

ChangHoon Hahn

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APPOINTMENTS

University of Arizona, Department of Astronomy Assistant Professor Assistant Astronomer, Steward Observatory	2025 -
Princeton University, Department of Astrophysical Sciences Associate Research Scholar	2020 -2025
Lawrence Berkeley National Laboratory and UC Berkeley Postdoctoral Fellow	2017 - 2020

EDUCATION

New York University — Ph.D. in Physics <i>Advisors</i> : Michael R. Blanton and Roman Scoccimarro <i>Thesis</i> : <i>Galaxies and their Host Dark Matter Structures</i>	2011 - 2017
Rutgers University — B.Sc. in Astrophysics <i>Advisors</i> : Andrew J. Baker and Jerry A. Sellwood <i>Awards</i> : <i>Paul Robeson Scholar</i>	2007 - 2011

GRANTS AND FELLOWSHIPS

Extreme Science and Engineering Discovery Environment (XSEDE) Startup PI; <i>Accelerated SED Modeling of Millions of Galaxies</i> — 2,500 GPU Hours	2022
Dean's Dissertation Fellowship, New York University	2016
James Arthur Graduate Fellowship, New York University	2015
Henry M. MacCracken Fellowship, New York University	2011 - 2015
Dean's Travel Grant, New York University	2015, 2016

LEADERSHIP AND COLLABORATIONS

PFS, Subaru Prime Focus Spectrograph <i>co-leader</i> , PFS Cosmology Survey <i>member</i> , PFS Galaxy Evolution Survey	2022 - 2021 -
DESI, Dark Energy Spectroscopic Instrument <i>Builder</i> , awarded for 3000+ hours of service <i>co-chair</i> , Bright Galaxy Survey Working Group <i>member</i> , Science Committee <i>member</i> , External Collaborator Committee <i>topical group lead</i> , Galaxy Quasar Physics Working Group	2022 - 2019 - 2022 2019 - 2022 2023 - 2024 2022 -
SimBIG Collaboration, Simulation-Based Inference of Galaxies <i>Spokesperson</i>	2021 -
Rubin Observatory Legacy Survey of Space and Time <i>member</i> , Dark Energy Science Collaboration	2023 -

SDSS, Sloan Digital Sky Survey-III, IV

PRIMUS, PRIsm MULti-object Survey

Scientific collaborations: [CAMELS](#), [Quijote](#), [IQ Collaboratory](#), [Learning the Universe](#)**PROFESSIONAL SERVICE**

Organizer	Simulation Based Inference for Galaxy Evolution	2024
Lead Organizer	Winter 2020 Berkeley Cosmology Conference, UC Berkeley, CA	2020
Organizer	Bay Area Likelihood-Free Inference Meeting, Berkeley	2019
Organizer	Likelihood-Free Inference workshop, Flatiron Institute, NYC	2019
Organizer	Berkeley Lab Institute for Nuclear and Particle Astrophysics Seminar	2019 - 2020
Organizer	LBNL/BCCP DESI lunch seminar	2018 - 2020
Organizer	NYU CCPP Astro Coffee	2014 - 2017
Member	Princeton Astro Postdoc Council	2023 - 2024
Member	American Physical Society	
Member	Statistics Without Borders	
Referee	ApJ, MNRAS, JCAP, A&A, PRD, PRL, JOSS, ICML, NeurIPS	
Reviewer	STFC DiRAC Resource Allocation Committee	2023
Reviewer	NASA Nancy Grace Roman Space Telescope Research Panel	2023
Reviewer	FINESST grant	2019 - 2020
Reviewer	AAS Chambliss Award	2017
Attendee	UCSF Scientific Leadership and Management Skills Course	2019

PRESS

Simons Foundation News, Astrophysicists Use AI to Precisely Calculate Universe's 'Settings'	2024
New York Times, The Early Universe Was Bananas	2024
MIT News, Where flood policy helps most	2024
UN Office for Disaster Risk Reduction, Prevention Web News, Where flood policy helps most	2024

RESEARCH ADVISING

Graduate Research			
Yuka Yamada	Univ. of Tokyo		2022 -
James Kyubin Kwon	UC Santa Barbara	<i>4 papers</i>	2019 -
Yan Liang	Princeton	<i>2 papers; 1 peer-reviewed conference paper</i>	2022 -
Jiaxuan Li	Princeton	<i>1 paper; 1 peer-reviewed conference paper</i>	2021 -
Christian Jespersen	Princeton		2021 -
Massimo Pascale	UC Berkeley		2019 - 2021
Undergraduate Research			
Liam Parker	Princeton	<i>1 paper; 1 peer-reviewed conference paper</i>	2022 - 2024
Arin Avsar	UC Berkeley		2019 - 2021
Tess Werhane	UC Berkeley		2019 - 2020
James Zhu	UC Berkeley		2019 - 2020
Patrick Staudt	Rutgers		2019 - 2020

TEACHING

Co-Instructor, Princeton University	2021
<i>Fall 2021 Graduate Seminar in Theoretical Astrophysics (AST541) on Simulation-Based Inference</i>	

- Instructor, Kavli Institute for Theoretical Physics (KITP) 2023
Tutorial on Simulation-Based Inference for the KITP “Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy” program.
- Instructor, DESI Early Career Scientist Workshop 2020
Virtual workshop on spectral energy distribution (SED) analysis of galaxy spectra

DIVERSITY, EQUITY, AND INCLUSION

- Princeton Astrophysics Climate Committee for Equity and Inclusion 2022 - 2024
Postdoc representative on the departmental committee tasked with assessing department climate and identifying and recommending ways to improve equity and inclusion.
- Princeton Astrophysics Affinity Group Committee 2022 -
Coordinating affinity groups for members of historically under-represented groups including Black Latinx, Indigenous, Asian, Pacific Islander, women and gender minorities, and LGBTQ+.
- Princeton Astrophysics Climate Committee Iconography Working Group 2022 - 2024
Updating iconography in Peyton Hall to improve climate and reflect the diversity in the department.
- Princeton Astrophysics Climate Committee TEAM-UP Working Group 2022 - 2024
Implementing the TEAM-UP report to increase the number of African-Americans in astrophysics.
- Princeton Astrophysics Equity and Inclusion Committee on Recruitment 2020 - 2021
Developed actionable plans for recruiting a more diverse body of students, postdocs, and faculty.
- Berkeley Lab In School Settings (BLISS) 2017 - 2019
Instructed science courses in K-8 classrooms in underserved neighborhoods in Richmond, California

OUTREACH

- Member, DESI Education and Public Outreach Committee 2020 - 2021
- Volunteer, QuarkNet Physics In and Through Cosmology Workshop 2020
- Volunteer, UC Berkeley Astro Night 2018 - 2019
- Volunteer, Berkeley Lab Exploration of New Discoveries (BLEND): Big Data 2018
- Volunteer, Intrepid Museum Kids Week Meet the Scientist 2017
- Volunteer, NY Hall of Science Big Data Fest 2015
- Appeared in an episode of the NYTimes podcast *Tell Me Something I Don't Know* 2016

PUBLICATIONS

total: 103 — first author: 22 — total citations: 5280, h-index: 32, i10-index: 59 [ADS] [Google Scholar]

PRIMARY AUTHOR

38. **Hahn, C.**; Melchior, P. *Inhomogeneous Dust Biases Photometric Redshifts and Stellar Masses for LSST* ApJL submitted 2024 ([arXiv:2409.19054](#)).
37. Cano, L.; **Hahn, C.** *Exposing disparities in flood adaptation for equitable future interventions in the USA* Nature Communications 15, 8333 2024 ([arXiv:2312.03843](#)).
Featured in Nature Communications Editor's Highlight
36. **Hahn, C.**; Lemos, P.; Parker, L.; *et al.* *Cosmological constraints from non-Gaussian and nonlinear galaxy clustering using the SIMBIG inference framework*
Nature Astronomy 2024 ([arXiv:2310.15246](#)).
35. **Hahn, C.**; Bottrell, C.; Lee, K.G. *HALOFLOW I: Neural Inference of Halo Mass from Galaxy Photometry and Morphology* ApJ 968, 90, 2024 ([arXiv:2310.04503](#)).
34. Massara, E.; **Hahn, C.** *et al.* *SIMBIG: Cosmological Constraints using Simulation-Based Inference*

of *Galaxy Clustering with Marked Power Spectra* PRD accepted 2024 ([arXiv:2404.04228](#)).

33. Kwon, K. J.; **Hahn, C.** *Modeling the Kinematics of Central and Satellite Galaxies Using Normalizing Flows* ApJ 976, 76 2024 ([arXiv:2401.12318](#)).
32. Horowitz, B.; **Hahn, C.**; Lanusse, F.; Modi, C.; Ferraro, S. *Differentiable Stochastic Halo Occupation Distribution* MNRAS 529, 2473, 2024 ([arXiv:2211.03852](#)).
31. Nemer, A.; **Hahn, C.**; Li, J.; Melchior, P.; Goodman, J. *Constraining Protoplanetary Disk Winds from Forbidden Line Profiles with Simulation-based Inference* ApJ 965, 157, 2024 ([arXiv:2403.10243](#)).
30. Hou, J.; Moradinezhad Dizgah, A.; **Hahn, C.**; et al. *SIMBIG: Cosmological Constraints from the Redshift-Space Galaxy Skew Spectra* PRD 109, 3528, 2024 ([arXiv:2401.15074](#)).
29. **Hahn, C.**; Eickenberg, M.; Ho, S.; et al. *SIMBIG: The First Cosmological Constraints from the Non-Linear Galaxy Bispectrum* PRD 109, 3534, 2024 ([arXiv:2310.15243](#)).
28. Régalo-Saint Blancard; **Hahn, C.**; Ho, S.; et al. *SIMBIG: Galaxy Clustering Analysis with the Wavelet Scattering Transform* PRD 109, 3535, 2024 ([arXiv:2310.15250](#)).
27. Lemos, P.; Parker, L.; **Hahn, C.**; et al. *SIMBIG: Field-level Simulation-Based Inference of Galaxy Clustering* PRD 109, 3536, 2024 ([arXiv:2310.15256](#)).
26. **Hahn, C.**; Villaescusa-Navarro, F.; Melchior, P.; Teyssier, R. *Cosmology with Galaxy Photometry Alone* ApJL 966, 18, 2024 ([arXiv:2310.08634](#)).
25. **Hahn, C.**; Aguilar, J. N.; Alam, S.; et al. *PROVABGS: The Probabilistic Stellar Mass Function of the BGS One-Percent Survey* ApJ 963, 56, 2024 ([arXiv:2306.06318](#)).
24. DESI Collaboration (incl. **Hahn, C.**) *Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument* AJ, 167, 62, 2024 ([arXiv:2306.06307](#)).
Led the DESI Bright Galaxy Survey as co-chair.
23. DESI Collaboration (incl. **Hahn, C.**) *The Early Data Release of the Dark Energy Spectroscopic Instrument* AJ 168, 58, 2023 ([arXiv:2306.06308](#)).
Led the DESI Bright Galaxy Survey as co-chair.
22. **Hahn, C.**; Eickenberg, M.; Ho, S.; Hou, J.; et al. *SIMBIG: A Forward Modeling Approach To Analyzing Galaxy Clustering* PNAS, 120, 42 2023 ([arXiv:2211.00723](#)).
21. **Hahn, C.**; Eickenberg, M.; Ho, S.; Hou, J.; et al. *SIMBIG: Mock Challenge for a Forward Modeling Approach to Galaxy Clustering* JCAP, 04, 010 2023 ([arXiv:2211.00660](#)).
20. **Hahn, C.**; Wilson, M. J.; Ruiz-Macias, O.; Cole, S.; Weinberg, D. H.; et al. *The DESI Bright Galaxy Survey: Final Target Selection, Design, and Validation* AJ, 165, 253, 2023 ([arXiv:2208.08512](#)).
19. Kwon, K. J.; **Hahn, C.**; Alsing, J. *Neural Stellar Population Synthesis Emulator for the DESI PROVABGS* ApJS 265, 23 2022 ([arXiv:2209.14323](#)).
18. **Hahn, C.**; Kwon, K. J.; Tojeiro, R.; Siudek, M.; Canning, R. E. et al. *The DESI PRObabilistic Value-Added Bright Galaxy Survey (PROVABGS) Mock Challenge* ApJ, 945, 16 2023 ([arXiv:2202.01809](#)).
17. **Hahn, C.**; Melchior, P. *Accelerated Bayesian SED Modeling using Amortized Neural Posterior Estimation* ApJ, 938, 1 2022 ([arXiv:2203.07391](#)).
15. **Hahn, C.**; Starkenburg, T. K.; Anglés-Alcázar D.; Choi, E.; Davé, R. et al. *IQ Collaboratory III: The Empirical Dust Attenuation Framework – Taking Hydrodynamical Simulations with a Grain of Dust* ApJ, 926, 122, 2022 ([arXiv:2106.09741](#)).
14. **Hahn, C.**, Villaescusa-Navarro, F.; *Constraining M_V with the Bispectrum II: The Total Information Content of the Galaxy Bispectrum* JCAP, 04, 029, 2021 ([arXiv:2012.02200](#)).

13. **Hahn, C.**; Villaescusa-Navarro, F.; Castorina, E.; Scoccimarro R. *Constraining M_ν with the Bispectrum I: Breaking Parameter Degeneracies* JCAP, 03, 040, 2020 ([arXiv:1909.11107](#)).
12. Villaescusa-Navarro, F.; **Hahn, C.**; Massara, E.; Banerjee, A.; Delgado, A. *et al. The Quijote Simulation* ApJS, 250, 2, 2020 ([arXiv:1909.05273](#)).
IOP Publishing 2023 Top Cited Paper Award
11. **Hahn, C.**; Tinker, J.; Wetzel, A. *Constraining Star Formation Histories of Blue Galaxies using the Scatter between Stellar Mass and Halo Mass* ([arXiv:1910.01644](#)).
10. **Hahn, C.**; Beutler, F.; Sinha, M.; Berlind, A.; Ho, S.; Hogg, D. W. *Likelihood Non-Gaussianity in Large-Scale Structure Analyses* MNRAS, 485, 2956, 2019 ([arXiv:1803.06348](#)).
9. **Hahn, C.**; Starkenburg, T.; Choi, E.; Davé, R.; Dickey, C.; Geha, M. *et al. IQ-Collaboratory 1.1: the Star-Forming Sequence of Simulated Central Galaxies* ApJ, 872, 160 2019 ([arXiv:1809.01665](#)).
8. Vakili, M.; **Hahn, C.** *How are galaxies assigned to halos? Searching for assembly bias in the SDSS galaxy clustering* ApJ, 872, 115, 2019 ([arXiv:1610.01991](#)).
7. Tinker, J.; **Hahn, C.**; Mao, Y.; Wetzel, A. *Halo Histories versus Galaxy Properties at $z=0$, III: The Properties of Star-Forming Galaxies* MNRAS, 478, 4487, 2018 ([arXiv:1705.08458](#)).
6. Tinker, J.; **Hahn, C.**; Mao, Y.; Wetzel, A.; Conroy, C. *Halo Histories versus Galaxy Properties at $z=0$, II: Large-Scale Galactic Conformity* MNRAS, 477, 935, 2018 ([arXiv:1702.01121](#)).
5. **Hahn, C.**; Tinker, J.; Wetzel, A. *Star Formation Quenching Timescale of Central Galaxies in a Hierarchical Universe* ApJ, 841, 6, 2017 ([arXiv:1609.04398](#)).
4. **Hahn, C.**; Vakili M.; Walsh, K.; Hearin, A.; Hogg, D. W.; Campbell, D. *Approximate Bayesian Computation in Large Scale Structure: Constraining the Galaxy-Halo Connection* MNRAS, 469, 2791, 2017 ([arXiv:1607.01782](#)).
3. **Hahn, C.**; Scoccimarro, R.; Blanton, M.; Tinker, J.; Rodríguez-Torres, S. *The Effect of Fiber Collisions on the Galaxy Power Spectrum Multipole* MNRAS, 467, 1940, 2017 ([arXiv:1609.01714](#)).
2. **Hahn, C.**; Blanton, M.; Moustakas, J.; Coil, A.; Cool, R.; Eisenstein, D. *et al. PRIMUS: Effects of Galaxy Environment on the Quiescent Fraction at $z < 0.8$* ApJ, 806, 162, 2015 ([arXiv:1412.7162](#)).
1. **Hahn, C.**; Sellwood, J.; Pryor C. *Velocity-space substructure from nearby RAVE and SDSS stars* MNRAS, 418, 2459, 2011 ([arXiv:1102.4626](#)).

CONTRIBUTING AUTHOR

65. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 VII: Cosmological Constraints from the Full-Shape Modeling of Clustering Measurements* submitted 2024 ([arXiv:2411.12022](#)).
64. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 V: Full-Shape Galaxy Clustering from Galaxies and Quasars* submitted 2024 ([arXiv:2411.12021](#)).
63. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 II: Sample Definitions, Characteristics, and Two-point Clustering Statistics* submitted 2024 ([arXiv:2411.12020](#)).
62. Bermejo-Climent, J. R.; *et al.* (incl. **Hahn, C.**) *Constraints on primordial non-Gaussianity from the cross-correlation of DESI Luminous Red Galaxies and Planck CMB lensing* submitted 2024 ([arXiv:2412.10279](#)).
61. Chen, X.; *et al.* (incl. **Hahn, C.**) *Extensive analysis of reconstruction algorithms for DESI 2024 baryon acoustic oscillations* submitted 2024 ([arXiv:2411.19738](#)).
60. Zaborowski, E. A.; *et al.* (incl. **Hahn, C.**) *A Sound Horizon-Free Measurement of H_0 in DESI 2024* JCAP submitted 2024 ([arXiv:2411.16677](#)).

59. Ishak, M.; *et al.* (incl. **Hahn, C.**) *Modified Gravity Constraints from the Full Shape Modeling of Clustering Measurements from DESI 2024* submitted 2024 ([arXiv:2411.12026](#)).
58. Findlay, N.; *et al.* (incl. **Hahn, C.**) *Exploring HOD-dependent systematics for the DESI 2024 Full-Shape galaxy clustering analysis* submitted 2024 ([arXiv:2411.12023](#)).
57. Rosado-Marín, A. J.; *et al.* (incl. **Hahn, C.**) *Mitigating Imaging Systematics for DESI 2024 Emission Line Galaxies and Beyond* submitted 2024 ([arXiv:2411.12024](#)).
56. Bianchi, D.; *et al.* (incl. **Hahn, C.**) *Characterization of DESI fiber assignment incompleteness effect on 2-point clustering and mitigation methods for DR1 analysis* submitted 2024 ([arXiv:2411.12025](#)).
55. Córdova Rosado, R.; *et al.* (incl. **Hahn, C.**) *Cross-correlation of Luminous Red Galaxies with ML-selected AGN in HSC-SSP II: AGN classification and clustering with DESI spectroscopy* submitted 2024 ([arXiv:2410.24020](#)).
54. Tamura, N; *et al.* (incl. **Hahn, C.**) *Prime Focus Spectrograph (PFS) for Subaru Telescope: progressing final steps to science operation* SPIE, 13096 2024
53. Ross, A. J.; *et al.* (incl. **Hahn, C.**) *The Construction of Large-scale Structure Catalogs for the Dark Energy Spectroscopic Instrument* submitted 2024 ([arXiv:2405.16593](#)).
52. Poppett, C.; *et al.* (incl. **Hahn, C.**) *Overview of the Fiber System for the Dark Energy Spectroscopic Instrument* AJ 168, 245 2024.
51. Soumagnac, M. T.; *et al.* (incl. **Hahn, C.**) *The MOST Hosts Survey: spectroscopic observation of the host galaxies of 40,000 transients using DESI* ApJS, 275, 22 2024 ([arXiv:2405.0385](#)).
50. Beyond-2pt Collaboration: Krause, E.; *et al.* (incl. **Hahn, C.**) *A Parameter-Masked Mock Data Challenge for Beyond-Two-Point Galaxy Clustering Statistics* submitted 2024 ([arXiv:2405.02252](#)).
49. Wang, Y.; *et al.* (incl. **Hahn, C.**) *Extracting high-order cosmological information in galaxy surveys with power spectra* Nat. Comm. Phys., 7, 130 2024 ([arXiv:2202.05248](#)).
48. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 VI: Cosmological Constraints from the Measurements of Baryon Acoustic Oscillations* submitted 2024 ([arXiv:2404.03002](#)).
46. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 IV: Baryon Acoustic Oscillations from the Lyman Alpha Forest* submitted 2024 ([arXiv:2404.03001](#)).
46. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 III: Baryon Acoustic Oscillations from Galaxies and Quasars* submitted 2024 ([arXiv:2404.03000](#)).
45. Schlafly, E. *et al.* (incl. **Hahn, C.**) *Measuring Fiber Positioning Accuracy and Throughput with Fiber Dithering for the Dark Energy Spectroscopic Instrument* AJ 168, 35 2024 ([arXiv:2404.05688](#)).
44. Guy, J. *et al.* (incl. **Hahn, C.**) *Characterization of contaminants in the Lyman-alpha forest auto-correlation with DESI* submitted 2024 ([arXiv:2404.03003](#)).
43. Paillas, E. *et al.* (incl. **Hahn, C.**) *Optimal Reconstruction of Baryon Acoustic Oscillations for DESI 2024* submitted 2024 ([arXiv:2404.03005](#)).
42. Mena-Fernández, J. *et al.* (incl. **Hahn, C.**) *HOD-Dependent Systematics for Luminous Red Galaxies in the DESI 2024 BAO Analysis* submitted 2024 ([arXiv:2404.03008](#)).
41. Ding, Z. *et al.* (incl. **Hahn, C.**) *HOD-Dependent Systematics in Emission Line Galaxies for the DESI 2024 BAO analysis* submitted 2024 ([arXiv:2404.03009](#)).
40. Khederlarian, A. *et al.* (incl. **Hahn, C.**) *Emission Line Predictions for Mock Galaxy Catalogues: a New Differentiable and Empirical Mapping from DESI* MNRAS 531, 1454 2024 ([arXiv:2404.03055](#)).
39. Ding, Z. *et al.* (incl. **Hahn, C.**) *Suppressing the sample variance of DESI-like galaxy clustering with fast simulations* JCAP submitted 2024 ([arXiv:2404.03117](#)).

38. Juneau, S. *et al.* (incl. **Hahn, C.**) *Identifying Quasars from the DESI Bright Galaxy Survey* AAS submitted 2024 ([arXiv:2404.03621](#)).
37. Andrade, U. *et al.* (incl. **Hahn, C.**) *Validating the Galaxy and Quasar Catalog-Level Blinding Scheme for the DESI 2024 analysis* submitted 2024 ([arXiv:2404.07282](#)).
36. Maus, M. *et al.* (incl. **Hahn, C.**) *A comparison of effective field theory models of redshift space galaxy power spectra for DESI 2024 and future surveys* submitted 2024 ([arXiv:2404.07272](#)).
35. Maus, M. *et al.* (incl. **Hahn, C.**) *An analysis of parameter compression and full-modeling techniques with Velocileptors for DESI 2024 and beyond* submitted 2024 ([arXiv:2404.07312](#)).
34. Wang, Y. *et al.* (incl. **Hahn, C.**) *Measuring the conditional luminosity and stellar mass functions of galaxies by combining the DESI LS DR9, SV3 and Y1 data* ApJ 971, 119 2024 ([arXiv:2312.17459](#)).
33. Smith, A. *et al.* (incl. **Hahn, C.**) *Generating mock galaxy catalogues for flux-limited samples like the DESI Bright Galaxy Survey* MNRAS 532, 903 2024 ([arXiv:2312.08792](#)).
32. Pandya, V. *et al.* (incl. **Hahn, C.**) *Galaxies Going Bananas: Inferring the 3D Geometry of High-Redshift Galaxies with JWST-CEERS* ApJ 963, 54 2024 ([arXiv:2310.15232](#)).
31. Modi, C.; Pandey, S.; Ho, M.; **Hahn, C.** *et al.* *Sensitivity Analysis of Simulation-Based Inference for Galaxy Clustering* MNRAS accepted 2024 ([arXiv:2309.15071](#)).
30. Chawak, C.; Villaescusa-Navarro, F.; *et al.* (incl. **Hahn, C.**) *Cosmology with multiple galaxies* ApJ 969, 105 2024 ([arXiv:2309.12048](#)).
29. Li, J.; Melchior, P.; **Hahn, C.**; Huang, S. *PopSED: Population-Level Inference for Galaxy Properties from Broadband Photometry with Neural Density Estimation* AJ, 167, 1 2023 ([arXiv:2309.16958](#)).
28. Liang, Y.; Melchior, P.; **Hahn, C.** *et al.* *Outlier Detection in the DESI Bright Galaxy Survey* ApJL, 956, 6 2023 ([arXiv:2307.07664](#)).
27. Thiele, L.; Massara, E.; Pisani, A.; **Hahn, C.** *et al.* *Neutrino mass constraint from an Implicit Likelihood Analysis of BOSS voids* ApJ 969, 89 2023 ([arXiv:2307.07555](#)).
26. Lovell, C. C.; *et al.* (incl. **Hahn, C.**) *A Hierarchy of Normalizing Flows for Modelling the Galaxy-Halo Relationship* submitted 2023 ([arXiv:2307.06967](#)).
25. Schlafly, E.; *et al.* (incl. **Hahn, C.**) *Survey Operations for the Dark Energy Spectroscopic Instrument* AJ 168, 35 2023 ([arXiv:2306.06309](#)).
24. Prada, F.; *et al.* (incl. **Hahn, C.**) *The DESI One-Percent Survey: Modelling the clustering and halo occupation of all four DESI tracers with Uchuu* submitted 2023 ([arXiv:2306.06315](#)).
23. Rocher, A.; *et al.* (incl. **Hahn, C.**) *The DESI One-Percent survey: exploring the Halo Occupation Distribution of Emission Line Galaxies with AbacusSummit simulations* JCAP, 10, 016 2023 ([arXiv:2306.06319](#)).
22. Rashkovetskyi, M.; *et al.* (incl. **Hahn, C.**) *Validation of semi-analytical, semi-empirical covariance matrices for two-point correlation function for Early DESI data* MNRAS, 524, 3894 2023 ([arXiv:2306.06320](#)).
21. Echeverri, P.; *et al.* (incl. **Hahn, C.**) *Cosmology with one galaxy? – The ASTRID model and robustness* ApJ, 954, 125 2023 ([arXiv:2304.06084](#)).
20. Melchior, P.; Yan, L.; **Hahn, C.**; Goulding, A. *Autoencoding Galaxy Spectra I: Architecture* AJ, 166, 74 2023 ([arXiv:2211.07890](#)).
19. Giusarma, E.; *et al.* (incl. **Hahn, C.**) *Learning neutrino effects in Cosmology with Convolutional Neural Networks*, ApJ, 950, 70, 2023 ([arXiv:1910.04255](#)).

18. Lemos, P.; Cranmer, M.; Abidi, M.; **Hahn, C.**; *et al.* *Robust Simulation-Based Inference in Cosmology with Bayesian Neural Networks* Machine Learning: Science and Technology, 4, 01 2023 ([arXiv:2207.08435](#))
17. Darragh-Ford, E; *et al.* (incl. **Hahn, C.**) *Target Selection and Sample Characterization for the DESI LOW-Z Secondary Target Program* ApJ 954, 149 2023 ([arXiv:2212.07433](#)).
16. Myers, A. D.; *et al.* (incl. **Hahn, C.**) *The Target Selection Pipeline for the Dark Energy Spectroscopic Instrument* AJ, 165, 50 2023 ([arXiv:2208.08518](#)).
15. Villaescusa-Navarro, F.; *et al.* (incl. **Hahn, C.**) *The CAMELS project: public data release* ApJS, 265, 54 2023 ([arXiv:2201.01300](#)).
14. Hou, J.; Moradinezhad Dizgah, A.; **Hahn, C.**; Massara, E. *Cosmological Information in Skew Spectra of Biased Tracers in Redshift Space* JCAP, 03, 045 2023 ([arXiv:2210.12743](#)).
13. Lan, T.; *et al.* (incl. **Hahn, C.**) *The DESI Survey Validation: Results from Visual Inspection of Bright Galaxies, Luminous Red Galaxies, and Emission Line Galaxies* ApJ, 943, 68 2023 ([arXiv:2208.08516](#)).
12. Massara, E.; Villaescusa-Navarro, F.; **Hahn, C.**; Abidi, M. M.; *et al.* *Cosmological Information in the Marked Power Spectrum of the Galaxy Field* ApJ, 951, 70 2023 ([arXiv:2206.01709](#)).
11. Abareschi, J.; *et al.* (incl. **Hahn, C.**) *Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument* AJ, 164, 207 2022 ([arXiv:2205.10939](#)).
10. Eickenberg, M.; *et al.* (incl. **Hahn, C.**) *Wavelet Moments for Cosmological Parameter Estimation* ApJ submitted 2022 ([arXiv:2204.07646](#)).
9. Friedrich, O.; *etal* (incl. **Hahn, C.**) *The PDF perspective on the tracer-matter connection: Lagrangian bias and non-Poissonian shot noise* MNRAS, 510, 5069, 2022 ([arXiv:2107.02300](#)).
8. Dickey, C. M.; Starkenburg, T. K.; Geha, M.; **Hahn, C.**; *et al.* *IQ Collaboratory II: The Quiescent Fraction of Isolated, Low Mass Galaxies Across Simulations and Observations* ApJ, 915, 53, 2021 ([arXiv:2010.01132](#)).
7. Ruiz-Macias, O. *et al.* (incl. **Hahn, C.**); *Characterising the target selection pipeline for the Dark Energy Spectroscopic Instrument Bright Galaxy Survey* MNRAS, 502, 4328, 2021 ([arXiv:2007.14950](#)).
6. Alsing, J.; Peiris, H.; Leja, J.; **Hahn, C.**; *et al.* *SPECULATOR: Emulating Stellar Population Synthesis for Fast and Accurate Galaxy Spectra and Photometry* ApJS, 249, 5, 2020 ([arXiv:1911.1178](#)).
5. Blanton, M. *et al.* (incl. **Hahn, C.**) *Sloan Digital Sky Survey IV: Mapping the Milky Way, Nearby Galaxies, and the Distant Universe* AJ, 154, 28, 2017 ([arXiv:1703.00052](#)).
4. Vakili, M. *et al.* (incl. **Hahn, C.**) *Accurate halo-galaxy mocks from automatic bias estimation and particle mesh gravity solvers* MNRAS, 472, 4144, 2017 ([arXiv:1701.03765](#)).
3. Rodríguez-Torres, S. *et al.* (incl. **Hahn, C.**) *Clustering of Quasars in the First Year of the SDSS-IV eBOSS survey: Interpretation and halo occupation distribution* MNRAS, 468, 728, 2017 ([arXiv:1612.06918](#)).
2. Zhai, Z.; Tinker, J.; **Hahn, C.** *et al.* *The Clustering of Luminous Red Galaxies at $z \sim 0.7$ from eBOSS and BOSS Data* ApJ, 848, 2, 2017 ([arXiv:1607.05383](#)).
1. Rodríguez-Torres, S. *et al.* (incl. **Hahn, C.**) *The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: modelling the clustering and halo occupation distribution of BOSS CMASS galaxies in the Final Data Release* MNRAS, 460, 1173, 2016 ([arXiv:1509.06404](#)).

PEER-REVIEWED MACHINE LEARNING CONFERENCE PAPERS

11. **Hahn, C.**; Gontcho A Gontcho, S.; Melchior, P. *Reconstructing Quasar Spectra and Measuring the Ly α Forest with SPENDERQ* NeurIPS Machine Learning and the Physical Sciences 2024
10. Pandey S. *et al.* (incl. **Hahn, C.**) *Sensitivity Analysis of Simulation-Based Inference for Galaxy Clustering* NeurIPS AI4Science 2023
9. **Hahn, C.**; Melchior, P.; Villaescusa-Navarro, F.; Teyssier, R. *Cosmology with Galaxy Photometry Alone* ICML Machine Learning for Astrophysics Workshop 2023
8. **Hahn, C.**; Lemos, P.; Regalado, B.; Parker, L. H. *et al.* *SIMBIG: Galaxy Clustering Beyond the Power Spectrum* ICML Machine Learning for Astrophysics Workshop 2023
7. Lemos, P.; Parker, L. H.; **Hahn, C.**; Regalado, B. *et al.* *SIMBIG: Field-level simulation-based inference of large-scale structure* ICML Machine Learning for Astrophysics Workshop 2023
6. Li, J.; Melchior, P.; **Hahn, C.**; Huang, S. *Population-Level Inference for Galaxy Properties from Broadband Photometry* ICML Machine Learning for Astrophysics Workshop 2023
5. Lovell, C. *et al.* (incl. **Hahn, C.**) *A Hierarchy of Normalizing Flows for Modelling the Galaxy-Halo Relationship* ICML Machine Learning for Astrophysics Workshop 2023
4. **Hahn, C.**; Abidi, M.; Eickenberg, M.; Ho, S.; Lemos, P. *et al.* *SIMBIG: Likelihood-Free Inference of Galaxy Clustering* ICML Machine Learning for Astrophysics Workshop 2022
3. **Hahn, C.**; Melchior, P. *Accelerated Galaxy SED Modeling using Amortized Neural Posterior Estimation* ICML Machine Learning for Astrophysics Workshop 2022
2. Lemos, P.; Cranmer, M.; Abidi, M.; **Hahn, C.**; *et al.* *Robust Simulation-Based Inference with Bayesian Neural Networks* ICML Machine Learning for Astrophysics Workshop 2022
1. Melchior, P.; **Hahn, C.**; Liang, Y. *Autoencoding Galaxy Spectra* ICML Machine Learning for Astrophysics Workshop 2022

WHITE PAPERS AND OTHERS

3. Greene, J.; *et al.* (incl. **Hahn, C.**) *The Prime Focus Spectrograph Galaxy Evolution Survey* 2022 ([arXiv:2206.14908](https://arxiv.org/abs/2206.14908)).
2. Tollerud, E. *et al.* (incl. **Hahn, C.**) *Sustaining Community-Driven Software for Astronomy in the 2020s* 2019
1. Ferraro, S. *et al.* (incl. **Hahn, C.**) *Inflation and Dark Energy from spectroscopy at $z > 2$* 2019 ([arXiv:1903.09208](https://arxiv.org/abs/1903.09208)).

SELECTED TALKS

(*: invited)

*Blackboard Talk, Aspen Center for Physics	Jun. 2024
*Astrophysics Seminar, IAC Tenerife	May. 2024
*Astrophysics Seminar, Penn State University	Mar. 2024
*Astrophysics Seminar, University of Illinois Urbana-Champaign	Mar. 2024
*Cosmology Seminar, Boston University	Mar. 2024
*Steward Observatory/NSF's NOIRLab Joint Colloquium, University of Arizona	Feb. 2024
*Astrophysics Seminar, University of Pittsburgh	Feb. 2024
*Astrophysics Seminar, University of Texas Austin	Feb. 2024
*Astrophysics Seminar, University of Connecticut	Feb. 2024
*Astrophysics Seminar, University of Pennsylvania	Jan. 2024
Potential of ML in Astronomical Surveys, Simons Foundation NYC	Dec. 2023

*Cosmology Seminar, Institute of Theoretical Astrophysics University of Oslo	Nov. 2023
*Astrophysics Seminar, Università degli Studi di Milano Statale	Nov. 2023
*New Physics from Galaxy Clustering II, ICTP Trieste	Nov. 2023
*Nuclear and Particle Theory Seminar, MIT Center for Theoretical Physics	Oct. 2023
*Gravity Group Seminar, Princeton Department of Physics	Oct. 2023
*Galaxies and Cosmology Seminar, UT Austin	Oct. 2023
*Physics Colloquium, University of Arizona	Oct. 2023
*Astro Seminar, Tufts University	Sep. 2023
*Seminar, NYC Office of the Mayor	Sep. 2023
*Bahcall Lunch, Institute for Advanced Studies, Princeton	Sep. 2023
*Seminar, Kavli IPMU, Tokyo	Sep. 2023
*DESI Collaboration Meeting, Durham UK	Jul. 2023
Cosmic Connections: ML×Astrophysics Symposium, Simons Foundation NYC	May 2023
*We MUST Talk Seminar, Remote	Apr 2023
*Tristate Cosmology Meeting, Flatiron Institute NYC	Mar 2023
HSC PFS Rubin Meeting, Princeton University NJ	Mar 2023
*Colloquium, Boston University MA	Feb 2023
*Kavli Institute for Theoretical Physics Workshop, Flatiron Institute NYC	Feb 2023
*Astrophysics Symposium, Yale University CT	Jan 2023
*241 st American Astronomical Society Meeting, Seattle	Jan 2023
*DESI Collaboration Meeting, Mexico	Dec 2022
*DESI Research Forum, Remote	Nov 2022
* <i>Euclid</i> Machine Learning Seminar, Remote	Oct 2022
Learning the Universe, Flatiron Institute NYC	Sep 2022
*Thursday Lunch Seminar, Flatiron Institute NYC	May 2022
*LSST DESC Seminar	May 2022
*DESI Research Forum	May 2022
*Institute for Advance Studies, Princeton	Apr. 2022
*NYU Astro Seminar, NYC	Apr. 2022
APS 2022 meeting, NYC	Apr. 2022
Large-Volume Spec Workshop, STScI, Remote	Mar. 2022
Learn the Universe, Flatiron Institute NYC	Mar. 2022
*DESI AI Seminar, Remote	Dec. 2021
Tristate Cosmology Meeting, Flatiron Institute NYC	Nov. 2021
Thunch, Princeton University	Nov. 2021
SpergelFest, Princeton University/Flatiron Institute NYC	Oct. 2021
Learning the Universe, Flatiron Institute NYC	Aug. 2021
COSMO21, University of Illinois, Remote	Aug. 2021
Multi-Object Spectroscopy for Galaxy Evolution, STScI, Remote	May 2021
ESO GALSPEC2021, Remote	Apr. 2021
Galread Seminar, Princeton Univiersity	Mar. 2021
*Astro/Cosmology Seminar, Kavli IPMU	Feb. 2021
*Cosmology-Galaxy-IGM Seminar, UC Santa Cruz	Jan. 2021
*Astro Seminar, University of Waterloo	Oct. 2020
Bahcall Lunch, Institute for Advanced Studies	Sep. 2020
Cosmology at Home, Remote	Aug. 2020
Aspen Galaxy Quenching, Aspen CO	Jan. 2020
*Cosmology Lunch Seminar, Princeton/Institute for Advanced Study	Dec. 2019
Hernquist group meeting, Harvard Center for Astrophysics	Nov. 2019

Galaxy Lunch, Yale University	Nov. 2019
Morning Tea, Carnegie Observatories	Oct. 2019
*Cosmology Seminar, KIPAC/SLAC/Stanford	Oct. 2019
KICP Chicago	Oct. 2019
CPAC seminar, Argonne National Lab	Oct. 2019
Cosmic Controversies, KICP Chicago	Oct. 2019
*DESI Commissioning and Survey Validation workshop, NOAO AZ	Sep. 2019
DESI Collaboration meeting, Berkeley Lab	Jul. 2019
Cosmology \times Data, NYU CCPP	May 2019
*Isolated and Quenched Galaxies Workshop, Flatiron Institute NYC	Dec. 2018
DESI Collaboration Meeting, Tuscon AZ	May 2018
Flatiron Institute NYC	Feb. 2018
Isolated and Quenched Galaxies Workshop, Flatiron Institute NYC	Sep. 2017
*CCAPP seminar, The Ohio State University	Feb. 2017
*seminar, Argonne National Lab	Jan. 2017
American Astronomical Society 229, Grapevine TX	Jan. 2017
*RPM seminar, Berkeley Lab	Dec. 2016
Yale University	Oct. 2016
Seminar, Universidad Nacional de Colombia, Bogota COL	Jun. 2016
Brownbag Lunch, NYU CCPP	Apr. 2016
Multi-Object Spectroscopy in the Next Decade, Canary Islands ESP	Feb. 2015
Evolving Galaxies in Evolving Environments, Bologna ITA	Sep. 2014

PUBLIC SOFTWARE AND DATA

SpenderQ	A spectrum autoencoder framework for reconstructing quasar spectra and measuring the Ly α forest.
CAUSALFLOW	A machine learning framework for measuring the causal treatment effect of policies using normalizing flows.
SEDflow	<i>python</i> package for accelerated Bayesian SED modeling of galaxy photometry using simulation-based inference with neural density estimators
provabgs	<i>python</i> package for joint SED modeling of galaxy photometry and spectroscopy using neural emulators
MOLINO	75,000 mock galaxy catalogs, constructed from full N -body simulations, designed to quantify the total cosmological information content of 3D galaxy distributions
pySpectrum	<i>python</i> package for measuring galaxy powerspectrum and bispectrum using Fast Fourier Transforms
starFS	<i>python</i> package for identifying the star-forming sequence in galaxy populations using Gaussian Mixutre Models

REFERENCES

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