Noah G. Sailer

Postdoctoral Researcher in Cosmology
@ Stanford // Cambridge

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Education

2019 – 2025 • **University of California, Berkeley** – Berkeley, CA
Ph.D., Physics 2025
M.A., Physics 2021

2015 – 2019 • **Cornell University college of Arts and Sciences** – Ithaca, NY
B.A. *summa cum laude* in Physics & *cum laude* in Mathematics 2019

Research Positions

2025 – t_0 • **Porat Fellow** – Stanford University & SLAC National Accelerator Laboratory
Stephen Hawking Advanced Fellow / Senior Research Associate – University of Cambridge
Joint position based at Stanford, 2 years → Cambridge, 3 years

2019 – '25 • **Graduate Student Researcher** – University of California, Berkeley
Thesis title: Towards accurate cosmology from CMB secondaries and large-scale structure surveys
Advisors: Martin White & Simone Ferraro

2023 • **DOE SCGSR Fellow** – Lawrence Berkeley National Laboratory
Project title: Structure growth from cross-correlations of galaxy clustering and CMB lensing
Advisor: Simone Ferraro

2017 – '19 • **Undergraduate Research Assistant** – Cornell University
Designed and built a cryogenic filter wheel. Failed at searching for fast radio bursts in Atacama Cosmology Telescope (ACT) time ordered data. *Advisors*: Eve Vavagiakis & Michael Niemack

2018 • **DOE SULI Intern** – SLAC National Accelerator Laboratory
Designed top flange and cold finger for a liquid argon (LAr) test-dewar. Failed at using image recognition to identify proton decay in LAr time projection chambers. *Advisors*: Kazuhiro Terao & Hirohisa Tanaka

Honors and Awards

2025 • Porat Fellowship
• Stephen Hawking Advanced Fellowship
• Postdoctoral Research Fellowship at Perimeter Institute, *declined*
2023 • DOE SCGSR Fellowship
2021 • NSF Graduate Research Fellowship, *honorable mention*
2019 • Kieval prize in physics, Cornell University
• Undergraduate teaching award, Cornell University
2018 • DOE SULI Fellowship
• Phi Beta Kappa, Cornell University

Publications

ADS iNSPIRE ORCiD

First Author

1 **N. Sailer**, J. DeRose, S. Ferraro, *et al.*, "Evolution of structure growth during dark energy domination: Insights from the cross-correlation of DESI galaxies with CMB lensing and galaxy magnification," *Phys. Rev. D*, vol. 111, no. 10, 103540, p. 103 540, May 2025. DOI: 10.1103/27rg-tq8z. arXiv: 2503.24385 [astro-ph.CO].

2 **N. Sailer**, G. S. Farren, S. Ferraro, and M. White, "Dispuτable: the high cost of a low optical depth," Apr. 2025. arXiv: 2504.16932 [astro-ph.CO].

Last updated: t_0 = August 15$^{\text{th}}$ 2025

3. **N. Sailer**, B. Hadzhiyska, and S. Ferraro, "Bias hardened estimators of patchy screening profiles," Jun. 2025. arXiv: 2506.17217 [astro-ph.CO].
4. **N. Sailer**, J. Kim, S. Ferraro, *et al.*, "Cosmological constraints from the cross-correlation of DESI Luminous Red Galaxies with CMB lensing from Planck PR4 and ACT DR6," *J. Cosm. Astrop. Phys.*, vol. 2025, no. 6, 008, p. 008, Jun. 2025. DOI: 10.1088/1475-7516/2025/06/008. arXiv: 2407.04607 [astro-ph.CO].
5. **N. Sailer**, S. Ferraro, and E. Schaan, "Foreground-immune CMB lensing reconstruction with polarization," *Phys. Rev. D*, vol. 107, no. 2, 023504, Jan. 2023. DOI: 10.1103/PhysRevD.107.023504. arXiv: 2211.03786 [astro-ph.CO].
6. **N. Sailer**, S.-F. Chen, and M. White, "Optical depth to reionization from perturbative 21 cm clustering," *J. Cosm. Astrop. Phys.*, vol. 2022, no. 10, 007, Oct. 2022. DOI: 10.1088/1475-7516/2022/10/007. arXiv: 2205.11504 [astro-ph.CO].
7. **N. Sailer**, E. Castorina, S. Ferraro, and M. White, "Cosmology at high redshift - a probe of fundamental physics," *J. Cosm. Astrop. Phys.*, vol. 2021, no. 12, 049, Dec. 2021. DOI: 10.1088/1475-7516/2021/12/049. arXiv: 2106.09713 [astro-ph.CO].
8. **N. Sailer**, E. Schaan, S. Ferraro, O. Darwish, and B. Sherwin, "Optimal multifrequency weighting for CMB lensing," *Phys. Rev. D*, vol. 104, no. 12, 123514, Dec. 2021. DOI: 10.1103/PhysRevD.104.123514. arXiv: 2108.01663 [astro-ph.CO].
9. **N. Sailer**, E. Schaan, and S. Ferraro, "Lower bias, lower noise CMB lensing with foreground-hardened estimators," *Phys. Rev. D*, vol. 102, no. 6, 063517, Sep. 2020. DOI: 10.1103/PhysRevD.102.063517. arXiv: 2007.04325 [astro-ph.CO].

Supporting Author

1. R. de Belsunce *et al.*, "Cosmology from Planck CMB Lensing and DESI DR1 Quasar Tomography," Jun. 2025. arXiv: 2506.22416 [astro-ph.CO].
2. B. Hadzhiyska, S. Ferraro, G. S. Farren, **N. Sailer**, and R. Zhou, "Missing baryons recovered: a measurement of the gas fraction in galaxies and groups with the kinematic Sunyaev-Zel'dovich effect and CMB lensing," Jul. 2025. arXiv: 2507.14136 [astro-ph.CO].
3. B. Hadzhiyska, **N. Sailer**, and S. Ferraro, "Mapping the gas density with the kinematic Sunyaev-Zel'dovich and patchy screening effects: a self-consistent comparison," Jun. 2025. arXiv: 2506.17379 [astro-ph.CO].
4. M. Maus, M. White, **N. Sailer**, *et al.*, "A joint analysis of 3D clustering and galaxy $\times$ CMB-lensing cross-correlations with DESI DR1 galaxies," May 2025. arXiv: 2505.20656 [astro-ph.CO].
5. D. Baradaran, B. Hadzhiyska, M. White, and **N. Sailer**, "Predicting the 21-cm field with a hybrid effective field theory approach," *Phys. Rev. D*, vol. 110, no. 10, 103517, p. 103 517, Nov. 2024. DOI: 10.1103/PhysRevD.110.103517. arXiv: 2406.13079 [astro-ph.CO].
6. J. Kim, **N. Sailer**, M. S. Madhavacheril, *et al.*, "The Atacama Cosmology Telescope DR6 and DESI: structure formation over cosmic time with a measurement of the cross-correlation of CMB lensing and luminous red galaxies," *J. Cosm. Astrop. Phys.*, vol. 2024, no. 12, 022, p. 022, Dec. 2024. DOI: 10.1088/1475-7516/2024/12/022. arXiv: 2407.04606 [astro-ph.CO].
7. O. Darwish, B. D. Sherwin, **N. Sailer**, E. Schaan, and S. Ferraro, "Optimizing foreground mitigation for CMB lensing with combined multifrequency and geometric methods," *Phys. Rev. D*, vol. 107, no. 4, 043519, Feb. 2023. DOI: 10.1103/PhysRevD.107.043519. arXiv: 2111.00462 [astro-ph.CO].
8. R. Zhou, S. Ferraro, M. White, *et al.*, "DESI luminous red galaxy samples for cross-correlations," *J. Cosm. Astrop. Phys.*, vol. 2023, no. 11, 097, Nov. 2023. DOI: 10.1088/1475-7516/2023/11/097. arXiv: 2309.06443 [astro-ph.CO].

Last updated: $t_0 =$ August 15^{th} 2025

Alphabetical & White Papers

1. M. Abitbol, I. Abril-Cabezas, S. Adachi, *et al.*, "The Simons Observatory: Science Goals and Forecasts for the Enhanced Large Aperture Telescope," Mar. 2025. arXiv: 2503.00636 [astro-ph.IM].
2. R. Besuner, A. Dey, A. Drlica-Wagner, *et al.*, "The Spectroscopic Stage-5 Experiment," Mar. 2025. arXiv: 2503.07923 [astro-ph.CO].
3. DESI Collaboration, M. Abdul-Karim, A. G. Adame, *et al.*, "Data Release 1 of the Dark Energy Spectroscopic Instrument," Mar. 2025. arXiv: 2503.14745 [astro-ph.CO].
4. K. Abazajian, A. Abdulghafour, G. E. Addison, *et al.*, "Snowmass 2021 CMB-S4 White Paper," Mar. 2022. arXiv: 2203.08024 [astro-ph.CO].
5. S. Ferraro, **N. Sailer**, A. Slošar, and M. White, "Snowmass2021 Cosmic Frontier White Paper: Cosmology and Fundamental Physics from the three-dimensional Large Scale Structure," Mar. 2022. arXiv: 2203.07506 [astro-ph.CO].
6. D. J. Schlegel, S. Ferraro, G. Aldering, *et al.*, "A Spectroscopic Road Map for Cosmic Frontier: DESI, DESI-II, Stage-5," Sep. 2022. arXiv: 2209.03585 [astro-ph.CO].

Presentations

2025
- *The CMB optical depth: resolving tensions with τ and constraining feedback with $\delta\tau$*

Cosmic Ecosystems, Perimeter Institute for Theoretical Physics — Waterloo, Canada
- *Disputable: the high cost of a low optical depth*

Cosmology from Home — virtual

2024
- *What is $S_8(z_{\rm low})$...actually?*

Cosmology group meeting, Columbia — New York City
Cosmology seminar, Institute for Advanced Study — Princeton, NJ
Tri-state cosmology meeting, Center for Computational Astrophysics — New York City
Cosmology seminar, Perimeter Institute for Theoretical Physics — Waterloo, Canada
Modern statistics of galaxies seminar, Ludwig Maximilian University — Munich, Germany
Cosmology seminar, Max Planck Institute for Astrophysics — Garching, Germany
New Physics from Old Light: Illuminating the Universe with CMB Secondaries — Cambridge, UK
Cambridge CMB/LSS meeting — Cambridge, UK
Cosmology in the Adriatic: From PT to AI — Split, Croatia
DESI collaboration meeting — Marseille, France
DESI C3 telecon — virtual
- *Structure growth from the cross-correlation of DESI Luminous Red Galaxies and CMB lensing*

Cosmology seminar, Stanford University — Stanford, CA
TACOS seminar, University of Arizona — Tucson, AZ

2023
- *Update on DESI LRGs $\times$ CMB lensing from Planck and ACT*

DESI collaboration meeting — Waikoloa, HI
- *Ensuring robust inference from DESI LRGs $\times$ ACT CMB lensing*

Cambridge CMB/LSS meeting — Cambridge, UK
DESI collaboration meeting — Durham, UK
- *Accurate cosmology from CMB lensing and galaxy surveys*

INPA seminar, Lawrence Berkeley National Laboratory — Berkeley, CA
- *Foreground-immune CMB lensing reconstruction with polarization*

CMB-S4 Maps to Other Statistics telecon — virtual
Simons Observatory lensing telecon — virtual
Berkeley CMB lunch — Berkeley, CA
- *Cross-correlating DESI Luminous Red Galaxies (LRGs) with ACT CMB lensing*

241st AAS meeting — Seattle, WA

2022 • *Removing extragalactic foregrounds from upcoming CMB lensing measurements*
BCCP cosmology workshop — Vipolže, Slovenia
Cosmology summer school, ICTP — Trieste, Italy

2021 • *Prospects for fundamental physics from high redshift*
Cosmology seminar, Canadian Institute for Theoretical Astrophysics — virtual
Cosmology seminar, Brookhaven National Laboratory — virtual
DESI lunch, Lawrence Berkeley National Laboratory — virtual

2020 • *Removing bias to CMB lensing from extragalactic foregrounds: combined estimators & modified ILCs*
Simons Observatory lensing telecon — virtual

• *Mitigating CMB lensing biases from extragalactic foregrounds with bias-hardening*
Simons Observatory lensing telecon — virtual

Mentorship, Teaching and Outreach

Mentorship

Jun 2024 – t_0 • *primary advisor*: Abby Schleigh, UC Berkeley undergraduate
Pi^2 Scholar (Summer 2024), BPURS Scholar (Spring 2025), SURF L&S Fellow (Summer 2025)

2022 – '23 • *co-advisor*: Nikolaos Kalntis, visiting student at LBNL

Jun – Aug 2022 • *co-advisor*: Kennedy Sleet, Simons-NSBP Scholar

Aug – Dec 2021 • *primary mentor*: Jonathan Conrad, UC Berkeley Physics Directed Reading Program

Teaching

2019 – '21 • Private physics tutor — Berkeley, CA

2017 – '19 • Physics tutor, Learning Strategies Center — Ithaca, NY

2016 • Undergraduate Teaching Assistant, Cornell University — Ithaca, NY
Physics 2217: Electricity and Magnetism (Fall)
Physics 1116: Mechanics and Special Relativity (Spring)

Pedagogical Training

• Physics 4484: Teaching and Learning Physics, Cornell University

Outreach

2020 • Bay Area Science Festival — Berkeley, CA
Gave a public talk about the role of massive neutrinos in cosmology.

• Self e-STEM — Oakland, CA
Volunteer: Helped participants design their own rooms in virtual reality.

2019, 2020 • Splash at Berkeley — Berkeley, CA
Gave a cosmology crash course to local high school students.

2018, 2019 • Expanding Your Horizons — Ithaca, NY
Volunteer: led various physics demos (e.g. Chladni plates)

Professional Service and Leadership

Current Collaboration Membership

2020 – t_0 • Dark Energy Spectroscopic Instrument (DESI)

• Simons Observatory (SO)

Prior Collaboration Membership

2021 – 2025 • CMB-S4

Conference Organization

2022 • *Power Spectrum Science* session co-chair, UC San Diego workshop on Primordial Physics with Spectroscopic Surveys

Journal Reviewer

- The Astrophysical Journal | Physical Review Letters | Physical Review D

Miscellaneous

2022 • Facilitator for UC Berkeley's Respect is a Part of Research

2021 – '22 • Graduate student representative for UC Berkeley faculty hiring committee

2019 – '21 • Social hour coordinator — Physics Department, University of California, Berkeley