

Gerrit Farren

Curriculum Vitae

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I am an Owen Chamberlain Postdoctoral Fellow at Lawrence Berkeley National Laboratory. I obtained my PhD in Applied Mathematics and Theoretical Physics from the University of Cambridge in July 2024 and a Bachelor of Science in Physics from Haverford College in May 2020. My interests lie at the intersection of theoretical and observational cosmology. I analyse the large-scale structure of the Universe using galaxy surveys and gravitational lensing of the cosmic microwave background. I develop and test new approaches and models to probe fundamental physics such as neutrino masses, dark matter properties, and structure formation.

Education

- Oct 2020 – July 2024 **PhD Applied Mathematics and Theoretical Physics**, *University of Cambridge*, Cambridge, United Kingdom
- Aug 2016 – May 2020 **BSc Physics**, *Haverford College*, Haverford, PA, United States

Employment

- Sep 2024 – present **Owen Chamberlain Postdoctoral Fellow**, *Lawrence Berkeley National Laboratory*, Berkeley, CA, United States
- May 2023 – June 2023 **Affiliate Researcher**, *Lawrence Berkeley National Laboratory*, Berkeley, CA, United States
- Oct 2020 – May 2024 **Undergraduate Supervisor**, *University of Cambridge*, Cambridge, United Kingdom
- Oct 2021 – Jan 2022 **Example Class Instructor**, *University of Cambridge*, Cambridge, United Kingdom

Awards and Recognitions

- 2024 – present **Owen Chamberlain Postdoctoral Fellowship**, *Lawrence Berkeley National Laboratory*
- 2020 – 2024 **Isaac Newton Studentship**, *University of Cambridge*
- 2020 – 2023 **Honorary Vice Chancellor's Award**, *University of Cambridge*
- 2020 – 2023 **Helen Stone Scholarship**, *University of Cambridge*
- 2020 **American Physical Society LeRoy Apker Award finalist**, *Haverford College*
- 2019 **Royal Astronomical Society Undergraduate Research Bursary**, *Durham University*
- 2019 **Phi Beta Kappa**, *Haverford College*, Inducted junior year
- 2016 – 2020 **Class of 1950 International Student Scholarship**, *Haverford College*
- 2016 – 2017 **The Robert Maquinay 1948 Scholarship and C.V. Star Scholarship**, *Haverford College*

Publications

First-author publications

Farren, G. S., Krolewski, A., Qu, F. J., Ferraro, S., et al. Atacama Cosmology Telescope: Multiprobe cosmology with unWISE galaxies and ACT DR6 CMB lensing. *Phys. Rev. D*, 111(8):083516, 2025. doi: 10.1103/PhysRevD.111.083516.

Farren, G. S., Sherwin, B. D., Bolliet, B., Namikawa, T., Ferraro, S., and Krolewski, A. Detection of the CMB lensing – galaxy bispectrum. *arXiv e-prints*, art. arXiv:2311.04213, Nov. 2023.

Farren, G. S., Krolewski, A., MacCrann, N., Ferraro, S., et al. The Atacama Cosmology Telescope: Cosmology from Cross-correlations of unWISE Galaxies and ACT DR6 CMB Lensing. *Astrophys. J.* 966(2):157, 2024. doi: 10.3847/1538-4357/ad31a5.

- Farren, G. S.**, Philcox, O. H. E., and Sherwin, B. D. Determining the Hubble constant without the sound horizon: Perspectives with future galaxy surveys. *Phys. Rev. D*, 105(6):063503, 2022. doi: 10.1103/PhysRevD.105.063503.
- Farren, G. S.**, Grin, D., Jaffe, A. H., Hložek, R., and Marsh, D. J. E. Ultralight axions and the kinetic Sunyaev-Zel'dovich effect. *Phys. Rev. D*, 105(6):063513, 2022. doi: 10.1103/PhysRevD.105.063513.
- Farren, G. S.**, Partridge, B., Kneissl, R., Aiola, S., Datta, R., Gralla, M., and Li, Y. Confirming the Calibration of ALMA Using Planck Observations. *Astrophys. J. Supp.* 256(1):19, Sept. 2021. doi: 10.3847/1538-4365/ac090d.

Selected co-authored works

- Sailer, N., **Farren, G. S.**, Ferraro, S., and White, M. Addressing Tensions in Λ CDM Cosmology by an Increase in the Optical Depth to Reionization. *Phys. Rev. Lett.* 136(8):081002, 2026. Joint first authors: N. Sailer and G. S. Farren. doi: 10.1103/6r54-81v4.
- Hadzhiyska, B., Ferraro, S., **Farren, G. S.**, Sailer, N., and Zhou, R. Missing baryons recovered: A measurement of the gas fraction in galaxies and groups with the kinematic Sunyaev-Zel'dovich effect and CMB lensing. *Phys. Rev. D*, 112(12):123507, 2025. doi: 10.1103/mdhz-fgj8.
- The Atacama Cosmology Telescope Collaboration (**incl. GSF**). The Atacama Cosmology Telescope: DR6 power spectra, likelihoods and Λ CDM parameters. *JCAP*, 11:062, 2025. doi: 10.1088/1475-7516/2025/11/062.
- The Atacama Cosmology Telescope Collaboration (**incl. GSF**). The Atacama Cosmology Telescope: DR6 constraints on extended cosmological models. *JCAP*, 11:063, 2025. doi: 10.1088/1475-7516/2025/11/063.
- The ACT and DESI Collaborations (**incl. GSF**). Atacama Cosmology Telescope DR6 and DESI: Structure growth measurements from the cross-correlation of DESI legacy imaging galaxies and CMB lensing from ACT DR6 and Planck PR4. *Phys. Rev. D*, 111(10):103503, 2025. doi: 10.1103/PhysRevD.111.103503.
- Wenzl, L., Bean, R., Chen, S.-F., **Farren, G. S.**, Madhavacheril, M. S., Marques, G. A., Qu, F. J., Sehgal, N., Sherwin, B. D., and Engelen, A. v. Constraining gravity with a new precision EG estimator using Planck + SDSS BOSS data. *Phys. Rev. D*, 109(8):083540, 2024. doi: 10.1103/PhysRevD.109.083540.
- The ACT Collaboration (**incl. GSF**). The Atacama Cosmology Telescope: DR6 Gravitational Lensing Map and Cosmological Parameters. *Astrophys. J.* 962(2):113, 2024. doi: 10.3847/1538-4357/acff5f.
- The ACT Collaboration (**incl. GSF**). The Atacama Cosmology Telescope: A Measurement of the DR6 CMB Lensing Power Spectrum and Its Implications for Structure Growth. *Astrophys. J.* 962(2):112, 2024. doi: 10.3847/1538-4357/acfe06.
- Philcox, O. H., **Farren, G. S.**, Sherwin, B. D., Baxter, E. J., and Brout, D. J. Determining the Hubble constant without the sound horizon: A 3.6% constraint on H_0 from galaxy surveys, CMB lensing, and supernovae. *Phys. Rev. D*, 106(6):063530, 2022. doi: 10.1103/PhysRevD.106.063530.
- Philcox, O. H., Sherwin, B. D., **Farren, G. S.**, and Baxter, E. J. Determining the Hubble Constant without the Sound Horizon: Measurements from Galaxy Surveys. *Phys. Rev. D*, 103(2):023538, 2021. doi: 10.1103/PhysRevD.103.023538.

Selected Talks

- Sep 2026 **Cosmology from the cross-correlation of DESI DR2 galaxies and CMB lensing**, *Cosmic Rhythms*, CBPF, Rio de Janeiro, Brazil, (contributed talk)
- Aug 2026 **The Dark Energy Spectroscopic Instrument–CMB lensing cross-correlations with DR2**, *New Frontiers in Cosmology*, A Coruña, Spain, (contributed talk)
- Aug 2025 **Multi-probe hints for beyond- Λ CDM physics—Untangling evidence from DESI, CMB, and more**, *Evolving Cosmos Workshop*, RIKEN iTHEMS, Saitama, Japan, (invited talk)

- Jul 2025 **Joint view of SZ and X-ray observations from ACT and eROSITA around DESI LRGs**, *Cosmic Ecosystems*, Perimeter Institute, Waterloo, Canada, (contributed talk)
- Jan 2025 **The Atacama Cosmology Telescope: Multi-probe cosmology with ACT CMB lensing and CMB lensing–galaxy cross-correlations**, *Rencontres du Vietnam 2025*, Quy Nhon, Vietnam, (invited talk)
- Nov 2023 **The Atacama Cosmology Telescope: Cosmology from DR6 CMB lensing cross-correlations with unWISE**, *Cosmology and Particle Physics Seminar*, University of Geneva, Switzerland, (invited seminar)
- Nov 2023 **The Atacama Cosmology Telescope: Cosmology from DR6 CMB lensing and cross-correlations with unWISE**, *Waterloo Centre for Astrophysics Seminar*, University of Waterloo, Canada, (invited seminar)
- Oct 2023 **The Atacama Cosmology Telescope: DR6 lensing release and cross-correlations with unWISE**, *CosmoPalooza 2023*, Online, (invited talk)
- Apr 2022 **Measuring H_0 using the equality scale with present and future galaxy surveys**, *American Physical Society April Meeting 2022*, New York City, USA, (contributed talk)

Collaborations

I am a member of several cosmology collaborations focusing on current and future surveys, including:

Atacama Cosmology Telescope Collaboration, Previous-generation CMB observatory in the Atacama Desert, Chile

Simons Observatory Collaboration, State-of-the-art CMB observatory in the Atacama Desert, Chile; currently serving as cross-correlation working group co-chair

Dark Energy Spectroscopic Instrument, Spectroscopic galaxy survey using the Mayall Telescope at Kitt Peak, USA; currently co-leading the Data Release 2 CMB lensing cross-correlation analysis

Legacy Survey of Space and Time Dark Energy Science Collaboration, Photometric galaxy survey beginning operations at the Vera C. Rubin Observatory on Cerro Pachón, Chile