

# Ethan Nadler | Curriculum Vitae

University of California, San Diego  
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## Research

### Galaxy Formation

- Understanding how the faintest galaxies formed and evolved;
- Modeling the connection between dwarf galaxies and dark matter halos.

### Dark Matter

- Searching for signals of dark matter microphysics in small-scale structure data;
- Simulating structure formation beyond CDM using high-resolution simulations.

### Near-field Cosmology

- Reconstructing primordial density fluctuations from local dwarf galaxy surveys;
- Combining dwarf galaxies and strong lensing to search for galaxy-free dark halos.

## Positions

**University of California, San Diego** 2025–  
*Assistant Professor, Department of Astronomy & Astrophysics*

**Carnegie Observatories & University of Southern California** 2021–24  
*Joint Postdoctoral Research Fellow, CTAC & USC Department of Physics and Astronomy*

## Education

**Stanford University** 2021  
*Ph.D., Physics (Advisor: Risa H. Wechsler)*

Thesis: [Faint Galaxies and Small Halos: Probes of Galaxy Formation and Dark Matter](#)

**University of California, Santa Barbara** 2016  
*B.S., Physics (Advisor: S. Peng Oh)*

Thesis: Universality in the Structure and Abundance of Dark Matter Halos

## Grants

**NSF Astronomy & Astrophysics Research Grant (PI; \$419,979)** 2024–  
*Collaborative Research: Reconstructing Primordial Density Fluctuations using Near-Field Cosmology*

**UC San Diego School of Physical Sciences Outreach Grant (PI; \$2,500)** 2024–25  
*The Preuss School + UCSD Astronomy & Astrophysics: Dark Matter & Scientific Programming*

**Carnegie Outreach Grant (PI; \$1,500)** 2022–24  
*CreateNow + Carnegie: Dark Matter & Data Visualization*

## Scientific Collaborations

**Rubin LSST Dark Energy Science Collaboration:** Co-Convener, Dark Matter Working Group 2025–

**Satellites Around Galactic Analogs Survey:** Member 2019–

**DECam Local Volume Exploration Survey:** Member 2019–

**Rubin LSST Dark Energy Science Collaboration:** Member 2018–

**Dark Energy Survey:** Member, Milky Way Working Group 2018–

## Fellowships & Awards

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<b>LSST Scialog Fellow:</b> Research Corporation for Science Advancement	2025
<b>ACCESS Allocation:</b> Optimizing Next-generation Cosmological Zoom-in Simulations	2025–
<b>Faculty Fellow:</b> San Diego Supercomputer Center	2025
<b>XSEDE Allocation:</b> Cosmological Simulations of Milky Way Analogs with Galactic Disks	2022–23
<b>XSEDE Allocation:</b> Simulations of Milky Way Halos with Large Magellanic Cloud Analogs	2020–22
<b>NSF Graduate Research Fellow:</b> National Science Foundation	2018–21
<b>Faculty Committee Commendation of Excellence:</b> UCSB College of Creative Studies	2016
<b>Outstanding Senior Award:</b> UCSB Department of Physics	2016

## Teaching

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<b>Professor (UCSD)</b>	2025–
◦ ASTR 2: <i>Galaxies and the Universe</i> (Spring '25, '26);	
◦ ASTR 122: <i>Physical Cosmology</i> (Winter '26).	
<b>Guest Lecturer (USC)</b>	2022
◦ <i>Advanced Cosmology:</i> Lecture on <i>Structure Formation &amp; Galaxies</i> .	
<b>Textbook Co-Author (UC Davis)</b>	2022
◦ <i>A Cosmology Workbook:</i> <a href="#">31: Structure Formation</a> , <a href="#">32: Galaxy Formation</a> .	
<b>Teaching Assistant (Stanford)</b>	2017–21
◦ <i>Structure Formation &amp; Galaxy Formation, Modern Astrophysics, Cosmology &amp; Extragalactic Astrophysics, Origin &amp; Development of the Cosmos, Electricity &amp; Magnetism.</i>	

## Service

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<b>Workshop Organizer</b> ( <a href="#">Spec-S5 Dark Matter Meeting</a> , KICP)	2025
<b>Conference Organizer</b> ( <a href="#">GalFRESKA</a> , UCSD)	2025
<b>ArXiv Hour Committee Chair</b> (UCSD Astronomy & Astrophysics)	2025–
<b>Postdoctoral Scholar Mentor</b> (UCSD Astronomy & Astrophysics)	2025–
<b>Graduate Advisory Committee Member</b> (UCSD Astronomy & Astrophysics)	2025–
<b>Doctoral Committee Member</b> (UCSD Physics)	2025–
<b>Graduate Admissions Committee Member</b> (UCSD Astronomy & Astrophysics)	2024–25
<b>Conference Coordinator</b> ( <a href="#">Cosmic Signals of Dark Matter Physics: New Synergies</a> , KITP)	2024
<b>Proposal Review Panel Member</b> (NASA ADAP, NSF AAG)	2022–
<b>USC Physics and Astronomy Climate Committee</b> (Postdoctoral & Staff Representative)	2021–24
<b>Journal Referee</b> ( <i>ApJ</i> , <i>ApJL</i> , <i>Astronomy &amp; Astrophysics</i> , <i>Astroparticle Physics</i> , <i>JCAP</i> , <i>MNRAS</i> , <i>Nature</i> , <i>PRD</i> , <i>PRL</i> , <i>Reviews of Modern Physics</i> , <i>Language &amp; Cognition</i> , <i>Lingua</i> )	2019–

## Outreach

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<b>Lyncean Group of San Diego Lecture</b> ( <a href="#">Speaker</a> )	2025
<b>UCSD STARTastro: Astronomy Workshop</b> ( <a href="#">Speaker</a> )	2025
<b>UCSD Stellar Beginnings: Astronomy &amp; Astrophysics Department Launch</b> ( <a href="#">Speaker</a> )	2025
<b>UCSD Preuss High School: Dark Matter &amp; Scientific Programming</b> ( <a href="#">Course Instructor</a> )	2025
<b>Carnegie Observatories Lectures at the Huntington</b> ( <a href="#">Speaker</a> )	2023
<b>USC Hybrid High School: Dark Matter &amp; Data Visualization</b> ( <a href="#">Course Instructor</a> )	2022
<b>UCSB Physics NSF REU</b> ( <a href="#">Speaker</a> )	2021–25
<b>San Mateo County Astronomical Society</b> ( <a href="#">Speaker</a> )	2021

# Mentoring

## Postdoc Advisor (bold: current)

2025–

- **Sandip Roy**, UCSD Schmidt AI Fellow: Emulating small-scale dark matter structure

## Graduate Student Advisor (bold: current; †: thesis student )

2025–

- †**Ollie Jackson**, UCSD: Strong lensing dark matter substructure modeling and constraints
- †**Wisha Wanichwecharungruang**, UCSD: Near-field cosmology using semi-analytic models
- †**Zewei Wu**, UCSD: Hydrodynamic simulations of ultra-faint dwarf satellite galaxies

## Undergraduate Student Advisor (bold: current; †: thesis student )

2025–

- **Stephen Canino**, UCSD '28: Subhalo abundance evolution in zoom-in simulations
- **Kimmy Dang**, Yale '28: Large Magellanic Cloud satellite populations across environments
- Steve Du, UCSD '25: Sterile neutrino dark matter constraints from small-scale structure
- **Bocheng Feng**, Peking '26: Dark matter halo pseudo phase space density profiles
- **Roxanne Lai**, UCSD '28: Subhalo abundance evolution in zoom-in simulations
- †**Sophia Um**, UCSD, '26: Environmental dependence of dwarf galaxy star formation

## Graduate Student Co-advisor (bold: current)

2021–

- Niussha Ahvazi, UCR '24 → UVA: Semi-analytic modeling of dwarf galaxy formation and evolution (see [N. Ahvazi, A. Benson, L. Sales, E. O. Nadler et al. 2024](#));
- **Arif Chu**, USC: Dark matter–baryon scattering constraints from Milky Way satellite galaxies;
- **Wendy Crumrine**, USC: Constraining dark matter–radiation interactions with small-scale structure (see [W. Crumrine, E. O. Nadler et al. 2024](#));
- **Tara Dacunha**, Stanford: Satellite galaxy disruption and stellar stream modeling;
- Elise Darragh-Ford, Stanford '24: Searching for dwarf galaxies and stellar streams in *Gaia* data (see [E. Darragh-Ford, E. O. Nadler et al. 2021](#));
- **Trey Driskell**, USC '25: Semi-analytic modeling of structure and galaxy formation (see [T. Driskell, E. O. Nadler et al. 2022, 2024](#));
- Noah Glennon, UNH '23: Soliton orbital evolution in self-interacting axion dark matter (see [N. Glennon, E. O. Nadler et al. 2022](#); [N. Glennon, N. Musoke, E. O. Nadler et al. 2024](#));
- **Demao Kong**, UCR: Modeling SIDM subhalo populations in the Milky Way and strong lens analogs (see [D. Kong, H.-B. Yu, E. O. Nadler et al. 2025](#));
- Sidney Mau, Stanford '25: Constraining the dark matter particle lifetime with dwarf galaxies (see [S. Mau, E. O. Nadler et al. 2022](#));
- **Siddhesh Raut**, USC: Self-interacting dark matter halo gravothermal evolution modeling;
- Yunchong Wang, Stanford '24: Empirically modeling dwarf galaxy star formation histories (see [Y. Wang, E. O. Nadler et al. 2021, 2024a](#); [Y. Wang, P. Mansfield, E. O. Nadler et al. 2024b](#));
- **James Wen**, USC: Hydrodynamic simulations of dark matter–baryon interactions;
- Xingyu Zhang, Tsinghua '25: Modeling stellar stream perturbers as SIDM subhalos (see [X. Zhang, H.-B. Yu, D. Yang, and E. O. Nadler 2025](#)).

## Undergraduate, Post-baccalaureate, & High-school Student Co-advisor

2018–

- Deveshi Buch, Stanford '24: Cosmological zoom-in simulations of Milky Way-like systems (see [D. Buch, E. O. Nadler et al. 2024](#));
- Shuxing Fang, USC '22: Large Magellanic Cloud infall in self-interacting dark matter;
- Abigail Lee, UPenn '19 → UChicago: Subhalo disruption in galaxy clusters.
- Nyal McCrea (Simons–NSBP Scholar), CWU '22: Zoom-in simulation visualizations;
- Ellen Min, Caltech '24: Code development and Python implementation for [Galacticus](#);
- Nicel Mohamed-Hinds, Stanford '19 → UW: Emulating hydrodynamic zoom-in simulations;
- Ezra Msolla (Simons–NSBP Scholar), UToronto '25: Neutrino self-interaction impact on cosmic structure
- Veronica Pratt, Stanford '23 → Tufts: Statistics of Large Magellanic Cloud analogs in the SAGA Survey;
- Juan Quiroz, Caltech '24: Modeling subhalo evolution in decaying dark matter models;
- Derek Rodriguez, USC Hybrid High '23 → UCLA: Symphony simulation analysis;
- Resherle Verna, USC '20 → UT Austin: Subhalo populations in SIDM + hydrodynamic simulations;
- Logan White (Simons–NSBP Scholar), NCSU '25: Halo mass function evolution beyond CDM;

## Media

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<b>Astronomy Magazine</b> , <i>How Weird is the Milky Way?</i>	2025
<b>USC Today</b> , <i>Scientists code Milky Way twin galaxies to better understand dark matter</i>	2025
<b>UC San Diego Today</b> , <i>A New Astronomy Programs Helps Young Minds Tackle Big Questions</i>	2025
<b>UC San Diego Today</b> , <i>Do “Completely Dark” Dark Matter Halos Exist?</i>	2025
<b>UC Riverside News</b> , <i>New dark matter theory explains two puzzles in astrophysics</i>	2023
<b>Quanta Magazine</b> , <i>In a Monster Star’s Light, a Hint of Darkness</i>	2023
<b>KIPAC Research Highlight</b> , <i>Between the worlds of the visible and invisible lies: Dark Matter</i>	2021
<b>Fermilab Press Release</b> , <i>DES census of the smallest galaxies hones the search for dark matter</i>	2020
<b>SLAC Press Release</b> , <i>Milky Way satellites reveal link between dark matter and galaxy formation</i>	2020
<b>AAS Nova Research Highlight</b> , <i>Constraining collisions of dark matter</i>	2019
<b>SLAC Press Release</b> , <i>Satellite galaxies provide new clues about dark matter</i>	2019
<b>KIPAC Research Highlight</b> , <i>Dark matter subhalo disruption: insights from machine learning</i>	2018

## Presentations

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<b><i>Dark Matter Insights from Small-scale Structure</i></b>	2025–
UC San Diego, High Energy Physics Seminar Stony Brook/Brookhaven, YITP Seminar	
<b><i>Which Dark Matter Halos Form Stars?</i></b>	2025–
UCSC 2025 Galaxy Workshop [ <a href="#">video</a> ]	
<b><i>Review: Satellite Galaxies and Stellar Streams as Probes of SIDM</i></b>	2025
Valencia Instituto de Física Corpuscular, Small-scale Structure of the Universe & SIDM [ <a href="#">slides</a> ]	
<b><i>Revealing Dark Matter and Galaxy Formation with Small-Scale Structure</i></b>	2024–25
University of Washington, Astronomy Colloquium Stanford/KIPAC, Astrophysics Colloquium UCSC, Astronomy & Astrophysics Colloquium UC Merced, Physics Colloquium Carnegie Observatories, Colloquium Rice, Astronomy & Astrophysics Seminar UC San Diego, Astrophysics Colloquium Caltech, TAPIR Seminar	
<b><i>COZMIC: Cosmological Zoom-in Simulations with Initial Conditions Beyond CDM</i></b>	2024–25
UCLA, Dark Matter 2025 [ <a href="#">slides</a> ] Princeton, Dark Cosmos Seminar Carnegie Observatories, GalFRESCA [ <a href="#">slides</a> ] PACIFIC Conference	
<b><i>Review: What can Dwarf Galaxies Reveal about the Nature of Dark Matter?</i></b>	2024–25
Dynamical Tracers of the Nature of Dark Matter [ <a href="#">slides</a> ] Durham, Small Galaxies, Cosmic Questions - II [ <a href="#">slides</a> ]	
<b><i>Dark Matter Physics in the Sky</i></b>	2024
KITP Blackboard Talk [ <a href="#">video</a> ]	
<b><i>Forecasts for Galaxy Formation and Dark Matter Constraints from Dwarf Galaxy Surveys</i></b>	2024
LSST DESC, Seminar LBNL, Fundamental Physics from Future Spectroscopic Surveys [ <a href="#">slides</a> ]	

<b><i>SIDM (Sub)halos in Milky Way and Strong Lens Analogs</i></b> Pollica Physics Centre, Self-Interacting Dark Matter Models, Simulations and Signals [ <a href="#">slides</a> ]	2023
<b><i>Cosmological Simulations with Novel Dark Matter Physics</i></b> UC Riverside, GalFRESCA UCLA, Dark Matter 2023 [ <a href="#">slides</a> ] KICP, Astronomy & Astrophysics Seminar	2023
<b><i>The Faint End of the Galaxy–Halo Connection</i></b> KITP, Building a Physical Understanding of Galaxy Evolution [ <a href="#">video</a> ]	2023
<b><i>Dark Matter Constraints from Small-Scale Structure</i></b> CERN, New Physics from Galaxy Clustering [ <a href="#">video</a> , <a href="#">slides</a> ]	2022
<b><i>Symphony: Cosmological Zoom-in Simulations over Four Decades of Host Halo Mass</i></b> Caltech, GalFRESCA [ <a href="#">slides</a> ]	2022
<b><i>Dark Matter Physics + Rubin LSST</i></b> LSST DESC, CosmoPalooza [ <a href="#">slides</a> ]	2022
<b><i>Towards Precision Near-Field Cosmology</i></b> KIPMU, Astro Lunch Seminar UC Riverside, Astronomy Seminar Fermilab, Cosmic Physics Center Seminar [ <a href="#">video</a> ]	2021–22
<b><i>Dark Matter Constraints from a Unified Analysis of Strong Lenses and Satellite Galaxies</i></b> LSST DESC, Dark Matter Working Group Virginia Tech Center for Neutrino Physics, Journal Club	2021
<b><i>The Faintest Galaxies and their Dark Matter Halos</i></b> Caltech, TAPIR Seminar Harvard-Smithsonian Center for Astrophysics, GCSP Seminar [ <a href="#">video</a> ] International Centre for Theoretical Sciences, Less Travelled Path of Dark Matter [ <a href="#">video</a> , <a href="#">slides</a> ] UC Berkeley Center for Cosmological Physics, Cosmology Seminar [ <a href="#">slides</a> ] STScI, The Local Group: Assembly and Evolution KITP, The Galaxy–Halo Connection Across Cosmic Time: Recent Updates [ <a href="#">video</a> ] LIneA, Webinar [ <a href="#">video</a> , <a href="#">slides</a> ] KIPAC, Astrophysics Colloquium [ <a href="#">video</a> ] Fermilab, New Perspectives [ <a href="#">slides</a> ] BSM Pandemic Seminar [ <a href="#">video</a> , <a href="#">slides</a> ]	2020–21
<b><i>Milky Way Satellites: Probes of Dark Matter Microphysics</i></b> University of Chicago, Cosmic Controversies [ <a href="#">slides</a> ] KICP, LSST Dark Matter Workshop [ <a href="#">slides</a> ] Institute for Advanced Study, Astro Coffee Johns Hopkins, High Energy Physics/Cosmology Seminar UC Berkeley, LSST DESC Winter Collaboration Meeting	2019
<b><i>Modeling Subhalos and Satellites in Milky Way-like Systems</i></b> KICP, Near-Field Cosmology with DES DR1 [ <a href="#">slides</a> ] KITP, The Small-Scale Structure of Cold(?) Dark Matter [ <a href="#">video</a> , <a href="#">slides</a> ] UC Berkeley Center for Cosmological Physics, Cosmology Seminar [ <a href="#">slides</a> ]	2018
<b><i>Predicting Realistic Subhalo Populations</i></b> KITP, The Galaxy–Halo Connection Across Cosmic Time	2017



## First-authored Publications (Google Scholar $h$ -index: 32; \*: $\geq 100$ Google Scholar citations)

20. **E. O. Nadler**, V. Gluscevic, and A. Benson. *The Effects of Linear Matter Power Spectrum Enhancement on Dark Matter Substructure*. 2507.16889 (ApJ in press).
19. **E. O. Nadler**, D. Kong, D. Yang, and H.-B. Yu. *SIDM Concerto: Compilation and Data Release of Self-interacting Dark Matter Zoom-in Simulations*. 2025, [ApJ](#), 991, 69.
18. **E. O. Nadler**, R. An, D. Yang, H.-B. Yu, A. Benson, and V. Gluscevic. *COZMIC. III. Cosmological Zoom-in Simulations of Self-interacting Dark Matter with Suppressed Initial Conditions*. 2025, [ApJ](#), 986, 129.
17. **E. O. Nadler**, R. An, V. Gluscevic, A. Benson, and X. Du. *COZMIC. I. Cosmological Zoom-in Simulations with Initial Conditions Beyond Cold Dark Matter*. 2025, [ApJ](#), 986, 127.
16. **E. O. Nadler** & A. Benson. *Semianalytic model for decaying dark matter halos*. 2025, [PRD](#), 111, 103522.
15. **E. O. Nadler**. *The Impact of Molecular Hydrogen Cooling on the Galaxy Formation Threshold*. 2025, [ApJL](#), 983, L23.
14. **E. O. Nadler**, V. Gluscevic, T. Driskell, R. H. Wechsler, L. A. Moustakas, *et al.* *Forecasts for Galaxy Formation and Dark Matter Constraints from Dwarf Galaxy Surveys*. 2024, [ApJ](#), 967, 61.
13. **E. O. Nadler**, D. Yang, and H.-B. Yu. *A Self-interacting Dark Matter Solution to the Extreme Diversity of Low-mass Halo Properties*. 2023, [ApJL](#), 958, L39.
12. **E. O. Nadler**, P. Mansfield, Y. Wang, X. Du *et al.* *Symphony: Cosmological Zoom-in Simulation Suites over Four Decades of Host Halo Mass*. 2023, [ApJ](#), 945, 159.
11. **E. O. Nadler**, A. Benson, T. Driskell, X. Du, and V. Gluscevic. *Growing the first galaxies' merger trees*. 2023, [MNRAS](#), 521, 3201.
10. **E. O. Nadler**, A. Banerjee, S. Adhikari, Y.-Y. Mao, and R. H. Wechsler. *The Effects of Dark Matter and Baryonic Physics on the Milky Way Subhalo Population in the Presence of the Large Magellanic Cloud*. 2021, [ApJL](#), 920, L11.
- \*9. **E. O. Nadler**, S. Birrer, D. Gilman, R. H. Wechsler, X. Du, A. Benson, A. Nierenberg, and T. Treu. *Dark Matter Constraints from a Unified Analysis of Strong Gravitational Lenses and Milky Way Satellite Galaxies*. 2021, [ApJ](#), 917, 7.
- \*8. **E. O. Nadler** & A. Drlica-Wagner *et al.* (DES Collaboration). *Constraints on Dark Matter Properties from Observations of Milky Way Satellite Galaxies*. 2021, [PRL](#), 126, 091101.
7. **E. O. Nadler**, A. Banerjee, S. Adhikari, Y.-Y. Mao, and R. H. Wechsler. *Signatures of Velocity-dependent Dark Matter Self-interactions in Milky Way-mass Halos*. 2020, [ApJ](#), 896, 112.
- \*6. **E. O. Nadler** & R. H. Wechsler *et al.* (DES Collaboration). *Milky Way Satellite Census. II. Galaxy-Halo Connection Constraints Including the Impact of the Large Magellanic Cloud*. 2020, [ApJ](#), 893, 48.
- \*5. **E. O. Nadler**, V. Gluscevic, K. K. Boddy, and R. H. Wechsler. *Constraints on Dark Matter Microphysics from the Milky Way Satellite Population*. 2019, [ApJL](#), 878, L32.
- \*4. **E. O. Nadler**, Y.-Y. Mao, G. M. Green, and R. H. Wechsler. *Modeling the Connection between Subhalos and Satellites in Milky Way-like Systems*. 2019, [ApJ](#), 873, 34.
3. **E. O. Nadler**, Y.-Y. Mao, R. H. Wechsler, S. Garrison-Kimmel, and A. Wetzel. *Modeling the Impact of Baryons on Subhalo Populations with Machine Learning*. 2018, [ApJ](#), 859, 129.
2. **E. O. Nadler**, A. Perko, and L. Senatore. *On the bispectra of very massive tracers in the Effective Field Theory of Large-Scale Structure*. 2018, [JCAP](#), 1, 058.
1. **E. O. Nadler**, S. P. Oh, and S. Ji. *On the apparent power law in CDM halo pseudo-phase space density profiles*. 2017, [MNRAS](#), 470, 500.

## Co-authored Publications (\*: $\geq 100$ Google Scholar citations)

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50. C. Y. Tan, A. Drlica-Wagner, A. B. Pace, W. Cerny, **E. O. Nadler** *et al.* (DELVE Collaboration). *DELVE Milky Way Satellite Census I: Satellite Population and Survey Selection Function*. (ApJ submitted).  
○ Major contributions: Interpreted empirical constraints on total Milky Way satellite population and its anisotropy.
49. E. Kado-Fong *et al.* (SAGA Survey, incl. **E. O. Nadler**). *SAGAbg III: Environmental Stellar Mass Functions, Self-Quenching, and the Stellar-to-Halo Mass Relation in the Dwarf Galaxy Regime*. (ApJ submitted).
48. Y. Asali *et al.* (SAGA Survey, incl. **E. O. Nadler**). *The SAGA Survey. VI.: The Size–Mass Relation for Low-Mass Galaxies Across Environments*. (ApJ submitted).
47. D. Kong, H.-B. Yu, **E. O. Nadler** *et al.* *Novel Challenges in Tracking Self-Interacting Dark Matter Subhalos*. [2507.09799](#) (JCAP submitted).  
○ Major contributions: Conceptualized subhalo finder comparison and interpreted subhalo population results.
46. T. Driskell, **E. O. Nadler**, A. Benson, and V. Gluscevic. *Population synthesis and astrophysical inference for high- $z$  JWST galaxies*. [2410.11680](#) (MNRAS submitted).  
○ Major contributions: Conceptualized likelihood framework and interpreted galaxy–halo connection results.
45. D. C. Baxter, A. L. Coil, **E. O. Nadler** *et al.* *Quantifying the Impact of Incompleteness on Identifying and Interpreting Galaxy Protocluster Populations with the TNG-Cluster Simulation*. 2025, [ApJ](#), **990**, 225.
44. M. S. Fischer, K. Dolag, M. Garny, V. Gluscevic, F. Groth, and **E. O. Nadler**. *N-body simulations of dark matter-baryon interactions*. 2025, [A&A](#) **700**, A145.
43. K. Tsiane, S. Mau, A. Drlica-Wagner, J. L. Carlin, P. S. Ferguson, K. Bechtol, **E. O. Nadler** *et al.* (DESC Collaboration). *Predictions for the Detectability of Milky Way Satellite Galaxies and Outer-Halo Star Clusters with the Vera C. Rubin Observatory*. 2025, [OJAp](#), **8**.  
○ Major contributions: Co-developed predictions for Rubin Milky Way satellite luminosity function constraints.
42. Y. Wang, P. Mansfield, **E. O. Nadler**, E. Darragh-Ford, and R. H. Wechsler. *EDEN: Exploring Disks Embedded in N-body simulations of Milky-Way-mass halos from Symphony*. 2025, [ApJ](#), **986**, 147.  
○ Major contributions: Co-developed disk potential simulation algorithm and interpreted disruption results.
41. R. An, **E. O. Nadler**, A. Benson, and V. Gluscevic. *COZMIC. II. Cosmological Zoom-in Simulations with Fractional non-CDM Initial Conditions*. 2025, [ApJ](#), **986**, 128  
○ Major contributions: Developed pipeline for fractional non-CDM simulations and derived constraints.
40. S. Ando, S. Horigome, **E. O. Nadler**, D. Yang, and H.-B. Yu. *SASHIMI-SIDM: semi-analytical subhalo modelling for self-interacting dark matter at sub-galactic scales*. 2025, [JCAP](#), **2**, 053.  
○ Major contributions: Derived analytic prediction for core-collapsed fraction and interpreted subhalo results.
39. W. Crumrine, **E. O. Nadler**, R. An, and V. Gluscevic. *Dark matter coupled to radiation: Limits from the Milky Way satellites*. 2025, [PRD](#), **111**, 023530.  
○ Major contributions: Co-developed and interpreted dark matter–radiation scattering constraints.
38. D. Yang, **E. O. Nadler**, and H.-B. Yu. *Testing the parametric model for self-interacting dark matter using matched halos in cosmological simulations*. 2025, [Physics of the Dark Universe](#), **47**, 101807.  
○ Major contributions: Provided cosmological SIDM simulations and interpreted parametric model results.
37. X. Zhang, H.-B. Yu, D. Yang, and **E. O. Nadler**. *The GD-1 Stellar Stream Perturber as a Core-collapsed Self-interacting Dark Matter Halo*. 2025, [ApJL](#), **978**, L23.  
○ Major contributions: Developed subhalo resimulation method and interpreted GD-1 results.
36. Y. Wang, **E. O. Nadler** *et al.* (SAGA Survey). *The SAGA Survey. V. Modeling Satellite Systems around Milky Way–mass Galaxies with Updated UNIVERSEMACHINE*. 2024, [ApJ](#), **976**, 119.  
○ Major contributions: Interpreted galaxy–halo connection constraints; co-developed modeling pipeline.

35. M. Geha *et al.* (SAGA Survey, incl. **E. O. Nadler**). *The SAGA Survey. IV. The Star Formation Properties of 101 Satellite Systems around Milky Way–mass Galaxies*. 2024, [ApJ](#), 976, 118.
34. Y.-Y. Mao *et al.* (SAGA Survey, incl. **E. O. Nadler**). *The SAGA Survey. III. A Census of 101 Satellite Systems around Milky Way–mass Galaxies*. 2024, [ApJ](#), 976, 117.
33. E. Kado-Fong *et al.* (SAGA Survey, incl. **E. O. Nadler**). *SAGAbg II: The Low-mass Star-forming Sequence Evolves Significantly between  $0.05 < z < 0.21$* . 2024, [ApJ](#), 976, 83.
32. [D. Buch](#), **E. O. Nadler**, R. H. Wechsler, and Y.-Y. Mao. *Milky Way-est: Cosmological Zoom-in Simulations with Large Magellanic Cloud and Gaia–Sausage–Enceladus Analogs*. 2024, [ApJ](#), 971, 79.
  - Major contributions: Piloted constrained zoom-in simulations and co-developed analysis pipeline.
31. P. Mansfield, E. Darragh-Ford, Y. Wang, **E. O. Nadler**, B. Diemer, and R. H. Wechsler. *SYMFIND: Addressing the Fragility of Subhalo Finders and Revealing the Durability of Subhalos*. 2024, [ApJ](#), 970, 178.
30. X. Du *et al.* (incl. **E. O. Nadler**). *Tidal evolution of cored and cuspy dark matter halos*. 2024, [PRD](#), 110, 023019.
29. E. Kado-Fong *et al.* (SAGA Survey, incl. **E. O. Nadler**). *SAGAbg. I. A Near-unity Mass-loading Factor in Low-mass Galaxies via Their Low-redshift Evolution in Stellar Mass, Oxygen Abundance, and Star Formation Rate*. 2024, [ApJ](#), 966, 129.
28. [N. Ahvazi](#), A. Benson, L. V. Sales, **E. O. Nadler** *et al.* *A comprehensive model for the formation and evolution of the faintest Milky Way dwarf satellites*. 2024, [MNRAS](#), 529, 3387.
  - Major contributions: Interpreted galaxy–halo connection and Milky Way satellite predictions.
27. [N. Glennon](#), N. Musoke, **E. O. Nadler**, C. Prescod-Weinstein, and R. H. Wechsler. *Dynamical friction in self-interacting ultralight dark matter*. 2024, [PRD](#), 109, 063501.
26. D. Yang, **E. O. Nadler**, H.-B. Yu, and Y.-M. Zhong. *A parametric model for self-Interacting dark matter halos*. 2024, [JCAP](#), 2, 032.
  - Major contributions: Ran cosmological SIDM simulations and interpreted parametric model performance.
25. M. McNanna, K. Bechtol, S. Mau, **E. O. Nadler** *et al.* (DES Collaboration). *A Search for Faint Resolved Galaxies Beyond the Milky Way in DES Year 6: A New Faint, Diffuse Dwarf Satellite of NGC 55*. 2024, [ApJ](#), 961, 126
  - Major contributions: Developed dwarf galaxy population predictions and interpreted NGC 55 satellite.
24. P. Hopkins, **E. O. Nadler**, M. Grudić, X. Shen *et al.* *Novel conservative methods for adaptive force softening in collisionless and multispecies N-body simulations*. 2023, [MNRAS](#), 525, 5951.
  - Major contributions: Conceptualized softening algorithms and interpreted cosmological simulation results.
23. E. Darragh-Ford *et al.* (DESI Collaboration, incl. **E. O. Nadler**). *Target Selection and Sample Characterization for the DESI LOW-Z Secondary Target Program*. 2023, [ApJ](#), 954, 149.
22. R. An, V. Gluscevic, **E. O. Nadler**, and Y. Zhang. *Can Neutrino Self-interactions Save Sterile Neutrino Dark Matter?* 2023, [ApJL](#), 954, L18.
  - Major contributions: Developed sterile neutrino limits and interpreted production mechanism constraints.
21. A. Banerjee, S. Das, A. Maharana, **E. O. Nadler**, and R. K. Sharma. *Nonthermal warm dark matter limits from small-scale structure*. 2023, [PRD](#), 108, 043518.
  - Major contributions: Derived small-scale structure constraints and interpreted results.
20. W. Cerny *et al.* (DELVE Collaboration, incl. **E. O. Nadler**). *Six More Ultra-faint Milky Way Companions Discovered in the DECam Local Volume Exploration Survey*. 2023, [ApJ](#), 953, 1.
19. D. Yang, **E. O. Nadler**, and H.-B. Yu. *Strong Dark Matter Self-interactions Diversify Halo Populations within and surrounding the Milky Way*. 2023, [ApJ](#), 949, 67.
  - Major contributions: Performed cosmological SIDM simulations and interpreted dwarf galaxy predictions.



18. S. Yang, X. Du, Z. C Zeng, A. Benson, F. Jiang, **E. O. Nadler et al.** *Gravothermal Solutions of SIDM Halos: Mapping from Constant to Velocity-dependent Cross Section*. 2023, [ApJ, 946, 47](#).
17. S. Wagner-Carena, J. Aalbers, S. Birrer, **E. O. Nadler et al.** *From Images to Dark Matter: End-to-end Inference of Substructure From Hundreds of Strong Gravitational Lenses*. 2023, [ApJ, 942, 75](#).
16. [T. Driskell](#), **E. O. Nadler**, J. Mirocha, A. Benson, K. K. Boddy et al. *Structure formation and the global 21-cm signal in the presence of Coulomb-like dark matter-baryon interactions*. 2022, [PRD, 106, 103525](#).
  - Major contributions: Interpreted structure formation predictions for interacting dark matter models.
15. [N. Glennon](#), **E. O. Nadler**, N. Musoke, A. Banerjee, C. Prescod-Weinstein, and R. H. Wechsler. *Tidal disruption of solitons in self-interacting ultralight axion dark matter*. 2022, [PRD, 105, 123540](#).
  - Major contributions: Conceptualized and interpreted soliton tidal disruption simulations.
14. [S. Mau](#), **E. O. Nadler**, R. H. Wechsler, A. Drlica-Wagner, K. Bechtol et al. (DES Collaboration). *Milky Way Satellite Census. IV. Constraints on Decaying Dark Matter from Observations of Milky Way Satellite Galaxies*. 2022, [ApJ, 932, 128](#).
  - Major contributions: Performed cosmological decaying dark matter simulations and derived constraints.
13. J. Bhattacharyya, S. Adhikari, A. Banerjee, S. More, A. Kumar, **E. O. Nadler et al.** *The Signatures of Self-Interacting Dark Matter and Subhalo Disruption on Cluster Substructure*. 2022, [ApJ, 932, 30](#).
12. J. F. Wu, J. E. G. Peek, E. J. Tollerud, Y.-Y. Mao, **E. O. Nadler et al.** *Extending the SAGA Survey (xSAGA). I. Satellite Radial Profiles as a Function of Host Galaxy Properties*. 2022, [ApJ, 927, 121](#).
11. D. Nguyen, D. Sarnaik, K. K. Boddy, **E. O. Nadler**, and V. Gluscevic. *Observational constraints on dark matter scattering with electrons*. 2021, [PRD, 104, 103521](#).
- \*10. A. Drlica-Wagner et al. (DELVE Collaboration, incl. **E. O. Nadler**). *The DECam Local Volume Exploration Survey: Overview and First Data Release*. 2021, [ApJS, 256, 2](#).
9. Y. Wang, **E. O. Nadler**, Y.-Y. Mao, S. Adhikari, R. H. Wechsler et al. *UniverseMachine: Predicting Galaxy Star Formation over Seven Decades of Halo Mass with Zoom-in Simulations*. 2021, [ApJ, 915, 116](#).
  - Major contributions: Interpreted dwarf galaxy star formation history predictions; analyzed simulations.
8. [E. Darragh-Ford](#), **E. O. Nadler**, S. McLaughlin, and R. H. Wechsler. *Searching for Dwarfs in Gaia DR2 Phase-space Data using Wavelet Transforms*. 2021, [ApJ, 915, 48](#).
  - Major contributions: Piloted and developed search algorithm; predicted number of detected dwarfs.
7. S. Das & **E. O. Nadler**. *Constraints on the epoch of dark matter formation from Milky Way satellites*. 2021, [PRD, 103, 043517](#).
  - Major contributions: Derived and interpreted constraints on dark matter formation redshift.
6. K. Maamari, V. Gluscevic, K. K. Boddy, **E. O. Nadler**, and R. H. Wechsler. *Bounds on Velocity-dependent Dark Matter–Proton Scattering from Milky Way Satellite Abundance*. 2021, [ApJL, 907, L46](#).
  - Major contributions: Developed numerical techniques to constrain interacting dark matter models.
- \*5. Y.-Y. Mao, M. Geha, R. H. Wechsler, B. Weiner, E. J. Tollerud, **E. O. Nadler et al.** (SAGA Survey). *The SAGA Survey. II. Building a Statistical Sample of Satellite Systems around Milky Way–like Galaxies*. 2021, [ApJ, 907, 85](#).
  - Major contributions: Provided theoretical predictions for SAGA satellite populations and interpreted results.
- \*4. A. Drlica-Wagner, K. Bechtol, S. Mau, M. McNanna, **E. O. Nadler et al.** (DES Collaboration). *Milky Way Satellite Census. I. The Observational Selection Function for Milky Way Satellites in DES Y3 and Pan-STARRS DR1*. 2020, [ApJ, 893, 47](#).
  - Major contributions: Developed machine-learning model of satellite detection sensitivity; analyzed simulations.
- \*3. S. Mau et al. (DELVE Collaboration, incl. **E. O. Nadler**). *Two Ultra-Faint Milky Way Stellar Systems Discovered in Early Data from the DECam Local Volume Exploration Survey*. 2020, [ApJ, 890, 136](#).

2. C. E. Martínez-Vázquez *et al.* (DES Collaboration, incl. **E. O. Nadler**). *Search for RR Lyrae stars in DES ultrafaint systems: Grus I, Kim 2, Phoenix II, and Grus II*. 2019, [MNRAS](#), **490**, 2183.

1. K. M. Stringer *et al.* (DES Collaboration, incl. **E. O. Nadler**). *Identification of RR Lyrae Stars in Multi-band, Sparsely Sampled Data from the Dark Energy Survey Using Template Fitting and Random Forest Classification*. 2019, [AJ](#), **158**, 16.

## White Papers

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11. J. Han *et al.* *NANCY: Next-generation All-sky Near-infrared Community survey*. 2023, [2306.11784](#).

10. A. Drlica-Wagner *et al.* *Report of the Topical Group on Cosmic Probes of Dark Matter for Snowmass 2021*. 2022, [2209.08215](#)

9. A. Banerjee *et al.* *Snowmass2021 Cosmic Frontier White Paper: Cosmological Simulations for Dark Matter Physics*. 2022, [2203.07049](#)

○ Major contributions: Developed simulation algorithm section and flowchart for tests of dark matter physics.

8. K. Bechtol *et al.* *Snowmass2021 Cosmic Frontier White Paper: Dark Matter Physics from Halo Measurements*. 2022, [2203.07354](#).

○ Major contributions: Developed ultra-faint dwarf galaxy section and power spectrum visualization.

7. Y.-Y. Mao *et al.* *Snowmass2021: Vera C. Rubin Observatory as a Flagship Dark Matter Experiment*. 2022, [2203.07252](#).

6. K. Boddy *et al.* *Astrophysical and Cosmological Probes of Dark Matter*. 2022, [2203.06380](#).

5. S. Gezari *et al.* *R2-D2: Roman and Rubin – From Data to Discovery*. 2022, [2202.12311](#).

4. V. Gluscevic *et al.* *Cosmological Probes of Dark Matter Interactions: The Next Decade*. 2019, [1903.05140](#).

3. J. Simon *et al.* *Dynamical Masses for a Complete Census of Local Dwarf Galaxies*. 2019, [1903.04743](#).

2. K. Bechtol *et al.* *Dark Matter Science in the Era of LSST*. 2019, [1903.04425](#).

1. A. Drlica-Wagner *et al.* *Probing the Fundamental Nature of Dark Matter with the Large Synoptic Survey Telescope*. 2019, [1902.01055](#).

○ Major contributions: Developed dwarf galaxy section and forecasted dark matter constraints.

## Book Reviews

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1. **E. O. Nadler**. *Dark Matter: Evidence, Theory, and Constraints* (Book Review). 2025, [Am. J. Phys](#) **93**, 763.

## Interdisciplinary Publications

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6. **E. O. Nadler**, D. Guilbeault, S. Ringold, T. R. Williamson *et al.* *Statistical or Embodied? Comparing Colorseeing, Colorblind, Painters, and Large Language Models in their Processing of Color Metaphors*. 2025, [Cognitive Science](#), **49**, e70083.

5. D. Guilbeault, S. Delecourt, T. Hull, B. S. Desikan, M. Chu, and **E. O. Nadler**. *Online images amplify gender bias*. 2024, [Nature](#), **626**, 1049.

4. **E. O. Nadler**, E. Darragh-Ford, B. S. Desikan *et al.* *Divergences in color perception between deep neural networks and humans*. 2023, [Cognition](#), **241**, 105621.

3. M. Chu, B. S. Desikan, **E. O. Nadler** *et al.* *Signal in Noise: Exploring Meaning Encoded in Random Character Sequences with Character-Aware Language Models*. 2022, [Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics](#), 7120

2. B. S. Desikan, T. Hull, **E. O. Nadler** *et al.* *comp-syn: Perceptually Grounded Word Embeddings with Color*. 2020, [Proceedings of the 28th International Conference on Computational Linguistics](#), 1744.

1. D. Guilbeault, **E. O. Nadler** *et al.* *Color associations in abstract semantic domains*. 2020, [Cognition](#), **201**, 104306.