Ian Chow

MSc. Astronomy Candidate | University of Western Ontario

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Research Interests

Small Solar System Bodies, Machine Learning, Astrostatistics, Planetary Dynamics, Bayesian Inference

Education

Aug. 2025 – Sep. 2023 | **University of Western Ontario** | *London, ON, Canada*
MSc. Astronomy
Cumulative GPA of **4.00/4.00**
Thesis : Orbital and Physical Properties of Decameter-Sized Earth Impactors
Supervisor : Prof. Peter G. Brown

May 2023 – Sep. 2018 | **University of Toronto** | *Toronto, ON, Canada*
Honours BSc. Astronomy & Physics Specialist, Statistics Major, Mathematics Minor
Graduated with High Distinction – Cumulative GPA of **3.60/4.00**
Astronomy Thesis : Analyzing Radial Velocity Data from the Resonant Planetary System HD 45364
Supervisors : Dr. Sam Hadden, Prof. Hanno Rein
Statistics Thesis : Probabilistic Dimensionality Reduction Methods for Stellar Chemodynamics
Supervisor : Prof. Joshua S. Speagle

Additional Research Positions

Aug. 2023 – May 2023 | **Dunlap Institute for Astronomy & Astrophysics, University of Toronto** | *Toronto, ON, Canada*
Summer Undergraduate Research Assistant
Project : Understanding the impact of Bayesian inference on ultra-light axion limits
Supervisor : Dr. Keir K. Rogers

Aug. 2022 – May 2022 | **Canadian Institute for Theoretical Astrophysics (CITA)** | *Toronto, ON, Canada*
Summer Undergraduate Research Fellow
Project : Modelling Migration Scenarios of Resonant Planets Using Radial Velocity Data
Supervisors : Dr. Sam Hadden, Prof. Hanno Rein, Prof. Norman Murray

Relevant Coursework

Astrophysics	Astrophysics (stellar structure/evolution, nucleosynthesis, galaxies, cosmology), Small-Body and Planetary Formation & Dynamics, Classical Mechanics I & II, Thermal Physics, Quantum Mechanics, Classical & Relativistic Electrodynamics, Nonlinear Physics and Chaos, Time-Series Analysis
Statistics	Probability & Statistics, Data Analysis, Surveys, Sampling and Observational Data, Statistical Computation, Machine Learning, Statistical Inference

Peer-Reviewed Journal Publications

First Author

1. **Chow, I.**, and Brown, P.G. "Decameter-sized Earth impactors – I : Orbital properties." 2025, Icarus, 429, 116444.
2. **Chow, I.**, and Hadden, S. "Influence of Modeling Assumptions on the Inferred Dynamical State of Resonant Systems : A Case Study of the HD 45364 System." 2025, ApJ, 980(2), 236.

Selected Awards, Scholarships, Fellowships & Honours

2025-2028	**NSERC Postgraduate Scholarship – Doctoral**, $120,000 CAD over three years	*NSERC*
2024	**NASA International Space Apps Challenge Global Winner**, honour	*NASA*
2024-2025	**Ontario Graduate Scholarship**, $15,000 CAD	*University of Western Ontario*
2023-2025	**Western Graduate Research Scholarship**, $9,932 CAD	*University of Western Ontario*
2023	**SURP Poster Competition Award**, $50 CAD	*University of Toronto*
2023	**Summer Undergraduate Research Program (SURP) Fellowship**, $9,980 CAD	*University of Toronto*

2022 **Summer Undergraduate Research Fellowship (SURF)**, $9,500 CAD — *CITA*
2022 **Smith Solis Research Scholarship in Astronomy and Astrophysics**, $1,250 CAD — *University of Toronto*
2020-2023 **Dean's List Scholar**, honour — *University of Toronto*

Teaching Experience

My duties in the following course included delivering lectures and conducting in-class demonstrations, holding office hours, proctoring, grading and reviewing exams.

2024-2025 **Astronomy 1021 : General Astronomy**, Teaching Assistant (x2) & Guest Lecturer — *University of Western Ontario*

My duties in the following course included supervising lab sessions and grading lab reports.

2023-2024 **First-Year Physics Labs**, Teaching Assistant (x2) — *University of Western Ontario*

My duties in the following courses included leading in-person tutorials and help centres, running midterm viewing sessions, proctoring, grading and reviewing exams.

2024 **Physics 1402 : Physics for Engineering Students II**, Teaching Assistant — *University of Western Ontario*
2023 **Physics 1201 : Physics for the Sciences I**, Teaching Assistant — *University of Western Ontario*

Relevant Professional Experience

Sep. 2020 – Jun. 2020 | **Innovere Medical** — *Markham, ON, Canada*
Software Developer

- Automated detection of dropouts in time-series audio data from an MRI scanner's wireless audio system using power spectrum analysis in MATLAB and Python, eliminating 20+ hours of work weekly
- Developed and tested TechSmart, an in-house multimedia app for patient use during MRI scans, with company's software development team

MATLAB | Python | Signal Processing

Aug. 2019 – Jun. 2019 | **Plantiga Technologies** — *Vancouver, BC, Canada*
Software Developer

- Developed methods to compute physical fitness heuristics from time-series acceleration (g-force) data, using signal processing techniques like digital filtering and convolution in Python (NumPy, SciPy, Pandas) to improve detection of foot impacts
- Field-tested and validated hardware such as sensor shoe insoles that track movement
- Acquired data from company partners such as physiotherapy clinics, universities (University of British Columbia, Simon Fraser University), and sports organizations (Houston Rockets, US Tennis Association)
- Wrote documentation of company products and services for clients

Python | Signal Processing | Data Analysis

Aug. 2017 – Jun. 2017 | **Synced Review** — *Toronto, ON, Canada*
Research Intern

- Conducted literature review focusing on advancements in reinforcement learning used in adversarial-search board and video game artificial intelligence programs for a company report
- Worked with company team to research and edit review articles on industry trends in machine learning and robotics technology

Machine Learning | Artificial Intelligence | Literature Review

Conference Presentations

Contributed Talks

Mar. 2025 **56th Lunar and Planetary Science Conference**, NASA/Lunar and Planetary Institute — *The Woodlands, TX, USA*
May 2024 **AAS Division on Dynamical Astronomy 55**, University of Toronto — *Toronto, ON, Canada*
Aug. 2022 **2022 CITA Planet Day**, Canadian Institute for Theoretical Astrophysics — *Toronto, ON, Canada*

Poster Presentations

Jun. 2024 **2024 Canadian Astronomical Society AGM**, University of Toronto/York University — *Toronto, ON, Canada*
Jun. 2023 **2023 Canadian Astronomical Society AGM**, University of British Columbia — *Penticton, BC, Canada*

Other Presentations

Selected Academic Presentations & Seminars

Feb. 2025	**CSA Executive Committee Meeting**, Canadian Space Agency. Talk.	*Virtual*
May 2024	**2024 NASA Day Meeting**, NASA Meteoroid Environment Office. Talk.	*Virtual*
Aug. 2023	**SURP Symposium**, University of Toronto. Poster.	*Toronto, ON, Canada*

Outreach Talks

Apr. 2025	**Royal Astronomical Society of Canada London**, "SkyShield : Protecting Earth and Satellites From Space Hazards."	*London, ON, Canada*

Leadership, Volunteering & Extracurricular Experience

Aug. 2024 – Jun. 2024 | **Hume Cronyn Memorial Observatory** | *London, ON, Canada*
Outreach Volunteer

- Volunteered at summer astronomy Public Nights attended by 80+ visitors weekly at the University of Western Ontario's Cronyn Observatory

Jun. 2024 – Sep. 2023 | **Consensus Trivia**
Question Writer/Editor

- Wrote and edited trivia questions for Consensus Trivia, a registered nonprofit organization that runs team-based trivia tournaments for high school and collegiate teams across Canada and the U.K.
- Moderated and kept score for tournament games as a staffer

May 2023 – Jan. 2019 | **University of Toronto Academic Trivia Club** | *Toronto, ON, Canada*
Vice President, Competitor, Tournament Organizer & Question Writer/Editor

- Elected Vice President of the University of Toronto's Academic Trivia Club during the 2020-2021 and 2021-2022 academic years organizing twice-weekly practices and social events, managing club Facebook group and Discord server with 300+ members, and moderating practices and tournament games
- Represented the University of Toronto at 30+ trivia (quiz bowl) tournaments across Canada and the U.S. as a competitor with several top finishes at North American championships, such as leading the team to fourth place at the 2022 Division II Intercollegiate Championship Tournament in Chicago
- Organized and directed several collegiate and high school tournaments, including the 2021 University of Toronto Collegiate Novice and the 2022 University of Ottawa ACF Fall tournaments, played by 30+ collegiate teams in total across Canada and the U.S.
- Wrote and edited trivia questions across a wide range of academic disciplines (including astronomy and physics) for 2022 WORKSHOP, 2023 Canadian Novice, and 2024 MRNA III, collegiate tournaments played by 80+ teams in total across Canada, the U.S., and the U.K.

Projects

SkyShield Orrery 2024
spaceapp-wmpgang2024orrery.netlify.app/
An interactive, physics-based digital Solar System orrery highlighting near-Earth objects and meteoroids. Developed by Dakota Cecil, Ian Chow, Simon Van Schuylenbergh and Maximilian Vovk for the 2024 NASA International Space Apps Challenge and selected by NASA as one of 10 Global Winners out of 10,000 submitted projects.
HTML CSS JavaScript

fasano-franceschini-test 2024
github.com/wmpg/fasano-franceschini-test
A Python implementation for the multivariate extension of the two-sample Kolmogorov-Smirnov (K-S) statistical test proposed by Fasano & Franceschini (1987). Published as part of Chow & Brown (2025).
Python

Here I Stand Calculator 2020
ia-chow.github.io/projects/his/
An online calculator tool to compute the odds of various outcomes for the strategy board game Here I Stand, written to familiarize myself with HTML, CSS and JavaScript. Hosted on a personal website.
HTML CSS JavaScript

Media Coverage

Jan. 2025	Team of Western students wins NASA Space Apps Challenge	*University of Western Ontario*
Oct. 2023	SURP Student Spotlight	*University of Toronto*

Skills

Programming	Python (NumPy, SciPy, Pandas, Matplotlib, Keras/TensorFlow, scikit-learn), MATLAB, R (ggplot, dplyr), HTML5 (Bootstrap), CSS, JavaScript (Node.js)
Software	LaTeX, Git/GitHub, Jupyter Notebook, Anaconda, R Suite, Bash, Linux (ssh), Microsoft Excel
Languages	English (fluent), French (intermediate), Cantonese (spoken)

Other Affiliations

2024- **Western Institute for Earth and Space Exploration**
2023- **Canadian Astronomical Society**