# Will Barnes

6100 Main Street MS-61 - Houston, TX 77005 > +1(405)308-0473 • > will.t.barnes@rice.edu • > wtbarnes

## **Personal Information**

Birthdate: 15 October 1990

Citizenship: USA

## Education

Rice University Houston, TX USA Ph.D. Physics

2016-present (expected 2019)

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

o 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

o Thesis: Astrophysical Applications of Dusty Plasma Physics, Advisor: Lorin Matthews, Ph.D.

o University Honors Program, Magna Cum Laude, Phi Beta Kappa

o 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**

o 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

o 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**

#### **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

SciPv. Enthought 10-16 July 2017

Austin, TX

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 31 May-3 June 2016

American Astronomical Society

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

**Space Physics Seminar Series** Houston, TX 9 November 2015

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

College Station, TX

Texas Undergraduate Astronomy Research Symposium

Texas A&M University 14 September 2012

Dust Grain Charging in a Protoplanetary Disk

**Conference Papers and Posters** 

**Rice Data Science Conference** Houston, TX

9-10 October 2017 Rice University

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

10-16 July 2017

ChiantiPy: a Python package for Astrophysical Spectroscopy

Solar Heliospheric and Interplanetary Environment (SHINE) Workshop Santa Fe, NM

11-15 July 2016 National Science Foundation

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**

- 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.