2021, 2022
$28,595 total

UofT John Pounder Prize in Astronomy (3rd Year) 2021
$200

NSERC Undergraduate Student Research Award 2021
$6,000

UofT Student Excellence and Leadership Award 2020
$250

UofT John Pounder Prize in Astronomy (2nd Year) 2019
$300

Teaching Experience

Teaching Assistant (TA), University of Toronto
UofT PHYA10: Introduction to Physics I for the Physical Sciences Fall 2021, Fall 2020
UofT PHYA22: Introduction to Physics II for the Life Sciences Winter 2021
UofT PHYA11: Introduction to Physics I for the Life Sciences Fall 2020

Facilitated Study Group (FSG) Leader, University of Toronto
UofT PHYA10: Introduction to Physics I for the Physical Sciences Fall 2020, Fall 2019
UofT PHYA21: Introduction to Physics II for the Physical Sciences Winter 2020

- Led & organized review sessions for midterms and finals.
- Created practice problem sets for the review sessions, and attended lectures.

Volunteer Physics Tutor, UofT Physics Study Centre 2019-2022

Talks

Presented interim results of master's thesis to Prof. Michilli's research group at the Laboratoire d'Astrophysique de Marseille (LAM) Apr 2025
Presented interim results of master's thesis to Prof. Masui's research group at the Massachusetts Institute of Technology (MIT) Nov 2024

Conferences and Workshops Attended

Scintillometry Workshop 2024 (University of Central Florida) Oct 2024
Fast Radio Burst follow-up workshop (University of Toronto) Apr 2023