

Vedant Chandra

Curriculum Vitae

+1 443 842 1362
vchandra@jhu.edu
vedantchandra.com
vedant-chandra
vedantchandra
vedantchandra

Updated September 17, 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. 2020, "A Gravitational Redshift Measurement of the White Dwarf Mass–Radius Relation", *The Astrophysical Journal*, 899, 146
- [1] **Chandra, V.**, Hwang, H.C., Zakamska, N.L. & Budavari, T. 2020, "Computational Tools for the Spectroscopic Analysis of White Dwarfs", *Monthly Notices of the Royal Astronomical Society*, 497, 2688

Press

- August 29, 2020 [ScienceNews Magazine](#), "Paradoxically, white dwarf stars shrink as they gain mass".
July 30, 2020 [JHU HUB](#), "Johns Hopkins astrophysicists observe long-theorized quantum phenomena".

Software Development

- [wdtools](#), *Computational tools to infer the atmospheric parameters of white dwarf stars from spectroscopic observations.*
[starwave](#), *Fitting the stellar birth function of resolved stellar populations with approximate Bayesian computation (WIP).*

Grant Allocations

- 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

Talks and Presentations

Invited

- July, 2020 [Space Telescope Science Institute](#), *Summer Symposium.*
"Fitting the Stellar Birth Function of Resolved Stellar Populations with Approximate Bayesian Computation", [19:30 onwards](#).
August, 2019 [Space Telescope Science Institute](#), *Summer Symposium.*
"White Dwarf Spectroscopy with Machine Learning", [21:00 onwards](#).
July, 2019 [Maryland Space Grant Consortium](#), *Annual Symposium.*
"White Dwarf Astronomy with Machine Learning". ([PDF](#))

Contributed

- 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

Principal Investigator

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

Co-Investigator

- 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 Professor Nadia Zakamska.
- Summer, 2020 **Felix Yu**, "*ML classification of WD spectra*", co-advisor with Professor Nadia Zakamska.
- 2019-2020 **Rebecca Mosier**, "*Feature extraction from physiological signals*", JHU Human Spaceflight Lab, co-advisor with Professor Mark Shelhamer.
- 2019-2020 **Jessica Nguyen**, "*Heartrate variability from wearable sensors*", JHU Human Spaceflight Lab, co-advisor with Professor Michael Rosen.

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 **Contributing Writer**, 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)