Madeline Anne Marshall — Curriculum Vitae

Plaskett Fellow
National Research Council Canada
Dominion Astrophysical Observatory
Victoria, BC, Canada

Email: madeline_marshall (at) outlook (dot) com
Website: https://madelinemarshall.github.io

Employment & Education

2020–present	**Research Associate (Plaskett Fellowship)**	**National Research Council of Canada**
	Herzberg Astronomy and Astrophysics Research Centre	
	Dominion Astrophysical Observatory	
2017–2020	**Doctor of Philosophy**	**University of Melbourne**
	Thesis: "The Host Galaxies of High-Redshift Quasars"	
	Supervisors: Professor Stuart Wyithe, Dr Simon Mutch	
	Conferred: March 5th 2021	
2016	**Bachelor of Science with First Class Honours**	**University of Tasmania**
	Thesis: "Triggering Active Galactic Nuclei in Galaxy Clusters"	
	Supervisors: Dr Stanislav Shabala, Dr habil. Martin Krause	
2015–2017	**Diploma of Philosophy**	**University of Tasmania**
2013–2015	**Bachelor of Science**	**University of Tasmania**
	GPA: 7.0 (on a 7-point scale)	

Key Involvement in Observing Programs

- **PI,** JWST GO-1813: *Unveiling Stellar Light from Host Galaxies of $z \sim 6$ Quasars*, (15.9 hours)
  Project lead
- **PI,** Gemini North NIRI AO, *Finding Suitable Stars to Help Uncover the Hosts of the First Quasars with JWST*, (1.33 hours DDT in 2021 and 0.45 hours FTT in 2022)
  Project lead
- **Co-I,** JWST GTO-1176: *Prime Extragalactic Areas for Reionization and Lensing Science (PEARLS)*, PI Windhorst
  Key 'builder' of the program, designing and updating the observing strategy (APT) since 2017
  Leading the two quasar observations within the program
  Focus group 'Obscured SF/AGN/Quasars' lead
  Website manager
- **Associate,** Galaxy Assembly with NIRSpec IFS (GA-NIFS) GTO program, JWST NIRSpec GTO team
  'QSOs at z > 6' project coordinator

Student Supervision

- **PhD Student,** Sabrina Berger, U. Melbourne. Co-Supervised with Stuart Wyithe, Dec 2022 - present
  Using simulations to understand observations of high-redshift quasar host galaxies.
- **Undergraduate Co-Op Student,** Katelyn Watts, NRC Herzberg, 4 months full time, Sept.–Dec. 2021
  Creating BlueTides mock images to understand how observations affect the measured sizes of high-z galaxies
- **Undergraduate Co-Op Student,** Laurie Amen, NRC Herzberg. Co-Supervised with Tyrone Woods and Patrick Côté, 4 months full time, May–Aug. 2022
  Developing the CASTOR Image Forecasting Simulations (FORECASTOR) to create mock CASTOR observations

Grants

- **$211,622 USD NASA JWST GO Grant,** Space Telescope Science Institute via Arizona State University, Funding PI Rogier Windhorst
- **$29,930 CAD CSA JWST GO Grant,** via University of Victoria, Funding PI Laura Ferrarese (exact amount TBC)

Awards

- **Faculty of Science Postgraduate Writing-Up Award, The Albert Shimmins Fund,** University of Melbourne, 2020
- **Alan Kenneth Head Travel Scholarship,** University of Melbourne, 2018
- **Women in Physics Award,** University of Melbourne, 2017
- **Australian Government Research Training Program (RTP) Scholarship,** University of Melbourne, 2017–2020
- **Bok Prize,** for outstanding research in astronomy by an Honours student or eligible Masters student at an Australian university, Astronomical Society of Australia, 2017
- **University Medal,** the highest undergraduate award, University of Tasmania (UTAS), 2017
- **Tasmania Honours Scholarship,** UTAS, 2016
- **Adrian La Palombara Annual Appeal Honours Scholarship in Physics,** UTAS, 2016
- **Dean's Honour Roll for the Faculty of Science, Engineering and Technology,** UTAS, 2013–2016
- **Australian Institute of Physics Prize,** for greatest proficiency in final year undergraduate Physics, UTAS, 2015
- **Premier of Tasmania National Undergraduate Scholarship,** UTAS, 2013–2016

Selected Talks

June 2023	**First Light (Invited talk)** Massachusetts Institute of Technology, USA
June 2023	**Fake Light** Center for Computational Astrophysics, Flatiron Institute, NYC, USA
Apr. 2023	**CANadian Virtual Astronomy Seminar (CANVAS)** Canada (Remote)
Mar. 2023	**Astrophysics Seminar** University of Victoria, Canada
Mar.2023	**A new era in extragalactic astronomy: early results from the JWST** Cambridge University, UK
Dec.2022	**First Science Results from JWST Conference** Baltimore (attended virtually)
Oct.2022	**Cosmic Dawn with the James Webb Space Telescope** Ringberg Castle, Germany
Feb. 2022	**CfA Seminar** Harvard (Remote)
Jan. 2022	**Quasars and Galaxies through Cosmic Time** Remote Conference
Oct. 2021	**SAZERAC: Models and Simulations of High-Redshift Galaxies** Remote Conference
Oct. 2021	**Astrophysics Colloquium** University of British Columbia, Vancouver, Canada (Remote)
June 2021	**European Astronomical Society Annual Meeting** Remote Conference
June 2021	**SAZERAC 2** Remote Conference
Dec. 2020	**SAZERAC: Quasars During Reionisation** Remote Conference

Oct. 2020	**DAO Astronomy Colloquium** NRC Herzberg, Victoria, Canada (Remote)
July 2020	**Astrophysics Seminar** University of Sussex, Brighton, UK (Remote)
Mar. 2020	**Black Holes and Galaxies at the Edge of the Universe** Ringberg Castle, Germany
Oct. 2019	**Cosmic Evolution of Quasars: From the First Light to Local Relics** Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing, China
Aug. 2019	**Astrophysics Seminar** Carnegie Mellon University, Pittsburgh, USA
July 2019	**Barefoot Reionization: Exploring the First Billion Years of the Universe** Fitzroy Island, Queensland, Australia
July 2018	**Are AGN Special?** Durham University, Durham, UK
July 2018	**The Early Growth of Supermassive Black Holes** Sexten Center for Astrophysics, Sexten, Italy
June 2018	**Astronomical Society of Australia Annual Scientific Meeting** Swinburne University of Technology, Melbourne, Australia
July 2017	**Astronomical Society of Australia Annual Scientific Meeting** Australian National University, Canberra, Australia *Bok Prize Talk*

Selected Workshops & Conferences

- **2022 Canadian Space Exploration Workshop,** Virtual Conference, June 2022
- **Canadian Astronomical Society (CASCA) 2022 AGM,** Virtual Conference, May 2022
- **Poster Symposium Targeting Early-career Researchers (PoSTER) - Poster competition winner,** Virtual Conference, May 2022
- **Canadian Astronomical Society (CASCA) 2021 AGM,** Virtual Conference, May 2021
- **Galaxy Formation and Evolution in the Era of the Nancy Grace Roman Space Telescope,** Virtual Conference, July 2020
- **SAZERAC Summer All Zoom Epoch Of Reionization Astronomy Conference,** Virtual Conference, July 2020
- **São Paulo School of Advanced Science on First Light: Stars, Galaxies and Black Holes in the Epoch of Reionization,** Instituto de Astronomia, Geofísica e Ciências Atmosféricas da Universidade de São Paulo, Brazil, July–August 2019
- **SciCoder Workshop,** University of Melbourne, November 2018
- **Harley Wood School of Astronomy,** Ballarat Observatory, June 2018 (LOC member)
- **ITSO/AAO Observational Techniques Workshop,** Australian Astronomical Observatory Headquarters, April/May 2018
- **ADACS - Introduction to high performance computing (HPC) for astronomers,** Swinburne University of Technology, November 2017
- **Harley Wood School of Astronomy,** Australian National University, July 2017

Teaching and Outreach

- **Herzberg Astronomy & Astrophysics Ambassador school talks,** Oak Bay High School, Victoria High School and Lambrick Park High School, Victoria BC, 2022
- **Up Close and BIG school careers talk,** Burnie Works, including primary and high schools throughout North West Tasmania, 2022
- **JWST Star Party public outreach events,** Friends of the Dominion Astrophysical Observatory, 2021,2022
- **Tutor, Physical Cosmology (Masters level),** University of Melbourne, 2018–2020
- **Lab Demonstrator, Third Year Laboratory and Computational Physics,** University of Melbourne, 2018–2019
- **Lab Demonstrator, First Year Physics (Advanced),** University of Melbourne, Semester 2 2017
- **Invited school visit,** Riana Primary School, Tasmania, 2020
- **Invited outreach talk,** Smithton Rotary Club, Tasmania, 2018 and 2020
- **Invited school talk,** Smithton Primary School, Tasmania, 2019
- **Laby Antarctica Explorer,** University of Melbourne/Laby Foundation, 2019
- **Year 10 Work Experience Volunteer,** University of Melbourne, 2017–2019

Press Release & Media Highlights

- **James Webb Space Telescope: Round 2 (ft. Maddie Marshall & Benji Metha),** Curiosity Killed the Rat science podcast, June 2022
- **Sneak Preview of Early Quasar Observations,** Physics magazine, Feb. 2022
- **Simulations Show Webb Telescope Can Reveal Distant Galaxies Hidden in Quasars' Glare,** STSci/NASA Press Release, Oct. 2020
- **Einstein-A-Go-Go Radio Interview,** RRR Melbourne, Nov. 2020
- **NASA's James Webb Telescope to Supersede Hubble Telescope Next Year,** Radio Interview at SYN Melbourne, Nov. 2020

Professional Activities

- **Member of the Astronomical Society of Australia,** ASA, 2017–present
- **Member of the Canadian Astronomical Society,** CASCA, 2021–present
- **Member of the ARC Centre of Excellence for All Sky Astrophysics in 3D,** ASTRO 3D, 2017–present
- **Referee for Monthly Notices of the Royal Astronomical Society,** MNRAS, 2021–present
- **Referee for the Astrophysical Journal,** ApJ, 2022–present
- **Referee for Gemini Canadian Time Allocation Committee,** CanTAC, 2021–present
- **NRC Herzberg DAO Seminar Series organising committee,** 2021–present,
- **Early Career Research Network (NRC ECRN),** National Research Council of Canada, 2020–present
- **Student Interview Committee Chair,** Astronomy Department Faculty Position, University of Melbourne, 2019
- **LOC Member,** Harley Wood School of Astronomy, 2018

First-author Papers

10. **Marshall, M. A.**, Perna, M., Willott, C. J., Maiolino, R., Scholtz, J., Übler, H., Carniani, S., Arribas, S., Lützgendorf, N., Bunker, A.J., Charlot, S., Ferruit, P., Jakobsen, P., Rodriguez Del Pino, B., Böker, T., Cameron, A. J., Cresci, G., Curtis-Lake, R., Jones, G.C., Kumari, N., and Pérez-Gonzalez, P. G.: 2023, *"Black hole and host galaxy properties of two $z \simeq 6.8$ quasars from the NIRSpec IFU"* Submitted to A&A, arxiv: 2302.04795.

9. **Marshall, M. A.**, Watts, K*, Wilkins, S., Di Matteo, T., Kuusisto, J. K., Roper, W. J., Vijayan, A. P., Ni, Y., Feng, Y., and Croft, R. A. C.,: 2022, *"The BlueTides Mock Image Catalogue: Simulated observations of high-redshift galaxies and predictions for JWST imaging surveys"* MNRAS 516, 1, 1047, DOI: 10.1093/mnras/stac2111 arxiv: 2206.08941.

8. **Marshall, M. A.**, Wilkins, S., Di Matteo, T., Roper, W. J., Vijayan, A. P., Ni, Y., Feng, Y., and Croft, R. A. C.,: 2022, *"The Impact of Dust on the Sizes of Galaxies in the Epoch of Reionization."* MNRAS 511, 4, 5475, DOI: 10.1093/mnras/stac380.

7. **Marshall, M. A.**, Wyithe, J. S. B., Windhorst, R. A., Di Matteo, T., Ni, Y., Wilkins, S., Croft, R. A. C., and Mechtley, M.: 2021, *"Observing the host galaxies of high-redshift quasars with JWST: predictions from the BlueTides simulation."* MNRAS 506, 1, 1209, DOI: 10.1093/mnras/stab1763.

6. **Marshall, M. A**., Mechtley, M., Windhorst, R. A., Cohen, S. H., Jansen, R. A., Jiang L., Jones, V. R., Wyithe, J. S. B., Fan, X., Hathi, N. P., Jahnke, K., Keel, W. C., Koekemoer, A. M., Marian, V., Ren, K., Robinson, J., Röttgering, H. J. A., Ryan, Jr., R. E., Scannapieco, E., Schneider, D. P., Schneider, G., Smith, B. M., and Yan, H.: 2020, *"Limits to Rest-Frame Ultraviolet Emission From Far-Infrared-Luminous $z \simeq 6$ Quasar Hosts."* ApJ 900, 21 DOI: 10.3847/1538-4357/abaa4c.

5. **Marshall, M. A**., Ni, Y., Di Matteo, T., Wyithe, J. S. B., Wilkins, S., and Croft R. A. C: 2020, *"The host galaxies of $z = 7$ quasars: predictions from the BlueTides simulation."* MNRAS 499, 3, 3819 DOI: 10.1093/mnras/staa2982.

4. **Marshall, M. A**., Mutch, S. J., Qin, Y., Poole, G. B., and Wyithe, J. S. B.: 2020, *"Dark-ages Reionization and Galaxy Formation Simulation – XVIII. The high-redshift evolution of black holes and their host galaxies."* MNRAS 494, 2747 DOI: 10.1093/mnras/staa936.

3. **Marshall, M. A**., Mutch, S. J., Qin, Y., Poole, G. B., and Wyithe, J. S. B.: 2019, *"Dark-ages Reionization and Galaxy Formation Simulation – XVII. Sizes, angular momenta and morphologies of high redshift galaxies."* MNRAS 488, 1941. DOI: 10.1093/mnras/stz1810.

2. **Marshall, M. A**., Shabala, S. S., Krause, M. G. H., Pimbblet, K. A., Croton, D. J., and Owers, M. S.: 2018, *"Triggering active galactic nuclei in galaxy clusters."* MNRAS 474, 3615. DOI: 10.1093/mnras/stx2996.

1. **Marshall, M. A.**, Ellingsen, S. P., Lovell, J. E. J., Dickey, J. M., Voronkov, M. A., Breen, S. L: 2017, *"Methanol absorption in PKS B1830-211 at milliarcsecond scales."* MNRAS 466, 2450. DOI: 10.1093/mnras/stw3295.

* Indicates a supervised student.

Co-author Papers, Refereed in Press

9. Duncan, K. J., Windhorst, R. A., Koekemoer, A. M., et al. 2023, *"JWST's PEARLS: TN J1338-1942 - I. Extreme jet-triggered star formation in a $z = 4.11$ luminous radio galaxy"*, MNRAS, 522, 4548. DOI: 10.1093/mnras/stad1267

8. Frye, B. L., Pascale, M., Foo, N., et al. 2023, *"The JWST PEARLS View of the El Gordo Galaxy Cluster and of the Structure It Magnifies"*, ApJ, 952, 81. DOI: 10.3847/1538-4357/acd929

7. Keel, W. C., Windhorst, R. A., Jansen, R. A., et al. 2023, *"JWST's PEARLS: Dust Attenuation and Gravitational Lensing in the Backlit-galaxy System VV 191"*, AJ, 165, 166. DOI: 10.3847/1538-3881/acbdff

6. Diego, J. M., Meena, A. K., Adams, N. J., et al. 2023, *"JWST's PEARLS: A new lens model for ACT-CL J0102-4915, "El Gordo," and the first red supergiant star at cosmological distances discovered by JWST"*, A&A, 672, A3. DOI: 10.1051/0004-6361/202245238

5. Cheng, C., Huang, J.-S., Smail, I., et al. 2023, *"JWST's PEARLS: A JWST/NIRCam View of ALMA Sources"*, ApJ, 942, L19. DOI: 10.3847/2041-8213/aca9d0

4. Yan, H., Cohen, S. H., Windhorst, R. A., et al. 2023, *"JWST's PEARLS: Bright 1.5-2.0 μm Dropouts in the Spitzer/IRAC Dark Field"*, ApJ, 942, L8. DOI: 10.3847/2041-8213/aca974

3. Windhorst, R. A., Cohen, S. H., Jansen, R. A., et al. 2023, *"JWST PEARLS. Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results"*, AJ, 165, 13. DOI: 10.3847/1538-3881/aca163

2. Roper, W. J., Lovell, C. C., Vijayan, A. P., et al. 2022, *"First Light And Reionisation Epoch Simulations (FLARES) – IV. The size evolution of galaxies at $z \geq 5$"*, MNRAS, 514, 1921. DOI: 10.1093/mnras/stac1368

1. Ren, K., Trenti, M., **Marshall, M. A.**, et al. 2021, *"The Diversity of Environments Around Luminous Quasars at Redshift $z \sim 6$"*, ApJ, 917, 89. DOI: 10.3847/1538-4357/ac0ae2

Co-author Papers, Unrefereed

6. Adams, N. J., Conselice, C. J., Austin, D., et al. 2023, *"EPOCHS Paper II: The Ultraviolet Luminosity Function from $7.5 < z < 13.5$ using 110 square arcminutes of deep, blank-field data from the PEARLS Survey and Public Science Programmes"*, arXiv preprint. DOI: 10.48550/arXiv.2304.13721

5. Kamieneski, P. S., Frye, B. L., Pascale, M., et al. 2023, *"Are JWST/NIRCam color gradients in the lensed z=2.3 dusty star-forming galaxy El Anzuelo due to central dust attenuation or inside-out galaxy growth?"*, arXiv preprint. DOI: 10.48550/arXiv.2303.05054

4. Carleton, T., Cohen, S. H., Frye, B., et al. 2023, *"PEARLS: Low Stellar Density Galaxies in the El Gordo Cluster Observed with JWST"*, arXiv preprint. DOI: 10.48550/arXiv.2303.04726

3. Übler, H., Maiolino, R., Curtis-Lake, E., et al. 2023, *"GA-NIFS: A massive black hole in a low-metallicity AGN at $z \sim 5.55$ revealed by JWST/NIRSpec IFS"*, arXiv preprint. DOI: 10.48550/arXiv.2302.06647

2. Ferreira, L., Conselice, C. J., Sazonova, E., et al. 2022, *"The JWST Hubble Sequence: The Rest-Frame Optical Evolution of Galaxy Structure at $1.5 < z < 8$"*, arXiv preprint. DOI: 10.48550/arXiv.2210.01110

1. Windhorst, R., Alpaslan, M., Andrews, S., et al. 2019, *"On the observability of individual Population III stars and their stellar-mass black hole accretion disks through cluster caustic transits"*, BAAS, 51, 449. DOI: 10.48550/arXiv.1903.06527

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