

# Will Barnes | CV

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## Personal Information

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**Birthdate:** 15 October 1990

**Citizenship:** USA

## Education

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### 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

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### 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

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◦ **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

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### 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*

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

## Conference Papers and Posters

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

## Software and Computing Skills

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**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

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**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

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### **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

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- 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

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### **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

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### **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.