

SHARON XUESONG WANG

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EDUCATION

PhD Candidate, Astronomy & Astrophysics, Penn State University Aug 2016
PhD Minor, Computational Sciences
Thesis: *On Detecting New Worlds: The Art of Doppler Spectroscopy Using Iodine Cells*
Advisor: Dr. Jason T. Wright

Bachelor of Science, Physics, Tsinghua University, Beijing, China Jun 2008
Thesis: *Characterizing the Luminosity-Variability Correlation in Gamma-Ray Bursts*
Advisor: Dr. Shuang-Nan Zhang

PROFESSIONAL EMPLOYMENT

Research Assistant / Fellow May 2010 – present
Department of Astronomy & Astrophysics, Penn State University

- Jan 2013 – Jun 2016, May 2010 – May 2011, with Prof. Jason Wright on detection and characterization of exoplanets with radial velocities (thesis work).
- May 2011 – Dec 2012, with Prof. W. Niel Brandt on observational studies of AGNs.
- May 2009 – May 2010, with Prof. Peter Mészáros on Gamma-ray Burst theories.

Teaching Assistant Aug 2008 – Dec 2009
Department of Astronomy & Astrophysics, Penn State University

- including instructing and leading astronomy lab classes (Astro 11)

AWARDS

Carnegie DTM Fellowship in Astronomy and Planetary Science since Sep 2016

NASA Earth and Space Science Fellow Sep 2014 - June 2016
Proposal title: Finding the Lowest Mass Exoplanets with Improved Radial Velocimetry

Downsborough Graduate Fellowship May 2013
Department of Astronomy & Astrophysics, Penn State University

- Award for senior graduate student for outstanding scholarly achievement.

Stephen B. Brumbach Fellowship in Astrophysics May 2010
Department of Astronomy & Astrophysics, Penn State University

- In recognition of excellence in academic performance and research during the first two years.

Zaccheus Daniel Fellowship 2009-2013
Department of Astronomy & Astrophysics, Penn State University

- Research and Travel Funding Award for current graduate student.

Teaching Assistant of the Year Award

Jun 2009

Department of Astronomy & Astrophysics, Penn State University

- In recognition of outstanding teaching by a graduate student.

TELESCOPE TIME AWARDED AND OBSERVING EXPERIENCE

Exoplanet Programs

PI, 25.7 hours on Hobby-Eberly Telescope, with the High Resolution Spectrograph 2013

Improve the Radial Velocity Precision of HET/HRS

Co-I: Jason Wright, Ming Zhao

Observer, Observing Planner, Tull Spectrograph at the McDonald Obs. 2.7m Telescope 2013

TS12 arm, R~500,000, day-time runs

Observer, Keck/HIRES remote observing at Caltech and Yale ROCs 2010, 2011, 2013

Extragalactic Programs

As founding member of the MUSSCEL program (MUltiwavelength Study of the Structure, Chemistry and Evolution of LSB galaxies):

Co-I, 5 hours of Green Bank Telescope, 2015A with AUGUS receiver 2014

CO in Low Surface Brightness Galaxies in Tandem with Optical/UV Star Formation

PI: Jason Young, Co-Is: Rachel Kuzio de Naray, Karen O'Neil

Co-I, 9 Nights on VIRUS-P IFU on 2.7m telescope of McDonald Observatory 2013, 2014, 2015

IFU Spectroscopy of Low Surface Brightness Galaxies

PI: Jason Young, Co-I for 2014 & 2015: Rachel Kuzio de Naray

Co-I, NASA Swift Cycle 10 GI Program 2013

Anchoring the Blue End of Low Surface Brightness Disk Galaxy SEDs

PI: Jason Young, Co-I: Rachel Kuzio de Naray

Others: Co-I on one *Fermi* proposal on GRB theory (2009) and one *Chandra* Archival proposal on AGN spectroscopy (2013).

TALKS AND CONFERENCE POSTERS

Talks

Paths, Roadblocks, and Byways in Detecting Habitable Rocky Planets in Radial Velocity Data

Invited Talk, Carnegie DTM Exoplanet Seminar Nov 2015

Invited Talk, Berkeley Center for Integrative Planetary Science Seminar Sep 2015

NExScI Exoplanet Seminar Sep 2015

Contributed Talk, Bay Area Exoplanet Science Meeting Sep 2015

<i>Co-Chair, Breakout Discussion Session on Telluric Contamination</i> The 2nd Extremely Precise Radial Velocity Workshop, Yale	Jul 2015
<i>Improve RV Precision through Better Modeling and Better Reference Spectra</i> Contributing Talk, The 1st Emerging Researchers in Exoplanet Symposium, Penn State	May 2015
<i>Pushing the Radial Velocity Precision to 1 m/s</i> Stellar, Solar and Planet Seminar, Harvard/CfA	Oct 2014
<i>Accreting Supermassive Black Holes in Submm Galaxies</i> Contributed Talk at the Penn State Neighborhood Cosmology Workshop	Apr 2013
<i>AGNs in Submm Galaxies — Combining the Power of Chandra and ALMA</i> Contributed Talk at 2013 AAS Winter Meeting, Long Beach	Jan 2013
Contributed Talk at Seyfert 2012 Workshop — Nuclei of Seyfert Galaxies and QSOs Max Planck Institute for Radio Astronomy, Bonn, Germany	Nov 2012
<i>Resolving the 6-8 keV X-ray Background</i> Lunch Talk at Kavli Institute of Astronomy & Astrophysics Peking University, Beijing, China	Aug 2012

plus 6 Penn State Department of Astronomy & Astrophysics Lunch Talks and 2 invited talks at the *Swift* Mission Control Center.

Posters

<i>Telluric Contamination: Effects and Solutions</i> Poster at the 2nd Extremely Precise Radial Velocity Workshop, Yale	Jul 2015
<i>Finding Extra-Solar Planet Near and Far</i> Poster Presentation at the 2013 Penn State Graduate Exhibition First Prize Winner in the Physical Sciences and Mathematics Category	Mar 2013
<i>Improving the Radial Velocity Precision of HET/HRS</i> Serial Poster Presentations at the 2011 AAS Winter Meeting in Seattle and Summer Meeting in Boston, the 1st Precise Radial Velocity Workshop at Penn State, and the 2014 AAS Winter Meeting in National Harbor.	May 2011, Jan 2014
<i>Spectral Lags from Structured Jets</i> Poster Presentation at the 2010 AAS Winter Meeting in D.C. Poster Presentation at the Swift 5 Year Conference, Poster Award Winner	Jan 2010 Nov 2009

SUMMER SCHOOLS AND TRAININGS

<i>The Dunlap Institute Summer School on Astronomical Instrumentation</i> Honorable Mention, Optical Design Challenge	Aug 2013
<i>The AAS CAE Tier I Workshop on Teaching Astro 101</i>	2011
<i>The Summer School in Statistics for Astronomers</i>	Jul 2010

Pennsylvania State University

The 37th Stanford SLAC Summer School
Revolutions on the Horizon: A Decade of New Experiments
Honorable Mention, The 37th SLAC Summer School Challenge

Aug 2009

SERVICES AND COMMITTEE WORK

Referee, ApJ, A&A

Outreach Volunteer since Aug 2008
Given over 10 planetarium shows to local school students and general public, and over 6 public talks at various outreach events through the Penn State Astro Outreach program.

Astronomy beyond Academia, Founder and Group Manager since Aug 2012
A *LinkedIn* network for astronomers outside academia, endorsed by AAS Employment Committee

Mentor for First-Year Physics Major Undergraduate since Sep 2014
Penn State Physics and Astronomy Women Mentoring Program

Scientific and Logistic Organizing Committee Member May 2015
The 1st Emerging Researchers in Exoplanet Symposium, Penn State

Graduate Council Representative Sep 2010 – May 2012
Penn State Graduate Student Association

Co-Chair and Event Organizer for Inside Scientists Studio Sep 2010 – May 2011
Graduate Women in Science, Nu Chapter at Penn State

Mentor for First-Year International Graduate Students 2009 – 2010
Penn State Global Programs

TECHNICAL SKILLS

Coding Languages:

IDL, Python, Java, C++, R

Astronomical Data Analysis Skills:

Exoplanet:

- Forward modeling echelle spectra for radial velocity (RV) extraction;
 - working with and improving the California Planet Survey Doppler code (used at Keck/HIRES, APF, HET/HRS, AAT, etc.)
 - building a Doppler code from scratch
- Diagnosing and solving problems in the context of iodine precise RV;
 - general diagnostic tests with calibration frames, standard stars frames, etc.;
 - modeling telluric contamination in reference and science spectra;

- modeling spectrograph response function (spectral PSF);
- modeling/characterizing iodine atlases (as calibration/reference spectra);
- Observation and raw data reduction with echelle spectrograph;
- Characterization of planetary systems with RV data;
- Modeling telluric absorption lines;
- Optical and NIR photometry;
- Solid background in statistical computing.

Extragalactic:

- X-ray: photometry, stacking, spectroscopy, and spectral modeling (CIAO tools and XSPEC)
- Galaxy Stellar SED fitting (UV, optical to NIR; experience with FAST, GalMC, and CIGAR)
- Metallicity estimate from emission lines (e.g. using the R23 method)

Astronomical Packages and Software:

California Planet Survey Consortium Doppler Code

REDUCE (optimal extraction for 2-D echelle spectrum)

TERRASPEC (software for modeling telluric spectra based on HITRAN line database)

IodineSpec5 (theoretical computation of iodine lines)

SourceExtractor (Optical/NIR photometry)

CIAO tools and XSPEC (X-ray photometry and spectroscopy)

FAST (galaxy SED fitting)

ALMA Observing and Proposal Tool

Published Code:

BOOTTRAN (in IDL, bootstrapping to compute error bars for Keplerian orbit parameters, including transit ephemeris, based on radial velocity data)

LIST OF PUBLICATIONS

Sharon X. Wang

Total publications: 14, with 4 as first or second author, 10 as contributing author.

Total citations: 294 (196 citations as first or second author), h-index: 10, as of Sep. 2016.

Publications as a Major Contributor:

4. The Exoplanet Orbit Database II: Updates to exoplanets.org
Eunhyu Han⁺, **Sharon X. Wang**, Jason T. Wright, et al. 2014, *PASP*, 126, 813
(⁺ Undergraduate student co-supervised)
3. The X-ray Properties of the Submillimeter Galaxies in the ALMA
LABOCA E-CDF-S Submillimeter Survey
Sharon Xuesong Wang, W. Niel Brandt, et al. 2013, *ApJ*, 778, 179
2. The Discovery of HD 37605c and A Null Detection of Transits of HD 37605b
Sharon Xuesong Wang, Jason T. Wright, et al. 2012, *ApJ*, 761, 46
1. Tracking Down the Source Population Responsible for the Unresolved Cosmic 6-8 keV Background
Yongquan Xue, **S. X. Wang**, et al. 2012, *ApJ*, 758, 129

Other Publications:

10. A comprehensive radial velocity error budget for next generation Doppler spectrometers
Samuel Halverson, and other 16 coauthors including Sharon Wang, 2016, *SPIE*, 9908P, 20
9. The Distribution of Star Formation and Metals in the Low Surface Brightness Galaxy UGC 628
Young, J. E.; Kuzio de Naray, Rachel; **Wang, Sharon X.**, 2015, *MNRAS*, 452, 2973
8. Evolution in the Black Hole—Galaxy Scaling Relations and the Duty Cycle of Nuclear Activity
in Star-forming Galaxies
Mouyuan Sun, and other 8 coauthors including Sharon X. Wang, 2015, *ApJ*, 802, 14S
7. The California Planet Survey IV: A Planet Orbiting the Giant Star HD 145934 and Updates to
7 Systems with Long-Period Planets
Katherina Y. Feng, Jason T. Wright, Ben Nelson, **Sharon X. Wang**, et al. 2014, *ApJ*, 800, 22F
6. MARVELS-1: A Face-on Double-lined Binary Star Masquerading as a Resonant Planetary
System and Consideration of Rare False Positives in Radial Velocity Planet Searches
Jason T. Wright, Arpita Roy, Suvrath Mahadevan, **Sharon X. Wang**, et al. 2013, *ApJ*, 770, 119
5. Host Star Properties and Transit Exclusion for the HD 38529 Planetary System
Gregory W. Henry, Stephen R. Kane, **Sharon X. Wang**, et al. 2013, *ApJ*, 768, 155
4. The HD 192263 System: Planetary Orbital Period and Stellar Variability Disentangled
Diana Dragomir, and other 13 coauthors including Sharon X. Wang, 2012, *ApJ*, 754, 37
3. A Search for the Transit of HD 168443b: Improved Orbital Parameters and Photometry
Genady Pilyavsky, and other 15 coauthors including Sharon X. Wang, 2011, *ApJ*, 743, 162
2. Stellar Variability of the Exoplanet Hosting Star HD 63454
Stephen R. Kane, and other 12 coauthors including Sharon X. Wang, 2011, *ApJ*, 737, 58
1. Revised Orbit and Transit Exclusion for HD 114762b
Stephen R. Kane, and other 6 coauthors including Sharon X. Wang, 2011, *ApJ*, 735, L41