

# John F. Wu

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## Education

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**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

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**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**

**Pittsburgh, PA**  
*July 2012–May 2013*

Undergraduate research assistant, advised by Rachel Mandelbaum  
• *Characterized galaxies in rich clusters by using Sloan Digital Sky Survey observations.*

**Carnegie Mellon University CyLab**

**Pittsburgh, PA**  
*May 2011–Aug 2011*

Research intern

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

## Refereed Publications (including submissions)

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- [3] “Using convolutional neural networks to predict galaxy metallicity from three-color images,”  
**Wu, J. F.** & Boada, S., *MNRAS*, submitted, arXiv:1810.12913. [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

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- [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

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### 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

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**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, 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

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<b>Princeton Astronomy</b> , <i>Data Science/COMPASS Seminar</i>	Nov 2018
<b>University of Cape Town (UCT) Astronomy</b> , <i>Seminar</i>	Aug 2018
<b>Galaxy Evolution Across Time (Paris)</b> , <i>Contributed poster</i>	June 2017
<b>Princeton-Rutgers 3rd annual extragalactic science day</b> , <i>Contributed talk</i>	May 2016
<b>American Astronomical Society (AAS) 227th meeting</b> , <i>Contributed talk</i>	Jan 2016
<b>Australian Astronomical Observatory (AAO)</b> , <i>Seminar</i>	Dec 2015

## Leadership, Service, and Outreach

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

## Telescope Proposals and Observing

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<b>Very Large Array (VLA)</b> Col, <i>A high-resolution multi-frequency map of PKS0326-288 [...] (19A-433)</i>	2019A
<b>Anglo-Australian Telescope (AAT)</b> Col, <i>Redshifts in the LADUMA Field to <math>z \sim 0.6</math> (N0331)</i> <ul style="list-style-type: none"><li>Awarded five nights of AAT/AAOmega to continue campaign of measuring redshifts in the LADUMA field.</li></ul>	2017B
Col, <i>Redshifts in the LADUMA Field to <math>z \sim 0.6</math> (N0334)</i> <ul style="list-style-type: none"><li>Awarded four nights of AAT/AAOmega time to measure galaxy redshifts in preparation for studying neutral hydrogen with the LADUMA survey.</li><li>Observed at the AAT and detected <math>\sim 1600</math> galaxy redshifts.</li></ul>	2015B
<b>Atacama Large Millimeter/submillimeter Array (ALMA)</b> Col, <i>ALMA Lensing Cluster Survey (2018.1.00035.L)</i>	Cycle 6
Col, <i>Galaxies in (and behind) two massive high-redshift clusters (2013.1.01358.S)</i> <ul style="list-style-type: none"><li>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.</li><li>Reduced data using the NAASC computing facilities at NRAO in Charlottesville.</li></ul>	Cycle 2
<b>Southern African Large Telescope (SALT)</b> Col, <i>Preparing for LADUMA: SALT Redshift Measurements (2017-1-MLT-014)</i>	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

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**Programming:** Python, MATLAB/Octave, IDL, SQL, Java, C++, HTML5/CSS, bash, L<sup>A</sup>T<sub>E</sub>X

**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