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 -
Lawrence Berkeley National Laboratory and UC Berkeley Postdoctoral Fellow	2017 - 2020

EDUCATION

New York University — Ph.D. in Physics
    Advisors : Michael R. Blanton and Roman Scoccimarro
    Thesis : *Galaxies and their Host Dark Matter Structures*
	2011 - 2017

Rutgers University — B.Sc. in Astrophysics
    Advisors : Andrew J. Baker and Jerry A. Sellwood
    Awards : *Paul Robeson Scholar*
	2007 - 2011

GRANTS AND FELLOWSHIPS

Extreme Science and Engineering Discovery Environment (XSEDE) Startup PI; *Accelerated SED Modeling of Millions of Galaxies* — 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	
co-leader, PFS Cosmology Survey	2022 -
member, PFS Galaxy Evolution Survey	2021 -
DESI, Dark Energy Spectroscopic Instrument	
Builder, awarded for 3000+ hours of service	2022 -
co-chair, Bright Galaxy Survey Working Group	2019 - 2022
member, Science Committee	2019 - 2022
member, External Collaborator Committee	2023 - 2024
topical group lead, Galaxy Quasar Physics Working Group	2022 -
SimBIG Collaboration, Simulation-Based Inference of Galaxies	
Spokesperson	2021 -
Rubin Observatory Legacy Survey of Space and Time	
member, 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
	NASA Nancy Grace Roman Space Telescope Research Panel	2023
	FINESST grant	2019 - 2020
	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	*4 papers*	2019 -
Yan Liang	Princeton	*2 papers; 1 peer-reviewed conference paper*	2022 -
Jiaxuan Li	Princeton	*1 paper; 1 peer-reviewed conference paper*	2021 -
Christian Jespersen	Princeton		2021 -
Massimo Pascale	UC Berkeley		2019 - 2021

Undergraduate Research

Liam Parker	Princeton	*1 paper; 1 peer-reviewed conference paper*	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

Fall 2021 Graduate Seminar in Theoretical Astrophysics (AST541) on Simulation-Based Inference

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: 99 — first author: 22 — total citations 4,941, h-index 31, i10-index 54 [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 Communcations 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 accepted *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. Régaldo-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_ν 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

61. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 VII: Cosmological Constraints from the Full-Shape Modeling of Clustering Measurements* submitted *2024* (`arXiv:2411.12022`).

60. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 V: Full-Shape Galaxy Clustering from Galaxies and Quasars* submitted *2024* (`arXiv:2411.12021`).

59. DESI Collaboration (incl. **Hahn, C.**) *DESI 2024 II: Sample Definitions, Characteristics, and Two-point Clustering Statistics* submitted *2024* (`arXiv:2411.12020`).

58. 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`).

57. 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`).

56. 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`).

55. 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`).

54. 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`).

53. Tamura, N; *et al.* (incl. **Hahn, C.**) *Prime Focus Spectrograph (PFS) for Subaru Telescope: progressing final steps to science operation* SPIE, 13096 *2024*

52. 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`).

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* submitted to ApJS *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* submitted *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 submitted *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* MNRAS submitted *2023* (`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 submitted *2023* (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 submitted *2023* (arXiv:2310.15232).

31. 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).

30. Modi, C.; Pandey, S.; Ho, M.; **Hahn, C.** *et al.* *Sensitivity Analysis of Simulation-Based Inference for Galaxy Clustering* MNRAS submitted *2023* (arXiv:2309.15071).

29. Chawak, C.; Villaescusa-Navarro, F.; *et al.* (incl. **Hahn, C.**) *Cosmology with multiple galaxies* submitted *2023* (arXiv:2309.12048).

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 submitted *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* submitted *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. Abareshi, 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 Lyα 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.; ; Regaldo, 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.**; Regaldo, 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`).

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`).

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
*241st American Astronomical Society Meeting, Seattle	Jan 2023
*DESI Collaboration Meeting, Mexico	Dec 2022
*DESI Research Forum, Remote	Nov 2022
*Euclid 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 Unviersity	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 × 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

SEDflow	*python* package for accelerated Bayesian SED modeling of galaxy photometry using simulation-based inference with neural density estimators
provabgs	*python* 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	*python* package for measuring galaxy powerspectrum and bispectrum using Fast Fourier Transforms
starFS	*python* package for identifying the star-forming sequence in galaxy populations using Gaussian Mixutre Models

REFERENCES

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