

# VEDANT CHANDRA

[vedant.chandra@cfa.harvard.edu](mailto:vedant.chandra@cfa.harvard.edu) | [vedantchandra.com](http://vedantchandra.com)

ORCID: [0000-0002-0572-8012](https://orcid.org/0000-0002-0572-8012) | Publications: [ADS Library](https://ui.adsabs.harvard.edu/authors/0000-0002-0572-8012)

## Research Interests

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- **The Milky Way:** dark matter, galactic archaeology, spectroscopic surveys, galaxy formation, stellar streams, dwarf galaxies, hydrodynamical simulations, chemical evolution, near-field cosmology;
- **Optical Instrumentation:** multi-object spectroscopy, robotic fiber positioning, metrology, software;
- **Stellar Evolution:** white dwarfs, binary stars, supernovae;

## Education

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Harvard University	2026
• A.M., Ph.D. Astronomy & Astrophysics	
Johns Hopkins University	2021
• B.S. Physics & Applied Mathematics, minor in Space Sciences	

## Professional Appointments

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

## Awards & Honors

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Price Prize in Cosmology and Astrophysics, CCAPP	2025
James Mills Peirce Fellowship, Harvard University	2021
Chambliss Astronomy Achievement Award, American Astronomical Society	2021
Provost's Undergraduate Research Award, JHU	2019
Dean's Undergraduate Research Award, JHU	2019

## Publication Summary

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53 refereed publications, 11 as lead author, 12 as second/supervising author;  $h$ -index = 23 ([ADS Library](https://ui.adsabs.harvard.edu/authors/0000-0002-0572-8012))

## Grant Allocations as PI

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STScI JWST Discretionary Fund (\$42,740)	2020
• “The Initial Mass Function of Resolved Stellar Populations in the Local Group”	
• PIs: Mario Gennaro, Vedant Chandra	
Various Undergraduate Research Grants (\$13,500)	2019-2020
• PI: Vedant Chandra, Co-Is: Nadia Zakamska, Hsiang-Chih Hwang, Kevin C. Schlaufman	

## Research Mentorship

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Catherine Miller (Harvard PhD, the Via robotic fiber positioner)	2025-Present
Camille Chiu (Yale UG, dynamical models of the Milky Way, 1 paper in prep.)	2025-Present
Abigail White (Harvard PhD, fiber optics for Via)	2024-Present

<a href="#">Riley Thai</a> (Monash UG, EMP stars from <i>Gaia</i> XP, 1 paper in prep.)	2024-Present
<a href="#">Gautham A. Pallathadka</a> (JHU PhD, WD-WD binaries in SDSS-V, 3 papers)	2022-2025
<a href="#">Stefan Arseneau</a> (JHU UG → BU PhD, the WD mass-radius relation, 1 paper)	2022-2025
<a href="#">Nicole Crumpler</a> (JHU PhD, WDs in SDSS-V, 2 papers)	2022-2024

## Talks

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### Invited Talks and Seminars († indicates invited plenary/review)

KICP Seminar, University of Chicago	October, 2025
Lunch Talk, UC Berkeley	October, 2025
KIPAC Tea Talk, Stanford University	October, 2025
Tea Talk, California Institute of Technology	September, 2025
Lunch Talk, Carnegie Observatories	September, 2025
Afternoon Science Talk, MIT Kavli Institute	September, 2025
CCAPP Price Prize Seminar, The Ohio State University	September, 2025
†XMC II: Clouds Over Yellowstone, Bozeman ( <a href="#">video</a> )	May, 2025
Tea Talk, California Institute of Technology	November, 2024
Decade of Illustris Meeting, Castello di Gargonzola	October, 2024
Wine & Cheese Seminar, Johns Hopkins University	September, 2024
Astrophysics Coffee, The Institute for Advanced Study	September, 2024
Galaxy Coffee, Max Planck Institute for Astronomy	June, 2024
Galaxy Coffee, Max Planck Institute for Astronomy	July, 2023
Online Meetings on Evolved Stars and Systems ( <a href="#">video</a> )	December, 2021
Astrophysics Coffee, Institute for Advanced Study	October, 2021

### Contributed Talks

SDSS-V Collaboration Meeting, Max Planck Institute for Astronomy	June, 2025
Magellan Science Meeting, Carnegie EPL	May, 2025
The Milky Way Assembly Tale, INAF Bologna	May, 2024
Milky Clouds Above Manhattan, Flatiron CCA	February, 2024
ITC Luncheon, CfA   Harvard & Smithsonian ( <a href="#">video</a> )	February, 2024
Supernova Explosions (SNEx) Meeting	November, 2023
Central Halo Workshop, University of Cambridge	September, 2023
ITC Luncheon, CfA   Harvard & Smithsonian ( <a href="#">video</a> )	September, 2023
SDSS-V Collaboration Meeting, Flatiron CCA	August, 2023
Gaia XPloration Workshop, University of Cambridge	May, 2023
Wide Field Spectroscopy vs Galaxy Formation Theory	March, 2023
Disk Formation Workshop, UC Irvine	September, 2022
ITC Luncheon, CfA   Harvard & Smithsonian ( <a href="#">video</a> )	September, 2022
Space Telescope Science Institute, Summer Symposium	July, 2020
Space Telescope Science Institute, Summer Symposium	August, 2019
Maryland Space Grant Consortium, Annual Symposium	July, 2019

## Observatory Allocations

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### Principal Investigator:

MPG/ESO 2.2m, FEROS, 250 hours	2023-2024
ESO Very Large Telescope, FLAMES/GIRAFFE, 75 hours	2023
Magellan Observatory, MagE, 19 nights	2022-2023
MMT Observatory, Hectochelle, 4 nights	2022-2023
Anglo-Australian Telescope, 2dF+AAOmega, 3 nights	2022
Gemini Observatory, GMOS, 30 hours	2021-2022
Apache Point Observatory, DIS & ARCTIC, 6 nights	2020-2021
Neils Gehrels Swift Observatory, UVOT, 1 hour	2021

### Co-Investigator:

WIYN 3.5m, NEID, 3 nights	2025
ESO Very Large Telescope, X-Shooter, 8 hours	2023
CTIO Blanco, DECam, 54 nights	2023
James Webb Space Telescope, NIRCAM, 48 hours	2023
Gemini Observatory, GMOS, 7 hours	2023
Magellan Observatory, MagE, 7 nights	2022-2023
Apache Point Observatory, DIS, 3 nights	2022

## Teaching

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Teaching Fellow, ASTRON 202a: Galaxies and Cosmology, Harvard	Spring, 2024
Teaching Fellow, ASTRON 120: Stellar Physics, Harvard	Spring, 2023
Teaching Assistant, 360.133: Great Books at Hopkins, JHU	Fall, 2018
Teaching Assistant, 171.101: General Physics I, JHU	Summer, 2018

## Professional Service

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Deputy Project Scientist, <a href="#">Via Project</a>	2022-Present
Journal Referee (8×: Nature, ApJL, ApJS, MNRAS, A&A, PASP)	2022-Present
Faculty Search Committee, Harvard Astronomy	2023-2024
Lead Organizer, Harvard Astronomy Student-Faculty Forum	2023-2024
Representative, Harvard Astronomy Student-Faculty Council	2021-2023

## Outreach

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Representative, Astronomy Graduate Student Congress	2023-Present
Guest Speaker	2023-Present
• Gloucester Area Astronomy Club, 50 attendees ( <a href="#">video</a> )	
• The Shri Ram School, 200 high-school students	
Executive Committee, CfA Social & Recreational Club	2021-2023

## Selected Press Coverage

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Discovery of the Magellanic Stellar Stream ([Chandra et al 2023](#))

- [CfA Press Release](#), “Distant Stars Spotted for the First Time in the Vast Magellanic Stream”
- [Sky & Telescope Magazine](#), “Astronomers find stars cast away from Galactic neighbors”
- [New Scientist](#), “Stars found hidden in huge cloud wrapped around the Milky Way”

Discovery of the ‘Poor Old Heart’ of the Milky Way ([Rix, Chandra et al 2022](#))

- [MPIA Press Release](#), “Astronomers identify the ancient heart of the Milky Way galaxy”
- [Quanta Magazine](#), “Astronomers Dig Up the Stars That Birthed the Milky Way”
- [ScienceNews Magazine](#), “A protogalaxy in the Milky Way may be our galaxy’s original nucleus”

Discovery of ‘Specter’, the faintest known disrupted dwarf galaxy ([Chandra et al 2022](#))

- [astrobites](#), “The Haunting of Boötes’ Backyard”

Novel measurements of the white dwarf mass-radius relation ([Chandra et al 2021](#))

- [JHU Press Release](#), “Johns Hopkins astrophysicists observe long-theorized quantum phenomena”
- [ScienceNews Magazine](#), “Paradoxically, white dwarf stars shrink as they gain mass”

## References

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Charlie Conroy, Harvard University	PhD Advisor, <a href="mailto:cconroy@cfa.harvard.edu">cconroy@cfa.harvard.edu</a>
Hans-Walter Rix, Max Planck Institute for Astronomy	Advisor, <a href="mailto:rix@mpia.de">rix@mpia.de</a>
Daniel Fabricant, Smithsonian Astrophysical Observatory	Advisor, <a href="mailto:dfabricant@cfa.harvard.edu">dfabricant@cfa.harvard.edu</a>
Nadia L. Zakamska, Johns Hopkins University	Advisor, <a href="mailto:zakamska@jhu.edu">zakamska@jhu.edu</a>
Daniel J. Eisenstein, Harvard University	TAC Chair, <a href="mailto:deisenstein@cfa.harvard.edu">deisenstein@cfa.harvard.edu</a>
Lars Hernquist, Harvard University	Teaching Reference, <a href="mailto:lhernquist@cfa.harvard.edu">lhernquist@cfa.harvard.edu</a>

## Publications ([ADS Library](#))

Project advisees are highlighted with an asterisk\*.

### Lead-Author Publications

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11. **Vedant Chandra**, Phillip A. Cargile, Alexander P. Ji, et al (2025)  
“Mapping the Distant and Metal-Poor Milky Way with SDSS-V”  
*The Astrophysical Journal, submitted*
10. **Vedant Chandra**, Rohan P. Naidu, Charlie Conroy, et al (2025)  
“All-Sky Kinematics of the Distant Halo: The Reflex Response to the LMC”  
*The Astrophysical Journal, 988, 156*
9. **Vedant Chandra**, Vadim A. Semenov, Hans-Walter Rix, et al (2024)  
“The Three-Phase Evolution of the Milky Way”  
*The Astrophysical Journal, 972, 112*
8. **Vedant Chandra**, Rohan P. Naidu, Charlie Conroy, et al (2023)  
“Discovery of the Magellanic Stellar Stream Out to 100 Kiloparsecs”  
*The Astrophysical Journal, 956, 110*
7. **Vedant Chandra**, Rohan Naidu, Charlie Conroy, et al (2023)  
“Distant Echoes of the Milky Way’s Last Major Merger”  
*The Astrophysical Journal, 951, 26*
6. **Vedant Chandra**, Charlie Conroy, Nelson Caldwell, et al (2022)  
“A Ghost in Boötes: The Least Luminous Disrupted Dwarf Galaxy”  
*The Astrophysical Journal, 940, 127*
5. **Vedant Chandra**, Hsiang-Chih Hwang, Nadia L. Zakamska, et al (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, et al (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*

### Publications as Co-Lead or Supervising Author

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12. Alexander P. Ji, **Vedant Chandra**, Selenna Mejias-Torres et al. (2025)  
“A nearly pristine star from the Large Magellanic Cloud”  
*Nature Astronomy, submitted*
11. Gautham A. Pallathadka\*, **Vedant Chandra**, Nadia Zakamska et al. (2025)  
“Double White Dwarf Binaries in SDSS-V DR19 : A catalog of DA white dwarf binaries and constraints on the binary population”  
*The Astrophysical Journal, submitted*

10. Gautham A. Pallathadka\*, **Vedant Chandra**, Nadia Zakamska et al. (2025)  
“Double White Dwarf Binaries in SDSS-V DR19 : The discovery of a rare DA+DQ white dwarf binary with 31 hour orbital period”  
*The Astrophysical Journal, submitted*
9. Nicole Crumpler\*, **Vedant Chandra**, Nadia Zakamska et al. (2025)  
“A Large Catalog of DA White Dwarf Characteristics using SDSS and Gaia Observations”  
*The Astrophysical Journal, 989, 24*
8. Christian Aganze, **Vedant Chandra**, Risa Wechsler, et al. (2025)  
“The Cocytes Stream: A Disrupted Globular Cluster from our Last Major Merger?”  
*The Astrophysical Journal, submitted*
7. Dennis Zaritsky, **Vedant Chandra**, Charlie Conroy, et al. (2024)  
“Untangling Magellanic Streams”  
*The Open Journal of Astrophysics, 8 (February)*
6. Nicole Crumpler\*, **Vedant Chandra**, Nadia Zakamska, et al (2024)  
“Detection of the Temperature-dependence of the White Dwarf Mass-Radius Relation with Gravitational Redshifts ”  
*The Astrophysical Journal, 977, 237*
5. Hans-Walter Rix, **Vedant Chandra**, Gail Zasowski, et al (2024)  
“The Extremely Metal Rich Knot of Stars at the Heart of the Galaxy ”  
*The Astrophysical Journal, 975, 293*
4. Stefan Arseneau\*, **Vedant Chandra**, Hsiang-Chih Hwang, et al (2024)  
“Measuring The Mass-Radius Relation of White Dwarfs Using Wide Binaries ”  
*The Astrophysical Journal, 963, 17*
3. Gautham A. Pallathadka\*, **Vedant Chandra**, Nadia L. Zakamska, et al (2024)  
“Discovery of a proto-white dwarf with a massive unseen companion”  
*The Astrophysical Journal, 968, 42*
2. Hans-Walter Rix, **Vedant Chandra**, René Andrae, et al (2022)  
“The Poor Old Heart of the Milky Way”  
*The Astrophysical Journal, 941, 45*
1. 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*

## Co-Authored Publications

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30. Richard A.N. Brooks, Jason Sanders, **Vedant Chandra** et al (2025)  
“The Milky Way – Large Magellanic Cloud Interaction with Simulation Based Inference”  
*Monthly Notices of the Royal Astronomical Society, submitted*
29. Cheyanne Shariat, Kareem El-Badry, Mario Gennaro et al (2025)  
“Wide binaries in an ultra-faint dwarf galaxy: discovery, population modeling, and a nail in the coffin of primordial black hole dark matter”  
*Publications of the Astronomical Society of the Pacific, submitted*
28. Pranav Nagarajan, Kareem El-Badry, Henrique Reggiani et al (2025)  
“A Spectroscopic Search for Dormant Black Holes in Low-Metallicity Binaries”  
*Publications of the Astronomical Society of the Pacific, submitted*
27. Juna Kollmeier, Hans-Walter Rix, Conny Aerts, et al (2025)  
“Sloan Digital Sky Survey-V: Pioneering Panoptic Spectroscopy”  
*The Astronomical Journal, submitted*

26. The SDSS-V Collaboration (2025)  
 "The Nineteenth Data Release of the Sloan Digital Sky Survey"  
*The Astronomical Journal, submitted*
25. Stefan Arseneau, JJ Hermes, Nadia Zakamska, et al. (2025)  
 "Resolution-Corrected White Dwarf Gravitational Redshifts Validate SDSS-V Wavelength Calibration and Enable Accurate Mass-Radius Tests"  
*The Astrophysical Journal, submitted*
24. Angus Beane, James Johnson, Vadim Semenov, et al. (2025)  
 "Rising from the Ashes II: The Bar-driven Abundance Bimodality of the Milky Way"  
*The Astrophysical Journal, 985, 221*
23. Amanda Byström, Sergey E. Koposov, Sophia Lilleengen, et al. (2025)  
 "Exploring the interaction between the MW and LMC with a large sample of blue horizontal branch stars from the DESI survey"  
*Monthly Notices of the Royal Astronomical Society, in press*
22. Rohan P. Naidu, Jorryt Matthee, Ivan Kramarenko, et al. (2025)  
 "All the Little Things in Abell 2744:  $>1000$  Gravitationally Lensed Dwarf Galaxies at  $z = 0 - 9$  from JWST NIRCam Grism Spectroscopy"  
*The Open Journal of Astrophysics, submitted*
21. Neige Frankel, Rene Andrae, Hans-Walter Rix, et al (2025)  
 "What Does the Large Magellanic Cloud Look Like? It Depends on [M/H] and Age"  
*The Astrophysical Journal, 979, 136*
20. Rebecca Woody, Charlie Conroy, Phillip Cargile, et al (2024)  
 "The Rapid Formation of the Metal Poor Milky Way "  
*The Astrophysical Journal, 978, 152*
19. Gagik Tovmassian, Keith Inight, Anna Francesca Pala, et al (2024)  
 "V498 Hya, a new candidate for a period bouncer Cataclysmic Variable"  
*Monthly Notices of the Royal Astronomical Society, 537, 3234*
18. Jiwon Jesse Han, Charlie Conroy, Dennis Zaritsky, et al (2024)  
 "Our Halo of Ice and Fire: Strong Kinematic Asymmetries in the Galactic Halo"  
*The Astrophysical Journal, submitted*
17. Logan Sizemore, Diego Llanes, Marina Kounkel, et al (2023)  
 "A self-consistent data-driven model for determining stellar parameters from optical and near-IR spectra"  
*The Astronomical Journal, 167, 173*
16. Vadim A. Semenov, Charlie Conroy, **Vedant Chandra**, et al (2023)  
 "Formation of Galactic Disks II: the Physical Drivers of Disk Spin-up"  
*The Astrophysical Journal, 972, 73*
15. Vadim A. Semenov, Charlie Conroy, **Vedant Chandra**, et al (2023)  
 "Formation of Galactic Disks I: Why did the Milky Way's Disk Form Unusually Early?"  
*The Astrophysical Journal, 962, 18*
14. Alexander P. Ji, Sanjana Curtis, Nicholas Storm, et al (2023)  
 "Spectacular nucleosynthesis from early massive stars"  
*The Astrophysical Journal Letters, 961, 25*
13. Jiadong Li, Kaze W.K. Wong, David W. Hogg, et al (2023)  
 "AspGap: Augmented Stellar Parameters and Abundances for 23 million RGB stars from Gaia XP low-resolution spectra"  
*The Astrophysical Journal Supplement, 272, 2*
12. Kareem El-Badry, Ken J. Shen, **Vedant Chandra**, et al (2023)  
 "The fastest stars in the Galaxy"  
*The Open Journal of Astrophysics, 6 (July)*

11. Guilherme Limberg, Alexander P. Ji, Rohan P. Naidu, et al (2023)  
 "Extending the Chemical Reach of the H3 Survey: Detailed Abundances of the Dwarf-galaxy Stellar Stream Wukong/LMS-1"  
*Monthly Notices of the Royal Astronomical Society*, 530, 2512
10. René Andrae, Hans-Walter Rix and **Vedant Chandra** (2023)  
 "Robust Data-driven Metallicities for 175 Million Stars from Gaia XP Spectra"  
*The Astrophysical Journal Supplement*, 267, 8
9. Keith Inight, Boris T. Gänsicke, Axel Schwöpe, et al (2023)  
 "Cataclysmic Variables from Sloan Digital Sky Survey V – the search for period bouncers continues"  
*Monthly Notices of the Royal Astronomical Society*, 525, 3597
8. The SDSS-V Collaboration (2023)  
 "The Eighteenth Data Release of the Sloan Digital Sky Surveys: Targeting and First Spectra from SDSS-V"  
*The Astronomical Journal*, 267, 44
7. Jiwon Jesse Han, Charlie Conroy, Benjamin D. Johnson, et al (2022)  
 "The Stellar Halo of the Galaxy is Tilted & Doubly Broken"  
*The Astronomical Journal*, 164, 249
6. Rohan P. Naidu, Charlie Conroy, Ana Bonaca, et al (2022)  
 "Live Fast, Die  $\alpha$ -Enhanced: The Mass-Metallicity- $\alpha$  Relation of the Milky Way's Disrupted Dwarf Galaxies"  
*The Astrophysical Journal*, submitted
5. Charlie Conroy, David H. Weinberg, Rohan P. Naidu, et al (2022)  
 "Birth of the Galactic Disk Revealed by the H3 Survey"  
*The Astrophysical Journal*, submitted
4. Rohan P. Naidu, Alexander P. Ji, Charlie Conroy, et al (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
3. Jiwon Jesse Han, Rohan P. Naidu, Charlie Conroy, et al (2022)  
 "A Tilt in the Dark Matter Halo of the Galaxy"  
*The Astrophysical Journal*, 934, 14
2. Hsiang-Chih Hwang, Yuan-Sen Ting, Charlie Conroy, et al (2022)  
 "Wide binaries from the H3 survey: the thick disk and halo have similar wide binary fractions"  
*Monthly Notices of the Royal Astronomical Society*, 513, 754
1. Evan Petrosky, Hsiang-Chih Hwang, Nadia L. Zakamska, et al (2021)  
 "Variability, periodicity and contact binaries in WISE"  
*Monthly Notices of the Royal Astronomical Society*, 503, 3975

## Unrefereed Publications

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5. Sy Boles & **Vedant Chandra** (2025)  
 "Strange galactic facts"  
*The Harvard Gazette*
4. Arjun Dey, Joan Najita, Carrie Fillion, et al (2023)  
 "RomAndromeda: The Roman Survey of the Andromeda Halo"  
*NASA Roman Core Community Survey White Paper*
3. Jiwon Jesse Han, Arjun Dey, Adrian M. Price-Whelan, et al (2022)  
 "NANCY: Next-generation All-sky Near-infrared Community surveyY"  
*NASA Roman Core Community Survey White Paper*

2. Charlie Conroy, Dan Fabricant, Nelson Caldwell, **Vedant Chandra**, et al (2022)  
“A Fast All-Sky Spectroscopic Survey to Discover the Nature of Dark Matter, Find the Edge of Galaxy Formation, and Map the Cold Gas Feeding the Milky Way”  
*CfA Science & Technology White Paper*
1. **Vedant Chandra** (2020)  
“Measuring the White Dwarf Mass-Radius Relation using Thousands of Stars”  
*astrobites*