

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

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

Software: COSMIC, DRAGONS, IRAF, AstroPy, 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 Gaelsner

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 or co-supervised(°).

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

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 **over 2000 undergraduate students in 16 courses**. From 2018-2023, I was the **Head Marker** for two of the **largest undergraduate courses in Canada**. 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 an 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

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 dept. professional development program	2023-2025

Publication List

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* edited by I. Mandel, 17pp, 4 citations

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, 2 citations
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 citations
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, 6 citations
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, 12 citations
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, 24 citations

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

Observing Programs

SUCCESSFUL OBSERVING PROPOSALS

[PI] 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] 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

INVITED TALKS & WORKSHOPS (15)

Hamilton, CA	McMaster University , Invited Colloquium	<i>Oct. 2025</i>
St. John's, CA	Memorial University of Newfoundland and Labrador , Invited Colloquium	<i>Oct. 2025</i>
London, CA	University of Western Ontario , Invited Colloquium	<i>Sep. 2025</i>
Montreal, CA	McGill University, Trottier Space Institute , Invited Colloquium	<i>Sep. 2025</i>
NYC, US	Stable Mass Transfer 2.0 Workshop , Center for Computational Astrophysics	<i>May 2025</i>
Sacramento, US	Special Session on Thorne-Zytkow Objects , Invited Talk, APS April Meeting	<i>Apr. 2024</i>
St. John's, CA	Memorial University of Newfoundland and Labrador , Invited Colloquium	<i>Mar. 2024</i>
Cambridge, US	Harvard Center for Astrophysics , Invited Seminar Talk	<i>Nov. 2022</i>
Toronto, CA	University of Toronto , Department Lunch Seminar	<i>Oct. 2022</i>
Virtual	AAS 238 , Invited Talk, Special Session on Thorne-Zytkow Objects	<i>June 2021</i>
Virtual	California Polytechnic State University , Invited Colloquium	<i>Apr. 2021</i>
Virtual	Univ. of Arizona, Univ. of Hawaii, Ohio State Univ. , Invited paper discussion (3)	<i>Oct. 2020</i>
St. John's, CA	Memorial University of Newfoundland and Labrador , Invited Colloquium	<i>Apr. 2019</i>

CONTRIBUTED TALKS (8)

Halifax, CA	CASCA AGM , CASCA	<i>Jun. 2025</i>
Virtual	Stripped Star Workshop , Lorentz Center	<i>July 2024</i>
Leuven, BE	Massive Triples, Binaries, and Mergers , KU Leuven	<i>July 2023</i>
Seattle, US	AAS Meeting, Dissertation Talk , AAS 241	<i>Jan. 2023</i>
Toronto, CA	Spoken-WERRD symposium ,	<i>Nov. 2022</i>
Virtual	Unsolved Problems in Giants and Red Supergiants , IAU	<i>June 2021</i>
Toronto, CA	astro-PH Paper Discussion , UofT	<i>Oct. 2020</i>
Virtual	CASCA AGM , CASCA	<i>June 2021</i>

CONTRIBUTED POSTERS (6)

Virtual	XMC II: Clouds over Yellowstone , NOIRLab	<i>May 2025</i>
Virtual	Transients From Space , Space Telescope Science Institute	<i>Apr. 2025</i>
Ballyconnel, IR	Massive Stars Near and Far , IAU Symposium 361	<i>May 2022</i>
Virtual	CASCA AGM , CASCA	<i>May 2020</i>
Toronto, CA	RASC and AAVSO Joint AGM , York University	<i>June 2019</i>
Baltimore, US	Deaths and Afterlives of Stars , Space Telescope Science Institute	<i>Apr. 2019</i>

PUBLIC TALKS, PANELS, & EDUCATION WORK (17)

Pittsburgh, US	Public Talk (2) , Allegheny Observatory	<i>Jul. 24, Apr. 25</i>
St. John's, CA	Public Talk (8) , Royal Astronomical Society of Canada, St. John's Chapter	<i>Dec. 2017-25</i>
St. John's, CA	Elizabeth R. Laird Lecture , Johnson GeoCentre	<i>Apr. 2024</i>
Mt. Pearl, CA	Public Talk , Mount Pearl Girl Guides Association	<i>Apr. 2024</i>
Virtual	Public Talk , Amateur Observer's Society of New York	<i>June 2022</i>
Toronto, CA	AstroTours Public Talk - Pride Month , University of Toronto Graduate Astronomy Society	<i>June 2022</i>
St. John's, CA	Presentation to Grade 5 and 6 Students , St. Mary's Elementary School	<i>Apr. 2022</i>
Virtual	Presentation to Grade 7-12 Students , Crescent Collegiate, NL	<i>Feb. 2021</i>
Toronto, CA	AstroTours Public Talk , University of Toronto Graduate Astronomy Society	<i>July 2019</i>

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

Service, Outreach, and Academic Leadership

CONFERENCE ORGANIZATION

Atlantic Universities Physics and Astronomy Conference Co-ORGANIZER OF LOC (WITH TYLER DOWNEY)	Aug. 2015 - Feb. 2016 St. John's, CA
<ul style="list-style-type: none">• Co-organizer 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, and ensuring the conference ran smoothly.	
Atlantic Universities Physics and Astronomy Conference HOST OF WOMEN IN SCIENCE PANEL	Feb. 2016 St. John's, CA
<ul style="list-style-type: none">• Invited and hosted four women scientists at hour-long a Women in Science panel.	

LEADERSHIP POSITIONS, COMMITTEES, AND SERVICE

Scholarships and Fellowship Review Panel, Physics & Astronomy NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA	2024-2027 Canada
<ul style="list-style-type: none">• Panel member for evaluating graduate scholarship and postdoctoral fellowship applications. 3 year appointment.	
McWilliams Fellowship Search Committee McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS	2024-2025 CMU
<ul style="list-style-type: none">• Committee member for evaluating postdoctoral fellowship applications.	
'Write Together Friends' Co-organizer McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS	2024-Present CMU
<ul style="list-style-type: none">• Co-creator and co-organizer of weekly department event to encourage interaction and co-working within the department.	
Jamboree Committee Member McWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS	2023 & 2024 CMU
<ul style="list-style-type: none">• 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 GRADUATE ASTRONOMY STUDENT ASSOCIATION	2016-2023 UofT
<ul style="list-style-type: none">• 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) PHYSICS & PHYSICAL OCEANOGRAPHY UNDERGRADUATE SOCIETY	2013-2016 MUNL
<ul style="list-style-type: none">• 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

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

2024

Media Speaker & Volunteer

2023 TOTAL SOLAR ECLIPSE EVENT, MEMORIAL UNIVERSITY OF NL

2023
MUNL

Volunteer

2017 PARTIAL SOLAR ECLIPSE EVENT, DUNLAP INSTITUTE

2017
UofT

Volunteer

RASC & DUNLAP INSTITUTE CANADA 150 STAR PARTY

2017
UofT

Volunteer

MATH DEPARTMENT GIRLS IN STEM EVENT

2017
UofT

Volunteer

ASTROTOURS & ASTRO ON TAP

2016-2020
UofT

Media, Interviews, & Press

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