

John F. Wu — CV

Space Telescope Science Institute
3700 San Martin Drive
Baltimore, MD 21218

Email: jowu@stsci.edu
Website: jwuphysics.github.io
ORCID: [0000-0002-5077-881X](https://orcid.org/0000-0002-5077-881X)

EDUCATION

Ph.D. in Physics and Astronomy <i>Rutgers, The State University of New Jersey</i>	Piscataway, NJ 2013 – 2019
B.Sc. in Physics/Astrophysics, with MCS Honors <i>Carnegie Mellon University</i>	Pittsburgh, PA 2009 – 2013

APPOINTMENTS

Assistant Astronomer <i>Space Telescope Science Institute</i>	Baltimore, MD 2022 – Present
Associate Research Scientist <i>Center for Astrophysical Sciences, Johns Hopkins University</i>	Baltimore, MD 2022 – Present
Postdoctoral Researcher <i>Space Telescope Science Institute</i>	Baltimore, MD 2020 – 2021
<i>Center for Astrophysical Sciences, Johns Hopkins University</i>	2019 – 2020
Graduate Research Assistant <i>Rutgers, The State University of New Jersey</i>	Piscataway, NJ 2013 – 2019
Undergraduate Research Assistant <i>McWilliams Center for Cosmology, Carnegie Mellon University</i>	Pittsburgh, PA 2012 – 2013
Research Intern <i>Carnegie Mellon University CyLab</i>	Pittsburgh, PA 2011

PROFESSIONAL MEMBERSHIPS

American Astronomical Society	2015 – Present
International Astronomical Union	2021 – Present

GRANTS AND AWARDS

Maryland Academy of Sciences, <i>Outstanding Young Scientist award</i> , \$5,000	2024
NSF, <i>Explore ACCESS GPU allocation</i> , equivalent to \$1,386	2023
STScI, <i>Director's Discretionary Research Funding</i> , \$68,110	2022
Google, <i>GCP Research Credits Program</i> , \$5,000	2019
Rutgers, <i>Robert A. Schommer Prize</i> , \$500	2018
USAID, <i>Research and Innovation Fellowship</i> , \$11,636	2016
Rutgers, <i>Special Study Award</i> , \$1,350	2014
Rutgers, <i>Claud Lovelace Graduate Fellowship & Excellence Fellowship Supplement</i> , \$1,000	2013
CMU, <i>Senior Leadership Recognition</i>	2013

ADVISING AND MENTORSHIP

Co-advisor, <i>Sophia Rivera (JHU/Undergrad)</i>	2024 – Present
Co-advisor, <i>Austin Larson (JHU/Masters in CS)</i>	2024 – Present
Primary advisor, <i>Mikaeel Yunus (JHU/PhD student in Physics and Astronomy)</i>	2023 – Present
Primary advisor, <i>Harish Krishnakumar (Princeton/Undergrad)</i>	2022 – Present
Primary advisor, <i>Phani Velicheti (Arizona/STScI Space Astronomy Summer Program)</i>	2022
Primary advisor, <i>Ziting Guo (Yale-NUS/Undergraduate capstone project)</i>	2021 – 2022
Mentor, <i>Kamonte Johnson (Frostburg State University/CollegeBound Foundation)</i>	2020 – 2022
Co-advisor, <i>Antoine Washington (Rutgers University/Undergraduate senior thesis)</i>	2017 – 2020
Co-advisor, <i>Marcell Howard (Case Western Reserve University/REU)</i>	2018
Co-advisor, <i>Manuel Perez III (University of Redlands/REU)</i>	2017

SEMINARS AND TALKS (†INVITED)

†Talk, <i>NOIRLab, Rare Gems in Big Data</i>	2024
†Talk, <i>LSST-DA Informatics & Statistics Science Collaboration meeting</i>	2024
Talk, <i>Aspen Center for Physics, Diffuse Cosmic Backgrounds [...]</i>	2024
†Seminar, <i>Swarthmore Physics & Astronomy, Colloquium</i>	2024
†Seminar, <i>Roman Virtual Lecture Series</i>	2024
Poster, <i>ICML, Machine Learning for Astrophysics</i>	2023
Talk, <i>STScI, Roman Science Inspired by Emerging JWST Results</i>	2023
Poster, <i>Flatiron CCA, Cosmic Connections Symposium</i>	2023
†Talk, <i>KITP, Galaxy Formation and Evolution in the Data Science Era</i>	2023
†Seminar, <i>University of Helsinki Astrophysics Seminar (virtual)</i>	2022
†Seminar, <i>Carnegie Observatories Lunch Talks</i>	2022
†Seminar, <i>UMBC Astrophysics Seminar</i>	2022
†Special Talk, <i>STScI</i>	2021
Talk, <i>JHU/STScI HotSci Series</i>	2021
†Seminar, <i>Université de Montréal, Astrophysics Seminar (virtual)</i>	2021
†Seminar, <i>University of Toronto, Statistics and Machine Learning Journal Club (virtual)</i>	2021
†Seminar, <i>Western Sydney University, Machine Learning in Astronomy</i>	2021
Seminar, <i>Space Telescope Science Institute, Galaxies Journal Club</i>	2021
†Seminar, <i>Fermilab, Cosmic Physics Center Seminar (virtual)</i>	2021
Poster, <i>NeurIPS, Machine Learning for the Physical Sciences workshop (virtual)</i>	2020
†Talk, <i>NCSA – Accelerated Artificial Intelligence for Big-Data Experiments (virtual)</i>	2020
Seminar, <i>NOIRLab, Flash Seminar (virtual)</i>	2020
†Seminar, <i>Wayne State University, Particle/Astro/Nuclear Physics Seminar (virtual)</i>	2020
†Talk, <i>The ISM in the Era of Big Data (AAS 236, virtual)</i>	2020
Talk, <i>JHU Astro Coffee</i>	2020
†Talk, <i>Astronomers Turned Data Scientists Meeting (AAS 235)</i>	2020
Poster, <i>AAS 235th Meeting</i>	2020
Seminar, <i>STScI, Science Coffee Seminar</i>	2019
Seminar, <i>JHU, CAS Wine & Cheese Seminar</i>	2019
†Deep learning workshop, <i>MIAPP – Galaxy Evolution in a New Era of HI Surveys</i>	2019

Talk, <i>ESO — Nine Billion Years of Gas Evolution</i>	2019
†Seminar, <i>Rutgers Statistics, Foundations of Probability Seminar</i>	2019
Dissertation talk, <i>AAS 233rd Meeting</i>	2019
Seminar, <i>Princeton, Galread Seminar</i>	2018
Seminar, <i>Princeton, Data Science/COMPASS Seminar</i>	2018
Seminar, <i>University of Cape Town, Lunch Seminar</i>	2018
Poster, <i>École Normale Supérieure – Galaxy Evolution Across Time</i>	2017
Talk, <i>Princeton-Rutgers Extragalactic Science Day</i>	2016
Talk, <i>AAS 227th Meeting</i>	2016
†Seminar, <i>Australian Astronomical Observatory, Colloquium</i>	2015

SERVICE

Journal Reviewer for <i>AJ</i> , <i>ApJ</i> , <i>A&A</i> , <i>JOSS</i> , <i>MNRAS</i> , and <i>PNAS</i>	
Machine Learning conference/workshop paper reviewer for <i>NeurIPS</i> and <i>ICML</i>	
Member, <i>STScI Honors Committee</i>	2024 – Present
Member, <i>JHU/STScI Joint Colloquium Committee</i>	2023 – Present
Member, <i>NOIRLab Data Science Advisory Sub-committee</i>	2022 – Present
Panel Moderator, <i>NeurIPS, Machine Learning and the Physical Sciences</i>	2023
Reviewer, <i>NASA Astrophysics Data Analysis Program (ADAP)</i>	2023
Reviewer, <i>NASA Postdoctoral Program (NPP)</i>	2023
Member, <i>NRAO Science Review Panel (SRP)</i>	2022 – 2023
Founder/Organizer, <i>STScI Machine Learning Reading Group (MLRG)</i>	2022 – 2023
Guest Editor, <i>Annual Reviews of Astronomy and Astrophysics (ARA&A Vol. 63)</i>	2023
Program Coordinator & Diversity Lead, <i>KITP Program - galevo23</i>	2023
Coordinator, <i>STScI Science Staff Retreat</i>	2022
Leveler, <i>JWST Cycle 1 Panel</i>	2021
Co-organizer, <i>Low Density Universe (LDU) Meetings</i>	2020 – 2021
STScI Liason, <i>JHU Physics and Astronomy Postdocs + Research Scientists</i>	2020
Session Chair, <i>AAS 236 ISM-BIG meeting-in-meeting</i>	2020
Co-organizer, <i>JHU CAS Astro Coffee</i>	2020
Co-organizer, <i>Rutgers Gaia DR2 Hackathon</i>	2018
Co-organizer, <i>Rutgers SPS/RAS Astro Hack Sessions</i>	2018
Webmaster, <i>Rutgers Physics GSO and SSPAR</i>	2014 – 2017
Time Allocation Committee Member, <i>SALT 2015-2 Rutgers TAC</i>	2015
Local Organizing Committee Member, <i>2015 PHISCC Workshop</i>	2015
Organizer, <i>Student Seminars in Physics and Astronomy at Rutgers (SSPAR)</i>	2014 – 2015
Vice President, <i>Rutgers Physics Graduate Student Organization (GSO)</i>	2014 – 2015

TEACHING AND OUTREACH

Guest Lecturer, <i>Swarthmore College, Introduction to Radio Astronomy</i>	2024
Ingenuity Speaker Series, <i>Ingenuity Project (Baltimore Polytechnic Institute)</i>	2023
Guest Lecturer, <i>LSST Data Science Fellowship Program (DSFP)</i>	2023
Speaker, <i>Linda Hall Library - "How Do I Become an Astronomer?"</i>	2023
Speaker, <i>Astronomy on Tap Baltimore</i>	2023
Podcast Guest Speaker, <i>Times Higher Education (THE) Campus Podcast</i>	2022
Guest Speaker, <i>Marymount School of New York, Independent Science Research</i>	2021
Teaching Assistant, <i>STScI ML Office Hours</i>	2021
Guest Lecturer, <i>Rutgers Byrne Seminar: The Poetry of Astronomy</i>	2016, 2019
Certificate, <i>Seminar In Graduate Mentoring in Astronomy and Physics (SIGMA-P)</i>	2018
Plenary Talk, <i>Friends of Rutgers Astronomy</i>	2017
Leadership Team, <i>Parsons Community Outreach</i>	2015 – 2016
Volunteer, <i>Parsons Community Outreach</i>	2013 – 2016
Teaching Assistant, <i>Rutgers 343: Observational Radio Astronomy</i>	2015
Public Talk, <i>Rutgers Astronomical Society</i>	2014
Certificate, <i>Developing Educational Leaders among TAs in Physics (DELTA-P)</i>	2013

WORKSHOPS AND OTHER EXPERIENCE (*LEAD)

*JSALT: Frederick Jelinek Memorial Summer Workshop	Baltimore, MD
<i>Evaluating Large Language Models for Research Astronomy</i>	(scheduled) June – Aug 2024
Aspen Winter Meeting	Aspen, CO
<i>Diffuse cosmic backgrounds and the low surface brightness universe</i>	Mar 2024
Galaxy Formation Meeting (Biosphere 2)	Tucson, AZ
<i>Wide-Field Spectroscopy meets Galaxy Formation Theory</i>	Mar 2023
*Kavli Institute of Theoretical Physics	Santa Barbara, CA
<i>Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy</i>	Jan – Mar 2023
Pascal Institute	Paris, France
<i>The Self-Organized Star Formation Process</i>	Sept 2019
MIAPP Topical Workshop	Munich, Germany
<i>Nine Billion Years of Gas Evolution</i>	July 2019
USAID Research & Innovation Fellowship	Cape Town, South Africa
<i>Improving the LADUMA Pipeline Using MeerKAT Early Science Data</i>	Sept – Nov 2016
SKA Pathfinders HI Science Coordination Committee	Piscataway, NJ
<i>2015 PHISCC Workshop: HI Surveys Get Real</i>	Mar 2015
Vatican Observatory Summer School	Castel Gandolfo, Italy
<i>Galaxies, Near and Far, Young and Old</i>	June 2014
NRAO Synthesis Imaging Workshop	Socorro, NM
<i>14th Synthesis Imaging Workshop</i>	May 2014

PROFESSIONAL COLLABORATIONS

4MOST Wide Area Vista Extragalactic Survey (WAVES/ORCHIDSS): *Member*

ALMA Lensing Cluster Survey (ALCS): *Member*

Dark Energy Spectroscopic Instrument (DESI): *External Collaborator (LOWZ Program)*

DECam Local Volume Exploration (DELVE): *WIDE Survey WG Member*

Deep Skies Lab: *Contributor*

LADUMA: *Pipeline & Calibration WG, Source-finding WG, and Ancillary Data WG Member*

LSST Galaxies Science Collaboration: *Member*

TELESCOPE OBSERVING PROPOSALS

Atacama Large Millimeter/submillimeter Array (ALMA)

PI, *one proposal (9.4 hrs – partially observed in Cycle 7)* *Cycles 7, 8*

CoI, *four proposals (120.9 hrs)* *Cycles 2, 6, 7, 8*

Gemini South/Flamingo2

CoI, *Fast Turnaround (5.8 hrs)* *2021B*

Very Large Array (VLA)

CoI, *19A-433 (10 hrs)* *2019A*

Anglo-Australian Telescope (AAT)

CoI, *N0331 (5 nights), N0334 (4 nights)* *2015, 2017*

Southern African Large Telescope (SALT)

PI, *2016-1-SCI-040 (3.9 hrs), 2015-2-SCI-052 (3.9 hrs), DDT (1.6 hrs)* *2015-1 — 2016-1*

CoI, *2017-1-MLT-014 (11.3 hrs), 2016-2-SCI-051 (20.4 hrs)* *2016-2 — 2017-1*

John F. Wu — Publication List

Names of students for whom I am the primary supervisor are underlined. For an up-to-date list of my publications, please see [my ADS Library](#) or [my ORCID](#).

JOURNAL ARTICLES – FIRST AUTHOR AND MAJOR CONTRIBUTIONS

14. *How the Galaxy–Halo Connection Depends on Large-Scale Environment*
Wu, J. F., Jespersen, C., Wechsler, R. H., 2024, *ApJ*, submitted. arXiv:2402.07995.
13. *Deep Learning Cosmic Ray Transport from Density Maps of Simulated, Turbulent Gas*
Bustard, C., **Wu, J. F.**, 2024, *ML&ST*, 5, 1, 015028.
12. *Target Selection and Sample Characterization for the DESI LOW-Z Secondary Target Program*
Darragh-Ford, E., **Wu, J. F.**, Mao, Y.-Y., Wechsler, R. H., et al. 2023, *ApJ*, 954, 149.
11. *Identification of Galaxy-Galaxy Strong Lens Candidates in the DECam Local Volume Exploration Survey Using Machine Learning*
Zaborowski, E., Drlica-Wagner, A., Ashmead, F., **Wu, J. F.**, et al., 2023, *ApJ*, 954, 68.
10. *Quantifying Roman WFI Dark Images with the Wavelet Scattering Transform*
Velicheti, P. D., **Wu, J. F.**, Petric, A. O., 2023, *PASP*, 135, 1050.
9. *Identification of galaxy shreds in large photometric catalogs using Convolutional Neural Networks*
Di Teodoro, E. M., Peek, J. E. G., **Wu, J. F.**, 2023, *AJ*, 165, 123.
8. *A Machine Learning Approach to Enhancing eROSITA Observations*
Soltis, J., Ntampaka, M., **Wu, J. F.**, et al., 2022, *ApJ*, 940, 60.
7. *Extending the SAGA Survey (xSAGA). I. Satellite Radial Profiles as a Function of Host-galaxy Properties*
Wu, J. F., Peek, J. E. G., Tollerud, E. J., et al, 2022, *ApJ*, 927, 121.
6. *Predicting the Spectrum of UGC 2885, Rubin’s Galaxy with Machine Learning*
Holwerda, B. W., **Wu, J. F.**, Keel, W. C., Young, J., et al., 2021, *ApJ*, 914, 142.
5. *Connecting Optical Morphology, Environment, and HI Mass Fraction for Low-Redshift Galaxies Using Deep Learning*
Wu, J. F., 2020, *ApJ*, 900, 148.
4. *The Star-Forming Interstellar Medium of Lyman Break Galaxy Analogs*
Wu, J. F., Baker, A. J., Heckman, T. M., et al., 2019, *ApJ*, 887, 251.
3. *Using convolutional neural networks to predict galaxy metallicity from three-colour images*
Wu, J. F., Boada, S., 2019, *MNRAS*, 484, 4683.
2. *Herschel and ALMA Observations of Massive SZE-selected Clusters*
Wu, J. F., Aguirre, P., Baker, A. J., et al., 2018, *ApJ*, 853, 195.
1. *Galaxy Candidates at $z \sim 10$ in Archival Data from the Brightest of Reionizing Galaxies (BORG[z8]) Survey*
Bernard, S. R., Carrasco, D., Trenti, M., Oesch, P. A., **Wu, J. F.**, et al., 2016, *ApJ*, 827, 76.

PEER-REVIEWED MACHINE LEARNING PAPERS

NOTE: MACHINE LEARNING CONFERENCE PAPERS ARE RIGOROUSLY REFEREED BY MULTIPLE REVIEWERS AND ARE CONSIDERED EQUIVALENT TO JOURNAL PUBLICATIONS.

5. *Predicting dark matter halo masses from simulated galaxy images and environments*
Larson, A., **Wu, J. F.**, Jones, C., 2024, *ICML: AI4Science workshop workshop*, submitted.
4. *Designing an Evaluation Framework for Large Language Models in Astronomy Research*
Wu, J. F., Hyk, A., McCormick, K., Ye, C., et al. 2024, *ICML: AI4Science workshop*, submitted, arXiv:2405.20389.
3. *Learning the galaxy-environment connection with graph neural networks*
Wu, J. F., Jespersen, C., 2023, *ICML: ML4astro workshop*, 1, arXiv:2306.12327.
2. *Identifying AGN host galaxies with convolutional neural networks*
Guo, Z., **Wu, J. F.**, Sharon, C. E., 2022, *NeurIPS: ML4PS workshop*, 63, arXiv:2212.07881.
1. *Predicting galaxy spectra from images with hybrid convolutional neural networks*
Wu, J. F., Peek, J. E. G., 2020, *NeurIPS: ML4PS workshop*, 3, arXiv:2009.12318.

JOURNAL ARTICLES - SURVEYS AND COLLABORATIONS

10. *The SAGA Survey. V. Modeling Satellite Systems around Milky Way-mass Galaxies with Updated UniverseMachine*
Wang, Y., Nadler, E. O., Mao, Y.-Y., et al. 2024, *ApJ*, submitted, arXiv:2404.14500
9. *The SAGA Survey. IV. The Star Formation Properties of 101 Satellite Systems around Milky Way-mass Galaxies*
Geha, M., Mao, Y.-Y., Wechsler, R. H., et al. 2024, *ApJ*, submitted, arXiv:2404.14499
8. *The SAGA Survey. III. A Census of 101 Satellite Systems around Milky Way-mass Galaxies*
Mao, Y.-Y., Geha, M., Wechsler, R. H., et al. 2024, *ApJ*, submitted, arXiv:2404.14498
7. *Katachi: Decoding the Imprints of Past Star Formation on Present Day Morphology in Galaxies with Interpretable CNNs*
Alfonzo, J. P.; Iyer, K. G.; Akiyama, M., et al. 2024, *ApJ*, in press.
6. *JWST constraints on the UV luminosity density at cosmic dawn: implications for 21-cm cosmology*
Hassan, S., Lovell, C. C., Madau, P., et al. 2023, *ApJL*, 958, 3.
5. *A variable active galactic nucleus at $z = 2.06$ triply-imaged by the galaxy cluster MACS J0035.4-2015*
Furtak, L., Mainali, R., Zitrin, A., et al. 2023, *MNRAS*, 522, 5142.
4. *The DECam Local Volume Exploration Survey Data Release 2*
Drlica-Wagner, A., Ferguson, P. S., Adamów, M., et al. 2022, *ApJS*, 261, 38.
3. *LADUMA: The First Untargeted Detection of an OH Megamaser at $z > 0.5$*
Glowacki, M., Collier, J. D., Kazemi-Moridani, A., et al., 2022, *ApJL*, 931, 7.
2. *The DECam Local Volume Exploration Survey: Overview and First Data Release*
Drlica-Wagner, A., Carlin, J. L., Nidever, D. L., et al., 2021, *ApJS*, 256, 2.

1. *ALMA Lensing Cluster Survey: an ALMA galaxy signposting a MUSE galaxy group at $z=4.3$ behind “El Gordo”*
Caputi, K. I., Caminha, G. B., Fujimoto, S., et al., 2021, *ApJ*, 908, 146.

STScI TECHNICAL REPORTS

1. *Simulating Cosmic Rays for the Roman Wide Field Instrument*
Wu, J. F., Sanchez, J., Casertano, S., Desjardins, T., 2023, *Roman Technical Report*, Roman-STScI-000502.

POPULAR SCIENCE AND OTHER

1. *Effective use of machine learning to empower your research*
Wu, J. F., 2022, *Times Higher Education – Campus*, Feature Article.

UNREFEREED CONFERENCE PAPERS AND WHITE PAPERS

6. *NANCY: Next-generation All-sky Near-infrared Community survey Y*
Han, J. J. ; Dey, A. ; Price-Whelan, A. M. et al., 2023, *Roman Core Community Survey White Papers*.
5. *Optical, Radio Continuum and HI Deep Spectroscopic Survey (ORCHIDSS)*
Duncan, K., Baker, A., Best, P., et al., *The Messenger*, 190, 25.
4. *Roman Ultra Deep Field*
Koekemoer, A. M. et al. 2021, *Roman Early-Definition Astrophysics Survey Opportunity*.
3. *Obscured AGN – Hiding High Growth at the Cosmic Noon*
Petric, A. et al. 2021, *Roman Early-Definition Astrophysics Survey Opportunity*.
2. *Herschel And ALMA Observations Of The ISM In Massive High-Redshift Galaxy Clusters*
Wu, J. F. et al. 2017, *Galaxy Evolution Across Time*, 51.
1. *LADUMA: Looking at the Distant Universe with the MeerKAT Array*
Blyth, S. et al. 2016, *Proceedings of MeerKAT Science: On the Pathway to the SKA*, 4.