

LEHMAN H. GARRISON

Cosmology — Large-Scale Structure
High-Performance Computing —
N-body Simulations

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EMPLOYMENT	Flatiron Research Fellow Cosmology X Data Science Group Center for Computational Astrophysics Flatiron Institute, New York, NY	2019–present
EDUCATION	Ph.D., Astronomy and Astrophysics <i>Harvard University</i> , Cambridge, MA Thesis: <i>Computational Modeling of Large-Scale Structure with Abacus</i> Advisor: Daniel J. Eisenstein	2013–2019
	B.A., Astrophysical Sciences (High Honors) <i>Princeton University</i> , Princeton, NJ Thesis: <i>Galactic Warp Excitation by the Magellanic Clouds</i> Advisors: David N. Spergel, Naoki Yoshida (U. Tokyo)	2009–2013
AWARDS AND HONORS	Eric Keto Prize Best Ph.D. Thesis in Theoretical Astrophysics at Harvard University	April 2019
	Smith Family Graduate Science and Engineering Fellowship <i>Harvard University</i>	2013
	Sigma Xi Book Award Best Senior Thesis in Astronomy at Princeton University	June 2013
PROFESSIONAL SERVICE	<i>Co-chair</i> , DESI Cosmological Simulations Working Group <i>Referee</i> , MNRAS & ApJ <i>Graduate Student Representative</i> , CfA Library Committee	Oct. 2020– since 2016 2017–2019
SELECTED PUBLICATIONS	First Author Publications 6. <i>Good and Proper: Self-similarity of N-body Simulations with Proper Force Softening</i> , Garrison, Lehman H. , Joyce, M., & Eisenstein, D., submitted, MNRAS 5. <i>Checkpointing with cp: the POSIX Shared Memory System</i> , Garrison, L. H. , Eisenstein, D., & Maksimova, N. accepted, NERSC First International Symposium on Checkpointing for Supercomputing 4. <i>Generating approximate halo catalogues for blind challenges in precision cosmology</i> , Garrison, L. H. , & Eisenstein, D. J. 2019, MNRAS, 485, 2407	

3. *A high-fidelity realization of the Euclid code comparison N-body simulation with Abacus*, **Garrison, L. H.**, Eisenstein, D. J., & Pinto, P. A. 2019, MNRAS, 485, 3370
2. *The abacus cosmos: a suite of cosmological N-body simulations*, **Garrison, L. H.**, Eisenstein, D. J., Ferrer, D., et al. 2018, The Astrophysical Journal Supplement Series, 236, 43
1. *Improving initial conditions for cosmological N-body simulations*, **Garrison, L. H.**, Eisenstein, D. J., Ferrer, D., Metchnik, M. V., & Pinto, P. A. 2016, MNRAS, 461, 4125

Contributing Author Publications

10. *Testing dark matter halo properties using self-similarity*, Leroy, M., **Garrison, L. H.**, Eisenstein, D., Joyce, M., & Maleubre, S. 2021, MNRAS, 501, 5064
9. *Quantifying resolution in cosmological N-body simulations using self-similarity*, Joyce, M., **Garrison, L. H.**, & Eisenstein, D. 2021, MNRAS, 501, 5051
8. *corrfunc—a suite of blazing fast correlation functions on the CPU*, Sinha, M., & **Garrison, L. H.** 2020, MNRAS, 491, 3022
7. *Corrfunc: Blazing Fast Correlation Functions with AVX512FSIMD Intrinsics*, Sinha, M., & **Garrison, L. H.** 2018, Workshop on Software Challenges to Exascale Computing, 3
6. *Cosmology with galaxy–galaxy lensing on non-perturbative scales: emulation method and application to BOSS LOWZ*, Wibking, B. D., Weinberg, D. H., Salcedo, A. N., et al. 2020, MNRAS, 492, 2872
5. *Emulating galaxy clustering and galaxy–galaxy lensing into the deeply non-linear regime: methodology, information, and forecasts*, Wibking, B. D., Salcedo, A. N., Weinberg, D. H., et al. 2019, MNRAS, 484, 989
4. *A Hybrid Deep Learning Approach to Cosmological Constraints From Galaxy Redshift Surveys*, Ntampaka, M., Eisenstein, D. J., Yuan, S., & **Garrison, L. H.** 2019, arXiv preprint arXiv:1909.10527
3. *Testing the Detection Significance on the Large-scale Structure by a JWST Deep Field Survey*, Zhang, H., Eisenstein, D. J., **Garrison, L. H.**, & Ferrer, D. W. 2019, The Astrophysical Journal, 875, 132
2. *Exploring the squeezed three-point galaxy correlation function with generalized halo occupation distribution models*, Yuan, S., Eisenstein, D. J., & **Garrison, L. H.** 2018, MNRAS, 478, 2019
1. *Using galaxy pairs to investigate the three-point correlation function in the squeezed limit*, Yuan, S., Eisenstein, D. J., & **Garrison, L. H.** 2017, MNRAS, 472, 577

OUTREACH

Mentor, CUNY Hackathon

Jan. 2021

– Supported weekend hackathon teams at the City University of New York

Comedian, Science Riot

July 2020

- Wrote and delivered a short stand-up comedy routine about N -body cosmology

Observer, Harvard Observing Project 2014–2019

- Taught undergrads and community members how to make scientific measurements on a telescope

Volunteer, Cambridge Explores the Universe Summers 2015–2018

- Ran CfA outreach activities at the Cambridge Science Festival

Author, BiteScis Lesson Plan: Shooting for the Stars March 2018

- Created an open-access high school physics lesson plan based on Breakthrough Starshot

Guest Instructor, SAO Latino Initiative Summers 2017 - 2019

- Lectured and tutored on introductory Python

Tutor, Banneker & Aztlán Institute Summer 2017

- Tutored on introductory Python and physics

TEACHING

Teaching Fellow

- PHYS P-17010 *Introduction to Cosmology* Summer 2017
- AST S-35 *Fundamentals of Contemporary Astro.* Summer 2015
- CS 109 *Data Science* Fall 2013

Lecturer, Wolbach Library at the Harvard-Smithsonian CfA 2017

- Lecture series on modern Python for astronomy, beginner to expert level