

---

## Education

**Massachusetts Institute of Technology**, Cambridge, Massachusetts, USA, 2004–2011

Ph.D., Physics, 25 January 2011.

Thesis advisor: Edmund Bertschinger. Thesis Committee: Alan Guth, Paul Schechter.

**University of Maryland**, College Park, Maryland, USA 1999–2003

B.S., Physics, High Honors and magna cum laude

B.S., Astronomy, High Honors and magna cum laude

---

## Professional Appointments

**Assistant Professor, Dept. of Physics & Astronomy, University of Pennsylvania** 2018–present.

**Associate Research Scientist, Center for Computational Astrophysics, Flatiron Institute** 2018–present.

**Postdoctoral scholar, Caltech** 2017–2018.

**NSF Astronomy and Astrophysics Postdoctoral Fellow** 2014–2017.

**Postdoctoral researcher, Kapteyn Astronomical Institute** 2011–2014.

**Ph.D. Thesis research, MIT** 2004–2011.

---

## Honors & Awards

**Sloan Research Fellow** 2023

**Research Corporation Scialog Fellow** 2019

**NSF Astronomy and Astrophysics Postdoctoral Fellowship** 2014–2017

**Henry Kendall Teaching Award** MIT Physics Department, 2010

**Whiteman Graduate Fellowship** MIT Physics Department, 2004–2006

---

## Lectureships and Residencies

**Interconnections between the Physics of Plasmas and Self-gravitating Systems** Kavli Institute for Theoretical Physics, 3 June–26 July 2024

**Geometric and Field Theoretic Methods for Astro-, Geo-, and Bio-physical Fluids** Aspen Center for Physics, 28 May–18 June 2023 (declined due to previous commitments)

**Applied Galactic Dynamics Summer School** Flatiron Institute, 5 July–13 August 2021 (SOC and mentor)

**Milky Way Chemodynamics** Aspen Center for Physics, 30 May–20 June 2021

**Follow-on visit** Kavli Institute for Theoretical Physics, 10–23 May 2020 (cancelled due to COVID-19)

**Summer School on Galactic Dynamics** Shanghai Jiao Tong University, 24–28 June 2019 (lecturer)

**Space Astrometry for Astrophysics** International School of Space Science, 3–7 June 2019 (lecturer)

**Dynamical Models for Stars and Gas in Galaxies in the Gaia Era** Kavli Institute for Theoretical Physics, 11 March–5 April 2019 (long-term invitee)

**Dynamics of the Milky Way System in the Era of Gaia**

Aspen Center for Physics, 27 Aug–14 Sept 2018 (Organizer)

---

**Publications** (\*Penn author)

1. Barry, M., A. Wetzel, S. Chapman, J. Samuel, **R. E. Sanderson**, and A. \*Arora (2023a). *The dark side of FIRE: predicting the population of dark matter subhaloes around Milky Way-mass galaxies*. *MNRAS* **523**(1), 428–440. arXiv: 2303.05527 [astro-ph.GA].
2. Carrillo, A., M. K. Ness, K. Hawkins, **R. E. Sanderson**, K. Wang, A. Wetzel, and M. A. Bellardini (2023). *The Relationship between Age, Metallicity, and Abundances for Disk Stars in a Simulated Milky Way*. *ApJ* **942**(1), 35, 35. arXiv: 2204.11358 [astro-ph.GA].
3. Craig, P., S. Chakrabarti, **R. E. Sanderson**, and F. Nikakhtar (2023). *Building an Acceleration Ladder with Tidal Streams and Pulsar Timing*. *ApJ* **945**(2), L32, L32. arXiv: 2211.00613 [astro-ph.GA].
4. Hey, D. R., D. Huber, B. J. Shappee, J. Bland-Hawthorn, T. Tepper-Garcia, **R. E. Sanderson**, S. Chakrabarti, N. Saunders, J. A. S. Hunt, T. R. Bedding, and J. Tonry (2023). *The far side of the Galactic bulge revealed through semi-regular variables*. *arXiv e-prints*, arXiv:2305.19319, arXiv:2305.19319. arXiv: 2305.19319 [astro-ph.GA].
5. Hopkins, P. F., A. Wetzel, C. Wheeler, **R. E. Sanderson**, M. Y. Grudić, O. Sameie, M. Boylan-Kolchin, M. Orr, X. Ma, C.-A. Faucher-Giguère, D. Kereš, E. Quataert, K.-Y. Su, J. Moreno, R. Feldmann, J. S. Bullock, S. R. Loebman, D. Anglés-Alcázar, J. Stern, L. Necib, C. R. Choban, and C. C. Hayward (2023). *FIRE-3: updated stellar evolution models, yields, and microphysics and fitting functions for applications in galaxy simulations*. *MNRAS* **519**(2), 3154–3181. arXiv: 2203.00040 [astro-ph.GA].
6. Horta, D., E. C. Cunningham, **R. E. Sanderson**, K. V. Johnston, N. \*Panithanpaisal, A. \*Arora, L. Necib, A. Wetzel, J. Bailin, and C.-A. Faucher-Giguère (2023). *The Observable Properties of Galaxy Accretion Events in Milky Way-like Galaxies in the FIRE-2 Cosmological Simulations*. *ApJ* **943**(2), 158, 158. arXiv: 2211.05799 [astro-ph.GA].
7. Nguyen, T., X. Ou, N. \*Panithanpaisal, N. Shipp, L. Necib, **R. E. Sanderson**, and A. Wetzel (2023). *Synthetic Gaia DR3 surveys from the FIRE cosmological simulations of Milky-Way-mass galaxies*. *arXiv e-prints*, arXiv:2306.16475, arXiv:2306.16475. arXiv: 2306.16475 [astro-ph.GA].
8. Santistevan, I. B., A. Wetzel, E. Tollerud, **R. E. Sanderson**, and J. Samuel (2023). *Orbital dynamics and histories of satellite galaxies around Milky Way - mass galaxies in the FIRE simulations*. *MNRAS* **518**(1), 1427–1447. arXiv: 2208.05977 [astro-ph.GA].
9. Shipp, N., N. \*Panithanpaisal, L. Necib, **R. E. Sanderson**, D. Erkal, T. S. Li, I. B. Santistevan, A. Wetzel, L. R. Culinane, A. P. Ji, S. E. Koposov, K. Kuehn, G. F. Lewis, A. B. Pace, D. B. Zucker, J. Bland-Hawthorn, E. C. Cunningham, S. Y. Kim, S. Lilleengen, J. Moreno, S. Sharma, S Collaboration, and FIRE Collaboration (2023). *Streams on FIRE: Populations of Detectable Stellar Streams in the Milky Way and FIRE*. *ApJ* **949**(2), 44, 44. arXiv: 2208.02255 [astro-ph.GA].
10. Thiele, S., K. Breivik, **R. E. Sanderson**, and R. Luger (2023). *Applying the Metallicity-dependent Binary Fraction to Double White Dwarf Formation: Implications for LISA*. *ApJ* **945**(2), 162, 162. arXiv: 2111 . 13700 [astro-ph.HE].
11. Wetzel, A., C. C. Hayward, **R. E. Sanderson**, X. Ma, D. Anglés-Alcázar, R. Feldmann, T. K. Chan, K. El-Badry, C. Wheeler, S. Garrison-Kimmel, F. Nikakhtar, N. Panithanpaisal, A. Arora, A. B. Gurvich, J. Samuel, O. Sameie, V. Pandya, Z. Hafen, C. Hummels, S. Loebman, M. Boylan-Kolchin, J. S. Bullock, C.-A. Faucher-Giguère, D. Kereš, E. Quataert, and P. F. Hopkins (2023). *Public Data Release of the FIRE-2 Cosmological Zoom-in Simulations of Galaxy Formation*. *ApJS* **265**(2), 44, 44. arXiv: 2202.06969 [astro-ph.GA].
12. \*Arora, A., **R. E. Sanderson**, N. \*Panithanpaisal, E. C. Cunningham, A. Wetzel, and N. Garavito-Camargo (2022). *On the Stability of Tidal Streams in Action Space*. *ApJ* **939**(1), 2, 2. arXiv: 2207.13481 [astro-ph.GA].
13. \*Panithanpaisal, N., **R. E. Sanderson**, A. \*Arora, E. C. Cunningham, and J. Baptista (2022). *Constraining the Tilt of the Milky Way’s Dark Matter Halo with the Sagittarius Stream*. *arXiv e-prints*, arXiv:2210.14983, arXiv:2210.14983. arXiv: 2210.14983 [astro-ph.GA].
14. \*Vargya, D., **R. E. Sanderson**, O. Sameie, M. Boylan-Kolchin, P. F. Hopkins, A. Wetzel, and A. Graus (2022). *Shapes of Milky-Way-mass galaxies with self-interacting dark matter*. *MNRAS* **516**(2), 2389–2405. arXiv: 2104.14069 [astro-ph.GA].
15. Abdurro’uf et al. (2022). *The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data*. *ApJS* **259**(2), 35. arXiv: 2112.02026 [astro-ph.GA].
16. Baptista, J., **R. E. Sanderson**, D. Huber, A. Wetzel, O. Sameie, M. Boylan-Kolchin, J. Bailin, P. F. Hopkins, C.-A. Faucher-Giguere, S. Chakrabarti, D. \*Vargya, N. \*Panithanpaisal, A. \*Arora, and E. Cunningham (2022). *Orientations of DM Halos in FIRE-2 Milky Way-mass Galaxies*. *arXiv e-prints*, arXiv:2211.16382, arXiv:2211.16382. arXiv: 2211.16382 [astro-ph.GA].

- 
17. Beaton, R. L., S. Werner, A. W. Mutschang, G. Lemson, A. Thakar, A.-M. Weijmans, J. R. Brownstein, F. Nikakhtar, **R. E. Sanderson**, A. Wetzel, S. Loebman, and S. Sharma (2022). *APOGEE-centric Ananke Simulations in a SciServer SQL Database*. *Research Notes of the American Astronomical Society* **6**(6), 125, 125.
  18. Chawla, C., S. Chatterjee, K. Breivik, C. K. Moorthy, J. J. Andrews, and **R. E. Sanderson** (2022). *Gaia May Detect Hundreds of Well-characterized Stellar Black Holes*. *ApJ* **931**(2), 107, 107. arXiv: 2110.05979 [astro-ph.GA].
  19. Cunningham, E. C., **R. E. Sanderson**, K. V. Johnston, N. \*Panithanpaisal, M. K. Ness, A. Wetzel, S. R. Loebman, I. Escala, D. Horta, and C.-A. Faucher-Giguère (2022). *Reading the CARDS: The Imprint of Accretion History in the Chemical Abundances of the Milky Way's Stellar Halo*. *ApJ* **934**(2), 172, 172. arXiv: 2110.02957 [astro-ph.GA].
  20. Escala, I., K. M. Gilbert, M. Fardal, P. Guhathakurta, **R. E. Sanderson**, J. S. Kalirai, and B. Mobasher (2022). *Kinematics and Metallicity of Red Giant Branch Stars in the Northeast Shelf of M31*. *AJ* **164**(1), 20, 20. arXiv: 2203.16675 [astro-ph.GA].
  21. Gezari, S., M. Bentz, K. De, K. D. French, A. Meisner, M. Ntampaka, R. Jedicke, E. Patel, D. Perley, **R. E. Sanderson**, C. Aganze, I. Andreoni, E. F. Bell, E. Berger, I. Dell'Antonio, R. Foley, H. Hsieh, M. Kasliwal, J. Kastner, C. D. Kilpatrick, J. D. Kirkpatrick, C. Lam, K. Meech, D. Minniti, E. O. Nadler, D. Nagai, J. Pierel, I. Shivaiei, R. Street, E. J. Tollerud, and B. Williams (2022). *R2-D2: Roman and Rubin – From Data to Discovery*. *arXiv e-prints*. arXiv: 2202.12311 [astro-ph.IM].
  22. Kado-Fong, E., **R. E. Sanderson**, J. E. Greene, E. C. Cunningham, C. Wheeler, T. K. Chan, K. El-Badry, P. F. Hopkins, A. Wetzel, M. Boylan-Kolchin, C.-A. Faucher-Giguère, S. Huang, E. Quataert, and T. Starkeburg (2022). *The In Situ Origins of Dwarf Stellar Outskirts in FIRE-2*. *ApJ* **931**(2), 152, 152. arXiv: 2109.05034 [astro-ph.GA].
  23. Reino, S., **R. E. Sanderson**, N. \*Panithanpaisal, E. M. Rossi, and K. Kuijken (2022). *Orbital phase-driven biases in galactic mass constraints from stellar streams*. *MNRAS* **509**(4), 5365–5381. arXiv: 2107.03798 [astro-ph.GA].
  24. Slizewski, A., X. Dufresne, K. Murdock, G. Eadie, **R. E. Sanderson**, A. Wetzel, and M. Jurić (2022). *Galactic Mass Estimates Using Dwarf Galaxies as Kinematic Tracers*. *ApJ* **924**(2), 131. arXiv: 2108.12474 [astro-ph.GA].
  25. Wu, Y., M. Valluri, N. \*Panithanpaisal, **Sanderson, R. E.**, K. Freese, A. Wetzel, and S. Sharma (2022). *Using action space clustering to constrain the recent accretion history of Milky Way-like galaxies*. *MNRAS* **509**(4), 5882–5901. arXiv: 2104.08185 [astro-ph.GA].
  26. \*Nikakhtar, F., **R. E. Sanderson**, A. Wetzel, S. Loebman, S. Sharma, R. Beaton, J. T. Mackereth, V. J. Poovelil, G. Zasowski, A. Bonaca, S. Martell, H. Jönsson, and C.-A. Faucher-Giguère (2021). *New Families in our Solar Neighborhood: Applying Gaussian Mixture Models for Objective Classification of Structures in the Milky Way and in Simulations*. *ApJ* **921**(2), 106. arXiv: 2104.08394 [astro-ph.GA].
  27. \*Panithanpaisal, N., **R. E. Sanderson**, A. Wetzel, E. C. Cunningham, J. Bailin, and C.-A. Faucher-Giguère (2021). *The Galaxy Progenitors of Stellar Streams around Milky Way-mass Galaxies in the FIRE Cosmological Simulations*. *ApJ* **920**(1), 10, 10. arXiv: 2104.09660 [astro-ph.GA].
  28. Reino, S., E. M. Rossi, **R. E. Sanderson**, E. Sellentin, A. Helmi, H. H. Koppelman, and S. Sharma (2021). *Galactic potential constraints from clustering in action space of combined stellar stream data*. *MNRAS* **502**(3), 4170–4193. arXiv: 2007.00356.
  29. Sameie, O., M. Boylan-Kolchin, **R. E. Sanderson**, D. \*Vargya, P. F. Hopkins, A. Wetzel, J. Bullock, A. Graus, and V. H. Robles (2021). *The central densities of Milky Way-mass galaxies in cold and self-interacting dark matter models*. *MNRAS* **507**(1), 720–729. arXiv: 2102.12480 [astro-ph.GA].
  30. Santistevan, I. B., A. Wetzel, **R. E. Sanderson**, K. El-Badry, J. Samuel, and C.-A. Faucher-Giguère (2021). *The origin of metal-poor stars on prograde disc orbits in FIRE simulations of Milky Way-mass galaxies*. *MNRAS* **505**(1), 921–938. arXiv: 2102.03369.
  31. Auge, C., D. Huber, A. Heinze, B. J. Shappee, J. Tonry, S. Chakrabarti, **R. E. Sanderson**, L. Denneau, H. Flewelling, T. W. .-S. Holoién, C. S. Kochanek, G. Pignata, A. Sickafoose, B. Stalder, K. Z. Stanek, D. Stello, and T. A. Thompson (2020). *Beyond Gaia: Asteroseismic Distances of M Giants Using Ground-based Transient Surveys*. *AJ* **160**(1), 18. arXiv: 2003.05459.
  32. Cunningham, E. C., N. Garavito-Camargo, A. J. Deason, K. V. Johnston, D. Erkal, C. F. P. Laporte, G. Besla, R. Luger, and **R. E. Sanderson** (2020). *Quantifying the Stellar Halo's Response to the LMC's Infall with Spherical Harmonics*. *ApJ* **898**(1), 4. arXiv: 2006.08621.
  33. Donlon II, T., H. J. Newberg, **R. E. Sanderson**, and L. M. Widrow (2020). *The Milky Way's Shell Structure Reveals the Time of a Radial Collision*. *ApJ* **902**(2), 119. arXiv: 2006.08764.
  34. Necib, L., B. Ostdiek, M. Lisanti, T. Cohen, M. Freytsis, S. Garrison-Kimmel, P. F. Hopkins, A. Wetzel, and **R. E. Sanderson** (2020). *Evidence for a vast prograde stellar stream in the solar vicinity*. *Nature Astronomy* **4**, 1078–1083. arXiv: 1907.07190.

- 
35. Ostdiek, B., L. Necib, T. Cohen, M. Freytsis, M. Lisanti, S. Garrison-Kimmel, A. Wetzel, **Sanderson, R. E.**, and P. F. Hopkins (2020). *Cataloging accreted stars within Gaia DR2 using deep learning*. *A&A* **636**, A75. arXiv: 1907.06652.
  36. **Sanderson, R. E.**, A. Wetzel, S. Loebman, S. Sharma, P. F. Hopkins, S. Garrison-Kimmel, C.-A. Faucher-Giguère, D. Kereš, and E. Quataert (2020). *Synthetic Gaia Surveys from the FIRE Cosmological Simulations of Milky Way-mass Galaxies*. *ApJS* **246**(1), 6. arXiv: 1806.10564.
  37. \*Beane, A., **R. E. Sanderson**, M. K. Ness, K. V. Johnston, D. Grion Filho, M.-M. Mac Low, D. Anglés-Alcázar, D. W. Hogg, and C. F. P. Laporte (2019). *The Implications of Local Fluctuations in the Galactic Midplane for Dynamical Analysis in the Gaia Era*. *ApJ* **883**(1), 103. arXiv: 1905.08803.
  38. Bellini, A. et al. (2019). *Astro2020 Science White Paper: Science at the edges: internal kinematics of globular clusters' external fields*. *Astro2020: Decadal Survey on Astronomy and Astrophysics*, 173. arXiv: 1903.05085.
  39. Cunningham, E. C., A. J. Deason, **R. E. Sanderson**, S. T. Sohn, J. Anderson, P. Guhathakurta, C. M. Rockosi, R. P. van der Marel, S. R. Loebman, and A. Wetzel (2019). *HALO7D II: The Halo Velocity Ellipsoid and Velocity Anisotropy with Distant Main-sequence Stars*. *ApJ* **879**(2), 120. arXiv: 1810.12201.
  40. Debattista, V. P., O. A. Gonzalez, **R. E. Sanderson**, K. El-Badry, S. Garrison-Kimmel, A. Wetzel, C.-A. Faucher-Giguère, and P. F. Hopkins (2019). *Formation, vertex deviation, and age of the Milky Way's bulge: input from a cosmological simulation with a late-forming bar*. *MNRAS* **485**(4), 5073–5085. arXiv: 1805.12199.
  41. Garrison-Kimmel, S., P. F. Hopkins, A. Wetzel, J. S. Bullock, M. Boylan-Kolchin, D. Kereš, C.-A. Faucher-Giguère, K. El-Badry, A. Lamberts, E. Quataert, and **R. E. Sanderson** (2019). *The Local Group on FIRE: dwarf galaxy populations across a suite of hydrodynamic simulations*. *MNRAS* **487**(1), 1380–1399. arXiv: 1806.04143.
  42. Garrison-Kimmel, S., A. Wetzel, P. F. Hopkins, **R. E. Sanderson**, K. El-Badry, A. Graus, T. K. Chan, R. Feldmann, M. Boylan-Kolchin, C. C. \*Hayward, J. S. Bullock, A. Fitts, J. Samuel, C. Wheeler, D. Kereš, and C.-A. Faucher-Giguère (2019). *Star formation histories of dwarf galaxies in the FIRE simulations: dependence on mass and Local Group environment*. *MNRAS* **489**(4), 4574–4588. arXiv: 1903.10515.
  43. Lamberts, A., S. Blunt, T. B. Littenberg, S. Garrison-Kimmel, T. Kupfer, and **R. E. Sanderson** (2019). *Predicting the LISA white dwarf binary population in the Milky Way with cosmological simulations*. *MNRAS* **490**(4), 5888–5903. arXiv: 1907.00014.
  44. Li, T. et al. (2019). *Dark Matter Physics with Wide Field Spectroscopic Surveys*. *BAAS* **51**(3), 252.
  45. Li, T. S., M. Kaplinghat, K. Bechtol, A. S. Bolton, J. Bovy, T. Carleton, C. Chang, A. Drlica-Wagner, D. Erkal, M. Geha, J. P. Greco, C. J. Grillmair, S. Y. Kim, C. F. P. Laporte, G. F. Lewis, M. Makler, Y.-Y. Mao, J. L. Marshall, A. W. McConnachie, L. Necib, A. M. Nierenberg, B. Nord, A. B. Pace, M. S. Pawlowski, A. H. G. Peter, **R. E. Sanderson**, G. F. Thomas, E. Tollerud, S. Vegetti, and M. G. Walker (2019). *Astrophysical Tests of Dark Matter with Maunakea Spectroscopic Explorer*. *arXiv e-prints*. arXiv: 1903.03155.
  46. Necib, L., M. Lisanti, S. Garrison-Kimmel, A. Wetzel, **R. E. Sanderson**, P. F. Hopkins, C.-A. Faucher-Giguère, and D. Kereš (2019). *Under the FIRElight: Stellar Tracers of the Local Dark Matter Velocity Distribution in the Milky Way*. *ApJ* **883**(1), 27. arXiv: 1810.12301.
  47. Ness, M. et al. (2019). *In Pursuit of Galactic Archaeology*. *BAAS* **51**(3), 238. arXiv: 1907.05422.
  48. **Sanderson, R. E.** et al. (2019a). *Astrometry with the Wide-Field Infrared Space Telescope*. *Journal of Astronomical Telescopes, Instruments, and Systems* **5**, 044005.
  49. **Sanderson, R. E.** et al. (2019b). *The Multidimensional Milky Way*. *BAAS* **51**(3), 347. arXiv: 1903.07641.
  50. The MSE Science Team (2019). *The Detailed Science Case for the Maunakea Spectroscopic Explorer, 2019 edition*. *arXiv e-prints*. arXiv: 1904.04907.
  51. Hopkins, P. F. et al. (2018). *FIRE-2 simulations: physics versus numerics in galaxy formation*. *MNRAS* **480**(1), 800–863.
  52. Lamberts, A., S. Garrison-Kimmel, P. F. Hopkins, E. Quataert, J. S. Bullock, C.-A. Faucher-Giguère, A. Wetzel, D. Kereš, K. Drango, and **R. E. Sanderson** (2018). *Predicting the binary black hole population of the Milky Way with cosmological simulations*. *MNRAS* **480**(2), 2704–2718.
  53. Garrison-Kimmel, S., P. F. Hopkins, A. Wetzel, K. El-Badry, **R. E. Sanderson**, J. S. Bullock, X. Ma, F. van de Voort, Z. Hafen, C.-A. Faucher-Giguère, C. C. Hayward, E. Quataert, D. Kereš, and M. Boylan-Kolchin (2018). *The origin of the diverse morphologies and kinematics of Milky Way-mass galaxies in the FIRE-2 simulations*. *MNRAS* **481**(3), 4133–4157. arXiv: 1712.03966.
  54. **Sanderson, R. E.**, A. Secunda, K. V. Johnston, and J. J. Bochanski (2017). *New views of the distant stellar halo*. *MNRAS* **470**, 5014–5031.

- 
55. **Sanderson, R. E.**, J. Hartke, and A. Helmi (2017). *Modeling the Gravitational Potential of a Cosmological Dark Matter Halo with Stellar Streams*. *ApJ* **836**, 234.
  56. **Sanderson, R. E.**, A. R. Wetzel, S. Sharma, and P. F. Hopkins (2017). *Better Galactic Mass Models through Chemistry*. *Galaxies* **5**(3), 43.
  57. Garrison-Kimmel, S., A. R. Wetzel, J. S. Bullock, P. F. Hopkins, M. Boylan-Kolchin, C.-A. Faucher-Giguere, D. Keres, E. Quataert, **R. E. Sanderson**, A. S. Graus, and T. Kelley (2017). *Not so lumpy after all: modelling the depletion of dark matter subhaloes by Milky Way-like galaxies*. *MNRAS* **471**, 1709–1727.
  58. Miller, B. W., T. Ahumada, T. H. Puzia, G. N. Candlish, S. S. McGaugh, J. C. Mihos, **R. E. Sanderson**, M. Schirmer, R. Smith, and M. A. Taylor (2017). *The Extended Baryonic Halo of NGC 3923*. *Galaxies* **5**(3), 29.
  59. **Sanderson, R. E.**, C. Vera-Ciro, A. Helmi, and J. Heit (2016). *Stream-subhalo interactions in the Aquarius simulations*. *A&A, subm.* arXiv: 1608.05624.
  60. **Sanderson, R. E.** (2016). *Inferring the Galactic Potential with GAIA and Friends: Synergies with Other Surveys*. *ApJ* **818**, 41.
  61. Helmi, A. and **R. E. Sanderson** (2015). Mass modelling from stellar streams in the Milky Way. In: *Galaxy Masses as Constraints of Formation Models*. Ed. by M. Cappellari and S. Courteau. Vol. 311. IAU Symposium, pp.11–15.
  62. **Sanderson, R. E.**, A. Helmi, and D. W. Hogg (2015). *Action-space Clustering of Tidal Streams to Infer the Galactic Potential*. *ApJ* **801**, 98.
  63. Bochanski, J. J., B. Willman, N. Caldwell, **R. E. Sanderson**, A. A. West, J. Strader, and W. Brown (2014). *The Most Distant Stars in the Milky Way*. *ApJ* **790**, L5.
  64. **Sanderson, R. E.**, A. Helmi, and D. W. Hogg (2014). Action-space clustering of tidal streams to map the Galactic potential. In: *Setting the scene for Gaia and LAMOST*. Ed. by S. Feltzing, G. Zhao, N. A. Walton, and P. Whitelock. Vol. 298. IAU Symposium, pp.207–212.
  65. Burgasser, A. J., J. K. Faherty, S. Schmidt, A. A. West, M. R. Zapatero Osorio, J. S. Pineda, B. Burningham, C. Nicholls, **R. E. Sanderson**, E. Shkolnik, D. Rodriguez, A. Riedel, and V. Joergens (2013). *The kinematics of very low mass dwarfs: Splinter session summary*. *Astronomische Nachrichten* **334**, 93.
  66. **Sanderson, R. E.** and A. Helmi (2013). *An analytical phase-space model for tidal caustics*. *MNRAS* **435**, 378–399.
  67. **Sanderson, R. E.**, R. Mohayaee, and J. Silk (2012). *Enhancements to velocity-dependent dark matter interactions from tidal streams and shells in the Andromeda galaxy*. *MNRAS* **420**, 2445–2456.
  68. Ahlen, S. et al. (2010). *The Case for a Directional Dark Matter Detector and the Status of Current Experimental Efforts*. *International Journal of Modern Physics A* **25**, 1–51.
  69. **Sanderson, R. E.** and E. Bertschinger (2010). *Seen and Unseen Tidal Caustics in the Andromeda Galaxy*. *ApJ* **725**, 1652–1675.
  70. Burgasser, A. J., S. Witte, C. Helling, **R. E. Sanderson**, J. J. Bochanski, and P. H. Hauschildt (2009). *Optical and Near-Infrared Spectroscopy of the L Subdwarf SDSS J125637.13-022452.4*. *ApJ* **697**, 148–159.
  71. Cushing, M. C., D. Looper, A. J. Burgasser, J. D. Kirkpatrick, J. Faherty, K. L. Cruz, A. Sweet, and **R. E. Sanderson** (2009). *2MASS J06164006-6407194: The First Outer Halo L Subdwarf*. *ApJ* **696**, 986–993.
  72. Kallivayalil, N., G. Besla, **R. E. Sanderson**, and C. Alcock (2009). *Revisiting the Role of M31 in the Dynamical History of the Magellanic Clouds*. *ApJ* **700**, 924–930.
  73. Richardson, D. C., P. Elankumaran, and **R. E. Sanderson**. (2005). *Numerical experiments with rubble piles: equilibrium shapes and spins*. *Icarus* **173**, 349–361.

---

## Recent conference talks & workshops

**Self-Interacting Dark Matter: Models, Simulations and Signals** Pollica, Italy, 19-23 June 2023

**Galaxy Evolution vs. Wide-Field Spectroscopy** Biosphere 2, Tucson, AZ 27-31 March 2023 (invited plenary and discussion leader)

**Linking the Galactic and Extragalactic** Wollongong, NSW, Australia, 28 Nov–2 Dec 2022 (invited plenary)

**Streams 22** Carnegie Observatories, Pasadena, CA 31 October–4 November 2022 (invited)

**Towards Real-Time Galactic Dynamics** Lorentz Center, Leiden, Netherlands, 25–29 July 2022 (SOC)

**53rd Division on Dynamical Astronomy Meeting** Flatiron Institute, New York, NY 25–28 April 2022 (SOC)

**Astrophysical windows on dark matter** Royal Society, London, England, 3-5 November 2021 (invited; could not attend due to Covid)

---

**SDSS Collaboration meeting 2021** Virtual meeting, 11-12 & 16-17 August 2021 (invited plenary)

**Phenomenology 2021** Virtual meeting, 24-26 May 2021 (invited plenary)

**Streams 2021** Virtual meeting, 22-26 February 2021 (invited discussion leader at live session)

**IAUS 353: Galactic Dynamics in the Era of Large Surveys** Shanghai, China, 30 June–5 July 2019  
(invited review)

**Science in Our Own Backyard: Exploring the Galaxy and the Local Group with WFIRST**  
Pasadena, 17–21 June 2019 (SOC)

**In the Balance: Stasis and Disequilibrium in the Milky Way** Kavli Institute for Theoretical Physics, 1–4 Apr  
2019 (Invited)

**Gaia Sprint** Kavli Institute for Theoretical Physics, 25–29 March 2019

**COSPAR 42nd Assembly** Pasadena, 14–22 July 2018 (Solicited)

**Shedding Light on the Dark Universe with Extremely Large Telescopes** Trieste, 2–6 July 2018 (Invited)

**Stellar Halos Across the Cosmos** Max Planck Institute for Astronomy, Heidelberg, 2–6 July 2018 (con-  
tributed)

**Small-Scale Structure of Dark Matter** Kavli Institute for Theoretical Physics, 18–22 June 2018 (Invited)

**49th Division on Dynamical Astronomy Meeting** San Jose, CA 15–19 April 2018 (Invited)

**The 21st Century H-R Diagram** STScI Spring Symposium, 23–26 April 2018 (Invited)

**Shedding Light on the Dark Universe with Extremely Large Telescopes** UCLA, 2–6 April 2018 (Invited)

**Science with Precision Astrometry** STScI, 13–15 March 2018 (Invited)

**Has Sterile Neutrino Dark Matter Been Detected?** Lorentz Center, 5–9 Feb 2018 (Invited)

**Searching for Dwarf Companions of the Milky Way and Beyond in the LSST Era**  
NOAO, Tucson, AZ 11–13 Oct 2017 (Invitation-only workshop)

---

## Recent colloquia

**University of Alabama Huntsville** Physics & Astronomy Colloquium, 27 April 2023

**University of Mississippi** Physics & Astronomy Colloquium, 25 April 2023

**Space Telescope Science Institute/Johns Hopkins University** Joint Astrophysics Colloquium, 8 February  
2023

**Yale University** Astronomy & Astrophysics Colloquium, 27 October 2022

**University of Hawaii Institute for Astronomy** Colloquium, 25 May 2022

**Temple University** Physics Colloquium, 7 March 2022

**Liverpool John Moores University** Astronomy Seminar, 8 December 2021 (virtual)

**Sharif University** Cosmology & Physics Colloquium, 17 October 2021 (virtual)

**Aspen Center for Physics** Colloquium, 3 June 2021

**Carnegie Observatories** Astronomy Colloquium, 13 April 2021

**University of Toledo** Astronomy Colloquium, 4 March 2021

**Munich** Joint Astrophysics Colloquium, 21 January 2021

**UNSW** School of Physics Colloquium, 23 July 2020

**University of Pennsylvania** Physics Colloquium, 13 May 2020

**Rider University** Science Friday, 6 March 2020

**IAS/Princeton University** Joint Astrophysics Colloquium, 3 Feb 2020

---

**SUNY Stony Brook** Astronomy Colloquium, 5 March 2019  
**Steward Observatory** Astronomy Colloquium, 21 Feb 2019  
**NRC Hertzberg Institute** Astronomy Colloquium, 5 Feb 2019  
**University of British Columbia** Physics & Astronomy Colloquium, 4 Feb 2019  
**McGill Space Science Institute** Astronomy Seminar, 8 Jan 2019  
**University of Washington** Astronomy Colloquium, 3 May 2018  
**University of Pennsylvania** Astronomy Seminar, 16 March 2018  
**Michigan State University** Astronomy Colloquium, 29 January 2018  
**Rutgers University** Astronomy Colloquium, 24 January 2018  
**University of Pittsburgh** Astronomy Colloquium, 22 January 2018  
**University of Florida** Astronomy Colloquium, 18 January 2018  
**Harvard CfA** Galaxies and Cosmology seminar, 7 November 2017  
**Caltech** Astronomy colloquium, 18 October 2017

---

## Service

Chair, Nancy Grace Roman Space Telescope Early-Definition Astrophysics Survey Assessment Committee  
Member of the **AURA Roman-Rubin Synergy Working Group** that developed a white paper on frontier science benefiting from synergies between these major survey facilities.

**Committee of the Division on Dynamical Astronomy** of the American Astronomical Society, 2020–2023.

**Lead developer, ananke synthetic survey pipeline.** Synthesizes resolved stellar surveys from zoomed cosmological-hydrodynamical simulations of Milky-Way-mass galaxies. [ananke.hub.yt](http://ananke.hub.yt).

Associate Institutional Member of the **Sloan Digital Sky Survey V** and **William Herschel Telescope Enhanced-Area Velocity Explorer (WEAVE)**. External Collaborator for the **Sloan Digital Sky Survey IV**.

**FSWG Chair, WFIRST Astrometry Working Group.** Led development of white paper on science cases and considerations for astrometry with the WFIRST Wide-Field Imager.

Member of the **WFIRST Infrared Nearby Galaxy Survey Science Investigation Team** (PIs: B. Williams, J. Dalcanton). Generating mock observations of nearby galaxy halos from simulations.

Proposal reviewer for NSF, NASA, HST, STFC (UK), ANR (France), FONDECYT (Chile); Referee for ApJ, MNRAS, A&A.