# Vedant Chandra

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## Education

**Johns Hopkins University** 2017–present

- B.S. Physics & Applied Mathematics (Minor in Space Sciences)
- Academic Advisors: Tobias Marriage, Beryl Castello, and Charles L. Bennett.

## Research Positions

**Research Intern, Space Telescope Science Institute (STScI)** June, 2020–present

- Studying star formation in nearby galaxies with the Hubble Space Telescope

**Research Assistant, Department of Physics & Astronomy, JHU** November, 2018–present

- Characterizing white dwarf stars with atmospheric models and spectroscopy

**Research Assistant, Human Spaceflight Lab, JHU** January, 2019–present

- Analyzing astronaut stress and performance during simulated spaceflight

## Awards & Honors

**Sigma Pi Sigma, Department of Physics & Astronomy, JHU** 2020

- Nominated to the national Physics honors society for strong academic achievement

**Summer Student Fellowship, JHU IDIES** 2020

- Awarded a $6000 grant for ongoing data-intensive research into metal-poor stars

**Provost's Undergraduate Research Award, JHU** 2019

- Awarded a $3000 grant for ongoing research into white dwarf atmospheres

**Dean's Undergraduate Research Award, JHU** 2019

- Awarded a $4500 grant for ongoing research into white dwarf binaries

**Dean's List, JHU Krieger School of Arts & Sciences** 2017-2020

- GPA above 3.5/4.0 for 6/6 semesters

## Grant Allocations

**STScI JWST Discretionary Fund ($42,740)** 2020

- "The Initial Mass Function of Resolved Stellar Populations in the Local Group"
- PI: Mario Gennaro, Co-I: Vedant Chandra

## Peer-Reviewed Publications

3. **Chandra, V.**, Schlaufman, K.C. 2020, "Searching for Low-mass Population III Stars Disguised as White Dwarfs", *submitted to AAS Journals*

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

**ScienceNews Magazine** August, 2020

- "Paradoxically, white dwarf stars shrink as they gain mass"

**JHU Press Release** July, 2020

- "Johns Hopkins astrophysicists observe long-theorized quantum phenomena"

## Invited Talks

**Summer Symposium, Space Telescope Science Institute** July, 2020

- "Fitting the Stellar Birth Function of Resolved Stellar Populations with Approximate Bayesian Computation", 19:30 onwards.

**Summer Symposium, Space Telescope Science Institute** August, 2019

- "White Dwarf Spectroscopy with Machine Learning", 21:00 onwards.

**Annual Symposium, Maryland Space Grant Consortium** July, 2019

- White Dwarf Astronomy with Machine Learning", PDF.

## Poster Presentations

**237th Meeting of the American Astronomical Society (submitted)** January, 2021

- "Resolved Stellar Populations in the Era of JWST and Roman"

**IDIES Annual Symposium (upcoming)** October, 2020

- "Hunting for Metal-Poor Main-Sequence Stars in SDSS"

**NASA HRP Investigators Workshop** January, 2020

- "Multivariate Analysis of Human Health and Performance in Spaceflight Simulation"

**IDIES Annual Symposium** October, 2019

- "Characterizing White Dwarf Spectra with Neural Networks"

**JHU DREAMS Conference** April, 2019

- "Hunting for Binary White Dwarf Stars with Spectroscopic Analysis"

## Observatory Allocations

**Apache Point Observatory, DIS Spectrograph** 2020

- "Time-resolved Radial Velocities of Massive White Dwarfs in Close Binary Systems"
- PI: Vedant Chandra; APO 4Q2020JH04

**Gemini Observatory, GMOS Spectrograph** 2020

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

**Apache Point Observatory, DIS Spectrograph** 2020

- "Gravitational redshifts of white dwarfs"
- PI: Hsiang-Chih Hwang; APO 1Q2020JH01

## Undergraduate Research Mentorship

**John Magardino (JHU P&A)** Summer, 2020

- "Magnetic white dwarfs", co-advisor with Professor Nadia Zakamska

**Felix Yu (JHU P&A)** Summer, 2020

- "ML classification of WD spectra", co-advisor with Professor Nadia Zakamska

**Rebecca Mosier (JHU Human Spaceflight Lab)** 2019-2020

- "Feature extraction from physiological signals", co-advisor with Professor Mark Shelhamer

**Jessica Nguyen (JHU Human Spaceflight Lab)** 2019-2020

- "Heartrate variability from wearable sensors", co-advisor with Professor Michael Rosen

## Teaching

**TA, 360.133 Great Books at Hopkins, JHU** Fall, 2018

**TA, 171.101 General Physics I, JHU** Summer, 2018

## Outreach

**Guest Writer, astrobites** September, 2020

**Head of Logistics, JHU MedHacks Hackathon** 2018-2019

**Volunteer, JHU P&A Spring Fair** 2018-2019

**Contributing Writer, space.stackexchange.com** 2014-2018

## Skills & Experience

- **Programming Environments:** Python, UNIX, IRAF/PyRAF, cluster computing
- **Research Experience:** White dwarfs, stellar binaries, resolved stellar populations, metal-poor stars, spaceflight physiology
- **Techniques:** Stellar spectroscopy, signal processing, non-linear dynamics, (un)supervised machine learning, artificial neural networks, Bayesian simulations and inference
- **Supercomputer Experience:** 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)

Updated October 15, 2020.