

Thomas M. Boudreaux

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RESEARCH INTERESTS

Computational astrophysics, stellar evolution, machine learning, pulsating hot sub-luminous B stars, chaotic systems.

EDUCATION

Dartmouth College
Master of Science — Astronomy
Advisor: [Brian C. Chaboyer](#)
Secondary Advisor: [Elisabeth R. Newton](#)
Doctor of Philosophy — Astronomy
Hanover, NH
May 2022 (expected)
Spring 2024 (expected)

High Point University
Bachelor of Science, summa cum laude — Computational Physics
Advisor: [Brad N. Barlow](#)
High Point, NC
May 2019

PUBLICATIONS

- **Boudreaux, T.M.**, Newton, E.R., Mondrik, N., Charbonneau, D., Irwin, J., 2021. “The Ca II H&K Rotation-Activity Relation in 38 early-to-late type M-Dwarfs”, *The Astrophysical Journal*. *Submitted*
- Guidry, J.A., Vanderbosch, Z.P., Hermes, J.J., Barlow, B.N., Lopez, I.D., **Boudreaux, T.M.**, Corcoran, K.A., Bell, K.J., Montgomery, M.H., Heintz, T.M. and Castanheira, B.G., 2021. I Spy Transits and Pulsations: Empirical Variability in White Dwarfs Using Gaia and the Zwicky Transient Facility. *The Astrophysical Journal*, 912(2), p.125.
- Vos, J., Vučković, M., Chen, X., Han, Z., **Boudreaux, T. M.**, Barlow, B. N., Østensen, R., Németh, P., 2019, “[The orbital period — mass ratio relation of wide sdB+MS binaries and its application to the stability of RLOF.](#)”, *Monthly Notices of The Royal Astronomical Society*, **482**, 4592
- **Boudreaux, T. M.**, 2017, “[The applications of deep neural networks to sdBV classification](#)”, *Open Astronomy*, **26**, 258.
- **Boudreaux, T. M.**, Barlow, B. N., Fleming, S. W., Soto, A. V., Million, C., Reichart, D. E., Haislip, J. B., Linder, T. R., Moore, J. P., 2017. “[A search for rapidly pulsating hot subdwarf stars in the GALEX survey](#)”, *Astrophysical Journal*, **845**, 171.

PROCEEDINGS

- Vos, J., Vučković, M., Chen, X., Han, Z., **Boudreaux, T. M.**, Barlow, B. N., Østensen, R., Németh, P., 2019, “[Using wide hot subdwarf binaries to constrain Roche-lobe overflow models](#)”, *Contrib. Astron. Obs. Skalnaté Pleso*, **49**, 264

COMPUTING SKILLS

- *Programming Languages:*
 1. *Expert:* Python, C/C++
 2. *Comfortable:* Fortran 77/90/95, Arduino, PHP, JavaScript, Mathematica
 3. *Familiar:* LabView, Go, Rust

- *Web Backend Technologies*: Flask, MongoDB, MySQL, MariaDB
- *Misc*: Period04, Docker, GitHub, ZFS, LaTeX, Bash, Zsh

AWARDS & HONORS

- **The National Science Foundation**, 2019
Graduate Record Fellowship Program Honorable Mention
- **High Point University**, 2019
University Award for Highest Achievement
- **High Point University Honors Scholar Program**, 2019
All University Honors
- **The Barry Goldwater Scholarship and Excellence in Education Foundation**, 2018
Goldwater Scholar in Mathematics, Science, and Engineering
- **High Point University Department of Physics**, 2018
Endowed Scholarship
- **National Collegiate Honors Council**, 2018
Portz Scholarship
- **Sigma Xi, The Scientific Research Honors Society**, 2018
Elected Associate Member
- **Sigma Pi Sigma, National Physics Honor Society**, 2018
Elected Member
- **The Barry Goldwater Scholarship and Excellence in Education Foundation**, 2017
Honorable Mention for excellence in Mathematics, Science, and Engineering
- **High Point University**, 2015–2019
Presidential Scholarship
- **High Point University**, 2015–2019
Honors Scholar
- **High Point University**, 2015–2019
Dean’s list

ORAL PRESENTATIONS

- **National Collegiate Honors Council Annual Meeting**, 2018, Boston, MA
“The Applications of Deep Neural Networks to sdBV Classification” [Invited]
- **North Carolina Astronomers Meeting**, 2017, Greensboro, NC
“The Applications of Deep Neural Networks to sdBV Classification”
- **Eighth Annual Meeting on Hot Subdwarfs and Related Objects**, 2017, Kraków, Poland
“The Applications of Deep Neural Networks to sdBV Classification”
- **High Point University Research and Creative Works Symposium**, 2017, High Point, NC
“A Virtual Survey of all known Hot Subdwarfs – searching for p-mode pulsations with GALEX”
- **Meeting of Astronomers in South Carolina**, 2017, Greenville, SC
“The Applications of Deep Neural Networks to Time Domain Astrophysics”
- **North Carolina Astronomers Meeting**, 2016, Greensboro, NC
“A Virtual Survey of all known Hot Subdwarfs – searching for p-mode pulsations with GALEX”

POSTER PRESENTATIONS

- 233rd Meeting of the American Astronomical Society, 2019, Seattle Washington
“[A Journey to Mars: HPUniverse Day and Its Impact on Young Minds and a Community.](#)”
- 233rd Meeting of the American Astronomical Society, 2019, Seattle Washington
“[Effects of the Primordial Binary Fraction on the Evolution of Globular Clusters.](#)”
- High Point University Research and Creative Works Symposium, 2018, High Point, NC
“Listening to the voices of Stars with Deep Neural Networks”
- 231st Meeting of the American Astronomical Society, 2018, Washington D.C.
“[Using Deep Learning to Analyze the Voices of Stars.](#)”
- North Carolina Academy of Sciences Annual Meeting, 2017, High Point, NC
“A Virtual Survey of all known Hot Subdwarfs – searching for p-mode pulsations with GALEX”
- High Point University Research and Creative Works Symposium, 2016, High Point, NC
“New Long Period Hot Subdwarfs from the Hobby-Eberly Telescope”
- 227th Meeting of the American Astronomical Society, 2016, Kissimmee, FL
“[New Long Period Hot Subdwarfs from the Hobby-Eberly Telescope](#)”

TEACHING EXPERIENCE

- Dartmouth College, 2020
Introductory Mechanics Teaching Assistant (*Phys 13*)
- Dartmouth College, 2020
Introductory Solar System Astronomy (*Astr 1*)

JOBS & INTERNSHIPS

- Harvard Smithsonian Astrophysical Observatory, 2018
Harvard SAO REU Student
- Space Telescope Science Institute, 2016
SASP Summer Intern
- High Point University, 2016
Student Instructor Calculus III

SOFTWARE

- All of my software can be found on my [GitHub](#) page.
- [mplEasyAnimate](#) — Simple and easy animation library for use with matplotlib.
 - [astroSynth](#) — Synthetic pulsating star light curve generation suite.
 - [pyBJD](#) — Python bindings for Ohio state UTC to BJD conversion. [Deprecated]
 - [vectorPy](#) — Python 3-vector package.

RESEARCH PROJECTS

- Modifying the Dartmouth Stellar Evolution Program to fully self consistently handel increased He abundance, 2020-
- The Ca II H&K Rotation-Activity Relation in 50 early-to-late type M-dwarfs, 2019-2020.
- Effects of the Primordial Binary Fraction on Globular Cluster Evolution, 2018
- Applications of Deep Learning to Classification of PTF Data, 2018
- Applications of Machine Learning to the Classification of Pulsating Stars, 2017–2018

- A Search for Rapidly Pulsating Hot Subdwarfs in the GALEX Survey, 2016–2017
- Orbital Solution Analysis of Long Period sdB+F/G/K Binaries, 2015–2016