Patrick Sandoval

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Education

University of Toronto — Toronto, ON

Honours Bachelor of Science — *Expected December 2024*

- CGPA: 3.52
- Physics and Astronomy Specialist
- Dean's List Scholar
- Summer Undergraduate Research Project (SURP)
- Director of Finance for the University of Toronto Amateur Astronomer's Society

Harvard University — Cambridge, MA

Certificates — *Completed November 2020*

- CS50x Introduction to Computer Science
- CS50AI Introduction to Artificial Intelligence with Python (In progress)

Experience

SURP Research Fellowship — May 2022 – August 2022

Dunlap Institute of Astronomy and Astrophysics — *Toronto, ON*

- In depth research on young core collapse supernova KSP ZN7090
- Developed routines to study and characterize the optical light curves of the supernova
- Reduced and analyzed the Gemini spectrum for ZN7090 through the pyraf module
- Held two meetings every week to discuss my research with my supervisor. And by the end of May presented my progress to the SURP panel

Physics & Mathematics Tutor — October 2021 – Present

Tutorbright — *Toronto, ON*

- Weekly sessions with student ranging from different levels
- Prepared problem set and practice quizzes
- All session are online through the company's platform

VP Internal — August 2021 – Present

University of Toronto Amateur Astronomer Society — *Toronto, ON*

- Organization of events for using telescope to observe star
- Scheduling and conducting bi-weekly meetings and note keeping for all meetings, managing project progress and bookkeeping.

Finance Director — August 2022 – Present

University of Toronto Amateur Astronomer Society — *Toronto, ON*

- Overlook clubs funding and create a budget for each event and forms of funding each event either through ticket or funcding from the student union
- Attended to finance meetings led by the student union on the formalities for requesting funding and organizing clubs funding.

Physics & Mathematics Tutor — May 2020 – August 2020

Tututor — *Quito, Ecuador*

- Prepared lesson plans for introduction to thermodynamics and advance functions
- All classes were carried out virtually through zoom

Community & Leadership

Volunteam Associate September 2020 – August 2021
Volunteer for Student Union *Mississauga, ON*

- Worked alongside the UTMSU to provide information services, events and mental health support for students at the University of Toronto Mississauga

Fundrasier Volunteer for Homes in Ecuador September 2018 – April 2019
Habitat for Humanity *Quito, Ecuador*

- Raised funds for building a home for a family in need in Ecuador. We had a monthly quota of 100 USD and when your group of volunteers was chosen then you needed to collect +500 USD for that month. At the end of the fundraising we travelled to the family's location and helped with the building of the home.

Perseids Meteor Shower Excursion August 12th 2022 – August 13th 2022
UTAAS & UTMPC *Toronto, ON*

- Organized a summer trip with the University of Toronto Mississauga Physics Club to observe the Perseids meteor shower on its peak light with telescopes and professional photography set up. I was the sole representative of UTAAS at the time so much of the logistics for the trip where managed primarily by me, and another executive from UTMPC.

AstroTours Telescope Instructor Volunteer June 2022 – September 2022
Dunlap Institute for Astronomy and Astrophysics *Toronto, ON*

- As part of Dunlap's monthly outreach events they invite the general public for talks in astronomy and observations with the university's telescopes. My role in these events is to properly setup the telescopes, aim the telescope at the sources and explain how the telescope works and what we are looking at the sky.

Projects

Crossword Solver AI | *Pyhton* August 2021 – September 2021

- Implementation of backtracking algorithms to solve optimization puzzle.
- Can solve any crossword, where the knowledge base of the AI is a dictionary of all English words

Research on Equation of State of Neutron Star | *Research Project* November 2020 – December 2020

- Research of the equation of state of a neutron star and its astronomical properties. Estimated the core's energy and used this computed value to argue for the existence of strange quarks in the core,
- Collaborative work with group members remotely, and received honorable mention by prof. Rachel Friesen

Remote Control Coil Propellant | *CS50 Final Project* November 2020

- For the final project for the Harvard certificate CS50 I built an high voltage induction based nail propeller that was controlled by an Arduino micro-controller.

Technical Skills

Languages: Python, MATLAB, LaTex, SQL, C#, Bash
Libraries: Numpy, Scipy, Pandas, Astropy, Scikit-learn, Matplotlib, Seaborn
Applications: Microsoft Excel, Outlook, Teams, Office