

Will Barnes | CV

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Personal Information

Birthdate: 15 October 1990

Citizenship: USA

Education

Rice University

Ph.D. Physics

Houston, TX USA

2016-present (expected 2019)

◦ Thesis: Modeling Hot Plasma in the Solar Corona (working title)

◦ Advisor: Stephen Bradshaw, Ph.D.

Rice University

M.S. Physics, GPA: 3.88/4.00

Houston, TX USA

2013-2016

Baylor University

B.S. Astrophysics, GPA: 3.89/4.00

Waco, TX USA

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

Graduate Research Assistant

Houston, TX USA

2013–present

Graduate research assistant studying observable signatures of impulsive heating in the solar corona.

Baylor University, CASPER

NSF REU Research Fellow

Waco, TX USA

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

Undergraduate Research Assistant

Waco, TX USA

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)

Naval Research Laboratory

Washington, D.C.

11 July 2018

Investigating Heating Frequency in Active Region Cores through Timelag Analysis of Forward Modeled Emission

Triennial Earth-Sun Summit

American Geophysical Union

Leesburg, VA

21-24 May 2018

Timelag Analysis of Simulated Active Region Cores Heated by Nanoflares

Python in Astronomy 2018 <i>Center for Computational Astrophysics, The Flatiron Institute</i> <i>A Complete fiasco - The Difficulties of Dealing with Atomic Data and a Possible Pythonic Solution</i>	New York City, NY 30 April-4 May 2018
SciPy: Scientific Computing in Python <i>SciPy, Enthought</i> <i>ChiantiPy: a Python package for Astrophysical Spectroscopy</i>	Austin, TX 10-16 July 2017
Coronal Loops Workshop VIII <i>INAF IASF Palermo</i> <i>Constraining Nanoflare Heating Frequency with a Global Active Region Model</i>	Palermo, Italy 27-30 June 2017
Space Physics Seminar Series <i>Rice University</i> <i>A Framework for Forward Modeling Solar Active Regions</i>	Houston, TX 27 February 2017
47th Annual Solar Physics Division Meeting <i>American Astronomical Society</i> <i>Hot Non-flaring Plasmas in Active Region Cores Heated by Single Nanoflares</i>	Boulder, CO 31 May-3 June 2016
Space Physics Seminar Series <i>Rice University</i> <i>Impacts of Two-fluid Effects on Emission from Impulsively Heated Coronal Loops</i>	Houston, TX 9 November 2015
Texas Undergraduate Astronomy Research Symposium <i>Texas A&M University</i> <i>Dust Grain Charging in a Protoplanetary Disk</i>	College Station, TX 14 September 2012

Conference Papers and Posters

Rice Data Science Conference <i>Rice University</i> <i>Timelag Analysis of Global Hydrodynamic Simulations of Active Regions in the Solar Corona</i>	Houston, TX 9-10 October 2017
SHINE Workshop <i>National Science Foundation</i> <i>Modeling Observable Signatures of Nanoflare Heating Frequency in Active Region Cores</i>	Saint-Sauveur, Quebec, CA 24-28 July 2017
SciPy: Scientific Computing in Python <i>SciPy</i> <i>ChiantiPy: a Python package for Astrophysical Spectroscopy</i>	Austin, TX 10-16 July 2017
Solar Heliospheric and Interplanetary Environment (SHINE) Workshop <i>National Science Foundation</i> <i>Understanding the Impact of Nanoflare Heating Frequency on the Observed Emission Measure Distribution</i>	Santa Fe, NM 11-15 July 2016
Coronal Loops Workshop VII <i>University of Cambridge</i> <i>Effects of Ion Heating on Emission Measure of Coronal Loops in Active Region Cores</i>	Cambridge, UK 21-23 July 2015
Triennial Earth-Sun Summit <i>American Astronomical Society</i> <i>Nonnegative Matrix Factorization as a Method for Studying Coronal Heating</i>	Indianapolis, IN 26-30 April 2015
44th Annual Lunar and Planetary Science Conference <i>Lunar and Planetary Science Institute</i> <i>Dust Grain Growth in a Protoplanetary Disk: Effects of Location on Charge and Size</i>	The Woodlands, TX 18-22 March 2013

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

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