VEDANT CHANDRA

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Professional Appointments

Graduate Student, Center for Astrophysics | Harvard & Smithsonian 2021–Present
Visiting Researcher, Max Planck Institute for Astronomy Summer, 2022
Research Intern, Space Telescope Science Institute 2020–2021
Research Assistant, Johns Hopkins University 2018–2021

Education

Harvard University 2021–Present
- A.M., Ph.D. Astronomy & Astrophysics (intended)

Johns Hopkins University 2017–2021
- B.S. Physics & Applied Mathematics, minor in Space Sciences

Awards & Honors

James Mills Peirce Fellowship, Harvard University 2021
Chambliss Medal, American Astronomical Society 2021
$\Sigma \Pi \Sigma$ 2020
Summer Student Fellowship, JHU IDIES 2020
Provost's Undergraduate Research Award, JHU 2019
Dean's Undergraduate Research Award, JHU 2019
Dean's List 7/7 Semesters, JHU 2017-2021

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

Various Undergraduate Research Grants ($13,500) 2019-2020
- PI: Vedant Chandra, Co-Is: Nadia Zakamska, Hsiang-Chih Hwang, Kevin C. Schlaufman

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

Milky Way Meeting, MPIA Heidelberg April, 2021
- "To 100 kpc and Beyond: The Outer Halo with RGB Stars".

Online Meetings on Evolved Stars and Systems December, 2021
- "Detection of Circumstellar Material and Rotation in a Runaway SNIa Donor", video.

Institute for Advanced Study, Astrophysics Coffee October, 2021
- "Circumstellar Material and Surface Rotation in a Runaway SNIa Donor"

Space Telescope Science Institute, Summer Symposium July, 2020
- "Fitting the Stellar Birth Function of Resolved Stellar Populations with Approximate Bayesian Computation", 19:30 onwards.

Space Telescope Science Institute, Summer Symposium August, 2019
- "White Dwarf Spectroscopy with Machine Learning", 21:00 onwards.

Maryland Space Grant Consortium, Annual Symposium 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", iPoster

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:

Anglo-Australian Telescope, 2dF+AAOmega, 3 nights 2022
- "New Structures in the Outskirts of the Milky Way", co-PI with Yuan-Sen Ting.

Magellan Observatory, MagE, 2 nights 2022
- "Surveying the Uncharted Outer Halo with MagE".

MMT Observatory, Hectochelle, 1 night 2022
- "A New Dwarf Galaxy Candidate in the Outskirts of the Milky Way".

Gemini Observatory, GMOS, 3 hours 2022
- "A Long-period Cataclysmic Variable in NGC 2234".

Gemini Observatory, GMOS, 6 hours 2022
- "A New Double-lined White Dwarf Binary from SDSS-V".

Gemini Observatory, GMOS, 3 hours 2022
- "A Long-Period AM CVn Binary with an Unusual Composition".

Magellan Observatory, MagE, 1 night 2022
- "The Uncharted Halo Beyond a Hundred Kiloparsecs".

Korea Microlensing Telescope, SSO, 28 nights 2021
- "Investigating the Evolution of Proto White Dwarfs", co-PI with Yuan-Sen Ting.

Gemini Observatory, GMOS, 3 hours 2021
- "A Short-period Double White Dwarf Binary from SDSS-V".

Gemini Observatory, GMOS, 2 hours 2021
- "Monitoring a Dynamic Gaseous Debris Disk around a White Dwarf".

Gemini Observatory, GMOS, 5 hours 2021
- "Double White Dwarf Binaries from SDSS-V".

Apache Point Observatory, ARCTIC, 12 hours) 2021
- "Monitoring Circumstellar Debris around a Runaway SN Ia Donor".

Apache Point Observatory, DIS, 2 nights 2021
- "Peculiar Hypervelocity Stars from Gaia EDR3".

Apache Point Observatory, DIS, 2 nights 2020
- "Time-resolved RVs of Massive WDs in Close Binary Systems".

As Co-Investigator/Observer:

Apache Point Observatory, DIS, 1.5 nights 2022
- "Astrophysics of Stellar Binaries", PI: Nadia Zakamska.

Magellan Observatory, MagE, 4.5 nights 2022
- "The progenitors of extremely low-mass white dwarfs", PI: Kareem El-Badry.

Apache Point Observatory, DIS, 1.5 nights 2021
- "Following up Double White Dwarf Binaries found in SDSS-V", PI: Nadia Zakamska.

Neils Gehrels Swift Observatory, UVOT, 1 hour 2021
- "ToO: A 99-minute WD+WD Binary", PI: Gagik Tovmassian.

Gemini Observatory, 8 hours 2020
- "Discovery of mass-dependent gravitational redshifts in white dwarfs", PI: Hsiang-Chih Hwang.

Research Mentorship

Stefan Arseneau (JHU UG, gravitational redshift of WDs) Summer, 2022
Antonella Macoretta (JHU UG, gravitational redshift of WDs) Summer, 2022
John Magardino (JHU UG, rotation in magnetic WDs) Summer, 2020
Felix Yu (JHU UG, automated classification of WDs) Summer, 2020
Rebecca Mosier (JHU UG, modelling physiological signals in spaceflight) 2019-2020
Jessica Nguyen (JHU UG, modelling physiological signals in spaceflight) 2019-2020

Teaching

Teaching Assistant, 360.133 Great Books at Hopkins, JHU Fall, 2018

Teaching Assistant, 171.101 General Physics I, JHU Summer, 2018

Professional Service

Representative, Harvard Astronomy Student-Faculty Council 2021-Present

Member, Sloan Digital Sky Survey V 2020-Present

Outreach

Head of Logistics, JHU MedHacks Hackathon 2018-2019

Volunteer, JHU Physics Spring Fair 2018-2019

Contributing Writer, space.stackexchange.com 2014-2018

References

Professor Charlie Conroy, Harvard University (cconroy@cfa.harvard.edu)

Professor Nadia L. Zakamska, Johns Hopkins University (zakamska@jhu.edu)

13 refereed publications, 6 first-author. *h*-index: 4.

First-Author Publications

6. **Vedant Chandra**, Charlie Conroy, Nelson Caldwell, Ana Bonaca, Rohan P. Naidu, Dennis Zaritsky, Phillip A. Cargile, Jiwon Jesse Han, Benjamin D. Johnson, Joshua S. Speagle, Yuan-Sen Ting & Turner Woody (2022)
"A Ghost in Boötes: The Least Luminous Disrupted Dwarf Galaxy"
The Astrophysical Journal, submitted

5. **Vedant Chandra**, Hsiang-Chih Hwang, Nadia L. Zakamska, Simon Blouin, Andrew Swan, Thomas R. Marsh, Ken J. Shen, Boris T. Gänsicke, J.J. Hermes, Odelia Putterman, Evan B. Bauer, Evan Petrosky, Vikram S. Dhillon, Stuart P. Littlefair & Richard P. Ashley (2022)
"The SN Ia Runaway LP 398-9: Detection of Circumstellar Material and Surface Rotation"
Monthly Notices of the Royal Astronomical Society, 512, 6122

4. **Vedant Chandra**, Hsiang-Chih Hwang, Nadia L. Zakamska, Boris T. Gänsicke, J.J. Hermes, Axel Schwope, Carles Badenes, Gagik Tovmassian, Evan B. Bauer, Dan Maoz, Matthias R. Schreiber, Odette F. Toloza, Keith P. Inight, Hans-Walter Rix & Warren R. Brown (2021)
"A 99-minute Double-lined White Dwarf Binary from SDSS-V"
The Astrophysical Journal, 921, 160

3. **Vedant Chandra** & Kevin C. Schlaufman (2021)
"Searching for Low-mass Population III Stars Disguised as White Dwarfs"
The Astronomical Journal, 161, 197

2. **Vedant Chandra**, Hsiang-Chih Hwang, Nadia L. Zakamska & Sihao Cheng (2020)
"A Gravitational Redshift Measurement of the White Dwarf Mass–Radius Relation"
The Astrophysical Journal, 899, 146

1. **Vedant Chandra**, Hsiang-Chih Hwang, Nadia L. Zakamska & Tamás Budavári (2020)
"Computational Tools for the Spectroscopic Analysis of White Dwarfs"
Monthly Notices of the Royal Astronomical Society, 497, 2688

Co-Authored Publications

7. Rohan P. Naidu, Charlie Conroy, Ana Bonaca, Dennis Zaritsky, Yuan-Sen Ting, Nelson Caldwell, Phillip A. Cargile, Joshua S. Speagle, **Vedant Chandra**, Benjamin D. Johnson, Turner Woody, and Jiwon Jesse Han (2022)
"Live Fast, Die α-Enhanced: The Mass-Metallicity-α Relation of the Milky Way's Disrupted Dwarf Galaxies"
The Astrophysical Journal, submitted

6. Charlie Conroy, David H. Weinberg, Rohan P. Naidu, Tobias Buck, James W. Johnson, Phillip Cargile, Ana Bonaca, Nelson Caldwell, **Vedant Chandra**, Jiwon Jesse Han, Benjamin D. Johnson, Joshua S. Speagle, Yuan-Sen Ting, Turner Woody, and Dennis Zaritsky (2022)
"Birth of the Galactic Disk Revealed by the H3 Survey"
The Astrophysical Journal, submitted

5. Rohan P. Naidu, Alexander P. Ji, Charlie Conroy, Ana Bonaca, Yuan-Sen Ting, Dennis Zaritsky, Lieke A. C. van Son, Floor S. Broekgaarden, Sandro Tacchella, **Vedant Chandra**, Nelson Caldwell, Phillip Cargile & Joshua S. Speagle (2022)
"Evidence from Disrupted Halo Dwarfs that r-process Enrichment via Neutron Star Mergers is Delayed by $\gtrsim$ 500 Myrs"
The Astrophysical Journal Letters, 926, L36

4. Jiwon Jesse Han, Rohan P. Naidu, Charlie Conroy, Ana Bonaca, Dennis Zaritsky, Nelson Caldwell, Phillip Cargile, Benjamin D. Johnson, **Vedant Chandra**, Joshua S. Speagle, Yuan-Sen Ting & Turner Woody (2022)
"A Tilt in the Dark Matter Halo of the Galaxy"
The Astrophysical Journal, submitted

3. Evan B. Bauer, **Vedant Chandra**, Ken J. Shen & J.J. Hermes (2022)
"Masses of White Dwarf Binary Companions to Type Ia Supernovae Measured from Runaway Velocities"
The Astrophysical Journal Letters, 923, L24

2. Hsiang-Chih Hwang, Yuan-Sen Ting, Charlie Conroy, Nadia L. Zakamska, Kareem El-Badry, Phillip Cargile, Dennis Zaritsky, **Vedant Chandra**, Jiwon Jesse Han, Joshua S. Speagle & Ana Bonaca (2022)
"Wide binaries from the H3 survey: the thick disk and halo have similar wide binary fractions"
Monthly Notices of the Royal Astronomical Society, submitted

1. Evan Petrosky, Hsiang-Chih Hwang, Nadia L. Zakamska, **Vedant Chandra** & Matthew Hill (2021)
"Variability, periodicity and contact binaries in WISE"
Monthly Notices of the Royal Astronomical Society, 503, 3975

Other Published Works

astrobites September, 2020

- "Measuring the White Dwarf Mass-Radius Relation using Thousands of Stars"