

# RUYI XU

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## EXPERIENCE

### NATIONAL UNIVERSITY OF SINGAPORE | RESEARCH

ASSISTANT AT NATIONAL QUANTUM SAFE NETWORKS

Oct 2025 – Current | Singapore

- Reviewed the security and performance of Quantum Key Distribution systems in our network
- Studied the feasibility of non-traditional methods of operating Quantum Key Distribution systems e.g operation on drones and vehicles.
- Debugged and maintained Quantum Key Distribution systems.
- Engaged with suppliers of Quantum Key Distribution and adjacent vendors.

### UNIVERSITY OF TORONTO | WORK-STUDY REMOTE

OBSERVATORY ASSISTANT UNDER PROF. MIKE REID

Sep 2024 – Apr 2025 | Toronto, Ontario, Canada

- Developed an exposure time calculator for the university's new observatory using python, HTML, and CSS
- Written instruction manual on how to use widgets for selected targets.
- Partially developed a feature to calculate the exposure time required for non-point source targets.

### | WORK STUDY RESEARCH ASSISTANT UNDER PROF. RACHEL FRIESEN

Sep 2023 – Apr 2024 | Toronto, Ontario, Canada

- Investigated complex carbon molecules in star-forming regions of Taurus and Perseus using Agglomerative Hierarchical Clustering.
- manipulated large complex image data cubes, created image masks using Astropy and Numpy
- Learned how to use SAODS9 to image .Fits files such as color scaling, noise identification.

### UNIVERSITY OF TORONTO PHYSICS STUDENT UNION |

TREASURER

May 2024 – Apr 2025 | Toronto, Ontario, Canada

- Developed a new system to keep track of expenses as well as receipts for easier accounting.
- Planned and executed social and academic events for the student population of the Physics Department

### SINGAPORE ARMED FORCES | NATIONAL SERVICE, COMBAT & SERVICE MEDIC, CORPORAL

Oct 2019 – June 2021, Apr 2025 - Jun 2025 | Singapore

- worked at the frontlines conducting swabs and healthcare to migrant workers relocated to Jurong Camp. Received a commendation for frontline service during COVID-19 and awarded the COVID resilience medal
- Post-pandemic, I served as the Triage in-charge at Sungei Gedong Medical Centre, where I made meaningful changes to streamline the triage process under different circumstances and initiated an activity-based roster where manpower is varied based on the activities of units in the camp.
- Disrupted in June 2021 to pursue my studies and resumed my service in May 2025 as a triage service medic.

## EDUCATION

### UNIVERSITY OF TORONTO

BACHELOR OF SCIENCE IN  
ASTRONOMY AND PHYSICS  
Graduated Jun 2025

## SKILLS

### PROGRAMMING

4+ years:

Python

2+ years:

Git, Shell

1+ years:

HTML • Javascript • SQL

### TECHNOLOGY

Github • LaTeX • SAODS9

iMovie • LTspice • AutoCAD

## COURSEWORK

### GRADUATE

General Relativity I&II, High Energy Physics

### UNDERGRADUATE

Electronics Lab

Computational Physics

Time Series Analysis

Computational Astrophysics

## CERTIFICATIONS

Contract For Difference, Unit Trusts and Investment-Linked Insurance Policy, Structured Products, Structured Deposits Dual Currency Investments, Foreign Exchange Margin Trading (The Association of Banks in Singapore)

## AWARDS

COVID Resilience Medal | Singapore | June 2023

ACE UTSG stock market challenge | ACE UTSG | August 2023: 2nd Placing

Global Learning Case Competition | University of Toronto | February 2023: 1st Placing

PYJAC 2022 | UTM WiSC | January 2022: 1st Placing in Beginner Category

UEC Case Competition | UTM UEC | October 2021: 1st placing,

February 2022: 4th placing,

October 2022: 2nd, placing,

October 2023: 2nd placing

## LINKS

[ruyixu00.github.io](https://github.com/ruyixu00)

[github.com/ruyixu00](https://github.com/ruyixu00)

[linkedin.com/in/ruyi-xu-9463a6187/](https://linkedin.com/in/ruyi-xu-9463a6187/)

[orcid.org/0009-0004-0672-2255](https://orcid.org/0009-0004-0672-2255)

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## PROJECTS

**SMART TELESCOPE ARRAYS(STARS)** | INDEPENDENT RESEARCH COURSE PROJECT UNDER PROF. ROBERTO ABRAHAM  
Sep 2024 – Apr 2025

- Making photometry comparisons between custom telescopes and an array of cheap off-the-shelf telescopes.
- Currently creating a pipeline for automatic photometry for the telescope array via SMB networking and setting up cloud computing resources.

**COMPLEX MOLECLES AS VIRIAL STABILITY INDICATORS** SUPERVISED RESEARCH COURSE PROJECT UNDER DR. DUO XU AND PROF. RACHEL FRIESEN  
Sep 2024 – Apr 2025

- Continuation from work study research, utilising analysed data to draw relationships between viral stability and abundance of complex molecules.
- Presented results at the Rubin Community Workshop in August 2025 and made a poster presentation as well.

**EXPERIMENTAL DESIGN WITH UNISTELLAR EVSCOPE FOR UNDERGRADUATE COURSES** RESEARCH OPPORTUNITY PROGRAM UNDER PROF. LEA HIRSCH AND  
May 2021 - Aug 2021

- Designed 2 experiments for 1st year undergraduate astronomy courses.
  - Designed an experiment to measure the sun's rotation rate by observing sunspots.
  - Designed an experiment to measure the radial velocity of satellites by measuring the length of satellite streaks in images.
- Presented experiment and results at the monthly meeting of the Royal Astronomical Society of Canada's monthly meeting.

**MODIFIED ENERGY DISPERSION RELATIONS IN NEUTRINO OSCILLATIONS** SCIENCE RESEARCH PROGRAM AT NATIONAL UNIVERSITY OF SINGAPORE SUPERVISED BY DR. CHING CHEE LEONG.  
Jun 2016 - Apr 2017

- Proposed a modified energy dispersion relation for 2 flavor neutrino oscillations based on data collected from MINOS, Super Kamiokande and KamLAND.
- Used Mathematica to plot and compute new constrains for proposed empirical parameters based on data collected.

## SOCIETIES & VOLUNTEER

### BOYS' BRIGADE SINGAPORE 47TH COMPANY

2025 – 2026 Adult Volunteer  
2016 – 2019 Primer (officer cadet)  
2013 – 2015 Boy (CCA Participant)

- Involved Involved in Boys' Brigade as a member since Secondary School graduated Seniors' programme as a Staff Sergeant with Founders Award (highest award attainable)
- Subsequently returned and continued to serve as a primer, graduated as a Lieutenant cadet and attained the anchors award (2nd highest award attainable)
- Continued as an adult volunteer. Daily activities include planning and executing daily activities, planning for camps, counselling youths and managing administrative duties.