Benjamin R. Roulston, Ph.D.

Postdoctoral Scholar Research Associate in Astronomy
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Division of Physics, Mathematics and Astronomy
California Institute of Technology
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Education

Ph.D., Astronomy — 08/2022
Boston University, Boston, MA
Thesis Title: "Forged by Giants: Understanding the Dwarf Carbon Stars"
Thesis Advisors: Dr. Paul Green & Prof. J.J. Hermes

M.A., Astronomy — 05/2018
Boston University, Boston, MA

B.S. (Honors), Physics — 05/2016
Clarkson University, Potsdam, NY

Current Appointment

Postdoctoral Scholar Research Associate in Astronomy — 09/2022 – present
California Institute of Technology, Sponsor: Prof. Shri Kulkarni

Past Research Appointments

Predoctoral Fellowship — 07/2017 – 08/2022
Smithsonian Astrophysical Observatory, Advisor: Dr. Paul Green

Graduate Research Assistant — 05/2017 – 09/2017
Boston University Center for Space Physics, Advisor: Prof. Wen Li

Undergraduate Researcher — 05/2014 – 06/2016
Clarkson University, Advisor: Prof. Joshua Thomas

Past Teaching Appointments

Teaching Fellow, Boston University

AS203	Principles of Astronomy II, for astronomy majors	Spring 2018
AS202	Principles of Astronomy I, for astronomy majors	Fall 2017
AS101	The Solar System, for non-science majors	Spring 2017
AS202	Principles of Astronomy I, for astronomy majors	Fall 2016

Teaching Assistant, Clarkson University

PH132	Physics II, for physical science majors	Spring 2016
PH131	Physics I, for physical science majors	Fall 2015
PH131	Physics I, for physical science majors	Spring 2015

Awards & Honors

SDSS Travel Grant – *SDSS 2019 Collaboration Meeting, Ensenada, Mexico* — June 2019

Clarkson University Physics Department Outstanding Senior Award — May 2016

Awarded Telescope Proposals

2022, 3.7 nights 6.5m MMT, Optical Spectroscopy [**PI** 2022A]

2021, 208ks, Cycle 23, *Chandra X-ray Telescope*: ACIS-S [Co-I, Program 23200076]
2021, 5.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2021C]
2021, 2.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2021B]
2021, 1.0 nights 6.5m MMT, Optical Spectroscopy [**PI** 2021A]
2021, 1.0 nights 6.5m Magellan Telescopes, Optical Spectroscopy [**PI** 2021A]
2021, 1.0 nights FLWO 1.2m, FAST Spectroscopy [**PI-DDT** 2021A]

2020, 100ks, Cycle 22, *Chandra X-ray Telescope*: ACIS-S [Co-I, Program 22200008]
2020, 2 orbits, Cycle 28, *Hubble Space Telescope*: WFC3, ACS [Co-I, Program 16392]
2020, 3.0 nights FLWO 1.2m, KeplerCam Imaging [**PI** 2020C]
2020, 0.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2020B]
2020, 3.5 nights 6.5m Magellan Telescopes, Optical Spectroscopy [**PI** 2020B]
2020, 5.0 nights FLWO 1.2m, KeplerCam Imaging [**PI** 2020B]
2020, 0.5 nights FLWO 1.2m, KeplerCam Imaging [**PI-DDT** 2020A]
2020, 0.5 nights 6.5m MMT, Optical Spectroscopy [**PI-DDT** 2020A]

2019, 121.5ks, Cycle 21, *Chandra X-ray Telescope*: ACIS-S [Co-I, Program 21200072]
2019, 1.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2019C]
2019, 1.5 nights 6.5m Magellan Telescopes, Optical Spectroscopy [**PI** 2019B]
2019, 1.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2019B]
2019, 0.5 nights 6.5m MMT, Optical Spectroscopy [**PI** 2019A]

First-author Refereed Publications

4. **Roulston, Benjamin R.**; Green, Paul J.; Montez, Rodolfo; Filippazzo, Joseph; Drake, Jeremy J.; Toonen, Silvia; Anderson, Scott F.; Eracleous, Michael; Frank, Adam 2022, ApJ, *New Clues to the Evolution of Dwarf Carbon Stars From Their Variability and X-ray Emission*

3. **Roulston, Benjamin R.**; Green, Paul J.; Toonen, Silvia; Hermes, J.J. 2021, ApJ, *Unexpected Short-Period Variability in Dwarf Carbon Stars from the Zwicky Transient Facility*

2. **Roulston, Benjamin R.**; Green, Paul J.; Kesseli, Aurora Y.; 2020, ApJS, *Classifying Single Stars and Spectroscopic Binaries Using Optical Stellar Templates*

1. **Roulston, Benjamin R.**; Green, Paul J.; Ruan, John J.; MacLeod, Chelsea L.; Anderson, Scott F.; Badenes, Carles; Brownstein, Joel R.; Schneider, Donald P.; Stassun, Keivan G.; 2019, ApJ, *The Time-Domain Spectroscopic Survey: Radial Velocity Variability in Dwarf Carbon Stars*

Other Refereed Publications

3. The Astropy Collaboration; including **Roulston, Benjamin R.** 2022, ApJ, *The Astropy Project: Sustaining and Growing a Community-oriented Open-source Project and the Latest Major Release (v5.0) of the Core Package*

2. Green, Paul J.; Pulgarin-Duque, Lina; Anderson, Scott F.; MacLeod, Chelsea L.; Eracleous, Michael; Ruan, John J.; Runnoe, Jessie; Graham, Matthew; **Roulston, Benjamin R.**; Schneider, Donald P.; Ahlf, Austin; Bizyaev, Dmitry; Brownstein, Joel R.; Joesephine del Casal, Sonia; Dodd, Sierra A.; Hoover, Daniel; Matt, Cayenne; Merloni, Andrea; Pan, Kaike; Ramirez, Arnulfo; Ridder, Margaret 2022, ApJ, *The Time Domain Spectroscopic Survey: Changing-Look Quasar Candidates from Multi-Epoch Spectroscopy in SDSS-IV*

1. Green, Paul J.; Montez, Rodolfo; Mazzoni, Fernando; Filippazzo, Joseph; Anderson, Scott F.; De Marco, Orsola; Drake, Jeremy J.; Farihi, Jay; Frank, Adam; Kastner, Joel H.; Miszalski, Brent; **Roulston, Benjamin R.**; 2019, ApJ, *A Chandra Study: Are Dwarf Carbon Stars Spun Up and Rejuvenated by Mass Transfer?*

Invited Talks and Seminars

2. "The Chemically Peculiar Dwarf Carbon Stars: Insights from Spectroscopy" November 4, 2021
   Keynote, 2021 AAVSO Spectroscopy Workshop, Boston, USA

1. "The Time-Domain Spectroscopic Survey" June 24 — June 28, 2019
   2019 SDSS Collaboration Meeting, Ensenada, Mexico

Contributed Talks

7. "Short Period Dwarf Carbon Stars"
   AAS238 June 7 – Jun 9, 2021

6. "Stellar Variables in The Time-Domain Spectroscopic Survey"
   AAS237 January 11 – January 15, 2021

5. "Variable Stars in the TDSS"
   SDSS 2020 Collaboration Meeting June 22 — June 25, 2020

4. "Detection and Spectral Typing of Binaries from Optical Spectra with PyHammerSB2"
   AAS235, Honolulu, USA January 4 – January 8, 2020

3. "Stellar Variables in the Time-Domain Spectroscopic Survey"
   SDSS 2019 Collaboration Meeting, Ensenada, Mexico June 24 — June 28, 2019

2. "The Time-Domain Spectroscopic Survey: Orbital Separations of Dwarf Carbon Stars"
   AAS233, Seattle, USA January 6 – January 10, 2019

1. "The Time-Domain Spectroscopic Survey: Radial Velocity Variability in Dwarf Carbon Stars"
   Cool Stars 20, Boston, USA July 29 – August 3, 2018

Professional Service

Chandra Peer Review Facilitator 2021, 2022

AAS Congressional Visit Day Participant 2020

LOC Member Cool Stars 20 2018

Outreach

Sonifying the Digital Universe: making the rich universe of time-variable stars, black holes and quasars accessible on the web to the blind and visually impaired (BVI) community, and beyond. May 2020 – Present

Beacon Hill Seminar — 2 hour talk, Variable Stars Fall 2021

Beacon Hill Seminar — 2 hour talk, Stellar Evolution Spring 2021

ADA Job Shadow Lead, Center for Astrophysics | Harvard & Smithsonian Fall 2020, Fall 2021

SAO Latino Initiative Program Mentor Summer 2021

Python Hour with SAO Latino Initiative Program Summer 2019, 2020, 2021

Ask a Scientist (3 talks), Cambridge Public Schools, Grade 7	November 2020
Boston University Astronomical Society, Invited Speaker	December 2019
Boston University Center for Space Physics Science for Kids Day	June 2018
Boston University Observatory Public Nights	Fall 2016 – Present
Science Olympiad Event Supervisor, Clarkson University	Spring 2014, 2015, 2016
Clarkson University Roller Coaster Camp, Counselor	Summer 2014, Summer 2015
Clarkson University Observatory Public Nights	Fall 2014 – Spring 2016

Professional References

Dr. Paul J. Green
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Prof. Scott F. Anderson
Department of Astronomy
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