

Steffani Grondin

PHD CANDIDATE – UNIVERSITY OF TORONTO

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Education

University of Toronto

PHD IN ASTRONOMY & ASTROPHYSICS

Advisors: Prof. Maria Drout and Prof. Jeremy Webb

Title: Star Clusters as Evolutionary Probes: Decoding Binary Evolution and Cluster Dynamics in the Milky Way

Toronto, ON, Canada

2020-June 2025 (expected)

University of British Columbia

BSC IN PHYSICS & ASTRONOMY (W/ DISTINCTION)

Advisor: Prof. Harvey Richer

Title: White Dwarf Natal Kicks in Open Star Clusters

Vancouver, BC, Canada

2015 - 2020

Awards

SCHOLARSHIPS/FELLOWSHIPS (TOTAL FUNDING: \$115,815).....

PhD	University of Toronto Fellowship Top-Up, \$3,000	2024-2025
PhD	NSERC Postgraduate Scholarship - Doctoral (PGS-D), \$61,000 over two years	2023-2025
PhD	Walter C. Sumner Memorial Fellowship, \$14,050 over two years	2023-2025
PhD	Ontario Graduate Scholarship (OGS), \$15,000	2022-2023
PhD	Faculty Of Arts And Science Program-Level Fellowship, \$3,000	2020
PhD	Graduate Entrance Award, \$1,765	2020
BSc	Summer Undergraduate Research Program (SURP) Fellowship, \$9,500	2019
BSc	NSERC Undergraduate Student Research Award (USRA), \$8,500	2018

ACADEMIC/RESEARCH AWARDS.....

PhD	International Astronomical Union Travel Grant, €650	2024
PhD	School of Graduate Studies Conference Grant, \$850	2024
BSc	Top 10 Finalist, Undergraduate 3 Minute Thesis	2020
BSc	Top Research Poster, UofT SURP Research Poster Symposium	2019
BSc	Second Place Research Poster, Physics Summer Research Poster Competition	2018

Publication List

SIGNIFICANT CONTRIBUTION (5).....

1. **Grondin, S.**, Drout, M.R., Muirhead, P., Nordhaus, J., Speagle, J.S. & Chornock, R., “The first catalog of candidate white dwarf + main sequence binaries in open clusters: A new window into common envelope evolution”, 2024, *ApJ*, 976, 1.
2. Evans, F., **Grondin, S.**, Ye, C., Webb, J.J., Laroche, A. & Bovy, J., “The ejection of hypervelocity stars from compact object binaries in Milky Way globular clusters”, submitted to *MNRAS*.
3. **Grondin, S.**, Webb, J.J., Lane, J.M.M., Speagle, J.S. & Leigh, N., “A catalogue of Galactic GEMS: Globular cluster Extra-tidal Mock Stars”, 2024, *MNRAS*, 528, 3.
4. Leigh, N., Ye, C., **Grondin, S.**, Fragione, G., Webb, J.J. & Heinke, C., “The dominant mechanism(s) for populating the outskirts of star clusters with neutron star binaries”, 2023, *MNRAS*, 527, 3.
5. **Grondin, S.**, Webb, J.J., Leigh, N., Speagle, J.S. & Khalifeh, R., “Searching for the extra-tidal stars of globular clusters with high-dimensional analysis and a core particle-spray code”, 2023, *MNRAS*, 518, 3.

OTHER CONTRIBUTIONS (4).....

1. Muirhead, P. et al. (6 co-authors including **Grondin, S.**), “Reconstructing the Evolution of HZ 9: a Post-Common Envelope Binary in the Hyades Open Cluster”, submitted to *ApJ*.
2. Herrera-Urquieta, A. et al. (12 co-authors including **Grondin, S.**), “A systematic method to identify runaways from star clusters produced from single-binary interactions: A case study of M67”, in review at *A&A*.
3. Kramer, M. et al. (29 co-authors including **Grondin, S.**), “Strong Field Gravity Tests with the Double Pulsar”, 2021, *Physical Review X*, 11, 4.
4. Richer, H. et al. (8 co-authors including **Grondin, S.**), “Massive White Dwarfs in Young Star Clusters”, 2021, *ApJ*, 912, 165.

Observing Programs _____

Facilities: 2MASS, APOGEE, Gaia, Gemini GMOS, Keck LRIS, Kepler/K2, LDT, Magellan MagE, Pan-STARRS1, Swift, TESS, ZTF

SUCCESSFUL OBSERVING PROPOSALS.....

Gemini Observatories Total Time Allocation: **58 hours** [Principle Investigator]; **14 hours** [Co-Investigator]

[PI] Spectroscopy of candidate post-common envelope binaries in star clusters *Gemini-N/S*
 Co-IS: DROUT, M., MUIRHEAD, P., & NORDHAUS, J. (AWARDED: 38 HOURS) *2022A/B, 2023B, 2024A/B*

[PI] A new post-common envelope binary candidate in Alessi 12 *Gemini-N*
 Co-IS: DROUT, M., MUIRHEAD, P., & NORDHAUS, J. (AWARDED: 10 HOURS; TOP-QUARTILE) *May 2023/April 2024 FT*

[PI] A new post-common envelope binary candidate in the Pleiades *Gemini-N*
 Co-IS: DROUT, M., MUIRHEAD, P., & NORDHAUS, J. (AWARDED: 10 HOURS; TOP-QUARTILE) *2024A, Oct. 2023 FT*

[Co-I] Spectroscopy of white dwarfs in Stock 2 and Stock 12 *Gemini-N*
 PI: RICHER, H. (AWARDED: 4 HOURS) *2020B*

[Co-I] Spectroscopy of very massive white dwarfs in young clusters *Gemini-N/S*
 PI: RICHER, H. (AWARDED: 10 HOURS) *2020B*

OBSERVING EXPERIENCE.....

6.5-meter Magellan Telescopes (10 nights; on-site and remote) *Las Campanas Observatory, CL*
 PIS: MARIA DROUT, YLVA GÖTBERG, PETER SENCHYNA *2021, 2022, 2023, 2024*

Selected Academic Presentations _____

INVITED TALKS (7).....

Pasadena, US	Caltech Tea Talks , California Institute of Technology	<i>Dec. 2024</i>
Amsterdam, NL	Multi-Star Group Meeting , University of Amsterdam	<i>July 2024</i>
Vienna, AT	Institute Seminar , Institute of Science and Technology Austria	<i>July 2024</i>
Paris, FR	Joint Galaxies and Cosmology Seminar , L’Observatoire de Paris (virtual)	<i>Dec. 2023</i>
Toronto, CA	Local Galaxy Group Department Meeting , UofT	<i>Feb/Nov. 2023</i>
Toronto, CA	Department Lunch Seminar , UofT	<i>Nov. 2022</i>
Toronto, CA	Statistics and Machine Learning Journal Club , UofT	<i>Nov. 2021</i>

CONTRIBUTED TALKS (11).....

Pasadena, US	Carnegie Tea , Carnegie Observatories	<i>Dec. 2024</i>
Paraty, BR	IAU Symposium 395: Stellar populations in the Milky Way and beyond , IAU	<i>Nov. 2024</i>
Warsaw, PL	MODEST-24 Star Clusters , Nicolaus Copernicus Astronomical Centre	<i>Aug. 2024</i>
Barcelona, ES	EuroWD24 , Universitat Politècnica de Catalunya	<i>July 2024</i>
Toronto, CA	CASCA 2024 , University of Toronto	<i>June 2024</i>
Toronto, CA	Globular Clusters and Their Tidal Tails , University of Toronto	<i>May 2024</i>
Garching, DE	The Interplay Between Binaries and Star Clusters , ESO Garching	<i>Sept. 2023</i>
Evanston, US	MODEST-23 Star Clusters , Northwestern University	<i>Aug. 2023</i>
Ann Arbor, US	Great Lakes Star Clusters & Streams , University of Michigan	<i>Aug. 2023</i>
Hamilton, CA	Star Clusters at McMaster , McMaster University	<i>Aug. 2022</i>
Busan, KR	IAU General Assembly XXXI (Machine Learning in Astronomy Session) , IAU	<i>Aug. 2022</i>

INSTRUCTED TUTORIALS AND WORKSHOPS (2).....

Garching, DE	'Machine Learning Techniques for Star Cluster Science', 75+ participants	Sept. 2023
Ann Arbor, US	'Dimensionality Reduction: Applications to Star Clusters', 50+ participants	Aug. 2023

Advising Experience

Undergraduate students supervised with: Jeremy Webb (*), Joshua Speagle (†) and Alison Sills (°)

BSc	Max Zabrodski ^{†,°} , Literature review: Multiple stellar populations in globular clusters	2023-2024
BSc	Rosalind Liang ^{*,†} , Project: Optimizing chemical abundances for extra-tidal star searches	2022-2023
BSc	Khemaka Oo ^{*,†} , Project: Comparing performances of dimensionality reduction algorithms	2022-2023
BSc	Ryan Wang ^{*,†} , Project: Automating a search for extra-tidal stars of globular clusters	2022-2023
BSc	Eric Connena ^{*,†} , Project: A high-order dimensional analysis of APOGEE DR16 using UMAP	2021-2022

Teaching Experience

I have **instructed 2500+ undergraduate students in 15 university classes** as a teaching assistant from 2018- 2024. From 2021-2024, I was the **Head Teaching Assistant for the two largest undergraduate courses in Canada** (AST 101/201). In this role, I led a team of 20 graduate instructors and developed weekly tutorial curricula for thousands of non-science students.

UofT	AST 201: Stars and Galaxies, Head Tutorial TA (x3), Graduate TA (x1)	2021-2024
UofT	AST 101: The Sun and Its Neighbours, Head Tutorial TA (x3), Graduate TA (x5)	2020-2024
UBC	PHYS 109: Enriched Experimental Physics Lab, Undergraduate TA	2020
UBC	PHYS 101: Energy and Waves Lab, Undergraduate TA	2019
UBC	PHYS 119: Experimental Physics Lab, Undergraduate TA	2018

Service and Academic Leadership

CONFERENCE ORGANIZATION.....

CASCA 2024: Harvey Richer Memorial Session June 2024
Co-ORGANIZER (WITH PROF. GWEN EADIE) Toronto, CA

- Proposed and ran a special parallel session to honor the scientific achievements of the late Prof. Harvey Richer.

Globular Clusters and Their Tidal Tails May 2024
LOC Co-CHAIR (WITH PROF. JOSHUA SPEAGLE) Toronto, CA

- Organized a 4-day international conference devoted to star cluster science at the University of Toronto.

LEADERSHIP POSITIONS/COMMITTEES.....

Co-President 2023-2024
UOFT GRADUATE ASTRONOMY STUDENT ASSOCIATION (GASA) UofT

- Led and advocated for 50+ UofT astronomy graduate students, overseeing financial, social, and mentorship initiatives.
- Petitioned the department to increase PhD student stipends, resulting in a multi-thousand dollar raise.

Education and Public Outreach Committee & Grad Student Representative 2021-2023
CANADIAN ASTRONOMICAL SOCIETY (CASCA) UofT

- Acted as a liason between the CASCA graduate student committee and the UofT GASA.

Secretary 2018-2019
UBC PHYSICS SOCIETY UBC

- Organized academic and social events for physics undergraduate students.

Co-President 2017-2018
UBC ASTRONOMY CLUB UBC

- Led a 30+person council to expand public engagement in astronomy through lectures, public observations, radio interviews, newspaper articles and presentations. In one year, we reached thousands of people throughout British Columbia.

Outreach and Science Communication

Volunteer & Roaming Astronomer

2023

ASTRONOMY ON TAP T.O.

UofT

- Assisted in event organization and answered public questions at Toronto's largest astronomy event.

Speaker & Volunteer Coordinator

2022-2023

UOFT ASTROTOURS

UofT

- Coordinated 20+ monthly volunteers and gave talks for a 100+ person astronomy public talk series.

Astronomy/STEM Educator

2021-2023

BRITISH COLUMBIA SCHOOL DISTRICT NO. 27 & NO. 36

UofT

- Visited primary and secondary schools to run astronomy and women in STEM lessons.

Science Writer

2021

UP AND ATOM YOUTUBE CHANNEL

YouTube

- Created popular-science video scripts that explain astronomy concepts for a YouTube channel with 350K+ subscribers.

Science Communications Assistant

2018

TRIUMF (CANADA'S PARTICLE ACCELERATOR CENTRE)

Vancouver, CA

- Synthesized complex science into engaging communications pieces (e.g. web articles, public tours and social media).

STEM Instructor

2017

UBC GEERING UP ENGINEERING OUTREACH

Vancouver, CA

- Educated 1000+ K-12 aged children across British Columbia about STEM in both a classroom and summer camp environment.
- Developed content and travelled to rural and Indigenous communities to foster interest and participation in STEM.