Chloe M. Cheng

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EDUCATION

LEIDEN UNIVERSITY
Doctor of Philosophy
Expected Aug. 2026 | Leiden, NL
Leiden Observatory PhD Candidate

UNIVERSITY OF WATERLOO
Master of Science
Oct. 2022 | Waterloo, ON
Department of Physics and Astronomy/Waterloo Centre for Astrophysics
Cum. GPA: 83.5% / 100%

UNIVERSITY OF TORONTO
Honors Bachelor of Science with Distinction
Jun. 2020 | Toronto, ON
Faculty of Arts & Science, Trinity College
Astronomy and Physics Specialist and Mathematics Minor
Cum. GPA: 3.24 / 4.0

SKILLS

PROGRAMMING
Languages
Python • Bash shell • LaTeX • C++
MATLAB • Fortran • R
Tools
alf • PypeIt • apogee • astropy • docopt
numpy • PyTorch • SLURM • ROOT •
GRSISort • SciDraw
Techniques
spectroscopy • stellar population synthesis • full spectrum fitting • data reduction • Bayesian statistics • forward modeling • detector configuration

AWARDS

Science Graduate Award
2020-2022 | University of Waterloo
Marie Curie Graduate Award
2020-2022 | University of Waterloo
2nd Place, Department of Physics Undergraduate Research Fair
Sept. 2019 | University of Toronto
Undergraduate Student Research Award (USRA)
May - Aug. 2018 | Natural Sciences and Engineering Research Council (NSERC)
President's Entrance Scholarship
Sept. 2016 | University of Toronto

RESEARCH EXPERIENCE

BALOGH RESEARCH GROUP | MSc Thesis Research Student
Sept. 2020 - Aug. 2022 | University of Waterloo, Waterloo, ON

- Supervisors: Professor Michael Balogh and Dr. Alexa Villaume (Waterloo Centre for Astrophysics Postdoctoral Fellow)
- Project: Testing the extremes of initial mass function (IMF) variability using compact stellar systems
- Full reduciton of Keck LRIS spectra. Simultaneously constraining IMF variations and stellar population parameters via full-spectrum stellar population synthesis modeling.

BOVY RESEARCH GROUP | BSc Thesis Research Student
Sept. 2019 - Aug. 2020 | University of Toronto, Toronto, ON

- Supervisors: Professor Jo Bovy (Canada Research Chair in Galactic Astrophysics) and Dr. Natalie Price-Jones (PhD 2020)
- Project: Testing the chemical homogeneity of chemically-tagged dissolved birth clusters (`10.1093/mnras/stab2106`)
- Strongly constrained intrinsic abundance scatter in star clusters by modeling stellar spectra as a one-dimensional function of initial stellar mass, forward modeling the spectra by creating simulations where scatter in 1 element was varied at a time, and comparing simulations to observations via Approximate Bayesian Computation.

GRIFFIN COLLABORATION | Research Assistant
May – Aug. 2019 | TRIUMF, Vancouver, BC

- Supervisor: Dr. Adam B. Garnsworthy (GRIFFIN Chair and Spokesperson)
- Project: Probing shape coexistence in ^{192}Hg through combined electron and γ-ray spectroscopy (established spin-parity assignments for negative-parity band and 8^- state; measured mixing ratio for $8^- \rightarrow 7^-$ transition).
- Hands-on work: re-configuring detectors; re-cabling data acquisition systems; assisting during experimental beam run-time (calibrating and monitoring equipment and experiment, communicating with beam operations staff).

ZHANG LAB | NSERC USRA/Institute of Medical Science Research Student
May - Aug. 2018 | Toronto Western Hospital/Krembil Research Institute, Toronto, ON

- Supervisor: Dr. Liang Zhang, Department of Fundamental Neurobiology
- Project: Verification of the mouse model for MRI-negative temporal lobe epilepsy (duties detailed below).
- Leadership role - taught, organized, supervised, and managed undergraduate students, International Research Fellows, and Faculty members.

VOLUNTEER EXPERIENCE

CANADIAN CONFERENCE FOR UNDERGRADUATE WOMEN IN PHYSICS | Volunteer
Jan. 19, 2020 | Toronto, ON
Directed conference attendees and speakers to workshops, talks, and activities. Arranged refreshments and gifts. Led small-group lab tours.

ZHANG LAB | Research Volunteer & Team Member
May – Aug. 2017 | Toronto Western Hospital/Krembil Research Institute, Toronto, ON
Kindled seizures in mice. Sectioned brain tissue and prepared slides. Performed cell counting. Soldered electrodes. Analyzed EEG recordings of seizures using MATLAB.

TEACHING

Teaching Assistant

Sept. 2020 - Apr. 2022 | University of Waterloo

PHYS 375: Stars
PHYS 342: Electricity and Magnetism 2
PHYS 112L: Physics 2 Laboratory
PHYS 121: Mechanics

Fundamentals of University Teaching Program

2020 - 2021 | University of Waterloo

COURSEWORK

GRADUATE

Fundamentals of Astrophysics I
Cosmology
Electromagnetic Theory
Fundamentals of Astrophysics II

UNDERGRADUATE

Research Topic in Astronomy
Practical Astronomy
Introductory Astrophysics
Galaxies and Cosmology
Stars and Planets
Computational Physics
Relativistic Electrodynamics
Quantum Mechanics II
Advanced Classical Mechanics
Thermal Physics
Partial Differential Equations
Complex Variables

LEADERSHIP & EXTRA-CURRICULAR

LEIDEN OBSERVATORY EQUITY, DIVERSITY, AND INCLUSION COMMITTEE MEMBER

Sept. 2022 - Present

GRADUATE STUDENT COMMITTEE, CANADIAN ASTRONOMICAL SOCIETY (CASCA)

Sept. 2021 - Aug. 2022

• Social Media Coordinator and Representative

ROTTERDAM RAVENS QUIDDITCH TEAM

Sept. 2022 - Present

UNIVERSITY OF TORONTO QUIDDITCH TEAM

Sept. 2017 - Apr. 2022

• Co-Captain & Vice President (Sept. 2019 - Apr. 2020)
• Treasurer (Sept. 2018 - Aug. 2021)

VOICE EXPERIENCE

Sept. 2010 - Apr. 2022

• National Association of Teachers of Singing (NATS) Ontario Chapter Auditions 3rd Place (Nov. 2021)
• NATS Ontario Chapter Auditions 2nd Place (Nov. 2019)

PUBLICATIONS

[1] **Cheng, C. M.**, Price-Jones, N., & Bovy, J. "Testing the chemical homogeneity of chemically tagged dissolved birth clusters". 2021, MNRAS, 506, 5573, doi: 10.1093/mnras/stab2106. https://arxiv.org/abs/2010.09721.

[2] Liu, H., Hameed, A. Z., Chow, J., Sivanenthiran, N., **Cheng, C.**, et al. "EEG features of spontaneous recurrent seizures in a mouse model of extended hippocampal kindling". 2021, Clinph, 132(9), e2, doi: 10.1016/j.clinph.2021.03.028.

[3] Liu, H., Tufa, U., Zahra, A., Chow, J., Sivanenthiran, N., **Cheng, C.**, et al. "Electrographic Features of Spontaneous Recurrent Seizures in a Mouse Model of Extended Hippocampal Kindling". 2021, TexCom, 2(1), doi:10.1093/texcom/tgab004.

[4] MacLean, A. D., Laffoley, A. T., Svensson, C. E., et al, incl. **Cheng, C.**. "High-precision branching ratio measurement and spin assignment implications for ^{62}Ga superallowed β decay". 2020, Phys Rev C, 102(5), doi: 10.1103/physrevc.102.054325. https://arxiv.org/abs/2011.03857.

[5] Liu, H., Stover, K. R., Sivanenthiran, N., Chow, J., **Cheng, C.**, et al. "Impaired Spatial Learning and Memory in Middle-Aged Mice with Kindling-Induced Spontaneous Recurrent Seizures". 2019, Front. Pharmacol., 10, 1077, doi: 10.3389/fphar.2019.01077.

[6] Song, H., Tufa, U., Chow, J., Sivanenthiran, N., **Cheng, C.**, et al. "Effects of Antiepileptic Drugs on Spontaneous Recurrent Seizures in a Novel Model of Extended Hippocampal Kindling in Mice". 2018, Front. Pharmacol., 9, 451, doi: 10.3389/fphar.2018.00451.

[7] Rocchini, M., Garrett, P. E., Zielińska, M., Lenzi, S. M., Dao, D. D., Nowacki, F., Bildstein, V., MacLean, A. D., Olaizola, B., Ahmed, Z., Andreoiu, C., Babu, A., Ball, G. C., Bhattacharjee, S. S., Bidaman, H., **Cheng, C.**, et al. "First Evidence of Axial Shape Asymmetry and Configuration Coexistence in ^{74}Zn: Suggestion for a Northern Extension of the $N = 40$ Island of Inversion". 2022, Physical Review Letters, in prep.

[8] Romanowsky, A. J., Larsen, S. S., Villaume, A., Carlin, J., Janz, J., Sand, D., Strader, J., Brodie, J. P., **Cheng, C. M.**, Crnojević, D., Forbes, D. A., Garling, C., Hargis, J., et al. "Low-density star cluster formation: discovery of a young faint fuzzy on the outskirts of the low-mass spiral galaxy NGC 247". 2022, MNRAS, in press. https://arxiv.org/abs/2210.03220.

POSTER PRESENTATIONS

[1] **Cheng, C.**, Villaume, A., and Balogh, M. L. "Testing the extremes of initial mass function variability using compact stellar systems". Presented at: *CASCA 2022 Annual General Meeting*; May 2022; Waterloo, ON.

[2] **Cheng, C.**, Olaizola, B., Paxman, C., et al. "Probing shape coexistence in ^{192}Hg through combined electron and γ-ray spectroscopy". Presented at:

a *The Canadian Conference for Undergraduate Women in Physics 2020*; 19 Jan. 2020; University of Toronto, Toronto, ON.
b *The Department of Physics Undergraduate Research Fair 2019*; 26 Sept. 2019; University of Toronto, Toronto, ON.
c *The TRIUMF Users' Group Annual General Meeting Student Poster Slam and Oral Presentation Competition*; 22 Aug. 2019; TRIUMF, Vancouver, BC.

[3] **Cheng, C.**, Chow, J., Lim, S., et al. "Verification of the mouse model for MRI-negative temporal lobe epilepsy". Presented at: *50th Annual Institute of Medical Science Summer Undergraduate Research Day*; 15 Aug. 2018; Toronto, ON.

RESEARCH TALKS

- *APOGEE Monthly Teleconference.* "Testing the chemical homogeneity of chemically-tagged dissolved birth clusters". 10 Nov. 2020.
- *SDSS 2020 Collaboration Meeting Lightning Talks.* "Testing the chemical homogeneity of open clusters". 23 Jun. 2020.
- *TRIUMF Summer Undergraduate Student Symposium.* "Examining internal conversion electrons in ^{192}Hg". 15 Aug. 2019; TRIUMF, Vancouver, BC.