

Anna O'Grady

POSTDOCTORAL FELLOW – CARNEGIE MELLON UNIVERSITY

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Research Skills and Interests

Topics: Observational Stellar Astronomy, Binary Massive Star Evolution, Resolved Stellar Populations, Variable Stars, Core Collapse Supernovae Progenitors, UVOIR Spectroscopy, Population Synthesis Modeling

Telescopes: Hubble Space Telescope, Chandra X-ray Observatory, Magellan Telescopes (LCO), Gemini, South African Large Telescope

Software: COSMIC, DRAGONS, IRAF, AstroPy, Python, Git

Research Positions

Postdoctoral Fellow

McWILLIAMS CENTER POSTDOCTORAL FELLOWSHIP

Carnegie Mellon University

Sept. 2023 - Present

PhD Student

ADVISORS: PROF. MARIA DROUT, PROF. BRYAN GAENSLER, AND PROF RENÉE HLÔZEK

University of Toronto

Sept. 2016 - Aug. 2023

Undergraduate Student and NSERC Research Award

ADVISORS: PROF. IVAN BOOTH AND PROF. HARI KUNDURI

Memorial University of NL

Sept. 2012 - June 2016

Dorrit Hoffleit Undergraduate Summer Research Award

ADVISOR: PROF. LOUISE EDWARDS

Yale University

May 2014 - July 2014

Education

University of Toronto

PHD IN ASTRONOMY & ASTROPHYSICS

Advisors: Prof. Maria Drout and Prof. Bryan Gaensler

Title: Identification of super-AGB stars and Yellow Supergiant Binaries in the Magellanic Clouds

Toronto, ON, Canada

2016-2023

Memorial University of Newfoundland and Labrador

BSc HONOURS IN PHYSICS & APPLIED MATHEMATICS

Advisors: Prof. Ivan Booth and Prof. Hari Kunduri

Title: Perturbations of black hole horizons

St. John's, NL, Canada

2012-2016

Advising Experience

3 students supervised. (°) indicates co-supervision.

PhD **Shannon Bowes**°, PhD Thesis: Variability of Yellow Supergiant Binaries

2025-Present

BSc **Mark Martinez**°, Project: SNe Progenitors of Binary Neutron Star Mergers in COSMIC

2024-Present

High Sch. **Esme Offner**, Science Fair: Radial Velocities of Nearby Stars

2024-2025

Awards & Grants

SCHOLARSHIPS & FELLOWSHIPS

PhD	GM Women in Science and Mathematics Award, \$5000 CAD	2022
PhD	Lachlan Gilchrist Fellowship, \$12000 over 3 years	2018-2021
PhD	Walter C. Sumner Memorial Fellowship, \$16000 CAD over 2 years	2018-2020
PhD	OGS-QEII Graduate Scholarship, \$60000 CAD over 4 years	2016-2020
Undergrad	NSERC USRA & MUNL Internship Award, \$12000 CAD for 2 summers	2015-2016
Undergrad	Dr. S.W. Brekon Scholarship in Physics, \$1000 CAD	2015
Undergrad	Dorrit Hoffleit Summer Undergraduate Research Award, \$3000 USD	2014

ACADEMIC, RESEARCH, & LEADERSHIP AWARDS

PhD	Jiu Lin Allen Yen Award for O'Grady et al. 2020, \$1000 CAD	2021
PhD	"You Lead, We Follow" Leadership Award, UofT Dept. of Astronomy and Astrophysics	2021
Undergrad	Memorial University Lou Visentin Award, Achieved Dean's List in all years	2016
Undergrad	Dr. Hugh J. Anderson Leadership Award, Memorial University of NL	2013-2015

GRANTS

Postdoc	NSF Proposal - Near Field Population Synthesis, Collaborator	2025
Postdoc	McWilliams Seed Grant - Write Together Program, Yearly funding for new dept. professional development initiative	2023-2025

Observing Programs

SUCCESSFUL OBSERVING PROPOSALS

[PI, Director's Discretionary Time] X-ray detection of the low-mass companion responsible for Betelgeuse's long secondary period	Chandra X-Ray Observatory
Co-IS: O'CONNOR, B; GOLDBERG, J.; JOYCE, M.; MOLNAR, L.; JOHNSON, C.; HARE, J.; BREIVIK, K.; DROUT, M. (AWARDED: 45 KS)	2024B, Cycle 26 DDT
[Co-I, Director's Discretionary Time] Far-UV detection of the low-mass companion responsible for Betelgeuse's long secondary period	Hubble Space Telescope
PI: GOLDBERG, J. (AWARDED: 4 ORBITS)	2024B, Cycle 31 DDT
[PI] Confirming YSG Binaries in the Magellanic Clouds: Towards a Population of Partially Stripped Supernovae Progenitors	SALT
Co-IS: DROUT, M., (AWARDED: 6.3 HOURS)	2024B
[PI] Confirming YSG Binaries in the Magellanic Clouds: Towards a Population of Partially Stripped Supernovae Progenitors	Gemini-S
Co-IS: DROUT, M.; BREIVIK, K.; GOTBERG, Y.; LUDWIG, B., (AWARDED: 22 HOURS)	2024B
[PI] Confirmation of YSG Binaries in the Magellanic Clouds: Towards a Population of Supernova Progenitor Analogs	Gemini-S
Co-IS: DROUT, M.; BREIVIK, K.; GOTBERG, Y.; LUDWIG, B., (AWARDED: 18 HOURS)	2022B
[Co-I] The Nature of a New Class of Luminous Highly Variable Stars	Magellan/Baade 6.5m
PI: DROUT, M. (AWARDED: 1 NIGHT)	2020A
[Co-I] An APOGEE-2S Survey of Evolved Massive Stars in the Magellanic Clouds	du Pont 2.5m
PI: DROUT, M. (AWARDED: 4 NIGHTS)	2019
[Co-I] Yellow Supergiants as Probes of Stellar Evolution and Mass Loss	Magellan/Clay 6.5m
PI: DROUT, M. (AWARDED: 12 NIGHTS)	2017B

OBSERVING EXPERIENCE

Optical Echelle Spectrographs (MIKE, MagE)

Magellan 6.5m, LCO

25 NIGHTS

Optical Long-Slit Spectroscopy and Photometry (IMACS, LDSS)

Magellan 6.5m, LCO

4 NIGHTS

Optical Multi-Object Spectroscopy and Photometry (WFCCD)

du Pont 2.5m, LCO

3 NIGHTS

Academic Presentations

COLLOQUIA & SEMINARS (10)

Hamilton, CA	McMaster University, Seminar	Oct. 2025
St. John's, CA	Memorial University of Newfoundland and Labrador, Colloquium	Oct. 2025
London, CA	University of Western Ontario, Colloquium	Sep. 2025
Montreal, CA	McGill University, Trottier Space Institute, TSI Seminar Series	Sep. 2025
St. John's, CA	Memorial University of Newfoundland and Labrador, Colloquium	Mar. 2024
Cambridge, US	Harvard Center for Astrophysics, Seminar	Nov. 2022
Toronto, CA	University of Toronto, Seminar	Oct. 2022
Virtual	California Polytechnic State University, Colloquium	Apr. 2021
Virtual	Univ. of Arizona, Univ. of Hawaii, Ohio State Univ., Paper discussion (3)	Oct. 2020
St. John's, CA	Memorial University of Newfoundland and Labrador, Colloquium	Apr. 2019

CONFERENCES & WORKSHOPS (3 INVITED TALKS, 7 CONTRIBUTED TALKS, 6 POSTERS)

Halifax, CA	CASCA AGM, Contributed Talk, St. Mary's University	Jun. 2025
NYC, US	Stable Mass Transfer 2.0, <i>Invited</i> Workshop, Center for Computational Astrophysics	May 2025
Virtual	XMC II: Clouds over Yellowstone, Contributed Poster, NOIRLab	May 2025
Virtual	Transients From Space, Contributed Poster, Space Telescope Science Institute	Apr. 2025
Virtual	Stripped Star Workshop, Contributed Talk, Lorentz Center	July 2024
Sacramento, US	APS April Meeting, <i>Invited</i> Talk, Special Session on Thorne-Zytkow Objects	Apr. 2024
Leuven, BE	Massive Triples, Binaries, and Mergers, Contributed Talk, KU Leuven	July 2023
Seattle, US	AAS 241, Dissertation Talk, AAS Winter Meeting	Jan. 2023
Toronto, CA	Spoken-WERRD symposium, Contributed Talk	Nov. 2022
Ballyconnel, IR	Massive Stars Near and Far, Contributed Poster, IAU Symposium 361	May 2022
Virtual	AAS 238, <i>Invited</i> Talk, Special Session on Thorne-Zytkow Objects	June 2021
Virtual	Unsolved Problems in Giants and Red Supergiants, Contributed Talk, IAU Symposium	June 2021
Virtual	CASCA AGM, Contributed Talk	June 2021
Virtual	CASCA AGM, Contributed Poster	May 2020
Toronto, CA	RASC and AAVSO Joint AGM, Contributed Poster, York University	June 2019
Baltimore, US	Deaths and Afterlives of Stars, Contributed Poster, Space Telescope Science Institute	Apr. 2019

PUBLIC TALKS, PANELS, & EDUCATION WORK (18)

Pittsburgh, US	Public Talk (2), Allegheny Observatory	Jul. 24, Apr. 25
St. John's, CA	Public Talk (9), Royal Astronomical Society of Canada, St. John's Chapter	Dec. 2017-25
St. John's, CA	Elizabeth R. Laird Lecture, Johnson GeoCentre	Apr. 2024
Mt. Pearl, CA	Public Talk, Mount Pearl Girl Guides Association	Apr. 2024
Virtual	Public Talk, Amateur Observer's Society of New York	June 2022
Toronto, CA	AstroTours Public Talk - Pride Month, University of Toronto Graduate Astronomy Society	June 2022
St. John's, CA	Presentation to Grade 5 and 6 Students, St. Mary's Elementary School	Apr. 2022
Virtual	Presentation to Grade 7-12 Students, Crescent Collegiate, NL	Feb. 2021
Toronto, CA	AstroTours Public Talk, University of Toronto Graduate Astronomy Society	July 2019

Service, Outreach, and Academic Leadership

CONFERENCE ORGANIZATION

Atlantic Universities Physics and Astronomy Conference

Aug. 2015 - Feb. 2016

Co-CHAIR OF LOC (WITH TYLER DOWNEY)

St. John's, CA

- Co-chair of LOC for regional conference of 100+ undergraduate students across Atlantic Canada
- Responsible for assembling the rest of the LOC and volunteering groups, overseeing conference design and budget, acquiring meeting space and catering, choosing invited speakers, soliciting donations, hosting Women in Science panel, and ensuring the conference ran smoothly.

LEADERSHIP POSITIONS, COMMITTEES, AND SERVICE

Scholarships and Fellowship Review Panel, Physics & Astronomy

2024-2027

NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA

Canada

- Panel member for evaluating graduate scholarship and postdoctoral fellowship applications. 3 year appointment.

McWilliams Fellowship Search Committee

2024-2025

McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS

CMU

- Committee member for evaluating postdoctoral fellowship applications.

'Write Together Friends' Co-organizer

2024-Present

McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS

CMU

- Co-creator and co-organizer of weekly department event to encourage interaction and co-working within the department.

Jamboree Committee Member

2023 & 2024

McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS

CMU

- Committee member, responsible for organizing the yearly jamboree of flash talks for the department and securing venue for evening event; created standard procedure guide for future committees.

Regular Member, Committee Member

2016-2023

GRADUATE ASTRONOMY STUDENT ASSOCIATION

UofT

- Course & Qualifier Satisfaction Survey Committee (Chair) - Surveying student opinion on courses and qualifier exams and presenting results to faculty
- PRISM (LGBTQ+) Committee - Event organization
- Social Committee - Event organization

Regular Member, President (2015-2016)

2013-2016

PHYSICS & PHYSICAL OCEANOGRAPHY UNDERGRADUATE SOCIETY

MUNL

- Led the undergraduate society to organize monthly social events, survey students for opinions on course material and program design, and created a scholarship.

OUTREACH AND SCIENCE COMMUNICATION

Scientific Fact Checker

2024

BOOK – COSMIC COLLISIONS: SUPERGIANT VS. NEUTRON STAR | ISBN-13: 978-1536242256

Media Speaker & Volunteer

2023

2023 TOTAL SOLAR ECLIPSE EVENT, MEMORIAL UNIVERSITY OF NL

MUNL

Volunteer

2017

2017 PARTIAL SOLAR ECLIPSE EVENT & CANADA 150 STAR PARTY, RASC & DUNLAP INSTITUTE

UofT

Volunteer

2017

MATH DEPARTMENT GIRLS IN STEM EVENT

UofT

Volunteer

2016-2020

ASTROTOURS & ASTRO ON TAP

UofT

Media, Interviews, & Press

Press Rel.	X-Ray Study Reveals New Details About Betelgeuse's Elusive Companion Star , Amy Pavlak Laird, CMU Mellon College of Science	Oct. 2025
Interview	Anna O'Grady McWilliams Postdoctoral Fellow , Gale Force Wins Podcast, Ep 225	Feb. 2025
Interview	Holiday Question Show , Quirks and Quarks, CBC	Dec. 2023
Video	Stellar Struggles: Frank Kameny's fight for LGBTQ+ equality , Cosmos From Your Couch	June 2023
Docu.	Astronomer Searches for the Universe's Largest Stars , Imagine This	June 2023
Article	NL PhD student makes explosive discovery amongst the stars , Peter Jackson, Saltwire	June 2021
Article	Stellar alumna: Astronomy scholar discovers new type of star , Kelly Foss, MUN Gazette	June 2021
Article	On the Cusp of a New Understanding of the Stars , Emily Deibert, Research2Reality	Apr. 2021
Press Rel.	UofT Student Discovers Rare Star Population , Meaghan MacSween, Dunlap Institute	Mar. 2021

Collaborations and Professional Organizations

BLOeM BINARITY AT LOW METALLICITY COLLABORATION	2024-Present
YSE YOUNG SUPERNOVA EXPERIMENT COLLABORATION	2021-2023
IAU INTERNATIONAL ASTRONOMY UNION	2024-Present
CASCA CANADIAN ASTRONOMICAL SOCIETY SOCIÉTÉ CANADIENNE D'ASTRONOMIE	2019-Present
AAS AMERICAN ASTRONOMICAL SOCIETY	2022-Present

Teaching Experience

As a postdoc, I have instructed 50+ undergraduate students as a **guest lecturer** for 4 lectures, one of which I **designed myself**. As a graduate student, I have been a teaching assistant (TA) for **16 courses**. From 2018-2023, I was the **Head Marker** for two of the **largest** undergraduate courses in Canada (~ **1500 students** per semester). In this role I was responsible for organizing the duties of a team of 20+ TAs and overseeing the grading of all students. I also **designed and delivered** a lecture to summer research students. Finally, TA for a graduate course in 2022 and a undergraduate lab course during my senior undergraduate year.

CMU	PHYS 33120: Science and Science Fiction , Guest Lecturer (4 Lectures)	2025
UofT	Summer Undergraduate Research Program , Guest Lecturer (1 lecture)	2022
UofT	AST 301: Observational Astronomy , Graduate TA (x4)	2019-2022
UofT	AST 1410: Stars (Graduate Course) , Senior Graduate TA, Half semester appointment	2021-2025
UofT	AST 101/201: The Sun & Its Neighbours/Stars & Galaxies , Head Marker (x5.5), Grad. TA (x6)	2016-2023
MUNL	PHYS 1020: Introductory Physics I , Undergraduate TA	2015

Publication List

15 total publications; 4 first-author, 1 invited review. 50+ citations from significant contribution articles; over 300 citations total. Underlined authors indicate student supervision.

INVITED REVIEWS (1)

1. **O’Grady, A.J.G.**, Moriya, T.J.; Renzo, M.; Vigna-Gomez, A.; “[Thorne-Zytkow Objects](#)”, 2024, *Reference Module in Materials Science and Materials Engineering*, Elsevier, published as a chapter in Elsevier’s *Encyclopedia of Astrophysics* (2026), edited by I. Mandel, 17pp

SIGNIFICANT CONTRIBUTION (5)

5. **O’Grady, A.J.G.**, O’Connor, B.; Goldberg, J.; et al., “[Betelgeuse’s Buddy: X-Ray Constraints on the Nature of \$\alpha\$ Ori B](#)”, 2025, *ApJ* in press, arXiv:2505.18376, 15pp
4. Goldberg, J.; **O’Grady, A.J.G.**; et al., “[Betelgeuse, Betelgeuse, Betelgeuse, Betel-buddy? Constraints on the dynamical companion to \$\alpha\$ Orionis from HST](#)”, 2025, *ApJ* in press, arXiv:2505.18375, 15 pp
3. **O’Grady, A.J.G.**, Drout, M.R.; Neugent, K.F.; et al., “[Binary Yellow Supergiants in the Magellanic Clouds. I: Photometric Candidate Identification](#)”, 2024, *ApJ*, 975, 29, 21pp
2. **O’Grady, A.J.G.**, Drout, M.R.; Gaensler, B.M.; et al., “[Cool, Luminous, and Highly Variable Stars in the Magellanic Clouds. II: Spectroscopic and Environmental Analysis of Thorne-Zytkow Object and super-AGB Star Candidates](#)”, 2023, *ApJ*, 943, 18, 26pp
1. **O’Grady, A.J.G.**, Drout, M.R.; Shappee, B.J.; et al., “[Cool, Luminous, and Highly Variable Stars in the Magellanic Clouds from ASAS-SN: Implications for Thorne-Zytkow Objects and super-Asymptotic Giant Branch Stars](#)”, 2020, *ApJ*, 901, 2, 32pp

OTHER CONTRIBUTIONS (9)

9. Dorn-Wallenstein, T.Z.; et al. (7 co-authors, including **O’Grady, A.J.G.**), “[A Spectroscopic Hunt for Post-Red Supergiants in the Large Magellanic Cloud II: Turbulent Line Broadening in the Spectra of LMC Yellow Supergiants](#)”, 2025, *ApJ* in press.
8. Patrick, L.R.; et al. (39 co-authors including **O’Grady, A.J.G.**), “[Binarity at LOW Metallicity \(BLOeM\): The multiplicity properties and evolution of BAF-type supergiants](#)”, 2025, accepted for publication in *A&A*.
7. Shenar, T.; et al. (77 co-authors including **O’Grady, A.J.G.**), “[Binarity at LOW Metallicity \(BLOeM\): A spectroscopic VLT monitoring survey of massive stars in the SMC](#)”, 2024, *A&A*, 690, A289
6. Drout, M.R.; et al. (7 co-authors including **O’Grady, A.J.G.**), “[An observed population of intermediate-mass helium stars that have been stripped in binaries](#)”, 2023, *Science*, 382, 6676 **Press Release/Media: University of Toronto, Carnegie Observatories**
5. Kilpatrick, C.D.; et al. (25 co-authors including **O’Grady, A.J.G.**), “[Type II-P supernova progenitor star initial masses and SN 2020jfo: direct detection, light-curve properties, nebular spectroscopy, and local environment](#)”, 2023, *MNRAS*, 524, 2
4. Aleo, P.D.; et al. (87 co-authors including **O’Grady, A.J.G.**), “[The Young Supernova Experiment Data Release 1 \(YSE DR1\): Light Curves and Photometric Classification of 1975 Supernovae](#)”, 2023, *ApJS*, 226, 1
3. Chan, H-S.; et al. (6 co-authors including **O’Grady, A.J.G.**), “[Searching for Anomalies in the ZTF Catalog of Periodic Variable Stars](#)”, 2022, *ApJ*, 932, 2
2. Kessler, T.; et al. (30 co-authors including **O’Grady, A.J.G.**), “[Models and Simulations for the Photometric LSST Astronomical Time Series Classification Challenge \(PLASTiCC\)](#)”, 2019, *PASP*, 131, 1003
1. Booth, I.; Kunduri, H.K.; **O’Grady, A.J.G.**, “[Unstable marginally outer trapped surfaces in static spherically symmetric spacetimes](#)”, 2017, *Physical Review D*, 96, 2