

Tammy Do

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EDUCATION

PHD. ASTRONOMY | University of Western Ontario, LONDON, CANADA
Sept 2025 - Present

MSC. ASTRONOMY | University of Western Ontario, LONDON, CANADA
Sept 2023 - Aug 2025 | 2 years of course work/research

BSC. HONOURS PHYSICS AND ASTRONOMY | University of British Columbia, VANCOUVER, CANADA
Sept 2017 - April 2022 | 4 years of course work, 16 months Co-op program between third and fourth year, graduated Honours with Distinction.

HIGH SCHOOL GRADUATE | York House School, VANCOUVER, CANADA
Sept 2013 - Jun 2017 | Condensed 5 years of coursework into 4 to graduate a year early.

RESEARCH PROJECTS

NEW OBSERVATIONS OF THE SUPERNOVA REMNANT CTA 1

- Pre-processed and processed observational data from the DRAO Synthesis Telescope
- Studied the supernova remnant, CTA 1, using radio continuum, linear polarization and neutral hydrogen observations
- Presented two talks on my work, one focused on the data pre-processing/processing and the other focused on my analysis of CTA 1 using the processed data ([click here for video](#))
- Wrote a research paper with my three supervisors at DRAO published in the *Astrophysical Journal* in 2024

IMPACT OF YARKOVSKY EFFECT MODIFICATION ON THE CLOSE APPROACH STRUCTURE OF 99942 APOPHIS

- Honours Thesis project: Using the software package **REBOUND/X**, I ran high fidelity simulations for a range of possible post 2029-flyby scenarios to examine the effect the Earth could have on the spin state of Apophis during its close approach in 2029 and recalculated gravitational "keyholes" taking into account adjusted spin states
- Wrote and successfully defended the thesis project proposal ([click here for video](#))
- Top 10 finalist in the UBC Undergraduate 3 Minute Thesis competition ([click here for video](#))
- Wrote and successfully defended the thesis paper ([click here for video](#))
- Presented a talk on my thesis findings at the Apophis T-7 Years: Knowledge Opportunities for the Science of Planetary Defense conference ([click here for abstract](#))

DYNAMICALLY CHARACTERIZING SPORADIC METEOROID ORIGINS

- Simulated orbital histories, using the software package **REBOUND/X**, for 387 observed meteors, incorporating radiation pressure and gravitational forces, to classify them as asteroidal or cometary, using data from the Canadian Automated Meteor Observatory and electron-multiplying CCD cameras
- Derived probability distributions for meteoroid orbits at varying ejection times, focusing on velocities below 35 km/s, where distinguishing between asteroidal and cometary origins is most challenging
- Contributed an oral presentation at the Meteoroids 2025 conference in Perth, Australia
- Submitting a paper to the conference special issue in *Icarus* for Fall 2025

LUCIOLE LOWER EARTH ORBIT SATELLITE MONITORING

- Created a scientific dashboard to provide up-to-date information about Megaconstellation satellites that are visible over Canada to the public, for the purposes of space situational awareness (SSA).
- Provided an overview of the last night's satellite observations on the "Home" page from the entire network of cameras, including satellite detection counts, average brightness and an interactive map with the detected satellite ground tracks
- Designed "Database" and "Drilldown" pages allows for in-depth analysis of the data captured by the Luciole system with customizable graphs and tables, filtered and sorted by the user through a simple UI.

PUBLICATIONS

PEER-REVIEWED

- Do, T., Kothes, R., Hill, A.S., Gray, A., Reich, P., and Reich, W. (2024) "New Radio Observations of the Supernova Remnant CTA 1". *The Astrophysical Journal*. 977 271 (Co-op project)
- Vida, D., Mazur, M.J., Brown, P.G., Metchev, S., Clark, D.L., Do, T., Zhang, J., Scott, L. (2024) "Project Lucile: A Wide-Field, High-Cadence Uncued System for Comprehensive Tracking of Decimeter-Sized LEO Objects". *Advanced Maui Optical and Space Surveillance (AMOS) Technologies Conference Proceedings*. 143 (MSc work).

NON-PEER-REVIEWED

- Do, T., Brown, P.G., Pokorný, P. (2025) "The Dynamical Origin of Sporadic Meteoroids". Journal article submitted September 2025 to the "Meteoroids 2025 - Recent Advances in Meteor Science" special issue in *Icarus* (MSc thesis).
- Do, T., Brown, P.G. (2025) "Which meteoroids are from asteroids and which are from comets?". *Meteoroids 2025*. International conference. Oral presentation (MSc. work).
- Do, T., Boley, A.C. (2022) "Impact of Yarkovsky Effect Modification Due to 2029 Fly-by on the Close Approach Structure of 99942 Apophis". *Apophis T-7 Years: Knowledge Opportunities for the Science of Planetary Defense*. International conference. Oral presentation (BSc. thesis).
- Do, T., Boley, A.C. (2022) "99942 Apophis Close Approach Structure and the Impact of Modifying the Yarkovsky Effect". UBC Undergraduate 3 Minute Thesis Competition. Institutional conference. Oral presentation (Top 10 finalist, BSc. thesis).
- Do, T., Boley, A.C. (2022) "99942 Apophis Close Approach Structure and the Impact of Modifying the Yarkovsky Effect". UBC Undergraduate 3 Minute Thesis Competition. Institutional conference. Oral presentation (Top 10 finalist, BSc. thesis).
- Davis, C.A., Ker, H., Do, T., Suchy, D.A. (2022) "Building Plotly Dash Apps on a Lakehouse with Databricks SQL". *Plotly Medium Tech Blog*.

WORK EXPERIENCE

RESEARCH ASSISTANT Sept 2023 - Present | University of Western Ontario

- Researched the origins of meteoroids based on orbital evolution histories
- Created public-facing visualizations of real-time low Earth satellite orbit tracking data
- Contributed to building efficient data pipelines for the Western Meteor Physics Group datasets with "plug and play" user interfaces and postgres databases

TEACHING ASSISTANT Jan 2024 - June 2025 | University of Western Ontario

- Supervised and demonstrated first year physics labs, graded lab reports and gave feedback
- Ran help sessions/office hours and monitored online/asynchronous support forums, responding to questions related to course content
- Invigilated exams and midterms

DASH SOLUTIONS ARCHITECT May 2022 - April 2024 | Plotly

- Developed production-grade dashboard visualizations using the Plotly/Dash Python packages and accompanying component libraries for clients in the automotive industry and financial investment sector
- Provided office hours support and created proof-of-concept demos for clients, as well as presenting live demos for marketing purposes to potential clients including NASA
- Researched integrations of Dash Enterprise (DE) software with large data warehouse services such as Databricks, created a video tutorial on how to connect Databricks data sets to DE dashboards, contributed to a Medium article on the topic and created a sample dashboard utilizing the Databricks connector API (click here for video)
- Led in-person workshops with DE customers to teach developers how to use the software, which included creating/presenting slides and designing coding challenges to support hands-on learning
- Mentored a class of 3 interns, supervised their individual projects building Dash apps to support Plotly's engineering team in timing their releases of DE 5.1, managing their cloud costs, and lending insight into how customers use the DE product

PLANETARY DEFENSE ANALYST Jun 2022 - Oct 2022 | Outer Space Institute

- Created a summary document of conference papers and background literature relating to mission planning for the asteroids Apophis and/or Bennu to support mission planning efforts for a grant application
- Created simulations for different possible satellite reconnaissance missions to Apophis or other asteroids of similar size
- Created a user-interactive dashboard visualization of the simulation outcomes

DATA CONSULTANT Oct 2020 - June 2022 | Allwest Auto Insurance

- Created a semi-automated data processing pipeline using `Python`, `SQL`, and tools from Google Cloud Platform: BigQuery for database storage, Cloud Functions for automated data cleaning, Cloud Pub/Sub for triggering functions, Data Studio for dashboard visualizations, and Cloud Logging for data pipeline notifications
- Explored possible applications of machine learning to the customer data as well as the use of the `Flask` web-framework and `HTML` for embedding visualizations or data tables in a website

RESEARCH STUDENT Jan 2021-Aug 2021 | National Research Council

- Pre-processed observational data from the Dominion Radio Astrophysical Observatory (DRAO) Synthesis Telescope using `Perl` script wrappers for programs written in `Fortran`
- Learned and used observatory specific software packages: DRAO `EXPORT` for data processing, `Karma (kviz)` for data visualization
- Wrote `Python` code using the `astropy` package to process and analyze data cubes for investigation into the environment around the supernova remnant CTA 1
- Presented several talks and gave weekly science updates to the science group at DRAO/DAO

LEARNING TECHNOLOGY ROVER May-Dec 2020 | UBC Faculty of Medicine IT, Educational Technology

- Worked with instructors, students and administrators to integrate technology in innovative ways to overcome pedagogical challenges and enhance the teaching and learning experience during the transition to online learning during the Covid-19 pandemic
- Created user documentation (written/video tutorials) and media content (podcasts/videos), hosted workshops and drop-in clinics for instructors and students to navigate new technology, adapted course content for online delivery
- Handled IT support for large events as well as individual tickets from the faculty

HIGH SCHOOL MATH AND PROGRAMMING TUTOR Jun-Aug 2021

- Covered Grade 9/10 BC Math curriculum and taught an introduction to `Python`

RESEARCH ASSISTANT

Apr 2018-Dec 2020 | Dr. Meghan Winters' Cities, Health and Active Transportation Research Lab

May 2018-Jun 2020 | Research Assistant | Dr. Doan's Lab, BC Children's Hospital

- Data collection using Survey123, ArcGIS (geographic information system), REDCap (EDC database software)

VOLUNTEER EXPERIENCE**ULTIMATE FRISBEE COACH** Mar 2016 - August 2024 | Vancouver, BC & London, ON

- Assistant coached a girls-only elementary school (Grade 5-7) ultimate team at York House School, which included planning and running 2 weekly practices before school, attending games once a week after school and 2 full day tournaments per season
- Coached a co-ed high school (Grade 8-12) ultimate team at Lord Byng School, which included planning and running 2 weekly practices after school, attending games once a week after school and 2 full day tournaments per season
- Established London, Ontario's first junior women's competitive club ultimate team as part of London Ultimate Club's efforts to increase junior programming, which included coordinating and running skills clinics sessions at local high schools during the school year to recruit and promote the team, organizing the team during the season, coaching 1 practice a week and attending one tournament in the region

RESEARCH ASSISTANT Oct 2017 - May 2018 | BC Children's Hospital START Program

- Screened and recruited patients for multiple research studies conducted in the BCCH Emergency Department and entered data into research databases (REDCap)
- Recruiting patients included using patient swabs to run point of care rapid viral testing for Group A Strep and conducting standardized tests, such as the BESS test that checks for concussion symptoms

YOUTH GROUP LEADER Dec 2016 - May 2018 | Vietnamese Buddhist Youth Association - Vancouver Chapter

- Organized and lead activities for kids age 5-13, including Vietnamese language and Buddhist lessons