

David R. Miller

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Education

University of British Columbia

Vancouver, BC, Canada

PHD, ASTRONOMY

2022–Present

Supervisors: Dr. Jeremy Heyl and Dr. Harvey Richer (1944–2023)

Thesis: Probing Stellar Evolution With White Dwarfs in Open Clusters

Expected Completion: Spring 2027

University of British Columbia

Vancouver, BC, Canada

MSC, ASTRONOMY

2020–2022

Supervisor: Dr. Harvey Richer (1944–2023)

Thesis: The White Dwarf Initial-Final Mass Relation: Ultramassive White Dwarfs Ejected from Young Open Star Clusters

Simon Fraser University

Burnaby, BC, Canada

BSC, PHYSICS HONOURS (WITH DISTINCTION)

2016–2020

Supervisor: Dr. Levon Pogolian

Thesis: Dark Sector Cosmic Fluid Interactions as a Solution to the Observed Disagreement in Measurements of the Hubble Expansion Rate

Awards

UBC Four Year Fellowship (4YF), \$98,000

2023–2027

President's Academic Excellence Initiative PhD Award, \$4,800

2022–2026

Dunlap Institute Summer Undergraduate Research Program Fellowship (SURP), \$9,500

2019

NSERC Undergraduate Student Research Award (USRA), \$5,250

2018

Ken Caple College Transfer Entrance Scholarship, \$3,500

2016

Observing Programs

Led and authored 15 successful competitive observing proposals as PI, with one additional jointly developed program as Co-PI, across CFHT, Gemini, and HST.

Recent Highlights

Gemini	<i>Escaped white dwarfs as probes of the high-mass white dwarf initial-final mass relation</i>	2026
HST (Co-PI)	<i>Hidden in Plain Sight? Unraveling the Potential Merger Histories of Ultra-Massive White Dwarfs in the Initial-Final Mass Relation</i>	2026
Gemini	<i>Tracing contamination and stellar interactions in the white dwarf populations of open clusters and their tidal tails</i>	2026
CFHT	<i>Probing the mass gap in the white dwarf initial-final mass relation with the rich intermediate-aged open cluster NGC 2360</i>	2026
Gemini	<i>Probing Accelerated Cooling and Formation in a White Dwarf Binary from a Young Open Cluster</i>	2026

Publications

First Author (4)

1. **Miller, D. R.**, Heyl, J., and Tremblay, P-E. Investigating the Observational Progenitor Mass Gap in the White Dwarf Initial-Final Mass Relation. I. Cluster Census and Characterization of the First White Dwarfs in the Gap. 2026, *ApJ*, 1007:183.
2. **Miller, D. R.**, Caiazzo, I., Heyl, J., et al. The White Dwarf Initial-Final Mass Relation from Open Clusters in Gaia DR3. 2026, *ApJ*, 996:69.
3. **Miller, D. R.**, Caiazzo, I., Heyl, J. et al. An Extremely Massive White Dwarf Escaped From the Hyades Star Cluster. 2023, *ApJL*, 956:L41. **Featured in:** AAS Nova, Space.com, Universe Today.
4. **Miller, D. R.**, Caiazzo, I., Heyl, J. et al. The Ultramassive White Dwarfs of the Alpha Persei Cluster. 2022, *ApJL*, 926:L24.

Second/Third Author (3)

1. Jadhav, V. V., Kroupa, P., **Miller, D. R.**, Sahu, S., and Franktisek, D. The white dwarf population of open clusters and their tidal tails: Tracers of contamination and stellar interactions. 2026, *A&A*, accepted.
2. Yan, H., **Miller, D. R.**, Zhao, J., Guo, J., and Li, C. Escaped White Dwarf Candidates from Open Clusters. 2026, *ApJS*, 286:5.
3. Yan, H., Wang, L., **Miller, D. R.**, et al. Searching for White Dwarf Candidates Formed Through Binary Evolution in Star Clusters. 2026, *ApJ*, 999:167.

Contributing Author (4)

1. Cristea, A. A., Caiazzo, I., Cunningham, T., Raymond, J. C., Vennes, S., Kawka, A., Desai, A., **Miller, D. R.**, et al. A half ring of ionized circumstellar material trapped in the magnetosphere of a white dwarf merger remnant: A new class of white dwarf merger remnants with X-ray emission. 2026, *A&A*, 706, A188.
2. Côté, P., et al. (including **Miller, D. R.**). The CASTOR mission. 2025, *JATIS*, 11(4).
3. Richer, H. B., Caiazzo, I., Du, H., Grondin, S., Hegarty, J., Heyl, J., Kerr, R., **Miller, D. R.**, and Thiele, S. Massive White Dwarfs in Young Star Clusters. 2021, *ApJ*, 912:165. (Author order alphabetical after the first two)
4. Tzanavaris, P., Gallagher, S. C., Ali, S., **Miller, D. R.**, Penticga, S., and Johnson, K. E. Cosmic Pathways for Compact Groups in the Milli-Millennium Simulation. 2019, *ApJ*, 871:242.

Manuscripts in Preparation (4)

1. **Miller, D. R.**, Yan, H., et al. Characterization of Candidate High-Mass White Dwarf Escapees Candidates from Open Clusters. In prep.
2. Yan, H., **Miller, D. R.**, Li, C., et al. Photometric and Spectroscopic Analysis of an Extremely Low-Mass White Dwarf Binary. In prep.
3. **Miller, D. R.**, Caiazzo, I., and Heyl, J. Atypical White Dwarfs in Open Clusters. In prep.
4. **Miller, D. R.**, Heyl, J. A Spectroscopic Census of Cluster White Dwarfs from DESI, LAMOST, and SDSS. In prep.

Recent Talks

Victoria, Canada	DAO Astronomy Colloquium , NRC Herzberg	Colloquium	Nov. 2026
Hilo, USA	Gemini North Talk Series , Gemini Observatory	Research Talk	Oct. 2026
Vancouver, Canada	Astronomy Colloquium , University of British Columbia	Colloquium	Sept. 2026
Klosterneuburg, Austria	24th European White Dwarf Workshop	Contributed Talk	Aug. 2026
Halifax, Canada	CASCA 2025	Contributed Talk	June 2025
Burnaby, Canada	Cosmology Seminar , Simon Fraser University	Seminar	March 2025
Barcelona, Spain	23rd European White Dwarf Workshop	Contributed Talk	July 2024
Toronto, Canada	CASCA 2024: Harvey Richer Special Memorial Session	Invited Talk	June 2024

Teaching

Note: After 2023, I did not take on additional TA assignments because my graduate fellowship removed the requirement and my supervisor wanted me to prioritize research. In 2026, I was specifically asked to TA the biennial graduate Stellar Astronomy course, reflecting my standing as the department's leading graduate student in stellar astrophysics.

Astro 508: Stellar Astronomy , TA	2026
Sole TA for this graduate course. Duties include holding office hours, supporting student learning, and managing grading.	
Astro 310: The Solar System , Head Tutorial TA	2022–2023
Oversaw tutorials, managed the course gradebook, held office hours, and revised tutorial materials now used in subsequent offerings.	
Astro 311: Stars and Galaxies , Tutorial TA	2023
Astro 102: Intro to Stars and Galaxies , Tutorial TA	2022
Phys 131: Energy and Waves , Tutorial TA	2021
Astro 101: Introduction to the Solar System , Tutorial TA	2020–2021
Ran and supported tutorials, held office hours, and marked coursework.	

Academic Service

JOURNAL REFEREE – <i>ApJ</i>	2026–present
VOLUNTEER – Testing Gravity, <i>Vancouver, BC</i>	2019, 2025
SOLE ORGANIZER – Compact Object Journal Club, <i>University of British Columbia</i>	2021–2024
PROBLEM SETTER AND JUDGE – High-Energy Astrophysics Olympiad, <i>University of British Columbia</i>	2022

Outreach

PUBLIC TALKS

Space Camp Saturdays, <i>H. R. MacMillan Space Centre, Vancouver, BC</i>	2026
Science Rendezvous, <i>University of British Columbia</i>	2026

PUBLIC ENGAGEMENT

Astronomy on Tap, <i>University of British Columbia</i>	2024–2025
Astronomy on Tap, <i>University of Toronto</i>	2019
Cronyn Observatory, <i>University of Western Ontario</i>	2018

Affiliations & Training

RESEARCH AFFILIATIONS

Legacy Survey of Space and Time (LSST), <i>Canada</i>	2025–present
Provisional international data rights holder through Canada’s in-kind contribution to the Rubin Observatory.	
CASTOR Science Team - Stellar Astrophysics Working Group, <i>Canada</i>	2022–2023
Contributed to development of the stellar astrophysics science case for CASTOR, a proposed Canadian-led UV-optical space telescope.	

SCHOOLS & WORKSHOPS

Summer School in Statistics for Astronomers, <i>Penn State University</i>	2026
Statistical inference, regression and model selection, resampling, Bayesian analysis, MCMC and nested sampling, time series analysis, spatial statistics, and machine learning in R.	
ML4Astro Workshop – ICML 2025, <i>Vancouver, BC</i>	2025
Modern machine-learning methods in astrophysics, including foundation models, simulation-based inference, anomaly detection, and AI-assisted scientific workflows.	
Testing Gravity Pre-Conference School, <i>Vancouver, BC</i>	2025
Review lectures on gravitation and cosmology held in advance of the Testing Gravity conference.	
CRAQ Summer School on <i>Space Astronomy</i> , <i>Montreal, QC</i>	2023
Space-based astronomy, satellite operations, and the development of astronomical missions and instrumentation.	
CRAQ Summer School on <i>Large-Scale Astrophysics</i> , <i>Montreal, QC</i>	2018
Galaxy formation and evolution, galaxy clusters, and the use of large-scale structure as a cosmological probe.	