

# Ethan Nadler | Curriculum Vitae

University of California, San Diego  
9500 Gilman Dr. – La Jolla, CA 92093 – USA

✉ [enadler@ucsd.edu](mailto:enadler@ucsd.edu) •  [eonadler](#) •  [Ethan O. Nadler](#)

## 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–

*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>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
<b>Worster Summer Research Fellow:</b> UCSB Department of Physics	2015

## Mentoring

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**Undergraduate Student Advisor (bold: current; †: thesis student )** 2025–

- **Steve Du**, UCSD '25: Sterile neutrino dark matter small-scale structure constraints
- **Sophia Um†**, UCSD, '26: Environmental dependence of dwarf galaxy star formation

**Graduate Student Co-advisor (current in bold)** 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: 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;
- Sidney Mau, Stanford: 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 → Synrad: Visualizing subhalo populations;
- 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;

## Teaching

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<b>Professor (UCSD)</b>	2025–
◦ <i>ASTR 2: Galaxies and the Universe</i> (Spring '25).	
<b>Guest Lecturer (USC)</b>	2022
◦ <i>Advanced Cosmology: Lecture on Structure Formation &amp; Galaxies.</i>	
<b>Textbook Co-Author (UC Davis)</b>	2022
◦ <i>A Cosmology Workbook: 31: <a href="#">Structure Formation</a>, 32: <a href="#">Galaxy Formation</a>.</i>	
<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>	
<b>Course Assistant (UCSB)</b>	2015–16
◦ <i>Relativistic Quantum Mechanics, Kinetic Theory &amp; Relativity, Mechanics &amp; Waves, Newtonian Mechanics.</i>	
<b>Tutor (UCSB Campus Learning Assistance Services)</b>	2015–16
◦ Held biweekly supplementary lectures for <i>Basic Physics, Linear Algebra, Differential Equations.</i>	

## Service

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<b>Postdoctoral Scholar Mentor (UCSD Astronomy &amp; Astrophysics)</b>	2025
<b>Doctoral Committee Member (UCSD Physics)</b>	2025
<b>Conference Coordinator (KITP, <a href="#">Cosmic Signals of Dark Matter Physics: New Synergies</a>)</b>	2024
<b>Proposal Review Panel Member (NASA ADAP, NSF AAG)</b>	2022–
<b>USC Physics and Astronomy Climate Committee (Postdoctoral &amp; Staff Representative)</b>	2021–24
<b>Journal Referee (<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>Language &amp; Cognition</i>, <i>Lingua</i>)</b>	2019–

## Outreach

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<b>UCSD Stellar Beginnings: Astronomy &amp; Astrophysics Department Launch (<a href="#">Speaker</a>)</b>	2025
<b>UCSD Preuss High School: Dark Matter &amp; Scientific Programming (<a href="#">Course Instructor</a>)</b>	2025
<b>Carnegie Observatories Lectures at the Huntington (<a href="#">Speaker</a>)</b>	2023
<b>USC Hybrid High School: Dark Matter &amp; Data Visualization (<a href="#">Course Instructor</a>)</b>	2022
<b>Carnegie Observatories Lectures at Pasadena City College (Speaker)</b>	2022
<b>Carnegie Observatories Lunch with an Astronomer (Speaker)</b>	2022
<b>Cosmic Cocktail Hour with Carnegie Observatories (Speaker)</b>	2022
<b>UCSB Physics NSF REU (Speaker)</b>	2021–24
<b>San Mateo County Astronomical Society (<a href="#">Speaker</a>)</b>	2021
<b>Astronomy on Tap San Francisco (Speaker and Volunteer)</b>	2018–20
<b>Stanford Future Advancers of Science and Technology (Physics Mentor)</b>	2017–19

## Media

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<b>UC San Diego Today, <a href="#">A New Astronomy Programs Helps Young Minds Tackle Big Questions</a></b>	2025
<b>UC San Diego Today, <a href="#">Do “Completely Dark” Dark Matter Halos Exist?</a></b>	2025
<b>UC Riverside News, <a href="#">New dark matter theory explains two puzzles in astrophysics</a></b>	2023
<b>Quanta Magazine, <a href="#">In a Monster Star’s Light, a Hint of Darkness</a></b>	2023
<b>KIPAC Research Highlight, <a href="#">Between the worlds of the visible and invisible lies: Dark Matter</a></b>	2021

<b>Fermilab Press Release</b> , <a href="#">DES census of the smallest galaxies hones the search for dark matter</a>	2020
<b>SLAC Press Release</b> , <a href="#">Milky Way satellites reveal link between dark matter and galaxy formation</a>	2020
<b>AAS Nova Research Highlight</b> , <a href="#">Constraining collisions of dark matter</a>	2019
<b>SLAC Press Release</b> , <a href="#">Satellite galaxies provide new clues about dark matter</a>	2019
<b>KIPAC Research Highlight</b> , <a href="#">Dark matter subhalo disruption: insights from machine learning</a>	2018

## Invited Presentations

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<b><i>Review: Satellite Galaxies and Stellar Streams as Probes of SIDM</i></b> Valencia Instituto de Física Corpuscular, Small-scale Structure of the Universe and SIDM	2025
<b><i>Revealing Dark Matter and Galaxy Formation with Small-Scale Structure</i></b> UC Santa Cruz, Astronomy & Astrophysics Colloquium UC Merced, Physics Colloquium Carnegie Observatories, Colloquium Rice, Astronomy & Astrophysics Seminar UC San Diego, Astrophysics Colloquium Caltech, TAPIR Seminar	2024–
<b><i>COZMIC: Cosmological Zoom-in Simulations with Initial Conditions Beyond CDM</i></b> UCLA, Dark Matter 2025 [ <a href="#">slides</a> ] Princeton, Dark Cosmos Seminar Carnegie Observatories, GalFRESCA [ <a href="#">slides</a> ] PACIFIC Conference	2024–
<b><i>Review: What can Dwarf Galaxies Reveal about the Nature of Dark Matter?</i></b> Dynamical Tracers of the Nature of Dark Matter [ <a href="#">slides</a> ] Durham, Small Galaxies, Cosmic Questions - II [ <a href="#">slides</a> ]	2024–
<b><i>Dark Matter Physics in the Sky</i></b> KITP Blackboard Talk [ <a href="#">video</a> ]	2024
<b><i>Forecasts for Galaxy Formation and Dark Matter Constraints from Dwarf Galaxy Surveys</i></b> LSST DESC, Seminar LBNL, Fundamental Physics from Future Spectroscopic Surveys [ <a href="#">slides</a> ]	2024
<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	2022

## *Towards Precision Near-Field Cosmology*

2021–22

KIPMU, Astro Lunch Seminar

UC Riverside, Astronomy Seminar

Fermilab, Cosmic Physics Center Seminar [[video](#)]

## *Dark Matter Constraints from a Unified Analysis of Strong Lenses and Satellite Galaxies*

2021

LSST DESC, Dark Matter Working Group

Virginia Tech Center for Neutrino Physics, Journal Club

## *The Faintest Galaxies and their Dark Matter Halos*

2020–21

Caltech, TAPIR Seminar

Harvard-Smithsonian Center for Astrophysics, GCSP Seminar [[video](#)]

International Centre for Theoretical Sciences, Less Travelled Path of Dark Matter [[video](#), [slides](#)]

UC Berkeley Center for Cosmological Physics, Cosmology Seminar [[slides](#)]

STScI, The Local Group: Assembly and Evolution

KITP, The Galaxy–Halo Connection Across Cosmic Time: Recent Updates [[video](#)]

LIneA, Webinar [[video](#), [slides](#)]

KIPAC, Astrophysics Colloquium [[video](#)]

Fermilab, New Perspectives [[slides](#)]

BSM Pandemic Seminar [[video](#), [slides](#)]

## *Milky Way Satellites: Probes of Dark Matter Microphysics*

2019

University of Chicago, Cosmic Controversies [[slides](#)]

KICP, LSST Dark Matter Workshop [[slides](#)]

Institute for Advanced Study, Astro Coffee

Johns Hopkins, High Energy Physics/Cosmology Seminar

UC Berkeley, LSST DESC Winter Collaboration Meeting

## *Modeling Subhalos and Satellites in Milky Way-like Systems*

2018

KICP, Near-Field Cosmology with DES DR1 [[slides](#)]

KITP, The Small-Scale Structure of Cold(?) Dark Matter [[video](#), [slides](#)]

UC Berkeley Center for Cosmological Physics, Cosmology Seminar [[slides](#)]

## *Predicting Realistic Subhalo Populations*

2017

KITP, The Galaxy–Halo Connection Across Cosmic Time

## **First-authored Publications**

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**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*. [2503.10748](#) (ApJ submitted).

**E. O. Nadler**, R. An, D. Yang, H.-B. Yu, A. Benson, and V. Gluscevic. *COZMIC. III. Cosmological Zoom-in Simulations of SIDM with Suppressed Initial Conditions*. [2412.13065](#) (ApJ in press).

**E. O. Nadler**, R. An, V. Gluscevic, A. Benson, and X. Du. *COZMIC. I. Cosmological Zoom-in Simulations with Initial Conditions Beyond CDM*. [2410.03635](#) (ApJ in press).

**E. O. Nadler** & A. Benson. *Semianalytic model for decaying dark matter halos*. 2025, [PRD](#), **111**, 103522.

**E. O. Nadler**. *The Impact of Molecular Hydrogen Cooling on the Galaxy Formation Threshold*. 2025, [ApJL](#), **983**, L23.

**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.

**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.



- 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.
- E. O. Nadler**, A. Benson, T. Driskell, X. Du, and V. Gluscevic. *Growing the first galaxies' merger trees*. 2023, [MNRAS](#), **521**, 3201.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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

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- 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*. [2504.16203](#) (OJA submitted).
- Major contributions: Developed predictions for Rubin Milky Way satellite luminosity function observations.
- M. Fischer, K. Dolag, M. Garny, V. Gluscevic, F. Groth, and **E. O. Nadler**. *N-body simulations of dark matter-baryon interactions*. [2504.12393](#) (A&A submitted).
- Major contributions: Conceptualized scattering algorithm and developed halo formation simulation.
- 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*. [2504.03836](#) (ApJ submitted).
- R. An, **E. O. Nadler**, A. Benson, and V. Gluscevic. *COZMIC. II. Cosmological Zoom-in Simulations with Fractional non-CDM Initial Conditions*. [2411.03431](#) (ApJ in press).
- Major contributions: Developed fractional simulation pipeline and interpreted constraints.
- 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 astrophysical constraints.

- 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*. 2408.01487 (ApJ in press).
- Major contributions: Developed disk potential algorithm and growth model; interpreted disruption results.
- 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: Analytic prediction for core-collapse fraction and interpretation of SIDM models.
- 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: Interpreted improvement and scaling of dark matter–radiation scattering constraints.
- 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: Ran cosmological SIDM simulations and interpreted performance of parametric model.
- 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.
- Y. Wang, **E. O. Nadler et al.** (SAGA Collaboration). *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; developed modeling pipeline.
- M. Geha *et al.* (SAGA Collaboration, 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](#).
- Y.-Y. Mao *et al.* (SAGA Collaboration, incl. **E. O. Nadler**). *The SAGA Survey. III. A Census of 101 Satellite Systems around Milky Way–mass Galaxies*. 2024, [ApJ, 976, 117](#).
- E. Kado-Fong *et al.* (SAGA Collaboration, incl. **E. O. Nadler**). *SAGAbg II: The Low-mass Star-forming Sequence Evolves Significantly between  $0.05 < z < 0.21$* . 2024, [ApJ, 976, 83](#).
- 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: Conceptualization; co-developed zoom-in simulation pipeline and analysis.
- 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](#).
- X. Du *et al.* (incl. **E. O. Nadler**). *Tidal evolution of cored and cuspy dark matter halos*. 2024, [PRD, 110, 023019](#).
- E. Kado-Fong *et al.* (SAGA Collaboration, 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](#).
- 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.
- 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](#).
- 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 comparisons to parametric model.
- 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.

- 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 small-scale structure results.
- 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.
- 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 framework for sterile neutrino constraints.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Y.-Y. Mao, M. Geha, R. H. Wechsler, B. Weiner, E. J. Tollerud, **E. O. Nadler et al.** *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.
- 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.
- 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](#).
- 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](#).
- K. M. Stringer et al. (DES Collaboration, incl. **E. O. Nadler**). *Identification of RR Lyrae Stars in Multiband, 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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- J. Han et al. *NANCY: Next-generation All-sky Near-infrared Community survey*. 2023, [2306.11784](#).
- A. Drlica-Wagner et al. *Report of the Topical Group on Cosmic Probes of Dark Matter for Snowmass 2021*. 2022, [2209.08215](#)
- 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.
- 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.
- Y.-Y. Mao et al. *Snowmass2021: Vera C. Rubin Observatory as a Flagship Dark Matter Experiment*. 2022, [2203.07252](#).
- K. Boddy et al. *Astrophysical and Cosmological Probes of Dark Matter*. 2022, [2203.06380](#).
- S. Gezari et al. *R2-D2: Roman and Rubin – From Data to Discovery*. 2022, [2202.12311](#).
- V. Gluscevic et al. *Cosmological Probes of Dark Matter Interactions: The Next Decade*. 2019, [1903.05140](#).
- J. Simon et al. *Dynamical Masses for a Complete Census of Local Dwarf Galaxies*. 2019, [1903.04743](#).
- K. Bechtol et al. *Dark Matter Science in the Era of LSST*. 2019, [1903.04425](#).
- 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.

## Interdisciplinary Publications

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- 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, [osf.io/f9n2w\\_v1](#) (Cognitive Science in press).
- D. Guilbeault, S. Delecourt, T. Hull, B. S. Desikan, M. Chu, and **E. O. Nadler**. *Online images amplify gender bias*. 2024, [Nature, 626, 1049](#).

**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.

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

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.

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