

Nicholas Battaglia

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Citizenship: Canadian

Professional Appointments

Assistant Professor July 2018 - Present
Department of Astronomy, Cornell University

Associate Research Scientist August 2017 - July 2018
Center for Computation Astrophysics, Flatiron Institute

Lyman Spitzer Jr. Postdoctoral Fellow September 2014 - Aug 2017
Department of Astrophysical Sciences, Princeton University

McWilliams Postdoctoral Fellow September 2011- August 2014
McWilliams Center for Cosmology, Department of Physics, Carnegie Mellon University

Education

Ph.D., Astronomy and Astrophysics, September 2011
Department of Astronomy and Astrophysics, University of Toronto

B.S., Physics, May 2006
Department of Physics, McGill University

Research Interests

Cosmology, Computational Astrophysics and Data-Analysis, Cosmic Microwave Background, Large-Scale structure, Galaxy Clusters, Reionization, and Galaxy Formation.

Awards and Honors

Guest Professorship, l'Université Paris Diderot, Paris, France (May 2018)
Lyman Spitzer Jr. Postdoctoral Fellowship 2014 at Princeton Universe, awarded once per year to "a top theoretical postdoctoral astronomer".
McWilliams Postdoctoral Fellowship 2011 at Carnegie Mellon University, award to "[Researchers] who are expected to carry out their own program of original research".
Ontario Graduate Scholarships in Science and Technology 2010
Ontario Graduate Scholarship 2009
Shirley Jones Fellowship at the University of Toronto 2009

Grants

"A novel approach to maximize the astrophysical and cosmological information extracted from thermal Sunyaev-Zeldovich maps", NASA, 21-ATP21-0129, **PI: N. Battaglia**, \$309,642, 02/25/2022 - 02/24/2025

"Enhancing the Planck Sunyaev-Zel'dovich Galaxy Cluster Catalog and Revisiting their Cosmological Constraints", NASA, 21-ADAP21-0114, **PI: N. Battaglia**, \$270,480, 01/07/2022 - 01/06/2025

“MRI: Development of 350 GHz instrumentation to characterize Galactic dust polarization with CCAT-prime”, NSF, MRI-2117631, PI: M. Niemack, **Role: Co-I**, \$1,346,976, 09/01/2021 - 08/31/2024

“Observations to Constrain the Origins of Hot Gas Between Galaxies and Clusters of Galaxies Across Cosmic Time”, NSF, AST-1910021, **PI: N. Battaglia**, \$353,116, 09/01/2019 - 08/31/2023

“Mapping The Baryonic Majority: Comprehensive Multi-Mission Analysis of the Circumgalactic Medium (CGM) and the Intergalactic Medium (IGM), Year 3 - Renewal”, NASA JPL, RTD, PI: J. Bartlett, **Role: Co-I**, \$28,466, 10/01/20 - 09/30/21

“Mapping The Baryonic Majority: Comprehensive Multi-Mission Analysis of the Circumgalactic Medium (CGM) and the Intergalactic Medium (IGM), Year 2 - Renewal”, NASA JPL, RTD, PI: J. Bartlett, **Role: Co-I**, \$30,412, 10/01/19 - 09/30/20

“Mapping The Baryonic Majority: Comprehensive Multi-Mission Analysis of the Circumgalactic Medium (CGM) and the Intergalactic Medium (IGM), Year 1”, NASA JPL, RTD, PI: J. Bartlett, **Role: Co-I**, \$30,064, 10/01/18 - 09/30/19

“Elucidating the nature of the dark sector and gravity with novel tracers”, NASA, 17-ATP17-0060, PI: R. Bean, **Role: Co-I**, \$717,566, 06/2018-05/2022

“The Imprint of Patchy Reionization on the Cosmic Microwave Background”, NSF, AST-1312991, PI: H. Trac, **Role: Collaborator**, \$440k, 11/2013-10/2016

Collaborations and Leadership Roles

The Atacama Cosmology Telescope Collaboration (ACT, ACTPol, & AdvACT)

- **Group Leader:** ACT-HSC Collaboration Cross-Correlation working group.

The Simons Observatory Collaboration

- **Former Theory and Analysis Committee Member 2018-2020** (peer voted position)
- **Analysis Working Group Advisor:** Sunyaev-Zel’dovich working group.

CCAT-prime

- **Group Leader:** Galaxy Cluster and Sunyaev-Zel’dovich working group.

CMB Stage 4

- **Former Governing Board Member 2018-2020** (peer voted position)
- **Former Science Committee Member 2020-2022:** Sources and Transients (peer nominated position)

Hyper Suprime-Cam Collaboration

- **Group Leader:** ACT-HSC Cross-correlation.

Courses Taught

Graduate Cosmology (ASTR 6659), History of the Universe (ASTR 2201), Senior Cosmology (ASTR 4433), Graduate Reading Seminar (ASTR 7683), Black Holes: Race and the Cosmo (ASTR 2034)

Supervision of Undergraduate Students, Graduate Students, and Postdoctoral Researchers

-*Research group at Cornell:* 2 postdoctoral researcher, Dr. Anirban Roy, Dr. Eunseong Lee, 5 graduate students, Emily Moser (5th year), Raagini Patki (3rd year), Katie Chapman (3rd year), Chad Popik (2nd year), Olive Ross (2nd year), 3 undergraduate students, Ricco Venterea, Kailai Wang, Ariel Baksh. Previous undergraduate students, Jesse Werbow, Rizo Rakhmanov, Yijie Zhu, Rayne Liu, Isaac Sarnoff, Rana Anil Ahmad, Julia Meyer. Cornell REU student, Dariannette Valentin (ASU). Simons Foundation NSBP Summer Scholar, Anansa Keaton (USC).

-*Previous co-supervision as a postdoctoral fellow while at CMU and Princeton:* 5 graduate students, Paul La Plante (CMU), Michelle Ntampaka (CMU), JD Emberson (U of T), Johnny Greco (Princeton), Emmanuel Schaan (Princeton), and 2 undergraduate students, Paul Mansfield (CMU), Arianna Lanz (Princeton).

Colloquia

Cornell - Astronomy Colloquium - January 26, 2023
UIUC / NCSA - CAPS Astronomy Colloquium - November, 11 2022
Munich Joint Astronomy Colloquium - May 20, 2021
New Mexico State University - Astronomy Colloquium - March 12, 2021
Center for Computational Astrophysics - Colloquium - February 5, 2021
University of Toledo - Astronomy Colloquium - January 21, 2021
Pennsylvania State University - Astronomy Colloquium - September 18, 2019
Queens University - Physics Colloquium - November 9, 2018
Minnesota - Astrophysics Colloquium - October 20, 2017
Cornell - Astronomy Colloquium - February 23, 2017
Massachusetts Institute of Technology - Astrophysics Colloquium - February 7, 2017
University of Illinois Urbana-Champaign - Astronomy Colloquium - March 1 2016

Conference Talks (selected last 5 years)

- **Invited:** “SZ clusters masses: an ACT view”, Cluster Masses 2020 ESA (ESAC) Virtual Meeting, Sept. 7, 2021.
- **Invited:** “Probing the Outskirts of Galaxy Groups and Clusters with Cosmic Microwave Background Observations”, EAS 2020 Virtual Meeting, Jul. 1, 2020.
- **Invited:** “Secondary Anisotropies in the Cosmic Microwave Background, a Look Ahead”, The 12th Great Lakes Cosmology Workshop, Rochester, NY, Aug. 6, 2019.
- **Invited:** “Dark Energy with the Simons Observatory”, COSPAR 2018, Pasadena, CA, July 16, 2018.
- **Invited:** “On Cluster Profiles with CMB-S4”, SnowCluster 2018 - The Physics of Galaxy Clusters, Snowbird, UT, March 21, 2018.

Departmental Service and Outreach

Developed and implemented the Agri-Business Child Develop Astronomy outreach program, supported with funding by Engage Cornell, 2019 - present.
 Department Course committee member, 2019 - 2022.
 First year Graduate committee member, 2018 - 2022.
 Lecturer "Cosmic Opportunities" SLAC Summer Institute, SLAC, Aug 2017.
 Co-organizer of the Princeton Undergraduate Summer Research Program, Summer 2015 & 2016.
 Colloquium coordinator, Department of Astrophysical Sciences, Princeton, 2015-2016
 Cosmology lunch coordinator, Department of Astrophysical Sciences, Princeton, 2015-2017
 Science Day presenter, Wicoff School, Plainsboro NJ, 2015 - 2017
 Cosmology seminar coordinator, McWilliams Center for Cosmology, CMU, 2012 - 2013
 September Jamboree head organizer, McWilliams Center for Cosmology, CMU, 2012 & 2013
 Allegheny Observatory Public Lecture Series, "Comic Collisions", CMU, Feb. 15, 2013
 Transit of Venus event head coordinator, [Article](#), CMU, 2012

Academic Service

Journal reviewer: Astronomy & Astrophysics, Astrophysical Journal, Astrophysical Journal Letters, Journal of Cosmology and Astroparticle Physics, Monthly Notices of the Royal Astronomical Society, Nature, Physics Letters B, Nature Astronomy.
 NASA proposal reviewer: NASA Earth and Space Science Fellowship (NESSF) Program, Hubble Space Telescope, Astrophysics Theory (ATP), Astrophysics Data Analysis (ADAP), Chandra Space Telescope
 Telescope time reviewer: Giant Meterwave Telescope, Canadian Time Allocation Committee.

Publications

Citation information as of Feb. 21, 2023

Total Citations 10,062

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First or Main Author

1. D. Cromer, **N. Battaglia**, H. Miyatake, M. Simet "Towards 1% accurate galaxy cluster masses: Including baryons in weak-lensing mass inference", 2022, JCAP, 10, 034.
2. Y. Zhu, et al. (including **N. Battaglia**), "Estimating the impact of foregrounds on the future detection of Rayleigh scattering", 2022, JCAP, 09, 048.
3. E. Moser, **N. Battaglia**, et al., "The Circumgalactic Medium from the CAMELS Simulations: Forecasting Constraints on Feedback Processes from Future Sunyaev-Zeldovich Observations", 2022, ApJ, 933, 133.
4. A. Roy, A. van Engelen, V. Gluscevic, **N. Battaglia**, "Probing the circumgalactic medium with CMB polarization statistical anisotropy", 2022, Submitted to ApJ, arXiv:2201.05076.
5. R. Liu, G. Valogiannis, **N. Battaglia**, R. Bean et al., "Constraints on $f(R)$ and nDGP Modified Gravity Model Parameters with Cluster Abundances and Galaxy Clustering", 2021, PhRvD, 104, 103519.

6. T. Namikawa, A. Roy, B. D. Sherwin, **N. Battaglia**, D. N. Spergel “Constraining reionization with the first measurement of the CMB optical depth fluctuation - Compton-y cross-correlation”, 2021, PhRvD, 104, 063514.
7. E. Moser, S. Amodeo, **N. Battaglia**, M. Alvarez, E. Schaan, S. Ferraro “The Impacts of Modeling Choices on the Inference of the Circumgalactic Medium Properties from Sunyaev-Zeldovich Observations”, 2021, ApJ, 919, 2.
8. V. Calafut, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Detection of the Pairwise Kinematic Sunyaev-Zel’dovich Effect with SDSS DR15 Galaxies”, 2021, PhRvD, 104, 043502.
9. E. M. Vavagiakis, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Probing the Baryon Content of SDSS DR15 Galaxies with the Thermal and Kinematic Sunyaev-Zel’dovich Effects”, 2021, PhRvD, 104, 043503.
10. S. Amodeo, **N. Battaglia**, E. Schaan, S. Ferraro et al. “The Atacama Cosmology Telescope: Modelling the Gas Thermodynamics in BOSS CMASS galaxies from Kinematic and Thermal Sunyaev-Zel’dovich Measurements”, 2021, PhRvD, 103, 063514.
11. E. Schaan, S. Ferraro, S. Amodeo, **N. Battaglia** et al. “The Atacama Cosmology Telescope: Combined kinematic and thermal Sunyaev-Zel’dovich measurements from BOSS CMASS and LOWZ halos”, 2021, PhRvD, 103, 063513.
12. B. Beringue, P. D. Meerburg, J. Meyers, **N. Battaglia** “Cosmology with Rayleigh Scattering of the Cosmic Microwave Background”, 2020, JCAP, 01, 060.
13. M. Madhavacheril, C. Sifon, **N. Battaglia**, et al. “The Atacama Cosmology Telescope: Weighing Distant Clusters with the Most Ancient Light”, 2020, ApJL, ApJL, 903, L13.
14. G. Stein et al. (including **N. Battaglia**), “The Websky Extragalactic CMB Simulations”, 2020, JCAP, 10, 012.
15. J. D. Cohn, **N. Battaglia** “Multiwavelength cluster mass estimates and machine learning”, 2020, MNRAS, 491, 1575.
16. M. Madhavacheril, **N. Battaglia**, K. M. Smith, J. L. Sievers, “Cosmology with kSZ: breaking the optical depth degeneracy with Fast Radio Bursts”, 2019, PhRvD, 100, 103532.
17. D. Cromer, **N. Battaglia**, M. Madhavacheril, “Improving Constraints on Fundamental Physics Parameters with the Clustering of Sunyaev-Zeldovich Selected Galaxy Clusters” 2019, PhRvD, 100, 063529.
18. A. Kiessling et al. (including **N. Battaglia**), “Considerations, Coordination, and Sharing of Numerical Simulations for Astrophysics”, 2019, Astro2020: The Astronomy and Astrophysics Decadal Survey, APC White Papers, no. 278.
19. E. Medezinski, et al. (including **N. Battaglia**), “On the Assembly Bias of Cool Core Clusters Traced by H α Nebulae”, 2019, ApJ, 822, 166.
20. T. Shin, et al. (including **N. Battaglia**), “Measurement of the Splashback Feature around SZ-selected Galaxy Clusters with DES, SPT and ACT”, 2019, MNRAS, 487, 2900.

21. **N. Battaglia**, J. C. Hill, et al., “Probing Feedback in Galaxy Formation with Millimeter-wave Observations”, 2019, Astro2020: The Astronomy and Astrophysics Decadal Survey, Science White Papers, no. 332, arXiv:1903.04647.
22. H. Miyatake, **N. Battaglia**, et al., “Weak-Lensing Mass Calibration of ACTPol Sunyaev-Zel’dovich Clusters with the Hyper Suprime-Cam Survey”, 2019, ApJ, 875, 63.
23. J. Meyers, P. D. Meerburg, A. van Engelen, **N. Battaglia**, “Beyond CMB cosmic variance limits on reionization with the polarized SZ effect”, 2018, PhRvD, 97, 103505.
24. M. Hilton, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: The Two-Season ACTPol Sunyaev-Zel’dovich Effect Selected Cluster Catalog”, 2018, ApJS, 235, 20.
25. E. Medezinski, et al. (including **N. Battaglia**), “Planck Sunyaev-Zel’dovich Cluster Mass Calibration using Hyper Suprime-Cam Weak Lensing”, 2018, PASJ, 70, SP1, 28.
26. M. Madhavacheril, **N. Battaglia**, H. Miyatake, “Fundamental Physics from Future Weak-Lensing Calibrated Sunyaev-Zel’dovich Galaxy Cluster Counts”, 2017, PhRvD, 96, 103525.
27. **N. Battaglia**, S. Ferraro, E. Schaen, D. N. Spergel, “Future constraints on halo thermodynamics from combined Sunyaev-Zel’dovich measurements”, 2017, JCAP, 11, 040.
28. M. Simet, **N. Battaglia**, R. Mandelbaum, U. Seljak, “Weak Lensing Mass Calibration of the RBC X-ray Galaxy Cluster Catalog”, 2017, MNRAS, 466, 3663.
29. F. De Bernardis, et al. (including **N. Battaglia**), “Detection of the pairwise kinematic Sunyaev-Zel’dovich effect with BOSS DR11 and the Atacama Cosmology Telescope”, 2017, JCAP, 03, 008.
30. E. Medezinski, **N. Battaglia**, J. Coupon, R. Cen, M. Gaspari, M. A. Strauss, D. N. Spergel, “Testing the Large-Scale Environments of Cool-core and Noncool-core Clusters with Clustering Bias”, 2017, ApJ, 836, 54.
31. S. Ferraro, J. C. Hill, **N. Battaglia**, J. Liu, D. N. Spergel, “The Kinematic Sunyaev-Zel’dovich Effect with Projected Fields II: prospects, challenges, and comparison with simulations”, 2016, PhRvD, 94, 123526.
32. C. Sifon, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Dynamical masses for 44 SZ-selected galaxy clusters over 755 square degrees”, 2016, MNRAS, 461, 248.
33. **N. Battaglia**, “The Tau of Galaxy Clusters”, 2016, JCAP, 08, 058.
34. **N. Battaglia**, et al., “Weak-Lensing Mass Calibration of the Atacama Cosmology Telescope Equatorial Sunyaev-Zeldovich Cluster Sample with the Canada-France-Hawaii Telescope Stripe 82 Survey”, 2016, JCAP, 08, 013.
35. E. Calabrese, **N. Battaglia**, D. N. Spergel, “Testing Gravity with Gravitational Wave Source Counts”, 2016, Classical and Quantum Gravity, 33, 5004.
36. J. C. Hill, S. Ferraro, **N. Battaglia**, J. Liu, D. N. Spergel, “The Kinematic Sunyaev-Zel’dovich Effect with Projected Fields: A Novel Probe of the Baryon Distribution with Planck, WMAP, and WISE Data”, 2016, PhRvL, 117, 051301.

37. Y. Feng, T. Di Matteo, R. Croft, S. Bird, **N. Battaglia**, S. Wilkins, “The BlueTides Simulation: First Galaxies and Reionization”, 2016, MNRAS, 455, 2778.
38. J. C. Hill, **N. Battaglia**, J. Chulba, S. Ferraro, E. Schaen, D. N. Spergel, “Taking the Universe’s Temperature with PIXIE”, 2015, PhRvL, 115, 261301.
39. **N. Battaglia**, J. C. Hill, N. Murray, “Deconstructing Compton-Y and Lensing Cross-Correlations: Implications for the Intracluster Medium”, 2015, ApJ, 812, 154.
40. J. P. Greco, J. C. Hill, D. N. Spergel, **N. Battaglia**, “The Stacked Thermal SZ Signal of Locally Brightest Galaxies in Planck Nominal Mission Data: Evidence for Galaxy Feedback?”, 2015, ApJ, 808, 151.
41. Y. Feng, T. Di Matteo, R. Croft, A. Tenneti, S. Bird, **N. Battaglia**, S. Wilkins, “The formation of Milky Way-mass disk galaxies in the first 500 million years of a cold dark matter universe”, 2015, ApJL, 808, 17.
42. **N. Battaglia**, J. R. Bond, C. Pfrommer, J. L. Sievers, “On the Cluster Physics of Sunyaev-Zel’dovich and X-ray Surveys IV: Characterizing Density and Pressure Clumping due to Infalling Substructures”, 2015, ApJ, 806, 43.
43. M. Ntampaka, H. Trac, D. J. Sutherland, **N. Battaglia**, B. Pocz, J. Schneider, “A Machine Learning Approach for Dynamical Mass Measurements of Galaxy Clusters”, 2015, ApJ, 803, 50.
44. A. Natarajan, A. R. Zentner, **N. Battaglia**, H. Trac, “Systematic errors in the measurement of neutrino masses due to baryonic feedback processes: Prospects for stage IV lensing surveys”, 2014, PhRvD, 90, 063516.
45. E. Calabrese, et al. (including **N. Battaglia**), “Precision Epoch of Reionization studies with next-generation CMB experiments”, 2014, JCAP, 08, 010.
46. P. La Plante, **N. Battaglia**, A. Natarajan, J. B. Peterson, H. Trac, R. Cen, A. Loeb, “Reionization on Large Scales IV: Predictions for the 21 cm signal incorporating the light cone effect”, 2014, ApJ, 789, 31.
47. A. Hajian, **N. Battaglia**, D. N. Spergel, J. R. Bond, C. Pfrommer, J. L. Sievers, “Measuring the Thermal Sunyaev-Zel’dovich Effect Through the Cross Correlation of Planck and WMAP Maps with ROSAT Galaxy Cluster Catalogs”, 2013, JCAP, 11, 064.
48. **N. Battaglia**, J. R. Bond, C. Pfrommer, J. L. Sievers, “On the Cluster Physics of Sunyaev-Zel’dovich and X-ray Surveys III: Measurement Biases and Cosmological Evolution of Gas and Stellar Mass Fractions”, 2013, ApJ, 777, 123.
49. **N. Battaglia**, A. Natarajan, H. Trac, R. Cen, A. Loeb, “Reionization on Large Scales III: Predictions for Low- ℓ Cosmic Microwave Background Polarization and High- ℓ Kinetic Sunyaev-Zel’dovich Observables”, 2013, ApJ, 776, 83.
50. A. Natarajan, **N. Battaglia**, H. Trac, U-L. Pen, A. Loeb, “Reionization on Large Scales II: Detecting Patchy Reionization through Cross Correlation of the Cosmic Microwave Background”, 2013, ApJ, 776, 82.

51. **N. Battaglia**, H. Trac, R. Cen, A. Loeb, “Reionization on Large Scales I: A Parametric Model Constructed using Radiation-Hydrodynamic Simulations”, 2013, ApJ, 776, 81.
52. M., Hasselfield, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Sunyaev-Zel’dovich Selected Galaxy Clusters at 148 GHz from Three Seasons of Data”, 2013, JCAP, 07, 008.
53. T. Kahniashvili, Y. Maravin, A. Natarajan, **N. Battaglia** and A. G. Tevzadze, “Constraining primordial magnetic fields through large scale structure”, 2013, ApJ, 770, 47.
54. **N. Battaglia**, J. R. Bond, C. Pfrommer, J. L. Sievers, “On the Cluster Physics of Sunyaev-Zel’dovich and X-ray Surveys II: Deconstructing the Thermal SZ Power Spectrum”, 2012, ApJ, 758, 75.
55. **N. Battaglia**, J. R. Bond, C. Pfrommer, J. L. Sievers, “On the Cluster Physics of Sunyaev-Zel’dovich and X-ray Surveys I: The Influence of Feedback, Non-thermal Pressure and Cluster Shapes on Y-M Scaling Relations”, 2012, ApJ, 758, 74.
56. **N. Battaglia**, J. R. Bond, C. Pfrommer, J. L. Sievers, D. Sijacki, D., “Simulations of the Sunyaev-Zel’dovich Power Spectrum with Active Galactic Nucleus Feedback”, 2010 ApJ, 725, 91.
57. **N. Battaglia**, C. Pfrommer, J. L. Sievers, J. R. Bond, T. A. Enßlin, “Exploring the magnetized cosmic web through low-frequency radio emission”, 2009, MNRAS, 393, 1073.

Collaboration

58. CCAT-Prime Collaboration (including **N. Battaglia**), “CCAT-prime Collaboration: Science Goals and Forecasts with Prime-Cam on the Fred Young Submillimeter Telescope”, 2023, ApJS, 264, 7.
59. G. Stacey et al. (including **N. Battaglia**), “CCAT-Prime/FYST: a status report on the ultra-widefield submillimeter observatory on Cerro Chajnantor”, 2022, SPIE, 12182, 10.
60. M. Lokken et al. (including **N. Battaglia**), “Superclustering with the Atacama Cosmology Telescope and Dark Energy Survey: I. Evidence for thermal energy anisotropy using oriented stacking”, 2022, submitted to ApJ, 933, 134.
61. J. C. Hill et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Constraints on Pre-Recombination Early Dark Energy”, 2022, PRD, 105, 3536.
62. S. Pandey et al. (including **N. Battaglia**), “Cross-correlation of DES Y3 lensing and ACT/*Planck* thermal Sunyaev Zel’dovich Effect II: Modeling and constraints on halo pressure profiles”, 2022, PhRvD, 105, 3526.
63. M. Gatti et al. (including **N. Battaglia**), “Cross-correlation of DES Y3 lensing and ACT/*Planck* thermal Sunyaev Zel’dovich Effect I: Measurements, systematics tests, and feedback model constraints”, 2022, PhRvD, 105, 3525.
64. L. Thiele, et al. (including **N. Battaglia**), “Percent-level constraints on baryonic feedback with spectral distortion measurements”, 2022, PhRvD, 105, 3505.

65. F. Villaescusa-Navarro, et al. (including **N. Battaglia**), “The CAMELS Multifield Dataset: Learning the Universe’s Fundamental Parameters with Artificial Intelligence”, 2021, ApJS, 259, 61.
66. The CMB-S4 Collaboration (including **N. Battaglia**), “Snowmass 2021 CMB-S4 White Paper”, 2022, arXiv:2203.08024.
67. C. L. Chang et al. (including **N. Battaglia**), “Snowmass2021 Cosmic Frontier: Cosmic Microwave Background Measurements White Paper”, 2022, arXiv:2203.07638.
68. A. D. Hincks et al. (including **N. Battaglia**), “A high-resolution view of the filament of gas between Abell 399 and Abell 401 from the Atacama Cosmology Telescope and MUSTANG-2”, 2022, MNRAS, 510, 3334.
69. J. Kim et al. (including **N. Battaglia**), “Probing Hot Gas Components of Circumgalactic Medium in Cosmological Simulations with the Thermal Sunyaev-Zel’dovich Effect”, 2022, ApJ, 926, 179.
70. S. Raghunathan et al. (including **N. Battaglia**), “Constraining Cluster Virialization Mechanism and Cosmology using Thermal-SZ-selected clusters from Future CMB Surveys”, 2022, ApJ, 926, 172.
71. The CMB-S4 Collaboration (including **N. Battaglia**), “CMB-S4: Forecasting Constraints on Primordial Gravitational Waves”, 2022, ApJ, 926, 54.
72. J. Wadekar, et al. (including **N. Battaglia**), “Augmenting astrophysical scaling relations with machine learning : application to reducing the SZ flux-mass scatter”, 2022, submitted to PhRvD, arXiv:2201.01305.
73. F. Villaescusa-Navarro, et al. (including **N. Battaglia**), “The CAMELS project: public data release”, 2022, submitted to ApJS, arXiv:2201.01300.
74. S. Naess et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: A search for Planet 9”, 2021, ApJ, 923, 224.
75. S. Adhikari et al. (including **N. Battaglia**), “Probing galaxy evolution in massive clusters using ACT and DES: splashback as a cosmic clock”, 2021, ApJ, 923, 37.
76. T. Shin et al. (including **N. Battaglia**), “The mass and galaxy distribution around SZ-selected clusters”, 2021, MNRAS, 507, 5758.
77. J. Orlowski-Scherer et al. (including **N. Battaglia**), “Atacama Cosmology Telescope measurements of a large sample of candidates from the Massive and Distant Clusters of WISE Survey: Sunyaev-Zeldovich effect confirmation of MaDCoWS candidates using ACT”, 2021, A&A, 653, A135.
78. F. Villaescusa-Navarro et al. (including **N. Battaglia**), “The CAMELS project: Cosmology and Astrophysics with Machine Learning Simulations”, 2021, ApJ, 915, 71.
79. S. Naess et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Detection of mm-wave transient sources”, 2021, ApJ, 915, 14.

80. B. Fuzia et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: SZ-based masses and dust emission from IR-selected cluster candidates in the SHELA survey”, 2020, MNRAS, 502, 4026.
81. M. Hilton, et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: A Catalog of > 4000 Sunyaev-Zel’dovich Galaxy Clusters”, 2021, ApJS, 253, 3.
82. Y. He et al. (including **N. Battaglia**), “Debiased Galaxy Cluster Pressure Profiles from X-ray Observations and Simulations”, 2021, ApJ, 908, 91.
83. O. Darwish et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: A CMB lensing mass map over 2100 square degrees of sky and its cross-correlation with BOSS-CMASS galaxies”, 2021, MNRAS, 500, 2250.
84. D. Han et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Delensed Power Spectra and Parameters”, 2021, JCAP, 01, 060.
85. S. Aiola et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: DR4 Maps and Cosmological Parameters”, 2020, JCAP, 2020, 047.
86. S. Naess et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: arcminute-resolution maps of 18,000 square degrees of the microwave sky from ACT 2008-2018 data combined with Planck”, 2020, JCAP, 2020, 046.
87. S. K. Choi et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: A Measurement of the Cosmic Microwave Background Power Spectra at 98 and 150 GHz”, 2020, JCAP, 2020, 045.
88. D. Fielding et al. (including **N. Battaglia**), “First results from SMAUG: Uncovering the Origin of the Multiphase Circumgalactic Medium with a Comparative Analysis of Idealized and Cosmological Simulations”, 2020, ApJ, 903, 32.
89. M. Madhavacheril et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Component-separated maps of CMB temperature and the thermal Sunyaev-Zel’dovich effect”, 2020, PhRvD, 102, 023534.
90. T. Namikawa et al. (including **N. Battaglia**), “The Atacama Cosmology Telescope: Constraints on Cosmic Birefringence”, 2020, PhRvD, 101, 3527.
91. S. K. Choi et al. (including **N. Battaglia**), “Sensitivity of the Prime-Cam Instrument on the CCAT-prime Telescope”, 2020, JLTP, 199, 1089.
92. C. E. Romero et al. (including **N. Battaglia**), “Pressure profiles and mass estimates using high-resolution Sunyaev-Zel’dovich effect observations of Zwicky 3146 with MUSTANG-2”, 2020, ApJ, 891, 90.
93. K. R. Hall et al. (including **N. Battaglia**), “Quantifying the Thermal Sunyaev-Zel’dovich Effect and Excess Millimeter Emission in Quasar Environments”, 2019, MNRAS, 490, 2315.
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