

# Matias Zaldarriaga

Institute for Advanced Study  
School of Natural Sciences  
Einstein Drive  
Princeton, New Jersey 08540  
Tel: (609) 734-8016  
Email: matiasz@ias.edu

**Awards:** 2006 McArthur Fellowship  
2005 Gribov Medal, European Physical Society  
2004 Sloan Fellowship  
2003 Helen B. Warner Prize, American Astronomical Society  
2001 David and Lucile Packard Fellowship  
1998 Hubble Fellowship  
1996 Barret Prize (MIT) for originality in astrophysics research.

**Education:** 1998 PhD MASSACHUSETTS INSTITUTE OF TECHNOLOGY.  
1994 Licenciado en Ciencias Fisicas UNIVERSITY OF BUENOS AIRES.

**Positions:** Professor of Astrophysics, Institute for Advanced Study, 7/2009-Present  
Professor of Astronomy & Physics, Harvard University, 7/2004-6/2009  
Associate Professor, Harvard University, 1/2003-9/2004  
Assistant Professor, New York University, 1/2001-2002  
Long-term member, Institute for Advanced Study, 9/1998-1/2001

## Publications:

1. **“A New Perspective on Galaxy Clustering as a Cosmological Probe: General Relativistic Effects”** J. Yoo, A. L. Fitzpatrick and M. Zaldarriaga [arXiv:0907.0707 [astro-ph.CO]]
2. **“Non-Gaussianities in Single Field Inflation and their Optimal Limits from the WMAP 5-year Data”** L. Senatore, K. M. Smith and M. Zaldarriaga [arXiv:0905.3746 [astro-ph.CO]]
3. **“An Improved Method for 21cm Foreground Removal”** A. Liu, M. Tegmark, J. Bowman, J. Hewitt and M. Zaldarriaga [arXiv:0903.4890 [astro-ph.CO]]
4. **“Observing the Evolution of the Universe”** J. Aguirre *et al.* [arXiv:0903.0902 [astro-ph.CO]] FERMILAB-PUB-09-075-A(2009)
5. **“Constraining a spatially dependent rotation of the Cosmic Microwave Background Polarization”** A. P. S. Yadav, R. Biswas, M. Su and M. Zaldarriaga Phys. Rev. D **79**, 123009 (2009) [arXiv:0902.4466 [astro-ph.CO]]
6. **“The Origin of the Universe as Revealed Through the Polarization of the Cosmic Microwave Background”** S. Dodelson *et al.* [arXiv:0902.3796 [astro-ph.CO]] FERMILAB-PUB-09-052-A(2009)
7. **“Cosmology from the Highly-Redshifted 21 cm Line”** S. Furlanetto *et al.* [arXiv:0902.3259 [astro-ph.CO]]
8. **“Astrophysics from the Highly-Redshifted 21 cm Line”** S. Furlanetto *et al.* [arXiv:0902.3011 [astro-ph.CO]]
9. **“Contributions to the Dark Matter 3-Pt Function from the Radiation Era”** A. L. Fitzpatrick, L. Senatore and M. Zaldarriaga [arXiv:0902.2814 [astro-ph.CO]]
10. **“Optimal limits on  $f_{NL}^{local}$  from WMAP 5-year data”** K. M. Smith, L. Senatore and M. Zaldarriaga [arXiv:0901.2572 [astro-ph]]
11. **“Causality and Primordial Tensor Modes”** D. Baumann and M. Zaldarriaga JCAP **0906**, 013 (2009) [arXiv:0901.0958 [astro-ph.CO]]
12. **“Impact of Instrumental Systematic Contamination on the Lensing Mass Reconstruction using the CMB Polarization”** M. Su, A. P. S. Yadav and M. Zaldarriaga Phys. Rev. D **79**, 123002 (2009) [arXiv:0901.0285 [astro-ph.CO]]
13. **“Non-Gaussianities from Perturbing Recombination”** L. Senatore, S. Tassev and M. Zaldarriaga [arXiv:0812.3658 [astro-ph]]
14. **“Cosmological Perturbations at Second Order and Recombination Perturbed”** L. Senatore, S. Tassev and M. Zaldarriaga [arXiv:0812.3652 [astro-ph]]

15. **“CMBPol Mission Concept Study: Probing Inflation with CMB Polarization”** D. Baumann *et al.* [CMBPol Study Team Collaboration] AIP Conf. Proc. **1141**, 10 (2009) [arXiv:0811.3919 [astro-ph]]
16. **“CMBPol Mission Concept Study: Reionization Science with the Cosmic Microwave Background”** M. Zaldarriaga *et al.* [arXiv:0811.3918 [astro-ph]]
17. **“CMBPol Mission Concept Study: A Mission to Map our Origins”** D. Baumann *et al.* [CMBPol Study Team Collaboration] [arXiv:0811.3911 [astro-ph]] FERMILAB-PUB-08-600-A(2008)
18. **“HeII Reionization and its Effect on the IGM”** M. McQuinn, A. Lidz, M. Zaldarriaga, L. Hernquist, P. F. Hopkins, S. Dutta and C. A. Faucher-Giguere [arXiv:0807.2799 [astro-ph]]
19. **“Will point sources spoil 21 cm tomography?”** A. Liu, M. Tegmark and M. Zaldarriaga [arXiv:0807.3952 [astro-ph]]
20. **“Evolution of the Intergalactic Opacity: Implications for the Ionizing Background, Cosmic Star Formation, and Quasar Activity”** C. A. Faucher-Giguere, A. Lidz, L. Hernquist and M. Zaldarriaga [arXiv:0807.4177 [astro-ph]]
21. **“A Flat Photoionization Rate at  $2 < z < 4.2$ : Evidence for a Stellar-Dominated UV Background and Against a Decline of Cosmic Star Formation Beyond  $z$  3”** C. A. Faucher-Giguere, A. Lidz, L. Hernquist and M. Zaldarriaga *Astrophys. J.* **682**, 9 (2008) [arXiv:0806.0372 [astro-ph]]
22. **“Probing Reionization with the 21 cm-Galaxy Cross Power Spectrum”** A. Lidz, O. Zahn, S. Furlanetto, M. McQuinn, L. Hernquist and M. Zaldarriaga [arXiv:0806.1055 [astro-ph]]
23. **“Improved estimation of cluster mass profiles from the cosmic microwave background”** J. Yoo and M. Zaldarriaga [arXiv:0805.2155 [astro-ph]]
24. **“The Fast Fourier Transform Telescope”** M. Tegmark and M. Zaldarriaga [arXiv:0805.4414 [astro-ph]]
25. **“The Phase Transition to Slow-roll Eternal Inflation”** P. Creminelli, S. Dubovsky, A. Nicolis, L. Senatore and M. Zaldarriaga [arXiv:0802.1067 [hep-th]]
26. **“How accurately can 21 cm tomography constrain cosmology?”** Y. Mao, M. Tegmark, M. McQuinn, M. Zaldarriaga and O. Zahn *Phys. Rev. D* **78**, 023529 (2008) [arXiv:0802.1710 [astro-ph]]
27. **“Detecting the Rise and Fall of 21 cm Fluctuations with the Murchison Widefield Array”** A. Lidz, O. Zahn, M. McQuinn, M. Zaldarriaga and L. Hernquist *Astrophys. J.* **680**, 962 (2008) [arXiv:0711.4373 [astro-ph]]

28. **“Probing the Neutral Fraction of the IGM with GRBs during the Epoch of Reionization”** M. McQuinn, A. Lidz, M. Zaldarriaga, L. Hernquist and S. Dutta *Mon. Not. Roy. Astron. Soc.* **388**, 1101 (2008) [arXiv:0710.1018 [astro-ph]]
29. **“A Direct Precision Measurement of the Intergalactic Lyman-alpha Opacity at  $2 < z < 4.2$ ”** C. A. Faucher-Giguere, J. X. Prochaska, A. Lidz, L. Hernquist and M. Zaldarriaga *Astrophys. J.* **681**, 831 (2008) [arXiv:0709.2382]
30. **“Bumpy black holes from spontaneous Lorentz violation”** S. Dubovsky, P. Tinyakov and M. Zaldarriaga *JHEP* **0711**, 083 (2007) [arXiv:0706.0288 [hep-th]]
31. **“Studying Reionization with Ly-alpha Emitters”** M. McQuinn, L. Hernquist, M. Zaldarriaga and S. Dutta *Mon. Not. Roy. Astron. Soc.* **381**, 75 (2007) [arXiv:0704.2239[astro-ph]]
32. **“Quasar Proximity Zones and Patchy Reionization”** A. Lidz, M. McQuinn and M. Zaldarriaga *Astrophys. J.* **670**, 39 (2007) [arXiv:astro-ph/0703667]
33. **“The Line-of-Sight Proximity Effect and the Mass of Quasar Host Halos”** C. A. Faucher-Giguere, A. Lidz, M. Zaldarriaga and L. Hernquist *Astrophys. J.* **673**, 39 (2008)[arXiv:astro-ph/0701042]
34. **“Algorithms for bispectra: forecasting, optimal analysis, and simulation”** K. M. Smith and M. Zaldarriaga [arXiv:astro-ph/0612571]
35. **“Higher Order Contributions to the 21 cm Power Spectrum”** A. Lidz, O. Zahn, M. McQuinn, M. Zaldarriaga and S. Dutta *Astrophys. J.* **659**, 865 (2007) [arXiv:astro-ph/0610054]
36. **“A general solution to the E-B mixing problem”** K. M. Smith and M. Zaldarriaga *Phys. Rev. D* **76**, 043001 (2007) [arXiv:astro-ph/0610059]
37. **“The Morphology of HII Regions during Reionization”** M. McQuinn, A. Lidz, O. Zahn, S. Dutta, L. Hernquist and M. Zaldarriaga *Mon. Not. Roy. Astron. Soc.* **377**, 1043 (2007) [arXiv:astro-ph/0610094]
38. **“Eavesdropping on Radio Broadcasts from Galactic Civilizations with Upcoming Observatories for Redshifted 21cm Radiation”** A. Loeb and M. Zaldarriaga *JCAP* **0701**, 020 (2007) [arXiv:astro-ph/0610377]
39. **“Limits on  $f_{NL}$  parameters from WMAP 3yr data”** P. Creminelli, L. Senatore, M. Zaldarriaga and M. Tegmark *JCAP* **0703**, 005 (2007) [arXiv:astro-ph/0610600]
40. **“Estimators for local non-Gaussianities”** P. Creminelli, L. Senatore and M. Zaldarriaga *JCAP* **0703**, 019 (2007) [arXiv:astro-ph/0606001]
41. **“Simulations and Analytic Calculations of Bubble Growth During Hydrogen Reionization”** O. Zahn, A. Lidz, M. McQuinn, S. Dutta,

- L. Hernquist, M. Zaldarriaga and S. R. Furlanetto *Astrophys. J.* **654**, 12 (2006) [arXiv:astro-ph/0604177]
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  43. **“Cosmological Parameter Estimation Using 21 cm Radiation from the Epoch of Reionization”** M. McQuinn, O. Zahn, M. Zaldarriaga, L. Hernquist and S. R. Furlanetto *Astrophys. J.* **653**, 815 (2006) [arXiv:astro-ph/0512263]
  44. **“Lensing Reconstruction using redshifted 21cm Fluctuations”** O. Zahn and M. Zaldarriaga *Astrophys. J.* **653**, 922 (2006) [arXiv:astro-ph/0511547]
  45. **“The Impact of Temperature Fluctuations on the Lyman-alpha Forest Power Spectrum”** K. Lai, A. Lidz, L. Hernquist and M. Zaldarriaga *Astrophys. J.* **644**, 61 (2006) [arXiv:astro-ph/0510841]
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  47. **“The Effects of Reionization on Lyman-alpha Galaxy Surveys”** S. R. Furlanetto, M. Zaldarriaga and L. Hernquist *Mon. Not. Roy. Astron. Soc.* **365**, 1012 (2006) [arXiv:astro-ph/0507266]
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  49. **“The small-scale power spectrum of cold dark matter”** A. Loeb and M. Zaldarriaga *Phys. Rev. D* **71**, 103520 (2005) [arXiv:astro-ph/0504112]
  50. **“The Kinetic Sunyaev-Zel’dovich Effect from Reionization”** M. McQuinn, S. R. Furlanetto, L. Hernquist, O. Zahn and M. Zaldarriaga *Astrophys. J.* **630**, 643 (2005) [arXiv:astro-ph/0504189]
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  53. **“Planets in Stellar Clusters Extensive Search. III. A search for transiting planets in the metal-rich open cluster NGC 6791”** B. J. Mochejska *et al.* *Astron. J.* **129**, 2856 (2005) [arXiv:astro-ph/0501145]
  54. **“Perturbations in bouncing cosmologies: Dynamical attractor vs scale invariance”** P. Creminelli, A. Nicolis and M. Zaldarriaga *Phys. Rev. D* **71**, 063505 (2005) [arXiv:hep-th/0411270]

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D. Babich and M. Zaldarriaga Phys. Rev. D **70**, 083005 (2004) [arXiv:astro-ph/0408455]
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57. **“Constraining the Topology of Reionization Through Lyman-alpha Absorption”** S. Furlanetto, L. Hernquist and M. Zaldarriaga Mon. Not. Roy. Astron. Soc. **354**, 695 (2004) [arXiv:astro-ph/0406131]
58. **“The shape of non-Gaussianities”** D. Babich, P. Creminelli and M. Zaldarriaga JCAP **0408**, 009 (2004) [arXiv:astro-ph/0405356]
59. **“CMB 3-point functions generated by non-linearities at recombination”** P. Creminelli and M. Zaldarriaga Phys. Rev. D **70**, 083532 (2004) [arXiv:astro-ph/0405428]
60. **“Statistical Probes of Reionization With 21 cm Tomography”**  
S. Furlanetto, M. Zaldarriaga and L. Hernquist Astrophys. J. **613**, 16 (2004) [arXiv:astro-ph/0404112]
61. **“The Growth of HII Regions During Reionization”** S. Furlanetto, M. Zaldarriaga and L. Hernquist Astrophys. J. **613**, 1 (2004) [arXiv:astro-ph/0403697]
62. **“Measuring the small-scale power spectrum of cosmic density fluctuations through 21-cm tomography prior to the epoch of structure formation”** A. Loeb and M. Zaldarriaga Phys. Rev. Lett. **92**, 211301 (2004) [arXiv:astro-ph/0312134]
63. **“Ghost inflation”** N. Arkani-Hamed, P. Creminelli, S. Mukohyama and M. Zaldarriaga JCAP **0404**, 001 (2004) [arXiv:hep-th/0312100]
64. **“Probing Primordial Non-Gaussianity with Large-Scale Structure”** R. Scoccimarro, E. Sefusatti and M. Zaldarriaga Phys. Rev. D **69**, 103513 (2004) [arXiv:astro-ph/0312286]
65. **“21 Centimeter Fluctuations from Cosmic Gas at High Redshifts”** M. Zaldarriaga, S. R. Furlanetto and L. Hernquist Astrophys. J. **608**, 622 (2004) [arXiv:astro-ph/0311514]
66. **“CMBfit: Rapid WMAP likelihood calculations with normal parameters”** H. B. Sandvik, M. Tegmark, X. M. Wang and M. Zaldarriaga Phys. Rev. D **69**, 063005 (2004) [arXiv:astro-ph/0311544]
67. **“The significance of the largest scale CMB fluctuations in WMAP”**  
A. de Oliveira-Costa, M. Tegmark, M. Zaldarriaga and A. Hamilton Phys. Rev. D **69**, 063516 (2004) [arXiv:astro-ph/0307282]
68. **“Non-Gaussianities in models with a varying inflaton decay rate”** M. Zaldarriaga Phys. Rev. D **69**, 043508 (2004) [arXiv:astro-ph/0306006]

69. **“A comparison of cosmological Boltzmann codes: are we ready for high precision cosmology?”** U. Seljak, N. Sugiyama, M. J. White and M. Zaldarriaga Phys. Rev. D **68**, 083507 (2003) [arXiv:astro-ph/0306052]
70. **“Cosmological perturbations from inhomogeneous reheating, freezeout, and mass domination”** G. Dvali, A. Gruzinov and M. Zaldarriaga Phys. Rev. D **69**, 083505 (2004) [arXiv:astro-ph/0305548]
71. **“A new mechanism for generating density perturbations from inflation”** G. Dvali, A. Gruzinov and M. Zaldarriaga Phys. Rev. D **69**, 023505 (2004) [arXiv:astro-ph/0303591]
72. **“The accelerated universe and the Moon”** G. Dvali, A. Gruzinov and M. Zaldarriaga Phys. Rev. D **68**, 024012 (2003) [arXiv:hep-ph/0212069]
73. **“The end of unified dark matter?”** H. Sandvik, M. Tegmark, M. Zaldarriaga and I. Waga Phys. Rev. D **69**, 123524 (2004) [arXiv:astro-ph/0212114]
74. **“Probing the Friedmann equation during recombination with future CMB experiments”** O. Zahn and M. Zaldarriaga Phys. Rev. D **67**, 063002 (2003) [arXiv:astro-ph/0212360]
75. **“The last stand before MAP: cosmological parameters from lensing, CMB and galaxy clustering”** X. Wang, M. Tegmark, B. Jain and M. Zaldarriaga Phys. Rev. D **68**, 123001 (2003) [arXiv:astro-ph/0212417]
76. **“Benchmark parameters for CMB polarization experiments”** W. Hu, M. M. Hedman and M. Zaldarriaga Phys. Rev. D **67**, 043004 (2003) [arXiv:astro-ph/0210096]
77. **“The Far-Infrared Background Correlation with CMB Lensing”** Y. S. Song, A. Cooray, L. Knox and M. Zaldarriaga Astrophys. J. **590**, 664 (2003) [arXiv:astro-ph/0209001]
78. **“Higher-order moments of the lensing shear and other spin two fields”** M. Zaldarriaga and R. Scoccimarro Astrophys. J. **584**, 559 (2003) [arXiv:astro-ph/0208075]
79. **“Separating the Early Universe from the Late Universe: cosmological parameter estimation beyond the black box”** M. Tegmark and M. Zaldarriaga Phys. Rev. D **66**, 103508 (2002) [arXiv:astro-ph/0207047]
80. **“E/B decomposition of finite pixelized CMB maps”** E. F. Bunn, M. Zaldarriaga, M. Tegmark and A. d. Oliveira-Costa Phys. Rev. D **67**, 023501 (2003) [arXiv:astro-ph/0207338]
81. **“First attempt at measuring the CMB cross-polarization”** A. de Oliveira-Costa *et al.* Phys. Rev. D **67**, 023003 (2003) [arXiv:astro-ph/0204021]
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85. **“Dimming of supernovae by photon - pseudoscalar conversion and the intergalactic plasma”** C. Deffayet, D. Harari, J. P. Uzan and M. Zaldarriaga *Phys. Rev. D* **66**, 043517 (2002) [arXiv:hep-ph/0112118]
86. **“How Neutral is the Intergalactic Medium at  $z \approx 6$ ?”** A. Lidz, L. Hui, M. Zaldarriaga and R. Scoccimarro *Astrophys. J.* **579**, 491 (2002) [arXiv:astro-ph/0111346]
87. **“Inferring the Linear Power Spectrum from the Lyman-alpha Forest”** M. Zaldarriaga, R. Scoccimarro and L. Hui *Astrophys. J.* **590**, 1 (2003) [arXiv:astro-ph/0111230]
88. **“Nature of the E-B decomposition of CMB polarization”** M. Zaldarriaga *Phys. Rev. D* **64**, 103001 (2001) [arXiv:astro-ph/0106174]
89. **“Changing alpha with time: Implications for fifth-force-type experiments and quintessence”** G. R. Dvali and M. Zaldarriaga *Phys. Rev. Lett.* **88**, 091303 (2002) [arXiv:hep-ph/0108217]
90. **“Is cosmology consistent?”** X. m. Wang, M. Tegmark and M. Zaldarriaga *Phys. Rev. D* **65**, 123001 (2002) [arXiv:astro-ph/0105091]
91. **“The Imprint of Lithium Recombination on the Microwave Background Anisotropies s”** M. Zaldarriaga and A. Loeb *ApJ* **564**, 52 (2002) [arXiv:astro-ph/0105345]
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95. **“Weighing neutrinos with microwave background and galaxy data”** M. Tegmark, M. Zaldarriaga and A. J. S. Hamilton *Nucl. Phys. Proc. Suppl.* **91**, 387 (2001)
96. **“Constraints from the Lyman alpha forest power spectrum”** M. Zaldarriaga, L. Hui and M. Tegmark *ApJ* **557**, 519 (2001) [arXiv:astro-ph/0011559]

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98. **“Correlations in the Lyman alpha forest: testing the gravitational instability paradigm”** M. Zaldarriaga, U. Seljak and L. Hui *ApJ* **551**, 519 (2001[arXiv:astro-ph/0007101]) (Submitted to *Astrophys. J.*)
99. **“CMB Observables and Their Cosmological Implications”** W. Hu, M. Fukugita, M. Zaldarriaga and M. Tegmark *Astrophys. J.* **549**, 669 (2001) [arXiv:astro-ph/0006436]
100. **“New CMB constraints on the cosmic matter budget: trouble for nucleosynthesis?”** M. Tegmark and M. Zaldarriaga *Phys. Rev. Lett.* **85**, 2240 (2000) [arXiv:astro-ph/0004393]
101. **“Current cosmological constraints from a 10 parameter CMB analysis”** M. Tegmark and M. Zaldarriaga *Astrophys. J.* **544**, 30 (2000) [arXiv:astro-ph/0002091]
102. **“Lensing effect on polarization in the microwave background: Extracting the convergence power spectrum”** J. Guzik, U. Seljak and M. Zaldarriaga *Phys. Rev. D* **62**, 043517 (2000) [arXiv:astro-ph/9912505]
103. **“Lensing of the CMB: Non-Gaussian aspects”** M. Zaldarriaga *Phys. Rev. D* **62**, 063510 (2000) [arXiv:astro-ph/9910498]
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118. **“An All-Sky Analysis of Polarization in the Microwave Background”** M. Zaldarriaga and U. Seljak Phys. Rev. D **55**, 1830 (1997) [arXiv:astro-ph/9609170]
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