

# ChangHoon Hahn

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## RESEARCH INTERESTS

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**observational cosmology:** large-scale structure, cosmological neutrinos, dark energy, dark matter, higher-order statistics, spectroscopic surveys

**galaxy formation/evolution:** star formation quenching, galaxy–halo connection, spectral energy distribution, cosmological simulations

**statistical methods:** likelihood-free inference, emulation, hierarchical Bayesian models, data compression, machine learning

## POSITION

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2017 — **Lawrence Berkeley National Laboratory** and  
**Berkeley Center for Cosmological Physics**  
Cosmology Postdoctoral Fellow

## EDUCATION

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

May 2011 *B.Sc.* in Astrophysics, **Rutgers University**  
*Advisors* : Andrew J. Baker and Jerry A. Sellwood

## SCIENTIFIC COLLABORATIONS

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Dark Energy Spectroscopic Survey (DESI) 2017–  
Co-chair Bright Galaxy Survey  
member DESI Science Committee  
working groups Galaxy Quasar Clustering, Galaxy Quasar Physics  
Time Domain Science, Peculiar Velocity

Sloan Digital Sky Survey (SDSS) 2011–  
member SDSS-IV: extended-Baryon Oscillation Spectroscopic Survey  
member SDSS-III: Baryon Oscillation Spectroscopic Survey

PRISM Multi-object Survey (PRIMUS) 2011-2017

## PUBLICATIONS

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total: 19 — first author: 9 — major (2<sup>nd</sup> or 3<sup>rd</sup>) author: 5

19. **Hahn, C.**; Tinker, J.; Wetzel, A. *Constraining Star Formation Histories of Blue Galaxies using the Scatter between Stellar Mass and Halo Mass* ApJ submitted, 2019 (arXiv:1910.01644).
18. **Hahn, C.**; Villaescusa-Navarro, F.; Castorina, E.; Scoccimarro R. *Constraining  $M_\nu$  with the Bispectrum I: Breaking Parameter Degeneracies* JCAP submitted, 2019 (arXiv:1909.11107).
17. Giusarma, E.; Reyes, M.; Villaescusa-Navarro, F.; He, S.; Ho, S.; **Hahn, C.** *Learning neutrino effects in Cosmology with Convolutional Neural Networks* ApJ submitted, 2019 (arXiv:1910.04255).
16. Villaescusa-Navarro, F.; **Hahn, C.**; Massara, E.; Banerjee, A.; Delgado, A. *et al. The Quijote Simulation* ApJS submitted, 2019 (arXiv:1909.05273).

15. **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).
14. **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:1803.06348).
13. 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).
12. 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).
11. 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).
10. **Hahn, C.**; Tinker, J.; Wetzel, A. *Star Formation Quenching Timescale of Central Galaxies in a Hierarchical Universe* ApJ, 841, 6, 2017 (arXiv:1609.04398).
9. 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).
8. **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).
7. 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).
6. **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).
5. 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).
4. 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).
3. 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).
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).

## AWARDS AND HONORS

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2016	Dean's Dissertation Fellowship	New York University
2015	James Arthur Graduate Fellowship	New York University
2011	Henry M. MacCracken Fellowship	New York University
2011	Paul Robeson Scholar	Rutgers University

## SERVICE AND LEADERSHIP

(OC: organizing committee)

Co-chair	DESI Bright Galaxy Survey Working Group	2019 –
OC chair	LBL/BCCP conference, UC Berkeley, CA	2020
OC	Likelihood-Free Inference workshop, Flatiron Institute, NYC	2019

OC	Berkeley Lab <a href="#">Institute for Nuclear and Particle Astrophysics</a> Seminar	2019 –
Co-chair	LBNL/BCCP DESI lunch seminar	2018 –
Chair	<a href="#">NYU CCPP Astro Coffee</a>	2014 - 2017
Referee	Monthly Notices of the Royal Astronomical Society	
	Future Investigators in NASA Earth and Space Science and Technology grant	2019
	AAS <a href="#">Chambliss Award</a>	2017

## SELECTED TALKS

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(\*: invited)

[2019]	KICP Chicago	Oct
	CPAC seminar, Argonne National Lab	Oct
	DESI Time Domain Hack, Fermilab	Oct
	Cosmic Controversies, KICP Chicago	Oct
	*DESI Commissioning and Survey Validation workshop, NOAO AZ	Sep
	DESI Collaboration meeting, Berkeley Lab	Jul
	Cosmology × Data Group meeting, NYU CCPP	May
[2018]	*Isolated and Quenched Galaxies Workshop, Flatiron Institute NYC	Dec
	DESI Collaboration Meeting, Tuscon AZ	May
	Cosmology × Data Group meeting, Flatiron Institute NYC	Feb
[2017]	Isolated and Quenched Galaxies Workshop, Flatiron Institute NYC	Sep
	*CCAPP seminar, The Ohio State University	Feb
	*seminar, Argonne National Lab	Jan
	American Astronomical Society 229, Grapevine TX	Jan
[2016]	*RPM seminar, Berkeley Lab	Dec
	Galaxy group meeting, Yale University	Oct
	Seminar, Universidad Nacional de Colombia, Bogota COL	Jun
	Brownbag Lunch, NYU CCPP	Apr
[2015]	SDSS Collaboration Meeting, Madrid ESP	Jul
	Multi-Object Spectroscopy in the Next Decade, Canary Islands ESP	Feb
[2014]	BOSS+eBOSS Collaboration Meeting, Cloudcroft NM	Dec
	Evolving Galaxies in Evolving Environments, Bologna ITA	Sep

## RESEARCH ADVISING

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Graduate students		
Massimo Pascale	<i>UC Berkeley</i>	2019 –
Undergraduate students		
Patrick Staudt	<i>Rutgers University</i>	2017 –
James Zhu	<i>UC Berkeley</i>	2019 –
Arin Avsar	<i>UC Berkeley</i>	2019 –

## OUTREACH

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2018 –	UC Berkeley Astro Night
2018	Berkeley Lab Exploration of New Discoveries ( <a href="#">BLEND</a> ): Big Data
2017 –	Berkeley Lab In School Settings (BLISS) outreach program
2017	Represented SDSS-IV at <a href="#">AAS 229</a>
2017	Intrepid Museum Kids Week <a href="#">Meet the Scientist</a> event
2016	Appeared in hit podcast <a href="#">Tell Me Something I Don't Know</a> Episode 10
2015	Represented SDSS at <a href="#">NY Hall of Science Big Data Fest</a>

## REFERENCES

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**Prof. Michael R. Blanton**

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Center for Cosmology and Particle Physics, New York University

**Dr. David Schlegel**

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Lawrence Berkeley National Laboratory, Berkeley

**Prof. Jeremy L. Tinker**

[jlt12@nyu.edu](mailto:jlt12@nyu.edu)

Center for Cosmology and Particle Physics, New York University

**Prof. David W. Hogg**

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