

John F. Wu

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Education

Rutgers, The State University of New Jersey

Ph.D., Physics and Astronomy

Insights on galaxy evolution from studies of the multiphase interstellar medium

Piscataway, NJ

Sept 2013–Oct 2019

Carnegie Mellon University

B.Sc., Physics/Astrophysics, MCS Honors

Pittsburgh, PA

Sept 2009–May 2013

Professional Experience

Johns Hopkins University

Postdoctoral fellow, advised by Josh Peek

Baltimore, MD

Sept 2019–present

Rutgers, The State University of New Jersey

Graduate research assistant, advised by Andrew Baker

- Investigated how galaxies evolve in massive clusters by observing their star formation, cold gas, and dust properties.
- Studied the multi-phase interstellar media of extreme, UV-selected starbursting galaxies in the local Universe.
- Trained deep neural networks to predict metallicities of low- z galaxies using only optical imaging.

Piscataway, NJ

July 2013–Aug 2019

McWilliams Center for Cosmology, Carnegie Mellon University

Undergraduate research assistant, advised by Rachel Mandelbaum

- Characterized galaxies in rich clusters by using Sloan Digital Sky Survey observations.

Pittsburgh, PA

July 2012–May 2013

Carnegie Mellon University CyLab

Research intern

- Developed and tested robust facial recognition software.
- Created a proof of concept image manipulation tool for artificial aging.

Pittsburgh, PA

May 2011–Aug 2011

Refereed Publications (including submissions)

- [5] “Connecting Optical Morphology, Environment, and HI Mass Fraction for Low-Redshift Galaxies Using Deep Learning,”
Wu, J. F., 2020, *ApJ*, submitted, arXiv:2001.00018. [ADS]
- [4] “The Star-Forming Interstellar Medium of Lyman Break Galaxy Analogs,”
Wu, J. F., Baker, A. J., Heckman, T. M., Hicks, E. K. S., Lutz, D., Tacconi, L. J., 2019, *ApJ*, 887, 251. [ADS]
- [3] “Using convolutional neural networks to predict galaxy metallicity from three-color images,”
Wu, J. F. & Boada, S., 2019, *MNRAS*, 484, 4683. [ADS]
- [2] “Herschel and ALMA Observations of Massive SZE-selected Clusters,”
Wu, J. F., Aguirre, P., Baker, A. J., Devlin, M. J., Hilton, M., Hughes, J. P., Infante, L., Lindner R. R., Sifón, C., 2018, *ApJ*, 853, 195. [ADS]
- [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.**, Bradley, L. D., Schmidt, K. B., Bouwens, R. J., Calvi, V., Mason, C. A., Stiavelli, M., Treu, T., 2016, *ApJ*, 827, 76. [ADS]

Teaching Experience

Teaching Assistant, Physics 343: Observational radio astronomy (lab)	Spring 2015
Grader, Physics 342: Principles of astrophysics	Spring 2015

Other Experience

USAID Research & Innovation Fellow	Cape Town, South Africa
Improving the LADUMA Pipeline Using MeerKAT Early Science Data	Sept 2016–Nov 2016
<ul style="list-style-type: none">• Worked with S. Blyth (UCT) and B. Frank (SARAO) to analyze simulated MeerKAT data using ARCADE (African Research Cloud).• Developed a pipeline to test and benchmark source-finding software.• Attended the Visualization in Astronomy and 3GC4: HI Fidelity conferences.• Followed up in Aug 2018 by working with B. Frank on continuum subtraction with MeerKAT commissioning data using IDIA high-performance computing facilities.	
Vatican Observatory Summer School	Castel Gandolfo, Italy
VOSS: Galaxies, Near and Far, Young and Old	June 2014
<ul style="list-style-type: none">• Completed projects with Michele Trenti (Melbourne), Jacqueline van Gorkom (Columbia), and Chris Carilli (NRAO), the first of which led to an ApJ publication.	
NRAO Synthesis Imaging Workshop	Socorro, NM
National Radio Astronomy Observatory 14th Synthesis Imaging Workshop	May 2014
<ul style="list-style-type: none">• Reduced ALMA data using Common Astronomy Software Applications (CASA).	

Honors and Awards

Robert A. Schommer Prize , Rutgers	April 2018
Best astronomy paper by a graduate student	
University and Louis Bevier Fellowship Honorable Mention , Rutgers	April 2018
International Travel Grant , American Astronomical Society	Mar 2017
TA/GA Professional Development Fund , Rutgers	June 2016–June 2018
Travel support	
Special Study Award , Rutgers	Mar 2014
Claud Lovelace Fellowship , Rutgers	Sept 2013–June 2014
Senior Leadership Recognition , Carnegie Mellon	May 2013
Mellon College of Science College Honors , Carnegie Mellon	May 2013

Seminars and Conference Talks/Posters

ISM-BIG (MiM/AAS236) , Invited talk	June 2020
Astronomers Turned Data Scientists (ATDS/AAS235) , Invited talk	Jan 2020
American Astronomical Society (AAS) 235th meeting , Contributed poster	Jan 2020
Space Telescope Science Institute (STScI) , Friday Science Coffee Seminar	Dec 2019
Johns Hopkins University CAS , Wine & Cheese Seminar	Oct 2019
Galaxy Evolution in a New Era of HI Surveys (MIAPP) , Invited deep learning tutorial	Aug 2019
Nine Billion Years of Neutral Gas Evolution (ESO) , Contributed talk	July 2019
Rutgers Statistics , Foundations of Probability Seminar	Apr 2019
American Astronomical Society (AAS) 233rd meeting , Dissertation talk	Jan 2019

Center for Computational Astrophysics (CCA) , <i>Galaxies Group Meeting</i>	Dec 2018
Princeton Astronomy , <i>Galread Seminar</i>	Dec 2018
Princeton Astronomy , <i>Data Science/COMPASS Seminar</i>	Nov 2018
University of Cape Town (UCT) Astronomy , <i>Lunch seminar</i>	Aug 2018
Galaxy Evolution Across Time (ENS) , <i>Contributed poster</i>	June 2017
Princeton-Rutgers 3rd annual extragalactic science day , <i>Contributed talk</i>	May 2016
American Astronomical Society (AAS) 227th meeting , <i>Contributed talk</i>	Jan 2016
Australian Astronomical Observatory (AAO) , <i>Seminar</i>	Dec 2015

Leadership, Service, and Outreach

Session chair , <i>ISM-BIG (MiM) at AAS 236th Meeting</i>	June 2020
Co-organizer , <i>JHU CAS AstroCoffee</i>	Jan 2020–
Co-leader , <i>Rutgers Gaia Data Release 2 Hackathon</i>	May 2018
SIGMA-P , <i>Seminar In Graduate Mentoring in Astronomy and Physics</i>	Apr 2018
Co-leader , <i>SPS/RAS Astro Hack Sessions</i>	Mar–Apr 2018
Invited Plenary Talk , <i>Friends of Rutgers Astronomy</i> <i>Studying Galaxy Clusters with Herschel, ALMA, and SALT</i>	Sep 2017
Guest Lecturer , <i>Physics 343: Observational radio astronomy</i>	2017, 2019
TAC member , <i>SALT 2015-2 Rutgers Time Allocation Committee</i>	Sep 2015
LOC member , <i>SKA Pathfinders HI Science Coordination Committee (PHISCC)</i>	Mar 2015
Organizer , <i>Student Seminars in Physics and Astronomy at Rutgers (SSPAR)</i>	Oct 2014–May 2015
Vice President , <i>Rutgers Physics Graduate Student Organization (GSO)</i>	Sep 2014–May 2015
Webmaster , <i>Rutgers Physics GSO and SSPAR</i>	Sep 2014–May 2017
Public Talk , <i>Rutgers Astronomical Society</i> <i>Anisotropies in the Cosmic Microwave Background: B-modes and Inflation</i>	Mar 2014
DELTA-P , <i>Developing Educational Leaders among TAs in Physics</i>	Dec 2013

Accepted Telescope Proposals and Observing

Very Large Array (VLA)	
Col, <i>A high-resolution multi-frequency map of PKS0326-288 [...] (19A-433)</i>	2019A
Anglo-Australian Telescope (AAT)	
Col, <i>Redshifts in the LADUMA Field to $z \sim 0.6$ (N0331)</i>	2017B
• Awarded five nights of AAT/AAOmega to continue campaign of measuring redshifts in the LADUMA field.	
Col, <i>Redshifts in the LADUMA Field to $z \sim 0.6$ (N0334)</i>	2015B
• Awarded four nights of AAT/AAOmega time to measure galaxy redshifts in preparation for studying neutral hydrogen with the LADUMA survey.	
• Observed at the AAT and detected ~ 1600 galaxy redshifts.	
Atacama Large Millimeter/submillimeter Array (ALMA)	
Col, <i>ALMA Lensing Cluster Survey (2018.1.00035.L)</i>	Cycles 6 – 7
Col, <i>Galaxies in (and behind) two massive high-redshift clusters (2013.1.01358.S)</i>	Cycle 2

- Obtained Band 6 (230 GHz) mosaic observations to study atomic carbon and molecular CO emission of cluster galaxies, and also to study the dust continuum emission of cluster and background galaxies.
- Reduced data using the NAASC computing facilities at NRAO in Charlottesville.

Southern African Large Telescope (SALT)

Col, *Preparing for LADUMA: SALT Redshift Measurements* (2017-1-MLT-014) 2017-1 – present

- Awarded 40770 seconds of P1 (high priority) time to continue measuring redshifts in LADUMA field.
- Continuation of 2016-2-SCI-051.

Col, *Preparing for LADUMA: SALT Redshift Measurements* (2016-2-SCI-051) 2016-2

- Awarded 73616 seconds of observing time for pilot project to measure galaxy redshifts at $0.6 < z < 1.1$.

PI, *Fabry-Pérot imaging of two massive galaxy clusters* (2016-1-SCI-040) 2016-1

- Continuation of 2015-2-SCI-052 (awarded an additional 14000 seconds of P1 time).

PI, *Fabry-Pérot imaging of two massive galaxy clusters* (2015-2-SCI-052) 2015-2

- Continuation of the 2015-1 DDT proposal (awarded 14000 seconds of P1 time).

PI, *SALT Fabry-Pérot imaging of two massive galaxy clusters* (DDT) 2015-1

- Awarded 5600 seconds of P2 (medium priority) Rutgers discretionary time to pilot a blind Fabry-Pérot search for [OII] emitting galaxies in two massive, $z \sim 1$ clusters.

Conference Abstracts and Unrefereed Publications

- [9] “The morphological indicators of gas mass fraction for low-redshift galaxies,”
Wu, J. F., Peek, J., *AAS Meeting 235*, 2020, 208.14. [ADS]
- [8] “Galaxy Groups at Low and High Redshift with RESOLVE and LADUMA,”
Hutchens, Z. et al., 2020, *AAS Meeting 235*, 207.40. [ADS]
- [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. [ADS]
- [6] “Probing the Evolution of Galaxies by Stacking Stellar Mass Selected Samples”
Howard, M., Baker, A. J., **Wu, J. F.**, 2019, *AAS Meeting 233*, *AAS Meeting 233*, 145.08. [ADS]
- [5] “Using Convolutional Neural Networks to predict Galaxy Metallicity from Three-Color Images,”
Boada, S. & **Wu, J. F.**, 2019, *AAS Meeting 233*, 144.30. [ADS]
- [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. [ADS]
- [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. [ADS]
- [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. [ADS]
- [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. [ADS]