

Arpit Arora – Curriculum Vitae

Postdoctoral Scholar | [Department of Astronomy, University of Washington](#)
 arpitarora.space  arora125@uw.edu  [appy2806](#)

Research Interests

Galaxy Dynamics Galaxy Formation and Evolution Dark Matter Stellar Streams

Appointment

Moore Foundation Postdoctoral Fellow, [DiRAC/University of Washington](#) Sep 2024 – present
UW Data Science Postdoctoral Fellow, [eScience Institute, University of Washington](#) March 2025 – present

Education

Ph.D. in Physics and Astronomy, [University of Pennsylvania](#), Philadelphia, PA
Advisor: Prof. Robyn Sanderson 2019 – 2024
Thesis: Dark matter and disequilibrium at galactic scales

B.S. in Physics with highest distinction [University of Minnesota](#), Minneapolis, MN
Advisor: Prof. Liliya L. R. Williams 2015–2019

B.S. in Astrophysics with highest distinction [University of Minnesota](#), Minneapolis, MN
Advisor: Prof. Liliya L. R. Williams 2015–2019
Thesis: Power-law pseudo-phase-space density profiles of dark matter halos: A Fluke of Physics?

Scholarships and Awards

- Heising-Simons Scholars for IAU conference in Cape Town 2024
- [Laverne & Ted Jones Scholarship](#) for Academic Excellence, University of Minnesota 2017, 2018
- [Swanson Scholarship](#) for promising student in Astrophysics, University of Minnesota 2016
- [UROP](#) Research scholarship for first year undergraduates, University of Minnesota 2015 – 2016
- [International Buddy Program](#), International student leader, University of Minnesota 2017 – 2019
Awarded position with scholarship funds under ISSS. Tasked with building peer-to-peer/globally minded community programs involving 500+ students yearly.
- [Culture Corps](#), Student leadership Scholarship offered by ISSS, University of Minnesota 2015 – 2019
Developed/organized leadership programs focused on international students developing projects and initiatives that bring global perspectives to the campus.

Mentoring Experience

Total students advised or co-advised 10; 1 Ph.D., 2 postbac, 5 undergraduates, 3 high school.

- Jack Kohm (Graduate student at UW) Oct 2025 – present
Advising on Jack's Ph.D. thesis projects.
- Gray Thoron (Graduate student at UW) Oct 2024 – present
Advising on Gray's Ph.D. thesis projects.
- Videep Reddy (Undergraduate research at UW) Dec 2024 – present
- Abdelaziz Hussein (Graduate student at MIT) 2022 – 2024
Advising on one Ph.D. project on running SIDM simulations.

- Lily Joseph (Postbaccalaureate at UPenn) 2020 – 2023
Thesis & postbac project on surface of sections in MW. Pending journal submission.
- Jasjeev Singh (Undergraduate thesis at UPenn) 2023 – 2025
- Emily Bregou (Undergraduate research & Postbaccalaureate at UPenn) 2022 – 2023
- Christopher Regan (Undergraduate at UPenn) 2020 – 2021
Thesis & a published paper on time-evolving potential models.
- [Penn Laboratory Experiences in Natural Sciences](#) (grade 11-12 students) Summer 2022, 2023
3 student mentees from 2 different local schools with different academic/cultural background

Teaching Experience

Guest Lectures

- **University of Washington**
 - ASTR 102: Introduction to Astronomy Fall 2025
 - ASTR 511: Galactic Structure and Dynamics Winter 2025
- **University of Pennsylvania**
 - PHYS 522: Intro to Particle Physics Spring 2024, 2022
 - PHYS 533: Topics in Cosmology: Galactic Dynamics with Gaia Spring 2023
 - PHYS 150: Principles of Physics I: Mechanics and Wave Motion Fall 2020, 2021
- **University of Minnesota**
 - AST 2001: Fundamental Astrophysics Spring 2018, 2019
 - PHY 1301: Physics I for Science & Engineering Fall 2018

Teaching Assistantships

- **University of Pennsylvania**
 - PHYS 522: Intro to Particle Physics Spring 2021, 2022, 2024
 - PHYS 533: Galactic Dynamics with Gaia Spring 2023
 - PHYS 526: Astrophysical Radiation Fall 2022
 - PHYS 016: Energy, Oil, & Global Warming Fall 2023
 - PHYS 150: Principles of Physics I: Mechanics and Wave Motion Fall 2020, 2021
 - PHYS 101-102 Laboratory Summer 2020B, 2021A, 2021B
- **University of Minnesota**
 - PHY 1301: Physics I for Science & Engineering Fall 2018, Spring 2019
 - AST 2001: Intro to Modern Astrophysics Spring 2017, Spring 2018, Spring 2019

Grading and Tutoring

- **University of Pennsylvania**
 - ASTR 212: Intro to Astrophysics II Spring 2020
 - ASTR 007: The Big Bang and Beyond Fall 2019
- **University of Minnesota**
 - PHY 1302: Physics II for Science & Engineering Fall 2017
 - Certified Tutor, PLC Smart Learning Commons 2017–2018

Tutored undergraduate students in calculus, introductory physics, and astronomy.

Service to the community & Outreach

- Division of Dynamical Astronomy, AAS, [Committee Member](#) June 2025 – June 2028
- [Speaker on NPR *Short Wave*](#): Could the Milky Way be headed for a collision? June 2025
- DiRAC, University of Washington, Seminar committee Oct 2024 – present

- Referee for APJ, MNRAS, OJA 2023 – present
- Classroom astronomer 2022 – present
Led lectures/Q&A sessions for multiple high school astronomy classes.
- [DDA 53rd](#) volunteer LOC May 2022
Ranked/sorted and selected abstract submissions in Galaxy dynamics.

Publications list

[ADS/SciX](#), [ORCID](#), [Google Scholar](#)

Total: 28 – refereed: 21 – primary author: 11 – citations : 543 (as of May 18, 2026)

Primary author

* indicates work led by a student I advised or co-advised.

11. Silverman M.*, Hussein, A.*, **Arora, A.**, Kaplinghat, M., Lisanti, M., Necib, L., and Sanderson, R. E., in prep. Gravothermal Collapse in low-mass SIDM halos with self-interacting dark matter. Draft available on request.
10. **Arora, A.**, Ferguson, P. S., Nibauer, J., Shipp, N., Reddy, V., et. al. 2026. No Stream Left Unscathed: The imprint of a host galaxy on globular cluster stellar streams. *The Astrophysical Journal submitted*, arXiv:2605.16200.
9. Mansfield, M. W.*, Sanderson, R. E., Hey, D., Huber, D., **Arora, A.**, Cunningham E. C., and Panithanpaisal, N., 2026. Kinematic Signatures in the Stellar Halo from Cosmological Encounters between the Milky Way and its Clouds. *The Astrophysical Journal submitted*, arxiv:2602.03528.
8. Darragh-Ford, E.*, Garavito-Camargo, N., **Arora, A.**, Wechsler, R. H., Mansfield, P., Besla, G., et. al. 2025. Shaping the Milky Way. II. The dark matter halo’s response to the LMC’s passage in a cosmological context. *The Astrophysical Journal accepted*, arXiv:2511.02031.
7. **Arora, A.**, Garavito-Camargo, N., Sanderson, R. E., Weinberg, M. D., Petersen, M. S., et. al., 2025. Shaping the Milky Way: The interplay of mergers and cosmic filaments. *The Astrophysical Journal*, 988(1), p.190.
6. **Arora, A.**, Sanderson, R., Regan, C., Garavito-Camargo, N., Bregou, E., Panithanpaisal, N., Wetzel, A., Cunningham, E.C., Loebman, S.R., Dropulic, A. and Shipp, N., 2024. Efficient and accurate force replay in cosmological-baryonic simulations. *The Astrophysical Journal*, 977(1), p.23.
5. **Arora, A.**, Sanderson, R. E., Chakrabarti, S., Wetzel, A., Donlon, T., Horta, D., Loebman, S. R., Necib, L., and Oeur, M., 2024. The imprint of dark matter on the Galactic acceleration field. *The Astrophysical Journal*, 974(2), p.223.
4. Ansar, S., Pearson, S., Sanderson, R. E., **Arora, A.**, Hopkins, P. F., Wetzel, A., Cunningham, E. C., Quinn, J. 2024. Bar formation and destruction in the FIRE-2 simulations. *The Astrophysical Journal*, 978(1), p.37.
3. **Arora, A.**, Garavito-Camargo, N., Sanderson, R. E., Cunningham, E. C., Wetzel, A., Panithanpaisal, N., Barry, M. 2023. LMC-driven anisotropic boosts in stream–subhalo interactions. *The Astrophysical Journal*, 974(2), p.286.
2. **Arora, A.**, Sanderson, R.E., Panithanpaisal, N., Cunningham, E.C., Wetzel, A. and Garavito-Camargo, N., 2022. On the stability of tidal streams in action space. *The Astrophysical Journal*, 939(1), p.2.
1. **Arora, A.** and Williams, L.L., 2020. Power-law Pseudo-phase-space Density Profiles of Dark Matter Halos: A Fluke of Physics?. *The Astrophysical Journal*, 893(1), p.53.

Nth author

17. Zhang, X., Thoyas A., Necib, L., Wetzeo, A., and **Arora, A.**, 2026. Set the Night on FIRE: Building an Empirical Local Dark Matter Velocity Distribution. *The Astrophysical Journal submitted*, arxiv:2603.25783.
16. Mandacarú Guerra, L. S., O’Neil, S., Lisanti, M., Roy, S., Sanderson, R., Kundu, A., **Arora, A.**, Necib, L., Shipp, N., Shen, X. 2026. Probing Atomic Dark Matter with Stellar Streams in Milky Way-Mass Galaxies. *The Astrophysical Journal submitted*, arXiv:2603.20367.
15. Panithanpaisal, N., Sanderson, R. E., Rodriguez, C. L., Starckenburg, T., Pearson, S., Bonaca, A., Hopkins, P. F., Cook, B. T., **Arora, A.**, Weatherford, N. C. 2026. Breaking Down the CosmoGEMS: Toward Modeling and Understanding Globular Cluster Stellar Streams in a Fully Cosmological Context. *The Astrophysical Journal*, ApJ 997(1), p.182.
14. Quinn, J., Loebman, S. R., Daniel, K., Silva, L.B., Wetzel, A., Debattista, V., **Arora, A.**, McCluskey, F., Masoumi, D., Bailin, J. 2026. Spiral Structure Properties, Dynamics, and Evolution in MW-mass Galaxy Simulations. *The Astrophysical Journal*, ApJ 997(2), p. 29.
13. Hunt, J. A. S., Petersen, M. S., Weinberg, M. D., Johnston, K. V., Bernet, M., Daniel, K. J., Hyman, S. Ó., Price-Whelan, A. M., **Arora, A.**, the EXP Collaboration. 2025. The dark matter wake of a galactic bar revealed by multichannel Singular Spectral Analysis. *Monthly Notices of the Royal Astronomical Society*, staf2118.
12. Wetzel, A., Samuel, J., Gandhi, P.J., Ponnada, S.B., Su, K.Y., **Arora, A.**, Angles-Alcazar, D., Hayward, C.C., Sanderson, R.E., Feldmann, R. and Cochrane, R., et. al., 2025. Second public data release of the FIRE-2 cosmological zoom-in simulations of galaxy formation. arXiv preprint arXiv:2508.06608.
11. Ouer, M., Loebman, S. R., Price-Whelan, A.M., **Arora, A.**, Necib, L., and Horta, D., 2025. OTI on FIRE: Testing the Efficacy of Orbital Torus Imaging to Recover the Galactic Potential. *The Astrophysical Journal*, ApJ 993(1), p.29.
10. Shipp N., Riley A. H., Simpson C. M., Bieri R., Necib L., **Arora A.**, Fragkoudi F., Gómez F. A., Grand R. J. J., Marinacci F., 2024. Auriga Streams II: orbital properties of tidally disrupting satellites of Milky Way-mass galaxies. *Monthly Notices of the Royal Astronomical Society accepted*, 542(2), pp.1109-1124.
9. Lucey M., Sanderson R. E., Horta D., Kundu A, Hopkins P.F., **Arora A.**, Singh J., Panithanpaisal N., 2024. Cosmological predictions for minor axis stellar density profiles in the inner regions of Milky Way-mass galaxies. *The Astrophysical Journal*, 982(2), 87.
8. Donlon, T., Newberg, H.J., Sanderson, R., Bregou, E., Horta, D., **Arora, A.** and Panithanpaisal, N.J., 2023. The Debris of the “Last Major Merger” is Dynamically Young. *Monthly Notices of the Royal Astronomical Society*, 531(1), pp.1422-1439.
7. Horta, D., Cunningham, E.C., Sanderson, R., Johnston, K.V., Deason, A., Wetzel, A., McCluskey, F., Garavito-Camargo, N., Necib, L., Faucher-Giguère, C.A., **Arora, A.** and Gandhi, P.J., 2023. The proto-galaxy of Milky Way-mass haloes in the FIRE simulations. *Monthly Notices of the Royal Astronomical Society*, 527(4), pp.9810-9825.
6. Garavito-Camargo, N., Price-Whelan, A.M., Cunningham, E.C., Samuel, J., Patel, E., Wetzel, A., Johnston, K.V., **Arora, A.**, Sanderson, R. and Garrison, L., 2023. LMC-mass satellite galaxies inducing ‘apparent’ co-rotation motions in Milky Way-like galaxies in FIRE. *The Astrophysical Journal*, 975(1), p.100.
5. Barry, M., Wetzel, A., Chapman, S., Samuel, J., Sanderson, R. and **Arora, A.**, 2023. The dark side of FIRE: predicting the population of dark matter subhaloes around Milky Way-mass galaxies. *Monthly Notices of the Royal Astronomical Society*, 523(1), pp.428-440.
4. Wetzel, A., Hayward, C.C., Sanderson, R.E., Ma, X., Anglés-Alcázar, D., Feldmann, R., Chan, T.K., El-Badry, K., Wheeler, C., Garrison-Kimmel, S., Nikakhtar, F., Panithanpaisal, N., **Arora, A.**, Gurvich, A.B., Samuel, J., Sameie, O., Pandya, V., Hafen, Z., Hummels, C., Loebman, S., Boylan-Kolchin, M., Bullock, J.S., Faucher-Giguere, C.-A., Keres, D. and Hopkins, P.F, 2023. Public data release of the FIRE-2 cosmological zoom-in simulations of galaxy formation. *The Astrophysical Journal Supplement Series*, 265(2), p.44.

3. Horta, D., Cunningham, E.C., Sanderson, R.E., Johnston, K.V., Panithanpaisal, N., **Arora, A.**, Necib, L., Wetzel, A., Bailin, J. and Faucher-Giguère, C.A., 2023. The Observable Properties of Galaxy Accretion Events in Milky Way-like Galaxies in the FIRE-2 Cosmological Simulations. *The Astrophysical Journal*, 943(2), p.158
2. Baptista, J., Sanderson, R., Huber, D., Wetzel, A., Sameie, O., Boylan-Kolchin, M., Bailin, J., Hopkins, P.F., Faucher-Giguere, C.A., Chakrabarti, S. and Vargya, D., Panithanpaisal, N., **Arora, A.** and Cunningham, E., 2022. Orientations of DM Halos in FIRE-2 Milky Way-mass Galaxies. *The Astrophysical Journal*, 958(1), p.44.
1. Panithanpaisal, N., Sanderson, R.E., **Arora, A.**, Cunningham, E.C. and Baptista, J., 2022. Constraining the Tilt of the Milky Way's Dark Matter Halo with the Sagittarius Stream. *The Astrophysical Journal in revision*, arXiv:2210.14983.

Scientific Talks, Conferences & Workshops:

31 Total: 14 Invited (denoted by †), 3 posters. 25 in North America, 5 in Europe, 1 in Africa

- Yale University, Galaxies Seminar, CT, USA† April 2026
- University of Michigan, Galaxies seminar, MI, USA† Nov 2025
- Spec-S5 Dark Matter Meeting 2025, IL, USA Oct 2025
- Institute of Cosmos Science, University of Barcelona, seminar talk, Barcelona, Spain† Jun 2025
- Small-Scale Structure of the Universe and SIDM, invited talk, Valencia, Spain† Jun 2025
- LIRA, Observatoire de Paris, PSL Seminar talk, Paris, France† Jun 2025
- [Gravity in the local Group](#), contributed talk, Carnegie Mellon University, PA, USA Jun 2025
- DREAMS collaboration conference, invited talk, CCA, NY, USA† May 2025
- University of Washington, Seattle, Astronomy colloquium, WA, USA† Mar 2025
- University of Alabama, Huntsville, Astronomy colloquium, AL, USA† Feb 2025
- IAU General Assembly 2024, research talk, Cape Town, SA Aug 2024
- [XMC Workshop](#), contributed talk, NY, USA Feb 2024
- [243rd American Astronomical Society meeting](#), dissertation talk, Louisiana, USA Jan 2024
- [Surveying the Milky Way](#), poster, California, USA Oct 2023
- CCA, PACMAN seminar, NY, USA† Oct 2023
- MIT Kavli Institute Lunch talk, Boston, MA, USA† Oct 2023
- University of Michigan, Astronomy seminar, MI, USA† Oct 2023
- Simulating Beyond CDM workshop, NY, USA Aug 2023
- Galactic Frontiers: Dwarf Galaxies in the Local Volume and Beyond, *attendee*, NY, USA Jul 2023
- [Self Interacting Dark Matter: Models, Simulations and Signals](#), workshop talk, Pollica, Italy Jun 2023
- DESC stellar stream meeting, virtual talk† Jun 2023
- [54th Division for Dynamical Astronomy](#), contributed talk, MI, USA May 2023
- FIRE Collaboration Seminar Series, virtual talk† May 2023
- Stream across simulations workshop, NY, USA Apr 2023
- [Towards Real-Time Galactic Dynamics](#), workshop talk, Leiden, Netherlands Jul 2022
- [53rd Division for Dynamical Astronomy](#), poster, NY, USA May 2022
- FIRE Collaboration Seminar Series, virtual talk† Nov 2021
- [52nd Division for Dynamical Astronomy](#), contributed talk, Virtual meeting May 2021
- [51st Division for Dynamical Astronomy](#), *attendee*, Virtual meeting Aug 2020

-
- Undergraduate Research Symposium, contributed talk, MN, USA Aug 2018
 - Undergraduate Research Symposium, poster, MN, USA Aug 2016