Joshua S. Speagle

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POSITIONS

National Science Foundation Graduate Research Fellow: Harvard University	2016-**Present**
Project Academic Support Staff: Kavli IPMU (WPI), UTIAS, The University of Tokyo	2015-2016

EDUCATION

Harvard University: MA/PhD Program	2016-**Present**
Advisers: Daniel Eisenstein, Charlie Conroy, Doug Finkbeiner	
Harvard University: BA with Honors in Astrophysics and Physics	2011-2015
Adviser: Daniel Eisenstein	

RESEARCH INTERESTS

Statistical methods, big data, all-sky surveys, Galactic structure, stellar populations, galaxy evolution

TEACHING

Teaching Fellow: Harvard

ASTRON 191	**Spring 2019**
ASTRON 17	Fall 2018
ASTRON 130	Spring 2018
ASTRON 16	Spring 2017

Course Instructor: Banneker Institute (Harvard)

Python 1, Python 2	Summer 2018
Python 2, Data Analysis 2	Summer 2017

AWARDS & HONORS

Department of Astronomy Teaching Award	Spring 2018
Harvard Certificate of Distinction in Teaching	Spring 2017, 2018; Fall 2018
National Science Foundation Graduate Research Fellowship	2016
Herchel Smith-Harvard Undergraduate Science Fellowship	Summer 2014
Harvard College Research Program Research Fellowship	Spring 2014
	Spring, Summer, Fall 2012
Weismann International Internship Program Fellowship	Summer 2013
Chambliss Astronomy Achievement Student Award	(Honorable Mention) Winter 2013
	Winter 2011
REU in Astronomy and Astrophysics: Cornell U.	Summer 2012

SELECTED PRESENTATIONS

Apr. 2019: **Cambridge**, Data Intensive Science Seminar, **Talk**: "Mapping the 3-D Distribution of Dust in the Milky Way with Stellar Photometry"

Aug. 2018: **Harvard**, CMSA Big Data Conference, **Invited Talk**: "Revealing the Milky Way's Dust-iny" ([Video](#))

Mar. 2018: **Bayes Comp**, **Poster**: "Dynamic Nested Sampling with dynesty"

Oct. 2017: **UMass Amherst**, Data Science Tea, **Invited Talk**: "Big Data Inference: Combining Hierarchical Bayes and Machine Learning to Improve Photometric Redshifts"

Sep. 2017: **Harvard**, Astrostatistics Seminar, **Talk**: "An Introduction to Dynamic Nested Sampling"

Sep. 2017: **Harvard-Smithsonian CfA**, AstroStat Day, **Talk**: "Typical Sets: What They Are and How to (Hopefully) Find Them"

Jan. 2017: **AAS 229**, **Poster**: "Improving Photometric Redshifts for Hyper Suprime-Cam (HSC) with Hierarchical Bayes and Machine Learning"

May 2016: **COSMO21**, **Talk**: "Improving Photometric Redshifts for Hyper Suprime-Cam"

Mar. 2016: **Kavli IPMU**, Astro Lunch Seminar, **Talk**: "Mapping, Visualizing, and Exploiting the Color-Redshift Relation"

Apr. 2015: **Harvard**, Senior Thesis, **Talk**: "Mapping the Universe (at low resolution) with Photometric Redshifts"

Jan. 2015: **AAS 225**, **Talk**: "Improving Photometric Redshift Accuracy and Computational Efficiency"

Jan. 2014: **AAS 223**, **Poster**: "Parallel Galaxy Main Sequence and Quasar Evolution from z=0-6"

Dec. 2013: **Harvard**, Junior Thesis, **Talk**: "'Main Sequence' Evolution from z~0-6"

Aug. 2013: **Tsukuba Univ.**, **Talk**: "The Evolution of Star-Forming Galaxies Over Cosmic Time"

Jul. 2013: **Kavli IPMU**, Astro Lunch Seminar, **Talk**: "Gyrochronology and the Angular Momentum Evolution of Solar-like Stars"

Jan. 2013: **AAS 221**, **Poster**: "An In-Depth Analysis of the *Kepler* Low-Amplitude Blazhko RR Lyrae Stars"

Jan. 2012: **AAS 219**, **Poster**: "The X-ray Counterpart of the High-*B* Pulsar J0726-2612"

SELECTED PUBLICATIONS

First Author/Co-PI   **Nth Author**   **Other**

Submitted:

Speagle, J. S., **submitted to MNRAS** (code): "*dynesty*: A Dynamic Nested Sampling Package for Estimating Bayesian Posteriors and Evidences"

Speagle, J. S. et al., **submitted to MNRAS**: "Galaxy-Galaxy Lensing in HSC: Validation Tests and the Impact of Heterogeneous Spectroscopic Training Sets"

Portillo, S. K. N. & Speagle, J. S.; & Finkbeiner, D. P., **submitted to ApJ** (1902.02374; code): "Photometric Biases in Modern Surveys"

Zucker, C. Z. & Speagle, J. S.; et al., **submitted to ApJ** (1902.01425): "A Large Catalog of Accurate Distances to Local Molecular Clouds: The Gaia DR2 Edition"

Leja, J. **et al.**, **submitted to ApJ** (1812.05608): "An Older, More Quiescent Universe from Panchromatic SED Fitting of the 3D-HST Survey"

Huang, S. **et al.**, **submitted to MNRAS** (1811.01139): "Weak Lensing Reveals a Tight Connection Between Dark Matter Halo Mass and the Distribution of Stellar Mass in Massive Galaxies"

2019:

Leja, J. **et al.**, **ApJ** (1811.03637): "How to Measure Galaxy Star Formation Histories II: Nonparametric Models"

Forbes, J. C.; Krumholz, M. R.; & **Speagle, J. S.**, **MNRAS** (1810.12919): "Towards a Radially-Resolved Semi-Analytic Model for the Evolution of Disc Galaxies Tuned with Machine Learning"

2018:

Zucker, C.; Schlafly E. F.; **Speagle, J. S.** et al., **ApJ** (1803.08931): "A New Technique for Mapping Distances Across the Perseus Molecular Cloud Using CO Observations and Stellar Photometry"

Medezinski, E.; Masamune O.; Nishizawa, A. J.; **Speagle, J. S.** et al., **PASJ** (1706.00427): "Source Selection for Cluster Weak Lensing Measurements in the Hyper Sprime-Cam Survey"

Tanaka, M.; **the HSC Photo-z Team** et al., **PASJ** (1704.05988): "Photometric Redshifts for the Hyper Suprime-Cam Subaru Strategic Program Data Release 1"

2017:

Speagle, J. S. & Eisenstein, D. J., **MNRAS** (1510.08080): "Deriving Photometric Redshifts with Fuzzy Archetypes and Self-Organizing Maps II. Implementation"

Speagle, J. S. & Eisenstein, D. J., **MNRAS** (1510.08073): "Deriving Photometric Redshifts with Fuzzy Archetypes and Self-Organizing Maps I. Methodology"

2016:

Speagle, J. S. et al., **MNRAS** (1508.02484): "Exploring Photometric Redshifts as an Optimization Problem: An Ensemble MCMC and Simulated Annealing-Driven Template-fitting Approach"

Steinhardt, C. L.; Capak, P. L.; Masters, D. C.; & **Speagle, J. S.**, **ApJ** (1506.01377): "The Impossibly Early Galaxy Problem"

2015:

Masters, D. C. **et al.**, **ApJ** (1509.03318): "Mapping the Galaxy Color-Redshift Relation: Optimal Photometric Redshift Calibration Strategies for Cosmology Surveys"

2014:

Steinhardt, C. L. & **Speagle, J. S.**, **ApJ** (1409.2883): "A Uniform History for Galaxy Evolution"

Steinhardt, C. L.; **Speagle, J. S.** et al., **ApJL** (1407.7030): "Star Formation at 4 < z < 6 from the Spitzer Large Area Survey with Hyper-Suprime-Cam (SPLASH)" **(Press Release: JPL) (~80 citations)**

Speagle, J. S.; Steinhardt, C. L.; Capak, P. L.; & Silverman, J. D., **ApJS** (1405.2041): "A Highly Consistent Framework for the Evolution of the Star-Forming 'Main Sequence' from z~0-6" **(~390 citations)**

2011:

Speagle, J. S.; Kaplan, D. L.; & van Kerkwijk, M. H., **ApJ** (1111.2877): "The X-ray Counterpart of the High-*B* Pulsar J0726-2612"