

Rayna Rampalli

Dartmouth College | Department of Physics & Astronomy
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Research Interests: exoplanet demographics; stellar ages, kinematics, and abundances; Milky Way evolution

Education

Dartmouth College Hanover, NH
Ph.D. Physics & Astronomy 2020 - Present
Thesis: Tracing the Milky Way's Evolution & the Planet Hosts Within it Advisor: Elisabeth Newton

Columbia University New York, NY
Bridge to the Ph.D. Program in STEM 2018 - 2020
Project: Three K2 Campaigns Yield Rotation Periods for 1013 Stars in Praesepe Advisor: Marcel Agüeros

Wellesley College Wellesley, MA
B.A. Astrophysics with Honors 2014 - 2018
Thesis: Planet Candidate Validation in K2 Crowded Fields Advisors: Dave Latham, Andrew Vanderburg

Research Appointments

Present | Graduate Student Researcher, Dartmouth College (Hanover, NH)
2018 - 2020 | Bridge to the Ph.D. Program in STEM Scholar, Columbia University (New York, NY)
2017 - 2018 | Research Intern, Center for Astrophysics | Harvard & Smithsonian (Cambridge, MA)
Summer 2016 | NSF REU Intern, SETI Institute, NASA Ames (Mountain View, CA)
Summer 2015 | NSF REU Intern, Maria Mitchell Observatory (Nantucket, MA)

Awards & Honors

Dartmouth College Neukom Outstanding Graduate Research Prize - Honorable Mention 2024
LSSTC Data Science Fellow 2022 - 2024
NSF Graduate Research Fellow 2022 - 2025
Paul & Daisy Soros Fellowship for New Americans - Finalist 2022
Dartmouth College E.E. Just Graduate Fellow 2021 - Present
Best Talk: Columbia University Bridge to the Ph.D. Program in STEM Symposium 2019
Sigma Xi 2018

Mentorship, Service & Outreach

Professional

2024 - 2027 AAS Committee for Status of Women in Astronomy (CSWA) Committee Member
2023 - Present AAS CSWA Working Group Volunteer
Analyzed 2022 AAS Demographics Survey. Lead author paper to be submitted to Nature Astronomy.
2022 - Present Research Advisor
Advising Dilhan Flores: "Constraining Ages of Stars in Galactic Wrinkles Using Lithium", Dartmouth College.

Advised Jack Duranceau for honors thesis: “The Discovery and Characterization of Exoplanetary System TOI 3353”, Dartmouth College.

2022 - Present AAS Journals Referee

Institutional

2021 - Present E.E. Just Graduate Fellow (Dartmouth College)

Senior near-peer mentor for minoritized students; designer and facilitator for E.E. Just Program. Established set of workshop materials, recruited & interviewed new graduate fellows, and revitalized participation post-pandemic.

2014 - Present Public Observing Volunteer (Montshire Museum; Dartmouth College; Columbia University; Wellesley College; Maria Mitchell Observatory)

Departmental

2022 - 2024 Astronomy Journal Club Coordinator (Dartmouth College)

2020 - 2024 Physics/Astronomy DEI Working Group member (Dartmouth College)

Organized annual graduate school panel for undergraduates. Wrote up findings of graduate student initiated exit survey and suggested recommendations. Organized townhall to discuss improvements in physics and astronomy.

2016 - 2022 Retention & Student Success Advocate (Wellesley College)

Self-initiated. Co-organizer of Wellesley astronomy and physics departments’ post-baccalaureate dialogues. Identified and invited speakers. Participated and informally advised on graduate school panels for physics/astronomy students. Documented the history of the physics department and successfully advocated for updated curricula in 2018 that met current student needs. Curriculum won “Improving Undergraduate Physics Education” APS award (2024).

Observing Proposals & Grants

1. SALT 2023 - II RSS Spectroscopy: The Ages of Stars in Galactic Wrinkles (27224 seconds, PI: Rampalli)
2. TESS Cycle 6 Tracing the Milky Way’s Dynamical History with Gyrochronologic Ages (\$70,000, PI: Rampalli)

Presentations (5 invited, 9 contributed)

Invited

- “On Heterogeneity in Stellar Kinematics and Chemistries within the Milky Way.” Yale Galaxy Seminar. New Haven, CT. October 2024.
- “On Heterogeneity in Stellar Kinematics and Chemistries within the Milky Way.” MIT TESS Science Talk. Cambridge, MA. September 2024.
- “On Heterogeneity in Stellar Kinematics and Chemistries within the Milky Way.” UT Austin Stars & Planets Seminar. Austin, TX. September 2024.
- “Elemental Abundances for 17,412 Gaia RVS Solar Analogs and 50 Planet Hosts”. Penn State Exoplanet Seminar, State College, PA. February 2024.
- “Planet Candidate Validation in Crowded Fields.” Wellesley College Physics Colloquium. Wellesley, MA. April 2018.

Contributed

- “Wrinkles in Time: Age-dating Young Stars in Kinematic Overdensities Using Gyrochronology”. TESS Science Conference III. Cambridge, MA. July 2024.
- “Wrinkles in Time: Age-dating Young Stars in Kinematic Overdensities Using Gyrochronology”. Cool Stars 24 Conference. San Diego, CA. June 2024.
- “Examining Rotation and Light Curve Evolution For Low - Mass Stars in the Open Cluster Praesepe.” THYME Collaboration Workshop. Virtual. December 2020.
- “Examining Rotation and Light Curve Evolution For Low - Mass Stars in the Open Cluster Praesepe.” Bridge to the PhD Program in STEM 2019 Symposium. New York, NY. June 2019.

- “Perspectives on the Wellesley College Department: Where We’ve Been and Where We’re Going.” Wellesley College Ruhlman Conference. Wellesley, MA. May 2018.
- “Planet Candidate Validation in Crowded Fields.” Wellesley College Ruhlman Conference. Wellesley, MA. May 2018.
- “The Occurrence Rate of Hot Jupiters.” Keck Northeast Astronomy Consortium (KNAC): 2016 Symposium. Middletown, CT. October 2016.
- “The Occurrence Rate of Hot Jupiters.” SETI Institute REU Colloquium. Mountain View, CA. August 2016.
- “Exploring Extragalactic Emission: The H α Dot Survey.” Maria Mitchell Observatory Summer Colloquium. Nantucket, MA. August 2015.

Posters

- “Wrinkles in Time: Age-dating Young Stars in Kinematic Overdensities Using Gyrochronology”. Sagan 22 Workshop. Pasadena, California. July 2022.
- “Wrinkles in Time: Age-dating Young Stars in Kinematic Overdensities Using Gyrochronology”. Cool Stars 22 Conference. Toulouse, France. July 2022.
- “Examining Rotation and Light Curve Evolution For Low - Mass Stars in the Open Cluster Praesepe.” 235th AAS Meeting. Honolulu, HI. January 2020.
- “Examining Rotation and Light Curve Evolution For Low - Mass Stars in the Open Cluster Praesepe.” Kepler & K2 Science Conference V. Glendale, CA. March 2019.
- “Planet Candidate Validation in Crowded Fields.” 231st AAS Meeting. National Harbor, MD. January 2018.
- “The Occurrence Rate of Hot Jupiters.” 229th AAS Meeting. Grapevine, TX. January 2017.
- “Exploring Extragalactic Emission: The H α Dot Survey.” 227th AAS Meeting. Kissimmee, FL. January 2016.
- “Exploring Extragalactic Emission: The H α Dot Survey.” KNAC 2015 Symposium. Williamstown, MA. October 2015.

Observing

SOAR telescope (remote observing), Cerro Tololo Inter-American Observatory	3 nights (2018-2019)
Boller and Chivens 24”, Wellesley College Whitin Observatory	> 10 nights (2015-2017)
17” Plane Wave Dall-Kirkham telescope, Maria Mitchell Vestal Street Observatory	> 30 nights (Summer 2015)
Visitor’s Center 20” Telescope, Kitt Peak Observatory (Advanced Astronomy Camp)	1 night (Summer 2012)
WIYN 0.9-m Telescope, Kitt Peak Observatory (Advanced Astronomy Camp)	1 night (Summer 2011)

Teaching

Teaching Assistant* (Dartmouth College) 2021-Present

*Courses TAed: Astronomy 122: Astronomy Ethics, Astronomy 19: Habitable Planets, Astronomy 25: Galaxies & Cosmology, Astronomy 2/3: Exploring the Universe, Astronomy 1: Exploring the Solar System, Physics 4: Introductory Non-Major E&M

Publications (5 first author, 2 second/third author, 13 total, 2 first-author in prep/mature manuscripts)

First Author

5. Rampalli, R.; Ness, M.; Edwards, G.; Newton, E.; Bedell, M.; “The Sun Remains Relatively Refractory Depleted: Elemental Abundances for 17,412 Gaia RVS Solar Analogs and 50 Planet Hosts.” *ApJ* 965, 176 (2024).
4. Rampalli, R.; Smock, A.; Newton, E.; Daniel, K.; Curtis, J.; “Wrinkles in Time I: Rapid Rotators Found in Eccentric Orbits.” *ApJ* 958, 76 (2023).
3. Rampalli, R.; Agüeros, M.; Curtis, J.; Douglas, S.; Núñez, A.; et al. “Three K2 Campaigns Yield Rotation Periods for 1013 Stars in Praesepe” *ApJ* 921, 167 (2021).
2. Rampalli, R.; Ness, M.; Wylie, S. “The Astrophysical Variance in Gaia - RVS spectra” *ApJ*, 921, 78 (2021).
1. Rampalli, R.; Vanderburg, A.; Bieryla, A.; Latham, D.; Quinn, S.; et al. “A Hot Saturn Near (but Not Associated with) the Open Cluster NGC 1817” *AJ*, 158, 62 (2019).

Second/Third Author

2. Smock, A.; Daniel, K.; Rampalli, R.; et al. “Wrinkles in Time - - II: Analysis of Stellar Age Trends in Orbital Space Signatures from Simulations of Transient Spiral Structure.” Mature manuscript (2024).
1. Newton, E.; Rampalli, R.; et al. “TESS Hunt for Young and Maturing Exoplanets (THYME) VII : Membership, rotation, and lithium in the young cluster Group X and a new young exoplanet” *AJ* 164, 115 (2022).

In Prep/Mature Manuscripts

- Rampalli, R.; Newton, E.; Vanderburg, A.; Ness, M. “Disentangling Metallicity Effects on Hot Jupiter Occurrence Across Galactic Scale Parameters.” Mature manuscript.
- Rampalli, R.; Ness, M.; Johnson, J.; Edwards, G.; Newton, E.; Wang, K. “A Galactic Perspective on the Sun’s Relative Refractory Depletion:” in prep.

Co-Author

6. Heitzman, A.; including Rampalli, R.; et al. “TOI - 4562b: A Highly Eccentric Cool Jupiter Analog Orbiting a Young Star.” *AJ* 165, 121 (2023).
5. Núñez, A. et al., including Rampalli, R. “The Factory and the Beehive. IV. A Comprehensive Study of the Rotation–X - ray Activity Relation in Praesepe and the Hyades” *ApJ* 931, 45 (2022).
4. Dong, J. et al., including Rampalli, R. “NEID Rossiter - McLaughlin Measurement of TOI - 1268b: A Young Warm Saturn Aligned with Its Cool Host Star” *ApJL* 926, L7 (2022).
3. Anthony, F. et al., including Rampalli, R. “Activity and Rotation of Nearby Field M Dwarfs in the TESS Southern Continuous Viewing Zone” *AJ* 163, 257 (2022).
2. Watkins, J. et al., including Rampalli, R. “The H α Dots Survey. IV. A Fourth List of Faint Emission - line Objects” *ApJS*, 253, 39 (2021).
1. Newton, E. et al., including Rampalli, R. “TESS Hunt for Young and Maturing Exoplanets (THYME): A Planet in the 45 Myr Tucana-Horologium Association” *ApJL*, 880, L17 (2019).