

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, Core Collapse Supernovae Progenitors

Research Positions

Postdoctoral Fellow

McWILLIAMS CENTER POSTDOCTORAL FELLOWSHIP

Carnegie Mellon University

Sept. 2023 -

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

Toronto, ON, Canada

2016-2023

Advisors: Prof. Maria Drout and Prof. Bryan Gaelsner

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

Memorial University of Newfoundland and Labrador

BSc HONOURS IN PHYSICS & APPLIED MATHEMATICS

St. John's, NL, Canada

2012-2016

Advisors: Prof. Ivan Booth and Prof. Hari Kunduri

Title: Perturbations of black hole horizons

Awards

SCHOLARSHIPS/FELLOWSHIPS (TOTAL FUNDING: \$110,000 CAD, \$216,000 USD)

Postdoc	McWilliams Postdoctoral Fellowship, CMU, \$213,000 USD over 3 years	2023-2026
PhD	GM Women in Science and Mathematics Award, \$5000 CAD	2022
PhD	Frank S. Hogg Memorial Fellowship Fund, \$2500 CAD	2021
PhD	Lachlan Gilchrist Fellowship, \$12000 over 3 years	2018-2021
PhD	UofT Arts and Science Fellowship Award, \$500 CAD	2020
PhD	Walter C. Sumner Memorial Fellowship, \$16000 CAD over 2 years	2018-2020
PhD	Queen Elizabeth II Graduate Scholarship, \$45000 CAD over 3 years	2017-2020
PhD	Ontario Graduate Scholarship, \$15000 CAD	2016-2017
Undergrad	Memorial University Summer Internship Award, \$6000 CAD	2016
Undergrad	Dr. S.W. Brekon Scholarship in Physics, \$1000 CAD	2015
Undergrad	NSERC Summer Undergraduate Research Award, \$6000 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 Award in Physics , Memorial University of NL	2013-2015

Publication List

Underlined authors indicate student supervision.

SIGNIFICANT CONTRIBUTION (6)

6. **O’Grady, A.J.G.**, O’Connor, B.; Goldberg, J.; et al., “Betelgeuse’s Buddy: X-Ray Constraints on the Nature of α Ori B”, 2025, submitted to *ApJ*, arXiv:2505.18376, 15pp
5. Goldberg, J.; **O’Grady, A.J.G.**; et al., “Betelgeuse, Betelgeuse, Betelgeuse, Betel-buddy? Constraints on the dynamical companion to α Orionis from HST”, 2025, submitted to *ApJ*, arXiv:2505.18375, 15 pp
4. **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, to be published as a chapter in Elsevier’s *Encyclopedia of Astrophysics*, 17pp, 5 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, 3 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, 11 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 (8)

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

Co-IS: O'CONNOR, B.; GOLDBERG, J.; JOYCE, M.; MOLNAR, L.; JOHNSON, C.; HARE, J.; BREIVIK, K.; DROUT, M. (AWARDED: 45 KS)

Chandra X-Ray Observatory

2024B, Cycle 26 DDT

[Co-I] Far-UV detection of the low-mass companion responsible for Betelgeuse's long secondary period

PI: GOLDBERG, J. (AWARDED: 4 ORBITS)

Hubble Space Telescope

2024B, Cycle 31 DDT

[PI] Confirming YSG Binaries in the Magellanic Clouds: Towards a Population of Partially Stripped Supernovae Progenitors

Co-IS: DROUT, M., (AWARDED: 6.3 HOURS)

SALT

2024B

[PI] Confirming YSG Binaries in the Magellanic Clouds: Towards a Population of Partially Stripped Supernovae Progenitors

Co-IS: DROUT, M.; BREIVIK, K.; GOTBERG, Y.; LUDWIG, B., (AWARDED: 22 HOURS)

Gemini-S

2024B

[PI] Confirmation of YSG Binaries in the Magellanic Clouds: Towards a Population of Supernova Progenitor Analogs

Co-IS: DROUT, M.; BREIVIK, K.; GOTBERG, Y.; LUDWIG, B., (AWARDED: 18 HOURS)

Gemini-S

2022B

[Co-I] The Nature of a New Class of Luminous Highly Variable Stars

PI: DROUT, M. (AWARDED: 1 NIGHT)

Magellan/Baade 6.5m

2020A

[Co-I] An APOGEE-2S Survey of Evolved Massive Stars in the Magellanic Clouds

PI: DROUT, M. (AWARDED: 4 NIGHTS)

du Pont 2.5m

2019

[Co-I] Yellow Supergiants as Probes of Stellar Evolution and Mass Loss

PI: DROUT, M. (AWARDED: 12 NIGHTS)

Magellan/Clay 6.5m

2017B

OBSERVING EXPERIENCE

Optical Echelle Spectrographs (MIKE, MagE)

25 NIGHTS

Magellan 6.5m, LCO

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

4 NIGHTS

Magellan 6.5m, LCO

Optical Multi-Object Spectroscopy and Photometry (WFCCD)

3 NIGHTS

du Pont 2.5m, LCO

Academic Presentations

INVITED TALKS/SEMINARS/WORKSHOPS (12)

NYC, US	Stable Mass Transfer 2.0 Workshop , Center for Computational Astrophysics	May 2025
Sacramento, US	Special Session on Thorne-Zytkow Objects , APS April Meeting	Apr. 2024
St. John's, CA	Physics Department Colloquium , Memorial University of Newfoundland and Labrador	Mar. 2024
Cambridge, US	Astrophysics Lunch Seminar , Harvard Center for Astrophysics	Nov. 2022
Toronto, CA	Department Lunch Seminar , University of Toronto	Oct. 2022
Toronto, CA	Summer Undergraduate Research Seminar , University of Toronto	July 2022
Virtual	Special Session on Thorne-Zytkow Objects , AAS 238	June 2021
Virtual	Physics Department Colloquium , California Polytechnic State University	Apr. 2021
Virtual	Paper Presentation (3) , Univ. of Arizona, Univ. of Hawaii, Ohio State Univ.	Oct. 2020
St. John's, CA	Physics Department Colloquium , Memorial University of Newfoundland and Labrador	Apr. 2019

CONTRIBUTED TALKS (8)

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

CONTRIBUTED POSTERS (6)

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

PUBLIC TALKS, PANELS, AND EDUCATION WORK (17)

Pittsburgh, US	Public Talk (2) , Allegheny Observatory	Jul. 24, Apr. 25
St. John's, CA	Public Talk (8) , 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

Advising Experience

3 students supervised, co-supervision with Maria Drout (*) or Katie Breivik (°) indicated.

PhD	Shannon Bowes* , PhD Summer Project: Variability of Yellow Supergiant Binaries	2025-Present
BSc	Mark Martinez° , Project: SNe Progenitors of Binary Neutron Star Mergers in COSMIC	2024-Present
High Schl.	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 undergraduate lectures. One of these lectures I **designed myself**. As a graduate student, I have been a teaching assistant 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** (AST 101/201). In this role I was responsible for both organizing the marking duties of a team of 20+ other graduate teaching assistants and overseeing the grading of all students. I was also a teaching assistant 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	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

Service, Outreach, and Academic Leadership

CONFERENCE ORGANIZATION

Atlantic Universities Physics and Astronomy Conference	Aug. 2015 - Feb. 2016
Co-ORGANIZER OF LOC (WITH TYLER DOWNEY)	St. John's, CA
<ul style="list-style-type: none">Co-organizer of LOC for regional conference of 100+ undergraduate students across Atlantic CanadaResponsible 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	Feb. 2016
HOST OF WOMEN IN SCIENCE PANEL	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 • Panel member for evaluating graduate scholarship and postdoctoral fellowship applications. 3 year appointment.	2024-2027 Canada
McWilliams Fellowship Search Committee MCWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS • Committee member for evaluating postdoctoral fellowship applications.	2024-2025 CMU
‘Write Together Friends’ Co-organizer MCWILLIAMS CENTER FOR COSMOLOGY AND ASTROPHYSICS • Co-creator and co-organizer of weekly department event to encourage interaction and co-working within the department.	2024-Present CMU
Regular Member, Committee Member GRADUATE ASTRONOMY STUDENT ASSOCIATION • 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	2016-2023 UofT
Regular Member, President (2015-2016) PHYSICS & PHYSICAL OCEANOGRAPHY UNDERGRADUATE SOCIETY • Led the undergraduate society to organize monthly social events, survey students for opinions on course material and program design, and created a scholarship.	2013-2016 MUNL
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 Releases _____

Interview	Anna O’Grady McWilliams Postdoctoral Fellow , Gale Force Wins 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
Video	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	2024-Present
BINARITY AT LOW METALLICITY COLLABORATION	
YSE	2021-2023
YOUNG SUPERNOVA EXPERIMENT COLLABORATION	

CASCA

CANADIAN ASTRONOMICAL SOCIETY | SOCIÉTÉ CANADIENNE D'ASTRONOMIE

*2019-Present***AAS**

AMERICAN ASTRONOMICAL SOCIETY

2022-Present