

# 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**

**Houston, TX USA**

*Ph.D. Physics*

*2016-present (expected 2018)*

◦ 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

## 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

## 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

## Posters

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**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*

**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 Loop Workshop VII**

**Cambridge, UK**

*University of Cambridge*

*21-23 July 2015*

*Effects of Ion Heating on Emission Measure of Coronal Loops in Active Region Cores*

**Triennial Earth-Sun Summit**

*American Astronomical Society*

*Nonnegative Matrix Factorization as a Method for Studying Coronal Heating*

**44th Annual Lunar and Planetary Science Conference**

*Lunar and Planetary Science Institute*

*Dust Grain Growth in a Protoplanetary Disk: Effects of Location on Charge and Size*

**Indianapolis, IN**

*26-30 April 2015*

**The Woodlands, TX**

*18-22 March 2013*

## Talks

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**SciPy: Scientific Computing in Python**

*SciPy, Enthought*

*ChiantiPy: a Python package for Astrophysical Spectroscopy*

**Austin, TX**

*10-16 July 2017*

**Coronal Loops Workshop VIII**

*INAF IASF Palermo*

*Constraining Nanoflare Heating Frequency with a Global Active Region Model*

**Palermo, Italy**

*27-30 June 2017*

**Space Physics Seminar Series**

*Rice University*

*A Framework for Forward Modeling Solar Active Regions*

**Houston, TX**

*27 February 2017*

**47th Annual Solar Physics Division Meeting**

*American Astronomical Society*

*Hot Non-flaring Plasmas in Active Region Cores Heated by Single Nanoflares*

**Boulder, CO**

*31 May-3 June 2016*

**Space Physics Seminar Series**

*Rice University*

*Impacts of Two-fluid Effects on Emission from Impulsively Heated Coronal Loops*

**Houston, TX**

*9 November 2015*

**Texas Undergraduate Astronomy Research Symposium**

*Texas A&M University*

*Dust Grain Charging in a Protoplanetary Disk*

**College Station, TX**

*14 September 2012*

## Research Positions

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**Rice University**

*Graduate Research Assistant*

Research duties concentrated in computational solar physics. Teaching duties include, but are not limited to, a minimum of four semesters of leading lab sections of introductory physics.

**Houston, TX USA**

*2013–present*

**CASPER, Baylor University**

*NSF REU Research Fellow*

Studied the effects of dust grain charging on aggregate size in a protoplanetary disk. Numerical work in extending kinetic model of grain growth to examine effect of disk location on grain charging.

**Waco, TX USA**

*June 2012–August 2012*

**Baylor University**

*Summer Undergraduate Research Assistant*

Awarded a Summer Undergraduate Research in Physics (SURPh) grant from Department of Physics, Baylor University. Conducted research on anomalies in Saturn's F Ring by improving numerical models that simulate perturbed orbits of charged dust grains in a plasma environment.

**Waco, TX USA**

*June 2011–August 2011*

## 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 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 (GPA of at least 3.0, 12 semester hours), 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

## Teaching/Mentoring 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.

### **Google Summer of Code, Open Astronomy**

*Mentor, The SunPy Project*

*May-August 2016*

Mentored undergraduate student in developing a module to calculate the temperature response functions for the AIA instrument on the Solar Dynamics Observatory. SunPy is a community-developed, free and open-source solar data analysis environment for Python.

### **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.

## 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.