


Reece Boston
astrophysicist 

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Education

Ph.D., Physics University of North Carolina-Chapel Hill, 2022

M.S., Physics University of Georgia, 2015

B.S., Mathematics and Physics Georgia College, 2010

A.A., Mathematics Georgia Perimeter College, 2007

Published Work

- Boston, S. Reece, J. C. Clemens and C. R. Evans, “A Natural Classification Scheme for Hot ZZ Ceti Stars” *Astrophysical Journal*, (2022) [In Draft]. Role: constructed model grid of white dwarf stars for use in analysis, fitting all past observed variable white dwarfs to a new classification scheme
- Boston, S. Reece, C. R. Evans and J. C. Clemens, “Parametric White Dwarf Models for Asteroseismology” *Astrophysical Journal*, (2022) [In Draft]. Role: developed computer models of a white dwarf star to design a new classification scheme on the basis of observable pulsation periods, due to differences in helium layer mass
- Boston, S. Reece, C. R. Evans and J. C. Clemens, “The Limits of Newtonian White Dwarf Asteroseismology.” *Astrophysical Journal*, (2022) [Awaiting Submission]. Role: developed theory for post-newtonian pulsations, created C++ code for high-precision numerical analysis of stellar pulsations in newtonian, post-newtonian physics.
- de Souza, Rafael, [S. Reece Boston](#), Alain Coc, and Christian Iliadis, “Thermonuclear fusion rates for tritium+deuterium using Bayesian methods.” *Physical Review C*, (2018). Role: early analysis with Bayesian MCMC in R with JAGS, rewrote legacy fortran code into C++ to calculate S-factor for use with JAGS library for hundred-fold increase in productivity.
- Boston, S. Reece, “Time Travel in Transformation Optics.” *Physical Review D*, (2015).

Research Codes

GRPulse: High-precision asteroseismology code for Newtonian, post-Newtonian, and General Relativistic stellar models. Built-in capability for several basic stellar backgrounds.

Thrain: Asteroseismology code for simple analytic models of white dwarf stars. Equations of state, opacities, and element abundances are all given by simple equations for quick and precise calculation. Though simple, the models are powerful, and able to reproduce many physical discoveries of stellar evolution codes.

Research Experience

Research Assistant Fall 2016 - Present

Department of Physics and Astronomy, University of North Carolina - Chapel Hill

Research Advisor: Charles R. Evans

Topic: The numerical calculation of pulsation frequencies for white dwarf and other stellar objects in classical and general relativistic settings. Calculations performed in C++.

Industry Experience

Data Scientist at [Community](#), Sept 2021 - Present

Languages

- English (native)
- C++ (advanced)
- python (intermediate)
- Spanish (spoken in home)
- R (advanced)
- SQL (advanced)

Teaching Experience

Research Mentor Summer 2020-Summer 2021

Department of Physics and Astronomy, University of North Carolina - Chapel Hill

Role: Acting mentor for REU/Senior Honor's Thesis in relativistic pulsation of neutron stars and white dwarfs.

Physics Instructor Summer 2019, Summer 2020

Department of Physics and Astronomy, University of North Carolina - Chapel Hill

Course: Physics for Life Sciences

Recorded many of [the online lectures](#) during COVID-19 response (Lec 7-10,14,26-27).

Research Mentor Fall 2018 - Summer 2019

Department of Physics and Astronomy, University of North Carolina - Chapel Hill

Role: Mentoring NCCMS high school student in guided research project on relativistic pulsation of neutron stars. Student won [Regeneron STS 2019 Scholarship](#).

Teaching Assistant Fall 2016 - Ongoing

Department of Physics and Astronomy, University of North Carolina - Chapel Hill

Courses: Numerical Methods (LOI: python), Electronics Lab, Physics for Life Sciences

STEM Teacher Fall 2015 - Spring 2016

Mount Pisgah Christian School

Courses: AP Physics 1, High School Physics, Introductory Programming (LOI: C++)

Coach: FIRST Robotics Competition, FIRST Lego League

Teaching Assistant Fall 2010 - Spring 2015

Department of Physics and Astronomy, University of Georgia

Courses: Physics Labs, Scale-Up Physics for Engineers

Awards and Honors

Hamilton Award 2021, UNC

Monetary award given by the Physics and Astronomy department at UNC.

NC Space Grant 2020, UNC

Monetary grant awarded through NASA for promising graduate student work related to NASA missions.

Outstanding Physics TA 2018, UNC

Awarded for performance as teaching assistance. Included monetary award.

Outstanding Physics Major 2010, GCSU

Presented to top graduating physics major.

Sarah Nelson Scholarship 2008-2009, GCSU

Presented to exceptional math majors.