Vedant Chandra

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Updated September 13, 2020.

Employment

June, 2020 - Present
Research Intern, *Space Telescope Science Institute*.
Modeling stellar birth functions with the Hubble Space Telescope.
Supervised by Dr Mario Gennaro

November, 2018 - Present
Research Assistant, *Department of Physics & Astronomy, Johns Hopkins University*.
Characterizing white dwarf stars with atmospheric models and spectroscopic data.
Supervised by Professor Nadia L. Zakamska

June, 2020 - August, 2020
Summer Fellow, *Institute for Data Intensive Engineering and Science*.
Hunting for the oldest and most metal-poor stars in the Universe.
Supervised by Professor Kevin C. Schlaufman

January, 2019 - May, 2020
Research Assistant, *Department of Biomedical Engineering, Johns Hopkins School of Medicine*.
Analyzing astronaut stress and performance during simulated spaceflight.
Supervised by Professor Mark J. Shelhamer

Education

2017-Present
B.S. in Physics and Applied Mathematics, *Johns Hopkins University*, Baltimore, MD, USA, (Minor in Space Sciences).
Advised by Professors Tobias Marriage, Beryl Castello, and Charles L. Bennett.

Awards and Honors

2020
Sigma Pi Sigma, *JHU Department of Physics*.
Elected to the national Physics honors society for strong academic achievement.

2020
Summer Student Fellowship, *Institute for Data Intensive Engineering & Science*.
Awarded a $6000 grant for ongoing data-intensive research into metal-poor stars.

2019
Provost's Undergraduate Research Award (PURA), *JHU HOUR*.
Awarded a $3000 grant for ongoing research into white dwarf atmospheres.

2019
Dean's Undergraduate Research Award (DURA), *JHU URSCA*.
Awarded a $4500 grant for ongoing research into white dwarf binaries.

2017-2020
Dean's List, *JHU Krieger School of Arts and Sciences*.
GPA above 3.5/4.0 for 6/6 semesters.

Peer-Reviewed Publications

[2] **Chandra, V.**, Hwang, H.C., Zakamska, N.L. & Cheng, S. "*A Gravitational Redshift Measurement of the White Dwarf Mass–Radius Relation*", 2020, *The Astrophysical Journal, 899, 146*

[1] **Chandra, V.**, Hwang, H.C., Zakamska, N.L. & Budavari, T. "*Computational Tools for the Spectroscopic Analysis of White Dwarfs*", 2020, *Monthly Notices of the Royal Astronomical Society, 497, 2688*

Press

August 29, 2020
ScienceNews Magazine, *"Paradoxically, white dwarf stars shrink as they gain mass"*, https://bit.ly/3kxXT4W.

July 30, 2020 **JHU HUB**, *"Johns Hopkins astrophysicists observe long-theorized quantum phenomena"*, https://bit.ly/2PbIJEc.

Software Development

wdtools, *Computational tools to infer the atmospheric parameters of white dwarf stars from spectroscopic observations*, github.com/vedantchandra/wdtools.

starwave, *Fitting the stellar birth function of resolved stellar populations with approximate Bayesian computation (WIP)*, github.com/vedantchandra/starwave.

Grant Allocations as Co-I

April, 2020 **Space Telescope Science Institute**, *JWST Discretionary Fund ($42,740)*.
"The Initial Mass Function of Resolved Stellar Populations in the Local Group"
PI: Mario Gennaro, Co-I: Vedant Chandra

Invited Talks

July, 2020 **Space Telescope Science Institute**, *Summer Symposium*.
"Fitting the Stellar Birth Function of Resolved Stellar Populations with Approximate Bayesian Computation" (10 min.)

August, 2019 **Space Telescope Science Institute**, *Summer Symposium*.
"White Dwarf Spectroscopy with Machine Learning" (15 min.)

July, 2019 **Maryland Space Grant Consortium**, *Annual Symposium*.
"White Dwarf Astronomy with Machine Learning" (15 min.)

Contributed Presentations

January, 2020 **NASA**, *Human Research Program Investigators Workshop*.
"Multivariate Analysis of Human Health and Performance in Spaceflight Simulation"

October, 2019 **Institute for Data Intensive Engineering & Science**, *Annual Symposium*.
"Characterizing White Dwarf Spectra with Neural Networks"

April, 2019 **Johns Hopkins University**, *DREAMS Conference*.
"Hunting for Binary White Dwarf Stars with Spectroscopic Analysis"

Observatory Allocations as PI

2020 **Apache Point Observatory**, *DIS Spectrograph*.
"Time-resolved Radial Velocities of Massive White Dwarfs in Close Binary Systems"
APO 4Q2020JH04

Observatory Allocations as Co-I

2020 **Gemini Observatory**, *GMOS Spectrograph*.
"Discovery of mass-dependent gravitational redshifts in white dwarfs"
PI: Hsiang-Chih Hwang; GN-2020A-FT-103, GS-2020A-FT-101

2020 **Apache Point Observatory**, *DIS Spectrograph*.
"Gravitational redshifts of white dwarfs"
PI: Hsiang-Chih Hwang; APO 1Q2020JH01

Undergraduate Research Mentorship

Summer, 2020 **John Magardino**, *"Magnetic White Dwarfs"*, co-advisor with Nadia Zakamska.

Summer, 2020 **Felix Yu**, *"ML Classification of WD Spectra"*, co-advisor with Nadia Zakamska.
2019-2020 **Rebecca Mosier**, *JHU Human Spaceflight Lab*.
2019-2020 **Jessica Nguyen**, *JHU Human Spaceflight Lab*.

Teaching Experience

Fall, 2018 **TA**, *Great Books at Hopkins*, JHU Literature & Philosophy.
Summer, 2018 **TA**, *General Physics I*, JHU Physics & Astronomy.

Outreach

2018-2019 **Head of Logistics**, *JHU MedHacks Hackathon*.
2018-2019 **Volunteer**, *JHU Physics Department Spring Fair*.
2014-2018 **Contributor**, `space.stackexchange.com`.

Skills

- **Programming Environments:** Python, Jupyter, MATLAB, UNIX, LaTeX, high-performance cluster computing.
- **Research Experience:** White dwarfs, stellar binaries, resolved stellar populations, spaceflight physiology.
- **Techniques:** Stellar spectroscopy, signal processing, non-linear dynamics, (un)supervised machine learning, artificial neural networks, statistical modeling, Bayesian statistics and simulations.
- **Supercomputer Allocations:** Blue Crab cluster at the Maryland Advanced Research Computing Center.

References

- Professor Nadia L. Zakamska, Johns Hopkins University (zakamska@jhu.edu)
- Dr Mario Gennaro, Space Telescope Science Institute (gennaro@stsci.edu)
- Professor Kevin C. Schlaufman, Johns Hopkins University (kschlaufman@jhu.edu)
- Professor Mark J. Shelhamer, Johns Hopkins University (mshelhamer@jhu.edu)