Vedant Chandra

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Education

Johns Hopkins University 2017–present

- B.S. Physics & Applied Mathematics (Minor in Space Sciences)
- Cumulative GPA: 3.8/4.0

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*

Co-Authored Publications

2. Petrosky, E., Hwang, H.C., Zakamska, N.L., **Chandra, V.**, Hill, M. 2021, "Variables, periodic variables and contact binaries in WISE", *submitted to MNRAS*

1. Tang, S., **Chandra, V.**, Kashyap, A., Kilburn, W., Spencer, C., Mosier, R., Yaovatsakul, K., Nguyen, J., Sarma, M.S., Roberts, D., Shelhamer, M.J. 2021, "Multivariate Analysis of Human Physiology and Performance in a Spaceflight Analog Environment", *in preparation.*

Selected Press Coverage

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".

Poster Presentations

237th Meeting of the American Astronomical Society January, 2021

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

IDIES and MINDS Annual Symposium October, 2020

- "Hunting for Metal-Poor Main-Sequence Stars in SDSS", awarded Best Poster.

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

As Principal Investigator:

Apache Point Observatory, Double-Imaging Spectrograph, 3 half-nights 2021

- "A Survey of Runaway Donors to Type Ia Supernovae"

Apache Point Observatory, Double-Imaging Spectrograph, 2 half-nights 2020

- "Time-resolved Radial Velocities of Massive White Dwarfs in Close Binary Systems"

As Co-Investigator:

Gemini Observatory, GMOS, 8 hours 2020

- "Discovery of mass-dependent gravitational redshifts in white dwarfs", PI: Hwang.

Apache Point Observatory, Double-Imaging Spectrograph, 2 half-nights 2020

- "Gravitational redshifts of white dwarfs", PI: Hwang.

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 Physics 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)

Dr Yuan-Sen Ting, Institute for Advanced Study (ting@ias.edu)

Professor Mark J. Shelhamer, Johns Hopkins University (mshelhamer@jhu.edu)