

# Vedant Chandra

Updated August 26, 2020.

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## Employment

- June, 2020 - **Research Intern**, *Space Telescope Science Institute*.  
Present Modeling stellar birth functions with the Hubble Space Telescope.  
Supervised by Dr Mario Gennaro
- June, 2020 - **Summer Fellow**, *Institute for Data Intensive Engineering and Science*.  
Present Hunting for the oldest and most metal-poor stars in the Universe.  
Supervised by Professor Kevin C. Schlaufman
- January, 2019 - **Research Assistant**, *Department of Biomedical Engineering, Johns Hopkins School of Medicine*.  
Present Analyzing astronaut stress and performance during simulated spaceflight.  
Supervised by Professor Mark J. Shelhamer
- November, 2018 - **Research Assistant**, *Department of Physics & Astronomy, Johns Hopkins University*.  
Present Characterizing white dwarf stars with atmospheric models and spectroscopic data.  
Supervised by Professor Nadia L. Zakamska

## 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 12, 2020 **ScienceNews Feature**, "Paradoxically, white dwarf stars shrink as they gain mass", <https://bit.ly/3kxXT4W>.

- August 12, 2020 **Nerdist Feature**, "*Observations Confirm White Dwarf Stars Shrink As They Gain Mass*", <https://bit.ly/31sZ8u0>.
- July 30, 2020 **JHU HUB**, "*Johns Hopkins astrophysicists observe long-theorized quantum phenomena*", <https://bit.ly/2PbIJEc>.

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## 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

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## 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.)

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## 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"

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## 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; 1Q2020JH01

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## 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*.

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## Teaching Experience

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

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## Outreach

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

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## 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.

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## 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)