

Will Barnes | CV

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Personal Information

Birthdate: 15 October 1990

Citizenship: USA

Education

Rice University

Houston, TX USA

Doctor of Philosophy in Physics

expected 2018

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

◦ Advisor: Stephen Bradshaw, Ph.D.

Rice University

Houston, TX USA

Master of Science in Physics, GPA: 3.88/4.00

2013–2016

Baylor University

Waco, TX USA

Bachelor of Science in Astrophysics, GPA: 3.89/4.00

2009–2013

◦ Minors: Mathematics, Great Texts of the Western Tradition

◦ *Magna Cum Laude*, Phi Beta Kappa, University Honors Program

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

Computing Skills

Languages: C/C++, IDL, Mathematica, MATLAB, Python

Software Tools: git/GitHub, L^AT_EX, SLURM, TORQUE

Operating Systems: Linux, Mac OS X

Research Experience

Rice University

Houston, TX

Graduate Research Assistant, Advisor: Stephen Bradshaw, Ph.D.

2013–present

Research assistant in space physics division of the Department of Physics and Astronomy, Rice University. 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.

CASPER, Baylor University

Waco, TX

NSF REU Research Fellow

June 2012–August 2012

Accepted to National Science Foundation Research Experience for Undergraduates program in the Center for Astrophysics, Space Physics, and Engineering Research, Baylor University. 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.

Baylor University

Waco, TX

Summer Undergraduate Research Assistant

June 2011–August 2011

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.

Research Interests

Broadly, my research interests are in solar physics, specifically in the numerical modeling of plasma dynamics in the solar corona. I am interested in using hydrodynamic models to study nanoflare heating in the corona and how these modeled results can be compared to observations from instruments. Additionally, I am interested in using forward modeling to explore how novel machine learning techniques might be used to extract heating properties from active region core emission.

Publications

- o **W.T. Barnes**, P.J. Cargill, and S.J. Bradshaw, *Inference of Heating Properties from "Hot" Non-flaring Plasmas in Active Region Cores I. Single Nanoflares*, submitted, 2016
- o **W.T. Barnes**, P.J. Cargill, and S.J. Bradshaw, *Inference of Heating Properties from "Hot" Non-flaring Plasmas in Active Region Cores II. Nanoflare Trains*, in preparation, 2016

Talks and Posters

Space Physics Seminar Series

Rice University

Houston, TX

9 November 2015

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

Coronal Loop Workshop VII

University of Cambridge

Cambridge, UK

21-23 July 2015

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

Triennial Earth-Sun Summit

American Astronomical Society

Indianapolis, IN

26-30 April 2015

Poster title: *Nonnegative Matrix Factorization as a Method for Studying Coronal Heating*

44th Annual Lunar and Planetary Science Conference

Lunar and Planetary Science Institute

The Woodlands, TX

18-22 March 2013

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

Texas Undergraduate Astronomy Research Symposium

Texas A&M University

College Station, TX

14 September 2012

Talk title: *Dust Grain Charging in a Protoplanetary Disk*

Honors and Awards

- o Studentship Travel Award for 2015,2016 SPD Annual Meeting, Solar Physics Division of the American Astronomical Society
- o Dean's List, 7 of 8 semesters, Baylor University
- o President's Gold Scholarship (GPA of at least 3.0, 12 semester hours), all semesters
- o Gordon K. Teal Scholarship, 2 academic years
- o Herbert D. Schwetman Scholarship, 2 academic years
- o 2013 URSA Scholars Week Outstanding Research Poster in Physics

Teaching Experience

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

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 class of 300. Helped with departmental events and mailing.