

John F. Wu

Department of Physics and Astronomy
Rutgers, The State University of New Jersey
136 Frelinghuysen Rd
Piscataway, NJ 08854-8019

jfwu@physics.rutgers.edu
github.com/jwuphysics
+1 908 410 0317

Education

Rutgers, The State University of New Jersey

Ph.D., Physics and Astronomy

Piscataway, NJ

Sept 2013–present

Carnegie Mellon University

B.Sc., Physics/Astrophysics

Pittsburgh, PA

Sept 2009–May 2013

Professional Experience

Rutgers, The State University of New Jersey

Graduate research assistant, advised by Andrew Baker

Piscataway, NJ

July 2013–present

- *Investigating how galaxies evolve in massive clusters by observing their star formation, cold gas, and dust properties.*
- *Studying the multi-phase interstellar media of extreme, UV-selected starbursting galaxies in the local Universe.*
- *Using supervised deep learning to predict chemical enrichment of nearby galaxies using only optical imaging.*

Teaching assistant

Jan 2015–May 2015

- *Instructed lab sections for Physics 343: Observational radio astronomy.*
- *Graded assignments for Physics 342: Principles of astrophysics.*

McWilliams Center for Cosmology, Carnegie Mellon University

Undergraduate research assistant, advised by Rachel Mandelbaum

Pittsburgh, PA

July 2012–May 2013

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

Carnegie Mellon University CyLab

Research intern

Pittsburgh, PA

May 2011–Aug 2011

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

Refereed Publications (including submissions)

- [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*, submitted.
- [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]

Conference Abstracts and Unrefereed Publications

- [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.**, *AAS Meeting 233*, 145.08. [ADS]
- [5] "Using Convolutional Neural Networks to predict Galaxy Metallicity from Three-Color Images "
Boada, S. & **Wu, J. F.**, *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]

Other Experience

USAID Research & Innovation Fellowship

Cape Town, South Africa

Improving the LADUMA Pipeline Using MeerKAT Early Science Data

Sept 2016–Nov 2016

- 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

- 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

- 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

TA/GA Professional Development Fund, Rutgers

June 2017

Travel support for conference in France

International Travel Grant, American Astronomical Society

Mar 2017

TA/GA Professional Development Fund, Rutgers

June 2016

Travel support to South Africa

Special Study Award, Rutgers

Mar 2014

Claud Lovelace Fellowship , <i>Rutgers</i>	Sept 2013–June 2014
Senior Leadership Recognition , <i>Carnegie Mellon</i>	May 2013
Mellon College of Science College Honors , <i>Carnegie Mellon</i>	May 2013

Seminars and Conference Talks/Posters

American Astronomical Society (AAS) 233rd meeting , <i>Dissertation talk</i>	Jan 2019
Center for Computational Astrophysics (CCA) , <i>Galaxies Group Meeting</i>	Dec 2018
Princeton Astronomy , <i>Data Science/COMPASS Seminars</i>	Dec 2018
Princeton Astronomy , <i>Galread Seminar</i>	Nov 2018
Princeton Astronomy , <i>Data Science/COMPASS Seminar</i>	Nov 2018
University of Cape Town (UCT) Astronomy , <i>Seminar</i>	Aug 2018
Galaxy Evolution Across Time (Paris) , <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

Co-leader , <i>Rutgers Gaia Data Release 2 Hackathon</i>	May 2018
Co-leader , <i>SPS/RAS Astro Hack Sessions</i>	March–April 2018
Invited Plenary Talk , <i>Friends of Rutgers Astronomy</i> <i>Studying Galaxy Clusters with Herschel, ALMA, and SALT</i>	Sept 2017
Guest Lecturer , <i>Physics 343: Observational radio astronomy</i>	Mar 2017
Guest Lecturer , <i>Byrne Seminar: The Poetry of Astronomy</i>	Feb 2016
TAC member , <i>SALT 2015-2 Rutgers Time Allocation Committee</i>	Sept 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>	Sept 2014–May 2015
Webmaster , <i>Rutgers Physics GSO and SSPAR</i>	Sept 2014–May 2017
Public Talk , <i>Rutgers Astronomical Society</i> <i>Anisotropies in the Cosmic Microwave Background: B-modes and Inflation</i>	Mar 2014

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, *ALMA Lensing Cluster Survey* (2018.1.00035.L) Cycle 6

Col, *Galaxies in (and behind) two massive high-redshift clusters* (2013.1.01358.S) 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

- 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.

Skills

Programming: Python, MATLAB/Octave, IDL, SQL, Java, C++, HTML5/CSS, bash, L^AT_EX

Software: SciPy/matplotlib/pandas/seaborn, AstroPy, scikit-learn, fastai/Pytorch, Source Extractor, Miriad, CASA/MPICASA, Slurm, Docker, Singularity

Data reduction: ALMA, MeerKAT, SALT Fabry-Pérot