Maxwell A. Fine

University of Amsterdam
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Education

University of Amsterdam 2023 - 2025 (Expected)
MSc, Physics & Astrophysics

University of Toronto 2018 - 2023
B.Sc (Hons), Specialist in Physics & Astrophysics

Thesis: *Hunting for Fast Radio Bursts (FRBs) with SWIFT/bat*
Supervisors: Dr. Ziggy Plenuis & Dr. Paul Scholz and Prof. Bryan Gaensler

Thesis: *Gravitational waves from magnetar giant flares*
Supervisors: Dr. Sarah Gossan & Prof. Bryan Gaensler

Skills

I am skilled in `Linux` and `Git`, and I am fluent in `Python` programming, experienced in packages such as `Numpy`, `Scipy`, `Matplotlib`, `Pytorch`, `Scikit-Learn`, `Pandas`, `RM-TOOLS`, and `Astropy`. I am skilled in data analysis, Bayesian analysis, time-series analysis, algorithm development, machine learning, cloud computing, big data, and scientific computing. I have contributed significantly to the open-source scientific `Python` package `RM-TOOLS`, resulting in a published scientific paper. I am additionally experienced in: `C++`, `SQL`, `AWS`, `Kubernetes`, `Docker`.

Publications

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

Speaking Engagements

Panelist at ADL's Never is Now Conference Fall, 2022
The Anti-Defamation League (ADL) is the world's largest organization dedicated to fighting antisemitism. I was invited to be a panelist as an expert on antisemitism on College campuses. The conference was at the Javits Center in NYC.

Awards

3rd Year John Pounder Prize In Astronomy Fall, 2021
Awarded to a full-time student entering the third year of a physical sciences program on the basis of excellent achievement in astronomy courses ($300)

Undergraduate Student Research Award (USRA) Summer, 2021
Canadian Institute for Theoretical Astrophysics ($6,000)

Student Excellence and Leadership Award 2019-2020
Department of Physical & Environmental Sciences
For academic excellence and community leadership ($350)

2nd Year John Pounder Prize In Astronomy Fall, 2019
Awarded to a full-time student entering the second year of a physical sciences program on the basis of excellent achievement in astronomy courses ($300)

Research Experience

Hunting for Fast Radio Bursts (FRBs) with the 25m Dwingeloo Radio Telescope
Summer 2024
Astron & JIVE Summer Research Program
Advisor: Dr.Tammo Jan Dijkema, and co-advisor Proffesor Jason Hessels .
Studied bright repeating Fast Radio Bursts (FRBs) to understand the potential connections between repeating and apparently non-repeating FRBs. Tested the methodology, and learned radio astronomy techniques by looking at Pulsars, and Magnetars.

Hunting for Fast Radio Bursts (FRBs) with SWIFT/bat 2022-2023
Dunlap Institute: Summer Undergraduate Research Program (SURP)
AST425: Undergraduate Thesis
Supervisor: Dr. Ziggy Plenuis & Dr. Paul Scholz and Prof. Bryan Gaensler
Searching for and placing limits on the X-ray & gamma-ray emission from CHIME/FRBs using Swift/BAT and GUANO.

Gravitational waves from magnetar giant flares
PHYD01: Undergraduate Thesis Winter, 2022
Supervisor: Dr. Sarah Gossan & Prof. Bryan Gaensler
Determined if it is possible for the next generation of ground-based detectors to observe gravitational wave emission from magnetar giant flares.

Developing robust error analysis for radio polarization surveys
Dunlap Institute: Summer Undergraduate Research Program (SURP) Summer 2021
Supervisor: Dr. Cameron L. Van Eck
Helped to develop part of the error analysis pipeline for Polarization Sky Survey of the Universe's Magnetism (POSSUM).

Hunting for radio sources in extreme magnetized environments
Dunlap Institute: Summer Undergraduate Research Program (SURP) Summer 2020
Supervisor: Dr. Cameron L. Van Eck
Developed an improvement to the RM synthesis algorithm used in `RM-Tools`.

Teaching Experience

UofT Teaching Assistant
PHYA10: Introduction to Physics I for the Physical Sciences Fall, 2021
Ran weekly two hour long practical sessions for $\sim$ 10-15 students, and marked assignments & exams

UofT Teaching Assistant
PHYA22: Introduction to Physics II for the Life Sciences Winter, 2021
Ran weekly two hour long practical sessions for $\sim$ 10-15 students, and marked assignments & exams

UofT Teaching Assistant
PHYA11: Introduction to Physics I for the Life Sciences Fall, 2020
Ran weekly two hour long practical sessions for $\sim$ 10-15 students, and marked assignments & exams

UofT Facilitated Study Group Leader
PHYA10: Introduction to Physics I for the Physical Sciences Fall, 2020
Ran weekly study group sessions for $\sim$ 10-15 students. Attended lectures, created practice problem sets, and hosted review sessions for midterm and final exam.

UofT Facilitated Study Group Leader
PHYA21: Introduction to Physics II for the Physical Sciences Winter, 2020
Ran weekly study group sessions for $\sim$ 10-15 students. Attended lectures, created practice problem sets, and hosted review sessions for midterm and final exam.

UofT Facilitated Study Group Leader
PHYA10: Introduction to Physics I for the Physical Sciences Fall, 2019
Ran weekly study group sessions for $\sim$ 10-15 students. Attended lectures, created practice problem sets, and hosted review sessions for midterm and final exam.

Community and Outreach

CAMRAS Radio Telescope Outreach Volunteer Summer 2024
Operated a 35m Radio Telescope, and led public tours and demonstrations using the Radio Telescope.

Volunteer Age of the Universe Summer 2023
I helped create one of the Jupyter-notebooks for a astronomy workshop for highschool students in Toronto. I helped make the notebook on the Cosmic Microwave Background (CMB). See the https://github.com/simrannerval/Age-of-the-Universe organized by Dr. Simran Nerval.

Dunlap Institute: Astrotours Volunteer 2022-2023
Scarborough Campus Student Union: Director for Department of Physical & Environmental Sciences 2021-2022
Attended monthly Student Union meetings with the other director & executive officers. Aided in the planning of student lead initiatives including the fall of 2020 Climate Strike, served as liaison between student union and department association.

Winter Solstice Telescope Night Winter, 2021
Telescope operator

Environmental & Physical Sciences Student Association: Director for Physics & Astrophysics 2018-2020
In charge of planning and programming events, including the physics & astronomy 'mix and mingle', organization of the Physics Study Centre, and participation in outreach events.

Environmental & Physical Sciences Student Association: Physics Tutor 2019-2022
Volunteer tutor at the Physics Study Centre

Dunlap Institute: Earth Hour Volunteer Winter, 2019