

PETER BEHROOZI

CURRICULUM VITÆ

CONTACT INFORMATION:

University of Arizona
933 N Cherry Ave
Tucson, AZ 85719

Assistant Professor
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RESEARCH AREAS:

Galaxy Formation, Supermassive Black Holes, Cosmology

EDUCATION AND APPOINTMENTS:

Assistant Professor; University of Arizona	8/2017-present
Hubble Postdoctoral Fellow; UC Berkeley	12/2015-8/2017
Giacconi Postdoctoral Fellow; Space Telescope Science Institute	9/2013-12/2015
Postdoctoral Scholar; Stanford University	7/2012-8/2013
PhD, Physics; Stanford University (Advisor: Risa Wechsler)	9/2006-6/2012
BA, Physics and Math; Harvard University (<i>magna cum laude</i>)	9/2002-6/2006

PAPERS PUBLISHED / IN PRESS (88 TOTAL):

Statistics ([ADS](#)): $n_{\text{cites}} > 6300$, $h = 37$, $g = 79$. First-author: $n_{\text{cites}} > 2600$, $h = 11$, $g = 16$.

Most-cited paper: #9, $n_{\text{cites}} > 900$.

— *first- and student-authored papers in astrophysics* —

1. [Behroozi & Silk](#), “[The Most Massive Galaxies and Black Holes Allowed by \$\Lambda\$ CDM](#),” MNRAS 477, 5382 (2018).
2. [Choksi](#), [Behroozi](#), [Volonteri](#), et al., “[Recoiling Supermassive Black Hole Escape Velocities from Dark Matter Halos](#),” MNRAS 472, 1526 (2017).
3. [Behroozi & Peebles](#), “[On The History and Future of Cosmic Planet Formation](#),” MNRAS 454, 1811 (2015).
4. [Behroozi](#), [Knebe](#), [Pearce](#), et al., “[Major Mergers Going Notts: Challenges for Modern Halo Finders](#),” MNRAS 454, 3020 (2015).
5. [Behroozi](#), [Zhu](#), [Ferguson](#), et al., “[Using Galaxy Pairs to Probe Star Formation During Major Halo Mergers](#),” MNRAS 450, 1546 (2015).
6. [Behroozi & Silk](#), “[A Simple Technique for Predicting High-Redshift Galaxy Evolution](#),” ApJ 799, 32 (2015).
7. [Behroozi](#), [Ramirez-Ruiz](#), [Fryer](#), “[Interpreting Short Gamma Ray Burst Progenitor Kicks and Time Delays Using the Host Galaxy-Dark Matter Halo Connection](#),” ApJ 792, 123 (2014).
8. [Behroozi](#), [Wechsler](#), [Lu](#), et al., “[Mergers and Mass Accretion for Infalling Halos Both End Well Outside Cluster Virial Radii](#),” ApJ 787, 156 (2014).
9. [Behroozi](#), [Wechsler](#), [Conroy](#), “[The Average Star Formation Histories of Galaxies in Dark Matter Halos from \$z=0-8\$](#) ,” ApJ 770, 57 (2013).
10. [Behroozi](#), [Marchesini](#), [Wechsler](#), et al., “[Using Cumulative Number Densities to Compare Galaxies Across Cosmic Time](#),” ApJ 777, L10 (2013).
11. [Behroozi](#), [Loeb](#), [Wechsler](#), “[Unbound Particles in Dark Matter Halos](#),” JCAP 6, 19 (2013).
12. [Behroozi](#), [Wechsler](#), [Conroy](#), “[On the Lack of Evolution in Galaxy Star Formation Efficiency](#),” ApJL 762, L31 (2013).
13. [Behroozi](#), [Wechsler](#), [Wu](#), “[The Rockstar Phase-Space Temporal Halo Finder and the Velocity Offsets of Cluster Cores](#),” ApJ, 762, 109 (2013).
14. [Behroozi](#), [Wechsler](#), [Wu](#), et al., “[Gravitationally Consistent Halo Catalogs and Merger Trees for Precision Cosmology](#),” ApJ, 763, 18 (2013).

15. **Behroozi**, Conroy, Wechsler, “A Comprehensive Analysis of Uncertainties Affecting the Stellar Mass - Halo Mass Relation for $0 < z < 4$,” *ApJ*, 717, 379 (2010).

— papers with collaborators as first authors —

16. Somerville, **Behroozi** et al., “The Relationship between Galaxy and Dark Matter Halo Size from $z \sim 3$ to the present,” *MNRAS* 473, 2714 (2018).
17. Lee, Primack, **Behroozi**, et al., “Tidal Stripping and Post-Merger Relaxation of Dark Matter Halos: Causes and Consequences of Mass Loss,” *MNRAS* 481, 4038 (2018).
18. Zhang, Zaritsky, **Behroozi**, “Emission from the Ionized Gaseous Halos of Low Redshift Galaxies and Their Neighbors,” *ApJ* 861, 34 (2018).
19. Zhang et al., “Emission line ratios for the Circumgalactic Medium and the ‘Bimodal’ Nature of Galaxies,” *ApJL* 866, 4 (2018).
20. Fang et al., “Demographics of Star-forming Galaxies since $z \sim 2.5$. I. The *UVJ* Diagram in CANDELS,” *ApJ* 858, 100 (2018).
21. Imara et al., “A Model Connecting Galaxy Masses, Star Formation Rates, and Dust Temperatures Across Cosmic Time,” *ApJ* 854, 36 (2018).
22. Knebe et al., “MultiDark-Galaxies: data release and first results,” *MNRAS* 454, 5206 (2018).
23. Salcedo et al., “Spatial Clustering of Dark Matter Halos: Secondary Bias, Neighbor Bias, and the Influence of Massive Neighbors on Halo Properties,” *MNRAS* 475, 4411 (2018).
24. Breyse, Kovetz, **Behroozi**, et al., “Insights from probability distribution functions of intensity maps,” *MNRAS* 467, 2996 (2017).
25. Berti, Coil, **Behroozi**, et al., “PRIMUS: One- and Two-Halo Galactic Conformity at $0.2 < z < 1$,” *ApJ* 834, 87 (2017).
26. Lee, Primack, **Behroozi**, et al., “Properties of Dark Matter Halos as a Function of Local Environment Density,” *MNRAS* 466, 3834 (2017).
27. Harikane et al., “GOLDRUSH. II. Clustering of Galaxies at $z \sim 4 - 6$ Revealed with the Half-Million Dropouts Over the 100 deg² Area Corresponding to 1 Gpc³,” *PASJ* 70, 11 (2018).
28. Hearin et al., “High-Precision Forward Modeling of Large-Scale Structure: An open-source approach with Halotools,” *AJ* 154, 190 (2017).
29. Pandya et al. “The Nature of Massive Transition Galaxies in CANDELS, GAMA, and Cosmological Simulations,” *MNRAS* 472, 2054 (2017).
30. Leauthaud et al., “Lensing is Low: Cosmology, Galaxy Formation, or New Physics?,” *MNRAS* 467, 3024 (2017).
31. Rodríguez-Torres et al. “Clustering of quasars in the First Year of the SDSS-IV eBOSS survey: Interpretation and halo occupation distribution,” *MNRAS* 468, 728 (2017).
32. Rodríguez-Puebla, **Behroozi**, Primack, et al., “Halo and Subhalo Demographics with Planck Cosmological Parameters: Bolshoi-Planck and MultiDark-Planck Simulations,” *MNRAS* 462, 893 (2016).
33. Hearin, **Behroozi**, van den Bosch, “On the Physical Origin of Galactic Conformity,” *MNRAS* 461, 2135 (2016).
34. Gu, Conroy, **Behroozi**, “Hierarchical Galaxy Growth and Scatter in the Stellar Mass – Halo Mass Relation,” *ApJ* 833, 2 (2016).
35. Rodríguez-Puebla, Primack, **Behroozi**, Faber, “Is Main Sequence Galaxy Star Formation Controlled by Halo Mass Accretion?” *MNRAS* 455, 2592 (2016).
36. Guo, Zheng, **Behroozi**, et al., “Modelling Galaxy Clustering: Halo Occupation Distribution versus Subhalo Matching,” *MNRAS* 459, 3040 (2016).
37. Guo, Zheng, **Behroozi**, et al., “Galaxy Three-Point Correlation Functions and Halo/Subhalo Models,” *ApJ* 831, 3 (2016).
38. Pacifici, et al., “The evolution of star formation histories of quiescent galaxies,” *ApJ* 832, 79 (2016).
39. Saito et al., “Connecting Massive Galaxies to Dark Matter Halos in BOSS. I. Is Galaxy Color a Stochastic Process in High-Mass Halos?” *MNRAS* 460, 1457 (2016).
40. Papovich et al., “The Spitzer-HETDEX Exploratory Large-Area Survey,” *ApJS* 224, 28 (2016).
41. Rodríguez-Torres et al., “The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: Modeling the clustering and halo occupation distribution of BOSS-CMASS galaxies in the Final Data Release,” *MNRAS* 460, 1173 (2016).
42. Wang et al., “Sussing Merger Trees: Stability and Convergence” *MNRAS* 459, 1554 (2016).

43. Kawinwanichakij et al., "Satellite Quenching and Galactic Conformity at $0.3 < z < 2.5$," ApJ 817, 9 (2016).
44. van den Bosch et al., "On the Segregation of Dark Matter Substructure," MNRAS 455, 158 (2016).
45. Finkelstein, Song, Behroozi, et al., "An Increasing Stellar Baryon Fraction in Bright Galaxies at High Redshift," ApJ 814, 95 (2015).
46. Guo et al., "Redshift-Space Clustering of SDSS Galaxies — Luminosity Dependence, Halo Occupation Distribution, and Velocity Bias," MNRAS 453, 4368 (2015).
47. Finkelstein et al., "The Evolution of the Galaxy Rest-Frame Ultraviolet Luminosity Function over the First Two Billion Years," ApJ 810, 71 (2015).
48. Miller et al., "The bias of the submillimetre galaxy population: SMGs are poor tracers of the most massive structures in the $z \sim 2$ Universe," MNRAS 452, 878 (2015).
49. Popping, Behroozi, Peeples, "Evolution of the atomic and molecular gas content of galaxies in dark matter haloes," MNRAS 449, 477 (2015).
50. Old et al., "Galaxy Cluster Mass Reconstruction Project: II. Quantifying scatter and bias using contrasting mock catalogues," MNRAS 449, 1897 (2015).
51. Papovich et al., "ZFOURGE/CANDELS: On the Evolution of M^* Galaxy Progenitors from $z = 3$ to $z = 0.5$," ApJ 803, 26 (2015).
52. Grazian et al., "The galaxy stellar mass function at $3.5 \leq z \leq 7.5$ in the CANDELS/UDS, GOODS-South, and HUDF fields," A&A 575, 96 (2015).
53. Governato et al., "Faint dwarfs as a test of DM models: WDM vs. CDM," MNRAS 448, 792 (2015).
54. Salmon et al., "The Relation Between Star Formation Rate and Stellar Mass for Galaxies at $3.5 \leq z \leq 6.5$ in CANDELS," ApJ 799, 183 (2015).
55. Watson et al., "Predicting Galaxy Star Formation Rates via the Co-evolution of Galaxies and Halos," MNRAS 446, 651 (2015).
56. Shankar et al., "On the Intermediate-Redshift Central Stellar Mass–Halo Mass Relation, and Implications for the Evolution of the Most Massive Galaxies since $z \sim 1$," ApJL, 797, L27 (2014).
57. Lee et al., "Sussing Merger Trees : The Impact of Halo Merger Trees on Galaxy Properties in a Semi-Analytic Model," MNRAS 445, 4197 (2014).
58. Lu et al., "Semi-analytic Models for the CANDELS Survey: Comparison of Predictions for Intrinsic Galaxy Properties," ApJ 795, 123 (2014).
59. van der Wel et al., "3D-HST+CANDELS: The Evolution of the Galaxy Size-Mass Distribution since $z = 3$," ApJ 788, 28 (2014).
60. Hoffmann et al., "Subhaloes gone Notts: Subhaloes as tracers of the dark matter halo shape," MNRAS 442, 1197 (2014).
61. Avila et al., "Sussing Merger Trees: the influence of the halo finder," MNRAS 441, 3348 (2014).
62. Pujol et al., "Subhaloes gone Notts: the clustering properties of subhaloes," MNRAS 438, 3205 (2014).
63. Tinker et al., "Evolution of the Stellar-to-Dark Matter Relation: Separating Star-Forming and Passive Galaxies from $z = 1$ to 0," ApJ 778, 93 (2013).
64. Srisawat et al., "Sussing Merger Trees: The Merger Trees Comparison Project," MNRAS 436, 150 (2013).
65. Knebe et al., "Structure Finding in Cosmological Simulations: The State of Affairs," MNRAS 435, 1618 (2013).
66. Gerke, Wechsler, Behroozi, et al. "Improved Mock Galaxy Catalogs for the DEEP2 Galaxy Redshift Survey from Subhalo Abundance and Environment Matching," ApJS 208, 1 (2013).
67. Elahi et al., "Streams Going Notts: The tidal stream finder comparison project," MNRAS 433, 1537 (2013).
68. Hayward, Behroozi, Somerville, et al., "Spatially unassociated galaxies contribute significantly to the blended submillimetre galaxy population: predictions for follow-up observations of ALMA sources," MNRAS 434, 2572 (2013).
69. Reddick et al., "The Connection between Galaxies and Dark Matter Structures in the Local Universe," ApJ 771, 30 (2013).
70. Oman, Hudson, Behroozi, "Disentangling Satellite Galaxy Populations using Orbit Tracking in Simulations," MNRAS 431, 2307 (2013).
71. Knebe et al., "Galaxies going MAD: The Galaxy-Finder Comparison Project," MNRAS 428, 2039 (2013).

72. Wu et al., “Rhapsody: II. Subhalo Properties and the Impact of Tidal Stripping From a Statistical Sample of Cluster-Size Halos,” *ApJ* 767, 23 (2013)
73. Wu et al., “Rhapsody: I. Structural Properties and Formation History From a Statistical Sample of Re-simulated Cluster-size Halos,” *ApJ* 763, 70 (2013).
74. Onions et al., “Subhaloes gone Notts: Spin across Subhaloes and Finders,” *MNRAS*, 429, 2739 (2013).
75. Onions et al., “Subhaloes going Notts: the subhalo-finder comparison project,” *MNRAS*, 423, 1200 (2012).
76. Leauthaud, George, **Behroozi**, et al., “The integrated stellar content of dark matter halos,” *ApJ*, 746, 95 (2012).
77. Leauthaud et al., “New constraints on the evolution of the stellar-to-dark matter connection: a combined analysis of galaxy-galaxy lensing, clustering, and stellar mass functions from $z=0.2$ to $z=1$,” *ApJ*, 744, 159 (2012).
78. Busha, Wechsler, **Behroozi**, et al., “Statistics of Satellite Galaxies Around Milky Way-Like Hosts,” *ApJ*, 743, 117 (2011).
79. George et al., “Galaxies in X-ray Groups I: Robust Membership Assignment and the Impact of Group Environments on Quenching,” *ApJ*, 742, 125 (2011).
80. Knebe et al., “Haloes gone MAD: The Halo-Finder Comparison Project,” *MNRAS*, 415, 2293 (2011).
81. Leauthaud, Tinker, **Behroozi**, et al., “A theoretical framework for combining techniques that probe the link between galaxies and dark matter,” *ApJ*, 738, 45 (2011).
82. Liu et al., “How Common are the Magellanic Clouds?” *ApJ*, 733, 62 (2011).

— papers outside of astrophysics —

83. F. Behroozi & **P. Behroozi**, “Reliable Determination of Contact Angle from the Height and Volume of Sessile Drops, *AJP* accepted.
84. F. Behroozi & **P. Behroozi**, “Determination of surface tension from the measurement of internal pressure of mini soap bubbles,” *AmJPh*, 79,1089 (2011).
85. F. Behroozi & **P. Behroozi**, “The effect of a soap film on a catenary: measurement of surface tension from the triangular configuration,” *EJPh*, 32, 1237 (2011).
86. **Behroozi**, Cordray, Griffin, et al., “The Calming Effect of Oil on Water,” *AmJPh*, 75, 407 (2007).
87. Diehl, Lee, **Behroozi**, et al., “Microfluidic tuning of distributed feedback quantum cascade lasers,” *OExpr*, Vol. 14, Issue 24, 11660 (2006).
88. F. Behroozi & **P. Behroozi**, “Efficient Deconvolution of Noisy Periodic Interference Signals by Bessel Functions,” *JOSAA*, 23, 902 (2006).

PAPERS RECENTLY SUBMITTED:

1. **Behroozi**, Wechsler, Hearin, Conroy, “UniverseMachine: The Correlation between Galaxy Growth and Dark Matter Halo Assembly from $z=0-10$,” *MNRAS* submitted.
2. Hearin, **Behroozi**, et al., “Clustering Constraints on the Relative Sizes of Central and Satellite Galaxies,” *MNRAS* submitted.
3. Wang et al., “ATLAS Probe: Breakthrough Science of Galaxy Evolution, Cosmology, Milky Way, and the Solar System,” *Experimental Astronomy* submitted.
4. Goh et al., “Dark Matter Halo Properties vs. Local Density and Cosmic Web Location,” *MNRAS* submitted.
5. Miller et al., “Investigating overdensities around $z>6$ galaxies through ALMA observations of [CII],” *MNRAS* submitted.

RECENT TALKS:	Date	Location	Date	Location	Date
UArizona†	10/29/18	Stanford	4/3/17	Snowbird*	3/17/16
Caltech*	10/19/18	CCA (New York)	3/22/17	STScI*	3/16/16

*Invited Conference/Workshop Talk. †Public Talk

Location	Date	Location	Date	Location	Date
Berkeley	10/8/18	UFlorida*	3/16/17	Princeton	1/22/16
McGill	9/18/18	STScI*	3/15/17	UCSC	1/18/16
UCSC	8/9/18	UArizona	2/9/17	IPMU	12/3/15
UArizona†	5/17/18	Sexten*	1/18/17	STScI	6/24/15
UTokyo	4/19/18	Obergurgl*	1/15/17	ICTP (Trieste)*	5/14/15
JPL	2/1/18	IPMU	12/15/16	IAP (Paris)	5/7/15
Berkeley*	1/10/18	Kyoto	12/5/16	Potsdam	5/4/15
UCSC	1/8/18	Hiroshima*	11/29/16	Leiden*	4/30/15
Fermilab	11/13/17	Harvard	10/11/16	UT Austin*	4/3/15
NAOJ	10/10/17	CIERA*	8/31/16	STScI*	3/10/15
IPMU	10/3/17	UCSC	8/10/16	UCSC	2/23/15
Leiden*	9/8/17	IAP (Paris)	6/14/16	UT Austin	2/12/15
MIAPP	7/18/17	MPA	6/2/16	IfA (Hawaii)	11/5/14
Rome	7/6/17	USM (Munich)	6/1/16	UCSD	10/29/14
Arcetri	6/29/17	Stanford	4/25/16	Harvard	10/16/14
IAP (Paris)	6/15/17	LBNL	4/22/16	Yale	10/7/14
ENS (Paris)*	6/13/17	APS April Meeting*	4/16/16	JHU	9/8/14
KITP*	5/17/17	UCSC	4/11/16	UCSC	8/14/14

*Invited Conference/Workshop Talk. †Public Talk

PUBLIC SERVICE & OUTREACH:

STEM Faculty Lead for the [Warrior-Scholar Project](#), UA chapter (2018-).

Author of the open-source [UNIVERSEMACHINE](#) galaxy formation model, [ROCKSTAR](#) halo finder, [CONSISTENT TREES](#) merger tree code, & [NDRREDSHIFT](#) number density evolution code.

Referee for *ApJ* (2011-), *MNRAS* (2013-), *Comp. Astro. & Cosmo.* (2014-), *A&A* (2015-), and *Nature* (2015-).

Review panel member for NSF (2016-); NASA Postdoctoral Program (2014-) and NESSF (2016-).

Scientific organizing committee for *A decade of the star-forming main sequence* (2017); *Exploring the Universe with JWST – II* (2016); *KIPAC@10* (2013).

Core team member for the [ATLAS Probe](#).

DEPARTMENTAL SERVICE:

Colloquium Committee (2017-), Graduate Admissions Committee (2017-), Prize Theory Fellowship Committee (2017-), Diversity Committee (2018-)

PRESS:

“Most Earth-Like Worlds Have Yet to Be Born”, covered in *The Atlantic*, *New Scientist*, *Washington Post*, *The John Batchelor Show*, *Christian Science Monitor*, *Discovery News*, *Daily Mail*, *Independent*, etc.

HONORS AND GRANTS RECEIVED:

Co-I LRZ Supercomputing Grant (25M CPU hours)	2016
PI NASA Pleiades Supercomputing Grant (1.2M CPU hours)	2016-2017
Hubble Fellowship (2015-2018)	2015
Centre for Cosmological Studies Travel Grant	2015
Giacconi Fellowship (2013-2016)	2013
Co-I Hubble Theory Grant (Cycle 21)	2013
Co-I Hubble Theory Grant (Cycle 20)	2012
Co-I Hubble Theory Grant (Cycle 18)	2010
ARCS Scholar	2010
Concertmaster of Harvard Mozart Society Orchestra	2002-2006
Member of the U.S. Physics Team	2002
Siemens-Westinghouse Science Talent Search National Finalist	2001

RESEARCH SUPERVISED/CO-SUPERVISED:

Haowen Zhang	UArizona	Graduate	2018-present
Christine O'Donnell	UArizona	Graduate	2018-present
Ryan Endsley	UArizona	Graduate	2017-present
Magdalena Allen	UC Berkeley	Undergraduate	2017-present
Nick Choksi	UC Berkeley	Undergraduate	2016-2017

TEACHING EXPERIENCE:

ASTR 540	Structure & Dynamics of Galaxies	Fall 18	UArizona	Prof.
Phys. 63	Electricity, Magnetism, and Waves	Win. 09	Stanford	TA
Phys. 64	Advanced Electromagnetism Laboratory	Win. 09	Stanford	TA
Phys. 120	Intermediate Electricity and Magnetism	Win. 08	Stanford	TA
Phys. 15	The Nature of the Universe	Fall 07	Stanford	TA
Phys. 43	Electricity and Magnetism	Spr. 07	Stanford	TA
Phys. 123	Laboratory Electronics	Win. 04	Harvard	TA

PATENTS:

Characterizing transmission of access nodes within a wireless network	#8,493,945	2013
Characterizing uncoordinated interference of a wireless network	#8,559,407	2013
Mitigation of uncoordinated interference of a wireless access node	#8,606,187	2013

REFERENCES:

Risa Wechsler	Professor, Stanford University	rwechsler@stanford.edu
Joseph Silk	Professor, IAP / JHU	silk@iap.fr
Rachel Somerville	Group Leader, CCA	rsomerville@flatironinstitute.org
Joel Primack	Professor, UC Santa Cruz	joel@ucsc.edu
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Andrey Kravtsov	Professor, U. of Chicago	andrey@oddjjob.uchicago.edu
Eliot Quataert	Professor, UC Berkeley	eliot@berkeley.edu
John Kormendy	Professor, UT Austin	kormendy@astro.as.utexas.edu