Will Barnes | CV

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Personal Information

Birthdate: 15 October 1990

Citizenship: USA

Education

Rice University **Houston, TX USA**
Ph.D. Physics *2016-present (expected 2019)*
- Thesis: Modeling Hot Plasma in the Solar Corona (working title)
- Advisor: Stephen Bradshaw, Ph.D.

Rice University **Houston, TX USA**
M.S. Physics, GPA: 3.88/4.00 *2013-2016*

Baylor University **Waco, TX USA**
B.S. Astrophysics, GPA: 3.89/4.00 *2009-2013*
- Thesis: Astrophysical Applications of Dusty Plasma Physics, Advisor: Lorin Matthews, Ph.D.
- University Honors Program, Magna Cum Laude, Phi Beta Kappa
- Minors: Mathematics, Great Texts of the Western Tradition

Research Experience

Rice University, Dept. of Physics and Astronomy **Houston, TX USA**
Graduate Research Assistant *2013–present*
Graduate research assistant studying observable signatures of impulsive heating in the solar corona.

Baylor University, CASPER **Waco, TX USA**
NSF REU Research Fellow *June 2012–August 2012*
Received NSF REU fellowship to study dust grain charging and growth in protoplanetary disks using numerical models.

Baylor University, Dept. of Physics **Waco, TX USA**
Undergraduate Research Assistant *June 2011–August 2011*
Awarded summer research funding to investigate plasma physics of charged dust grains in Saturn's F Ring.

Publications

- **W.T. Barnes**, P.J. Cargill, S.J. Bradshaw, *Inference of Heating Properties from Hot Non-flaring Plasmas in Active Region Cores II. Nanoflare Trains*, ApJ, 2016, 2016ApJ...833..217B
- **W.T. Barnes**, P.J. Cargill, S.J. Bradshaw, *Inference of Heating Properties from Hot Non-flaring Plasmas in Active Region Cores I. Single Nanoflares*, ApJ, 2016, 2016ApJ...829...31B

Talks

NRL Solar and Heliospheric Physics Branch Seminar (Invited) **Washington, D.C.**
Naval Research Laboratory *11 July 2018*
Investigating Heating Frequency in Active Region Cores through Timelag Analysis of Forward Modeled Emission

Triennial Earth-Sun Summit **Leesburg, VA**
American Geophysical Union *21-24 May 2018*
Timelag Analysis of Simulated Active Region Cores Heated by Nanoflares

Python in Astronomy 2018 **New York City, NY**
Center for Computational Astrophysics, The Flatiron Institute *30 April-4 May 2018*
A Complete fiasco - The Difficulties of Dealing with Atomic Data and a Possible Pythonic Solution

SciPy: Scientific Computing in Python **Austin, TX**
SciPy, Enthought *10-16 July 2017*
ChiantiPy: a Python package for Astrophysical Spectroscopy

Coronal Loops Workshop VIII **Palermo, Italy**
INAF IASF Palermo *27-30 June 2017*
Constraining Nanoflare Heating Frequency with a Global Active Region Model

Space Physics Seminar Series **Houston, TX**
Rice University *27 February 2017*
A Framework for Forward Modeling Solar Active Regions

47th Annual Solar Physics Division Meeting **Boulder, CO**
American Astronomical Society *31 May-3 June 2016*
Hot Non-flaring Plasmas in Active Region Cores Heated by Single Nanoflares

Space Physics Seminar Series **Houston, TX**
Rice University *9 November 2015*
Impacts of Two-fluid Effects on Emission from Impulsively Heated Coronal Loops

Texas Undergraduate Astronomy Research Symposium **College Station, TX**
Texas A&M University *14 September 2012*
Dust Grain Charging in a Protoplanetary Disk

Conference Papers and Posters

Rice Data Science Conference **Houston, TX**
Rice University *9-10 October 2017*
Timelag Analysis of Global Hydrodynamic Simulations of Active Regions in the Solar Corona

SHINE Workshop **Saint-Sauveur, Quebec, CA**
National Science Foundation *24-28 July 2017*
Modeling Observable Signatures of Nanoflare Heating Frequency in Active Region Cores

SciPy: Scientific Computing in Python **Austin, TX**
SciPy *10-16 July 2017*
ChiantiPy: a Python package for Astrophysical Spectroscopy

Solar Heliospheric and Interplanetary Environment (SHINE) Workshop **Santa Fe, NM**
National Science Foundation *11-15 July 2016*
Understanding the Impact of Nanoflare Heating Frequency on the Observed Emission Measure Distribution

Coronal Loops Workshop VII **Cambridge, UK**
Unversity of Cambridge *21-23 July 2015*
Effects of Ion Heating on Emission Measure of Coronal Loops in Active Region Cores

Triennial Earth-Sun Summit **Indianapolis, IN**
American Astronomical Society *26-30 April 2015*
Nonnegative Matrix Factorization as a Method for Studying Coronal Heating

44th Annual Lunar and Planetary Science Conference **The Woodlands, TX**
Lunar and Planetary Science Institute *18-22 March 2013*
Dust Grain Growth in a Protoplanetary Disk: Effects of Location on Charge and Size

Software and Computing Skills

Languages: Bash, C, C++, Python

Scientific Computing: IDL, Mathematica, MATLAB, NumPy, SciPy, SLURM, TORQUE

Markup: CSS, HTML, LaTeX, markdown, reStructuredText

Other: continuous integration, documentation, testing, version control

Students Mentored

Lily Han: Undergraduate (Rice), assisted in advising undergraduate thesis work, October 2017-April 2018

Brandon Wang: High school intern, advisor for STEM research course, April 2017-May 2018

Tessa Wilkinson: Undergraduate, Google Summer of Code mentor (the SunPy project), May-August 2016

Teaching Experience

ASTR 201: Stars, Galaxies, and the Universe

Guest Lecturer *Spring 2017*

Gave two guest lectures for non-majors astronomy course of approximately 70 undergraduate students. Topics covered included eclipses, phases of the moon, and the celestial sphere.

PHYS 102: Electricity and Magnetism

Lab Teaching Assistant *Spring 2014, Spring 2015*

Instructed lab sections of 40+ undergraduate students on topics including electrostatic interactions, magnetic induction, and basic circuits.

PHYS 101: Mechanics

Lab Teaching Assistant *Fall 2014, Fall 2015*

Instructed lab sections of 40+ undergraduate students on topics including kinematics, collisions, and simple harmonic motion.

Honors and Awards

- Outstanding Student Poster Award, SHINE Workshop, July 2017
- William and Elva Gordon Fellowship, Rice University, May 2016
- Chuoke Award for Second- and Third-year Graduate Students, Rice University, May 2016
- Studentship Travel Award for 2015,2016,2018 SPD Annual Meetings, Solar Physics Division of the AAS
- URSA Scholars Week Outstanding Research Poster in Physics, Baylor University, 2013
- Dean's List, Baylor University, 7 of 8 semesters
- President's Gold Scholarship, Baylor University, all semesters
- Gordon K. Teal Scholarship, Dept. of Physics, Baylor University, 2 academic years
- Herbert D. Schwetman Scholarship, Dept. of Physics, Baylor University, 2 academic years

Societies and Associations

Alpha Lambda Delta

National Honors Society *April 2009-May 2013*

Completed 10 hours of service per semester.

Alpha Phi Omega

National Service Fraternity, Zeta Omega chapter *September 2010-May 2013*

Served as historian and treasurer. Completed 35 hours of service per semester. Managed finances for the organization. Organized a fundraiser.

Sigma Pi Sigma

National Physics Honors Society *April 2012-present*

Requirements for entry include being in upper-third of the class and completion of at least three semester of college course work in physics.

Society of Physics Students

President *September 2009-May 2013*

As president, initiated rechartering of university chapter. Scheduled and presided over meetings. Organized end of the year luncheon and design and printing of t-shirts.

Employment Experience

Department of Physics, Baylor University

Office Assistant *January 2010-May 2013*

Assisted with examinations and attendance for introductory astronomy class of approximately 300 students. Helped with departmental events and mailing as well as other miscellaneous duties.