O. Grace Telford, Ph.D.

Carnegie-Princeton Postdoctoral Fellow
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Education

University of Washington
Ph.D. in Astronomy with Specialization in Advanced Data Science 2019
Thesis: "Using Metals and Stars to Constrain Galaxies' Past Gaseous Inflows and Outflows"
Advisors: Julianne Dalcanton and Jessica Werk
Data science coursework: machine learning, database management, data visualization
M.S. in Astronomy 2014

University of Pittsburgh
B.S. in Physics and Astronomy 2013
B.S.E. in Bioengineering with Concentration in Signals & Imaging 2013

Academic Positions

Princeton University & Carnegie Observatories
Carnegie-Princeton Postdoctoral Fellow 2023 –

Rutgers University
Postdoctoral Associate 2019 – 2023

University of Washington
NSF Graduate Research Fellow 2016 – 2019
NSF Big Data IGERT Fellow 2014 – 2016
Teaching Assistant 2013 – 2014

University of Pittsburgh
Undergraduate Researcher in Physics & Astronomy 2010 – 2013
Undergraduate Researcher at the Simulation & Medical Technology Center 2009 – 2012

National Solar Observatory
NSF REU Student 2010

Awarded Grants and Telescope Time

Co-I of HST Cycle 32 Program GO-17833 – 162 orbits 2024

PI of NASA Keck Observatory Program 2024B_N014/N015 – 2.5 nights, $21k 2024

Co-I of JWST Cycle 3 Program GO-5255 – 14.7 hours 2024

PI of NASA Keck Observatory Program 2024A_N063 – 1.5 nights, $16k 2023

PI of Hubble Space Telescope Cycle 31 Treasury Program GO-17491 – 110 orbits, $269k 2023

Co-PI of Hubble Space Telescope Cycle 31 Program AR-17557 2023

PI of JWST Cycle 2 Program GO-3449 – 15.4 hours, $191k 2023

PI of NASA Keck Observatory Program 2023A_N048 – 1 night, $15k 2022

Co-I of Hubble Space Telescope Cycle 30 Program GO-17102 – 16 orbits 2022
PI of NASA Keck Observatory Program 2022B_N011 – 1 night, $14k 2022
PI of Hubble Space Telescope Mid-Cycle 29 Program GO-16920 – 14 orbits, $109k 2022
PI of Hubble Space Telescope Cycle 29 Program GO-16767 – 32 orbits, $357k 2021
PI of NASA Keck Observatory Program 2021B_N194 – 1 night, $12k 2021
Co-I of ALMA Cycle 8 Program 2021.1.00169.S – 14.9 hours 2021
Co-I of JWST Cycle 1 Program GO-1617 – 35.7 hours 2021
PI of Hubble Space Telescope Cycle 28 Program AR-16155 – $158k 2020
Co-I of Hubble Space Telescope Cycle 28 Program AR-16144 2020
Co-I of NASA Keck Observatory Program 2020B_N194 – 1 night 2020
Co-I of Gemini Observatory Program GS-2020B-FT-201 – 13.7 hours 2020
Co-I of Hubble Space Telescope Mid-Cycle 27 Program GO-16048 – 13 orbits 2019

Fellowships

Carnegie-Princeton Postdoctoral Fellowship 2023
NASA Hubble Postdoctoral Fellowship (Declined) 2023
Momental Foundation Mistletoe Research Fellowship 2022
NSF Graduate Research Fellowship 2015
NSF Integrative Graduate Education and Research Traineeship for Data Science 2014

Teaching & Mentoring

Research Advisor to Graduate Students:

Abby Mintz (Princeton) – project on metal-poor OB stars (Keck 2023A_N048) 2023 –
Ciarán Furey (Amsterdam, co-advised) – master's thesis on metal-poor O stars 2023 –

Research Advisor to Undergraduate Students:

Arya Lakshmanan (Rutgers) – Henry Rutgers Scholar Award for senior thesis 2021 – 2023
Avery Kiihne (Rutgers) – Chambliss Award Honorable Mention at AAS #238 2019 – 2021
Olivia Petry, Travis Mandeville (UW Pre-Major in Astronomy Program) 2017 – 2018

Instructor for Courses and Workshops:

Instructor for the Princeton Undergraduate Summer Research Program Bootcamp 2024
Guest Lecturer for Astronomy 522: Extragalactic Astronomy at Princeton University 2023
Guest Lecturer for Physics 342: Principles of Astrophysics at Rutgers University 2023
Rutgers JWST Proposal Tools Workshop (**lead organizer**) 2020
Software Carpentry Workshops (taught Python, Linux, Git, and GitHub) 2017 – 2018
TA for undergraduate courses: Introduction to Astronomy, The Planets 2013 – 2014

Leadership, Service, & Inclusion Work

PI of the Treasury of Extremely Metal-Poor O Stars (TEMPOS) Collaboration	2023 –
Lead of XShootU Collaboration Working Group 9 on Massive Star Feedback	2022 –
Referee for the Astrophysical Journal, Astronomy & Astrophysics	2016 –
Lead of seminars on applying for postdoctoral positions (Rutgers & Princeton)	2022 – 2024
Completed Advancing Inclusive Mentoring (AIM) Training at Carnegie Science	2024
Time Allocation Committee Member for HST Cycle 28, 29 and JWST Cycle 2	2020 – 2023
Founding co-organizer of Rutgers Physics Equity & Inclusion Journal Club	2020 – 2021

Selected Recent Talks

Invited Seminars & Colloquia:

UC Santa Cruz Astronomy & Astrophysics Seminar	2024
Boston University Institute for Astrophysical Research Seminar	2024
University of Connecticut Astrophysics Seminar	2024
Michigan State University Astronomy Seminar	2024
University of Texas at Austin Astronomy Colloquium	2023
University of Pittsburgh/Carnegie Mellon University AstroLunch Seminar	2023
University of Notre Dame Astrophysics Seminar	2023
Columbia University Local Local-Group Group Meeting	2023
Washington State University Physics & Astronomy Colloquium	2023

Invited Conference Talks:

KITP Conference: Cosmic Dawn Revealed by JWST	2024
UV Galaxies 2023: Illuminating Galaxy Properties Across Cosmic Time	2023
Lorentz Center Workshop "ULLYSES Sets Sail"	2022
Splinter Meeting on Early ULLYSES Results at AAS #240	2022
Wolfe Symposium (Conference on the CGM)	2022
Baltimore Wind Workshop	2021

Press & Outreach

Speaker at Astronomy on Tap in Seattle, WA; Austin, TX; and Trenton, NJ	2017 – 2024
Astrobites summary of results presented in Telford et al. (2023)	2024
Armagh Observatory & Planetarium press release for XShootU Survey Paper	2023
Results from Telford et al. (2021) profiled in an article for PNAS Front Matter	2022
Public lecturer for amateur astronomy organizations in New Jersey	2021
Presenter at the University of Washington Planetarium & Mobile Planetarium	2014 – 2017

Publications

Summary statistics from the Astrophysics Data System (November 2024):
24 astrophysics papers with an h-index of 12 and 4091 total citations

First-Author Papers (7):

7. "Molecular Hydrogen in the Extremely Metal-Poor, Star-Forming Galaxy Leo P"
Telford, O. G., Sandstrom, K., McQuinn, K., Glover, S., Tarantino, L., Bolatto, A., and Rickards Vaught, R. 2024, sent out for review at Nature, arXiv:2410.21368

6. "Observations of Extremely Metal-Poor O Stars: Weak Winds and Constraints for Evolution Models"
Telford, O. G., Chisholm, J., Sander, A., Ramachandran, V., McQuinn, K., and Berg, D. 2024, ApJ, 974 85

5. "The Ionizing Spectra of Extremely Metal-Poor O Stars: Constraints from the Only H II Region in Leo P"
Telford, O. G., McQuinn, K., Chisholm, J., and Berg, D. 2023, ApJ, 943, 65

4. "Far-Ultraviolet Spectra of Main-Sequence O Stars at Extremely Low Metallicity"
Telford, O. G., Chisholm, J., McQuinn, K., and Berg, D. 2021, ApJ, 922, 191

3. "Mass-to-Light Ratios of Spatially Resolved Stellar Populations in M31"
Telford, O. G., Dalcanton, J., Williams, B., Bell, E., Dolphin, A., Durbin, M., and Choi, Y. 2020, ApJ, 891, 32

2. "Spatially Resolved Metal Loss from M31"
Telford, O. G., Werk, J., Dalcanton, J., and Williams, B. 2019, ApJ, 877, 120

1. "Exploring Systematic Effects in the Relation between Stellar Mass, Gas Phase Metallicity, and Star Formation Rate"
Telford, O. G., Dalcanton, J., Skillman, E., and Conroy, C. 2016, ApJ, 827, 35

Contributing-Author Papers (17):

17. "X-Shooting ULLYSES: Massive Stars at Low Metallicity X. Physical Parameters and Feedback of Massive Stars in the LMC N11 B Star-Forming Region"
Gómez-González et al. (including **Telford, O. G.**) 2024, in press at A&A, arXiv:2411.14149

16. "Early Bright Galaxies from Helium Enhancements in High-Redshift Star Clusters"
Katz, H., Ji, A., **Telford, O. G.**, and Senchyna, P. 2024, in press at OJA, arXiv:2410.14846

15. "The Ancient Star Formation History of the Extremely Low-Mass Galaxy Leo P: An Emerging Trend of a Post-Reionization Pause in Star Formation"
McQuinn, K., Newman, M., Skillman, E., **Telford, O. G.**, Brooks, A., Adams, E., Berg, D., Boyer, M., Cannon, J., Dolphin, A., Pahl, A. Rhode, K., Salzer, J., Cohen, R., and Goldman, S. 2024, ApJ, 976, 60

14. "An Empirical Calibration of the Tip of the Red Giant Branch Distance Method in the

Near Infrared. II. JWST NIRCam Wide Filters"
Newman, M., McQuinn, K., Skillman, E., Boyer, M., Cohen, R., Dolphin, A., and **Telford, O. G.** 2024, ApJ, 975, 195

13. "Scylla III. The Outside-In Radial Age Gradient in the Small Magellanic Cloud and the Star Formation Histories of the Main Body, Wing and Outer Regions"
Cohen et al. (including **Telford, O. G.**) 2024, ApJ, 975, 43

12. "Scylla II. The Spatially Resolved Star Formation History of the Large Magellanic Cloud Reveals an Inverted Radial Age Gradient"
Cohen et al. (including **Telford, O. G.**) 2024, ApJ, 975, 42

11. "The Scatter Matters: Circumgalactic Metal Content in the Context of the M-σ Relation"
Sanchez, N., Werk, J., Christensen, C., **Telford, O. G.**, Tremmel, M., Quinn, T., Mead, J., Sharma, R., and Brooks, A. 2024, ApJ, 967, 100

10. "An Empirical Calibration of the Tip of the Red Giant Branch Distance Method in the Near Infrared. I. HST WFC3/IR F110W and F160W Filters"
Newman, M., McQuinn, K., Skillman, E., Boyer, M., Cohen, R., Dolphin, A., and **Telford, O. G.** 2024, ApJ, 966, 175

9. "A Comprehensive Investigation of Metals in the Circumgalactic Medium of Nearby Dwarf Galaxies"
Zheng, Y., Faerman, Y., Oppenheimer, B., Putman, M., McQuinn, K., Kirby, E., Burchett, J., **Telford, O. G.**, Werk, J., and Kim, D. 2024, ApJ, 960, 55

8. "Spatially-Resolved Recent Star Formation History in NGC 6946"
Tran, D., Williams, B., Levesque, E., Lazzarini, M., Dalcanton, J., Dolphin, A., Koplitz, B., Smercina, A., and **Telford, O. G.** 2023, ApJ, 954, 211

7. "X-Shooting ULLYSES: massive stars at low metallicity. I. Project Description"
Vink, J., et al. (including **Telford, O. G.**) 2023, A&A, 675, A154

6. "The Panchromatic Hubble Andromeda Treasury: Triangulum Extended Region (PHATTER) II. The Spatially Resolved Recent Star Formation History of M33"
Lazzarini, M., et al. (including **Telford, O. G.**) 2022, ApJ, 934, 76

5. "Star Formation Histories from SEDs and CMDs Agree: Evidence for Synchronized Star Formation in Local Volume Dwarf Galaxies over the Past 3 Gyr"
Olsen, C., Gawiser, E., Iyer, K., McQuinn, K., Johnson, B., **Telford, O. G.**, Wright, A., Broussard, A., and Kurczynski, P. 2021, ApJ, 913, 45

4. "CANDELS Visual Classifications: Scheme, Data Release, and First Results"
Kartaltepe, J., et al. (including **Telford, O. G.**) 2015, ApJS, 221, 11

3. "The host galaxies of X-ray selected active galactic nuclei to z = 2.5: Structure, star formation, and their relationships from CANDELS and Herschel/PACS"
Rosario, D., et al. (including **Telford, O. G.**) 2015, A&A, 573, A85

2. "CANDELS: The Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey – The Hubble Space Telescope Observations, Imaging Data Products, and Mosaics" Koekemoer, A., et al. (including **Telford, O. G.**) 2011, ApJS, 197, 36

1. "CANDELS: The Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey" Grogin, N., et al. (including **Telford, O. G.**) 2011, ApJS, 197, 35

Other Publications:

1. "X-Shooting ULLYSES: Massive Stars at Low Metallicity" Vink, J., et al. (including **Telford, O. G.**) 2024, ESO Messenger, arXiv:2405.00085

2. "Gaussian Mixture Models Use-Case: In-Memory Analysis with Myria" Maas, R., Hyrkas, J., **Telford, O. G.**, Balazinska, M., Connolly, A., and Howe, B. 2015, *Proceedings of the 3rd Very Large Databases Workshop on In-Memory Data Management*
   • NB: computer science paper not reflected in ADS statistics; 12 citations.