John F. Wu

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Education

Ph.D. in Physics and Astronomy — Piscataway, NJ
Rutgers, The State University of New Jersey — *2013 – 2019*

B.Sc. in Physics/Astrophysics, with MCS Honors — Pittsburgh, PA
Carnegie Mellon University — *2009 – 2013*

Appointments

Assistant Astronomer — Baltimore, MD
Space Telescope Science Institute — *2022 – Present*

Associate Research Scientist — Baltimore, MD
Center for Astrophysical Sciences, Johns Hopkins University — *2022 – Present*

Postdoctoral Researcher — Baltimore, MD
Space Telescope Science Institute — *2020 – 2021*
Center for Astrophysical Sciences, Johns Hopkins University — *2019 – 2020*

Graduate Research Assistant — Piscataway, NJ
Rutgers, The State University of New Jersey — *2013 – 2019*

Undergraduate Research Assistant — Pittsburgh, PA
McWilliams Center for Cosmology, Carnegie Mellon University — *2012 – 2013*

Research Intern — Pittsburgh, PA
Carnegie Mellon University CyLab — *2011*

Professional Memberships

American Astronomical Society — *2015 – Present*

International Astronomical Union — *2021 – Present*

Grants and Awards

STScI, *Director's Discretionary Research Funding, $68,110* — *2022*

Google, *GCP Research Credits Program, $5,000* — *2019*

Rutgers, *Robert A. Schommer Prize, $500* — *2018*

USAID, *Research and Innovation Fellowship, $11,636* — *2016*

Rutgers, *Special Study Award, $1,350* — *2014*

Rutgers, *Claud Lovelace Graduate Fellowship & Excellence Fellowship Supplement, $1,000* — *2013*

CMU, *Senior Leadership Recognition* — *2013*

Advising and Mentorship

Primary advisor, *Mikaeel Yunus (JHU/Research rotation)*	*2023 – Present*
Primary advisor, *Harish Krishnakumar (Tesla STEM High School)*	*2022 – 2023*
Primary advisor, *Phani Velicheti (Arizona/STScI Space Astronomy Summer Program)*	*2022*
Primary advisor, *Ziting Guo (Yale-NUS/Undergraduate capstone project)*	*2021 – 2022*
Mentor, *Kamonte Johnson (Frostburg State Unviersity/CollegeBound Foundation)*	*2020 – 2022*
Co-advisor, *Antoine Washington (Rutgers University/Undergraduate senior thesis)*	*2017 – 2020*
Co-advisor, *Marcell Howard (Case Western Reserve University/REU)*	*2018*
Co-advisor, *Manuel Perez III (University of Redlands/REU)*	*2017*

Service

Journal Reviewer for *PNAS* (2021–), *ApJ* (2020–), *AJ* (2021–), *MNRAS* (2020–), and *A&A* (2019–)

Guest Editor, *Annual Reviews of Astronomy and Astrophysics (ARA&A Vol. 63)*	*2023*
Program Coordinator & Diversity Lead, *KITP Program - galevo23*	*2023*
Founder/Organizer, *STScI Machine Learning Reading Group (MLRG)*	*2022 – Present*
Member, *NRAO Science Review Panel (SRP)*	*2022 – Present*
Member, *NOIRLab Data Science Advisory Group (DSAG)*	*2022 – Present*
Reviewer, *NeurIPS 36: ML4PS workshop*	*2022*
Coordinator, *STScI Science Staff Retreat*	*2022*
Reviewer, *NeurIPS 35: ML4PS workshop*	*2021*
Leveler, *JWST Cycle 1 Panel*	*2021*
Co-organizer, *Low Density Universe (LDU) Meetings*	*2020 – 2021*
STScI Liason, *JHU Physics and Astronomy Postdocs + Research Scientists*	*2020*
Session Chair, *AAS 236 ISM-BIG meeting-in-meeting*	*2020*
Co-organizer, *JHU CAS Astro Coffee*	*2020*
Co-organizer, *Rutgers Gaia DR2 Hackathon*	*2018*
Co-organizer, *Rutgers SPS/RAS Astro Hack Sessions*	*2018*
Webmaster, *Rutgers Physics GSO and SSPAR*	*2014 – 2017*
Time Allocation Committee, *SALT 2015-2 Rutgers TAC*	*2015*
Local Organizing Committee, *2015 PHISCC Workshop*	*2015*
Organizer, *Student Seminars in Physics and Astronomy at Rutgers (SSPAR)*	*2014 – 2015*
Vice President, *Rutgers Physics Graduate Student Organization (GSO)*	*2014 – 2015*

Teaching and Outreach

Speaker, *Astronomy on Tap, Baltimore*	*2023 (scheduled)*
Podcast Guest Speaker, *Times Higher Education (THE) Campus Podcast*	*2022*
Guest Speaker, *Marymount School of New York, Independent Science Research*	*2021*
Teaching Assistant, *STScI ML Office Hours*	*2021*
Guest Lecturer, *Rutgers Byrne Seminar: The Poetry of Astronomy*	*2016, 2019*
Certificate, *Seminar In Graduate Mentoring in Astronomy and Physics (SIGMA-P)*	*2018*
Plenary Talk, *Friends of Rutgers Astronomy*	*2017*
Leadership Team, *Parsons Community Outreach*	*2015 – 2016*
Volunteer, *Parsons Community Outreach*	*2013 – 2016*
Teaching Assistant, *Rutgers 343: Observational Radio Astronomy*	*2015*
Public Talk, *Rutgers Astronomical Society*	*2014*
Certificate, *Developing Educational Leaders among TAs in Physics (DELTA-P)*	*2013*

Seminars and Talks (†Invited)

Talk, *STScI, Roman Science Inspired by Emerging JWST Results*	*2023 (scheduled)*
Poster, *Flatiron CCA, Cosmic Connections Symposium*	*2023*
Talk, *KITP, Galaxy Formation and Evolution in the Data Science Era*	*2023*
†Seminar, *University of Helsinki Astrophysics Seminar (virtual)*	*2022*
†Seminar, *Carnegie Observatories Lunch Talks*	*2022*
†Seminar, *UMBC Astrophysics Seminar*	*2022*
†Special Talk, *STScI*	*2021*
Talk, *JHU/STScI HotSci Series*	*2021*
†Seminar, *Université de Montréal, Astrophysics Seminar (virtual)*	*2021*
†Seminar, *University of Toronto, Statistics and Machine Learning Journal Club (virtual)*	*2021*
†Seminar, *Western Sydney University, Machine Learning in Astronomy*	*2021*
Seminar, *Space Telescope Science Institute, Galaxies Journal Club*	*2021*
†Seminar, *Fermilab, Cosmic Physics Center Seminar (virtual)*	*2021*
†Talk, *NCSA – Accelerated Artificial Intelligence for Big-Data Experiments (virtual)*	*2020*
Seminar, *NOIRLab, Flash Seminar (virtual)*	*2020*
†Seminar, *Wayne State University, Particle/Astro/Nuclear Physics Seminar (virtual)*	*2020*
†Talk, *The ISM in the Era of Big Data (AAS 236, virtual)*	*2020*
Talk, *JHU Astro Coffee*	*2020*
†Talk, *Astronomers Turned Data Scientists Meeting (AAS 235)*	*2020*
Poster, *AAS 235th Meeting*	*2020*
Seminar, *STScI, Science Coffee Seminar*	*2019*
Seminar, *JHU, CAS Wine & Cheese Seminar*	*2019*
†Deep learning workshop, *MIAPP – Galaxy Evolution in a New Era of HI Surveys*	*2019*
Talk, *ESO — Nine Billion Years of Gas Evolution*	*2019*
†Seminar, *Rutgers Statistics, Foundations of Probability Seminar*	*2019*
Dissertation talk, *AAS 233rd Meeting*	*2019*
Seminar, *Princeton, Galread Seminar*	*2018*
Seminar, *Princeton, Data Science/COMPASS Seminar*	*2018*
Seminar, *University of Cape Town, Lunch Seminar*	*2018*
Poster, *École Normale Supérieure – Galaxy Evolution Across Time*	*2017*
Talk, *Princeton-Rutgers Extragalactic Science Day*	*2016*
Talk, *AAS 227th Meeting*	*2016*
Seminar, *Australian Astronomical Observatory, Colloquium*	*2015*

Workshops and Other Experience

Kavli Institute of Theoretical Physics — Santa Barbara, CA
Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy — *2023*

Pascal Institute — Paris, France
The Self-Organized Star Formation Process — *Sept 2019*

MIAPP Topical Workshop — Munich, Germany
Nine Billion Years of Gas Evolution — *July 2019*

USAID Research & Innovation Fellow — Cape Town, South Africa
Improving the LADUMA Pipeline Using MeerKAT Early Science Data — *Sept – Nov 2016*

SKA Pathfinders HI Science Coordination Committee — Piscataway, NJ
2015 PHISCC Workshop: HI Surveys Get Real — *Mar 2015*

Vatican Observatory Summer School — Castel Gandolfo, Italy
Galaxies, Near and Far, Young and Old — *June 2014*

NRAO Synthesis Imaging Workshop — Socorro, NM
14th Synthesis Imaging Workshop — *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

For an up-to-date list of my publications, please see my ADS Library or my ORCID.

Journal Articles – First Author and Major Contributions

11. 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.

10. 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. 2022, *ApJ, submitted.*

9. *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., 2022, arXiv:2210.10802.

8. *A Machine Learning Approach to Enhancing eROSITA Observations*
Soltis, J., Ntampaka, M., **Wu, J. F.**, et al., 2022, *ApJ*, in press, arXiv:2207.14324.

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, 2021, *ApJ*, arXiv:2112.01542

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

2. *Identifying AGN host galaxies with convolutional neural networks*
Guo, Z., **Wu, J. F.**, Sharon, C. E., 2022, *NeurIPS: ML4PS workshop*, 63.

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

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, arXiv:2305.02703.

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.

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, White Papers, and Abstracts

10. *Optical, Radio Continuum and HI Deep Spectroscopic Survey (ORCHIDSS)*
    Duncan, K., Baker, A., Best, P., et al., *The Messenger*, 190, 25.

9. *The morphological indicators of gas mass fraction for low-redshift galaxies*
   Wu, J. F., Peek, J., *AAS Meeting 235*, 2020, 208.14.

8. *Galaxy Groups at Low and High Redshift with RESOLVE and LADUMA*
   Hutchens, Z. et al., 2020, *AAS Meeting 235*, 207.40.

7. *Gas and galaxy evolution in extreme $z \sim 1$ clusters and extreme $z \sim 0.2$ starbursts*
   Wu, J. F. 2019, *AAS Meeting 233*, 230.03D.

6. *Probing the Evolution of Galaxies by Stacking Stellar Mass Selected Samples*
   Howard, M., Baker, A. J., **Wu, J. F.**, 2019, *AAS Meeting 233*, 145.08.

5. *Using Convolutional Neural Networks to predict Galaxy Metallicity from Three-Color Images*
   Boada, S. & **Wu, J. F.**, 2019, *AAS Meeting 233*, 144.30.

4. *Herschel And ALMA Observations Of The ISM In Massive High-Redshift Galaxy Clusters*
   Wu, J. F. et al. 2017, *Galaxy Evolution Across Time*, 51.

3. *Characterizing and Cataloguing Star-Forming Galaxies in Preparation for the LADUMA Survey*
   Perez, M. J., Baker, A. J., **Wu, J. F.** 2017. *AAS Meeting 229*, 347.30.

2. *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.

1. *Investigating star formation properties of galaxies in massive clusters with Herschel and ALMA*
   Wu, J. F. et al. 2016, *AAS Meeting 227*, 202.02.