lan Chow

MSc. Astronomy Candidate | University of Western Ontario

Department of Physics and Astronomy, 1151 Richmond Street, London, ON, Canada, N6A 3K7



RESEARCH INTERESTS

Astrostatistics, Machine Learning, Solar System/Exoplanet Dynamics, Meteors

EDUCATION

PRESENT University of Western Ontario London, ON, Canada

Sep. 2023

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

University of Toronto

Toronto, ON, Canada

Sep. 2018

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 Dunlap Institute for Astronomy & Astrophysics, University of Toronto Toronto, ON, Canada

May 2023

SUMMER UNDERGRADUATE RESEARCH ASSISTANT

Project: Understanding the impact of Bayesian inference on ultra-light axion limits

SUPERVISOR: Dr. Keir Rogers

Aug. 2022

Canadian Institute for Theoretical Astrophysics (CITA)

Toronto, ON, Canada

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May 2022

SUMMER UNDERGRADUATE RESEARCH FELLOW

Project: Modelling Migration Scenarios of Resonant Planets Using Radial Velocity Data

SUPERVISORS: Dr. Sam Hadden, Prof. Hanno Rein

RELEVANT COURSEWORK

Modern Astrophysics (stellar structure/evolution, nucleosynthesis, galaxies, cosmology), Small-Body and **Astrophysics**

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, Survey Sampling and Observational Data, Statistical Computation,

Machine Learning



PEER-REVIEWED PUBLICATIONS

FIRST AUTHOR

- 1. Chow, I., & Brown, P.G. "Decameter-Sized Earth Impactors I: Orbital Properties", accepted for publication in Icarus.
- 2. Chow, I., & Hadden, S. "Influence of Modeling Assumptions on the Inferred Dynamical State of Resonant Systems: A Case Study of the HD 45364 System", in revision at ApJ.

AWARDS, SCHOLARSHIPS, FELLOWSHIPS & HONOURS

| 2024 | NASA International Space Apps Challenge Global Finalist, honour | NASA |
|-----------|--|-------------------------------|
| 2024-2025 | Ontario Graduate Scholarship, \$15,000 CAD | University of Western Ontario |
| 2023-2024 | Western Graduate Research Scholarship, \$8,257 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 |



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 Astronomy 1021: General Astronomy, Teaching Assistant & 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

Innovere Medical

SOFTWARE DEVELOPER

Markham, ON, Canada

Jun. 2020

- 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

Plantiga Technologies

Vancouver, BC, Canada

Jun. 2019 | 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

Synced Review

Toronto, ON, Canada

Jun. 2017 | RESEARCH INTERN

- > Conducted literature review focusing on advancements in reinforcement learning used in adversarialsearch 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

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Conference Presentations

CONTRIBUTED TALKS

| Jun. 2024 | 2024 CASCA AGM, University of Toronto/York University | Toronto, ON, Canada |
|-----------|---|---------------------|
| 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. 2023 CASCA AGM, NRC Herzberg Research Centre/University of British Columbia Penticton, BC, Canada

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OTHER ACADEMIC PRESENTATIONS

May 2024NASA Day, NASA Meteoroid Environment Office. Invited talk.VirtualAug. 2023SURP Symposium, University of Toronto. Poster.Toronto, ON, CanadaAug. 2022SURF Symposium, Canadian Institute for Theoretical Astrophysics. Invited talk.Toronto, ON, Canada

Leadership, Volunteering & Extracurricular Experience

PRESENT

Hume Cronyn Memorial Observatory

London, ON, Canada

Jun. 2024

OUTREACH VOLUNTEER

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

Jun. 2024

Consensus Trivia

Sep. 2023

QUESTION WRITER/EDITOR

- > Wrote and edited trivia questions for Consensus Trivia, a federally registered not-for-profit organization that runs team-based trivia tournaments for 80+ high school and collegiate teams across Canada
- Moderated and kept score for tournament games as a staffer

May 2023

University of Toronto Academic Trivia Club

Toronto, ON, Canada

Jan. 2019

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 Face-book 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.



Media Coverage

Oct. 2023 SURP Student Spotlight Interview

Dunlap Institute for Astronomy & Astrophysics, University of Toronto



PROJECTS

SKYSHIELD ORRERY

2024

ia-chow.github.io/projects/skyshield-orrery
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 40 Global Finalists out of 10 000 submitted projects. Hosted on a personal website.

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 described by Fasano & Franceschini (1987). Used in Chow & Brown (2025), accepted for publication in Icarus.

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



Programming Python (NumPy, SciPy, Pandas, Matplotlib, Keras/TensorFlow, scikit-learn), MATLAB, R (ggplot, dplyr), HTML5

(Bootstrap), CSS, JavaScript (Node.js)

Software LTEX, Git/GitHub, Jupyter Notebook, Anaconda, R Suite, Bash, Linux (ssh), Microsoft Excel

Languages English (fluent), French (intermediate), Cantonese (spoken)



2024- Institute for Earth and Space Exploration

University of Western Ontario