

Mathew Syriac Madhavacheril

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- Education** **Stony Brook University**, Stony Brook, NY
PhD (2016), *MA* (2013) Physics
- University of Cambridge**, Cambridge, UK
MA, BA Affiliated, Part II and Part III Natural Sciences (Physics), First Class, 2011
- St. Stephen's College, University of Delhi**, New Delhi, India
BSc. (Hons.), Physics, First Class, 2009
- Research Interests** Cosmology and particle astrophysics; data analysis and theory
CMB lensing; optical weak lensing and shear estimation; joint CMB/optical probes
Galaxy clusters; growth of structure
Astrophysical probes of particle dark matter
- Academic Appointments** **Postdoctoral Research Associate (2016-)**
Department of Astrophysical Sciences, Princeton University, Princeton NJ
- Awards and Grants**
 - Astronomical Society of New York (ASNY) Graduate Student Paper Prize (2015)
 - LSST-DESC Student Travel Grant (2015)
 - *Editor's Suggestion* and *Viewpoint in Physics* pick for first-author paper in *Physical Review Letters* (2015)
 - H. B. Silsbee Award for Excellence, Physics Department, Stony Brook University (2015)
 - Jonathan Kauffman Student Excellence Prize in Physics, Physics Department, Stony Brook University (2014)
 - Jennings Prize, Wolfson College, University of Cambridge (2011)
 - Gates Cambridge Scholarship, University of Cambridge (2009)
- Teaching Experience**
 - Adviser for undergraduate researcher Teva Ilan at Princeton University (2017)
 - Co-adviser for undergraduate researchers Ho Nam Nguyen and Danylo Yakymiv at Stony Brook University (2016)
 - Teaching Assistant, Stony Brook University (2011 - 2013)
 - Faculty, Cambridge Tradition and Cambridge Prep Summer Schools, Oxbridge Academic Programs, UK (2011, 2012)
- Professional Service**
 - Referee for *Nature Astronomy* and *Monthly Notices of the Royal Astronomical Society*
 - Remote Observing Coordinator (ROC) for ACTPol observations since 09/14
 - Visited the ACTPol telescope site on Cerro Toco, Chile, 12/13 to help with site operations

Collaborations

- Atacama Cosmology Telescope (ACT) (involved with ACTPol and Advanced ACT analysis)
- Simons Observatory - lensing and SZ working groups
- Hyper Suprime-Cam (HSC) survey
- CMB Stage IV - lensing and dark energy working groups
- LSST Dark Energy Science Collaboration (DESC)

Talks

- Seminar at Rutgers University, New Brunswick NJ 11/17
- DPF2017 Conference, Fermilab 08/17
- WIN2017 Conference, Irvine CA, 06/17
- Seminar at University of Pennsylvania, Philadelphia PA 02/17
- Gravity Group Seminar, Princeton University, NJ 12/16
- Seminar at Perimeter Institute for Theoretical Physics, Waterloo, Canada 11/16
- APEC Seminar at Kavli IPMU, Kashiwa, Japan, 04/16
- Contributed Talk at *Future Challenges in Shear Estimation*, University of Pennsylvania, PA 11/15
- Astrophysics Seminar, Imperial College, UK 09/15
- Astrophysics Seminar, University College London, UK 09/15
- Institute of Astronomy Seminar, University of Cambridge, UK 09/15
- Oxford Astrophysics Seminar, University of Oxford, UK 09/15
- Contributed Talk at *Cosmology Meeting 2015*, Barcelona 09/15
- Joint Stony Brook / Brookhaven National Lab Cosmology Seminar, NY 06/15
- Seminar at Canadian Institute for Theoretical Astrophysics, Toronto 05/15
- Seminar at Perimeter Institute for Theoretical Physics, Waterloo, Canada 05/15
- Yang Institute for Theoretical Physics Seminar, Stony Brook, NY 02/15
- Department of Astronomy Seminar, Columbia University, NY 02/15
- Cosmology Lunch Seminar, Princeton University, NJ 01/15
- Department of Physics & Astrophysics Seminar, University of Delhi, India 08/14

Publications

First or Second Author

1. “The weight of cosmic lenses”, **M. S. Madhavacheril**, invited *News and Views* article for *Nature Astronomy*, 2017
2. “Fundamental Physics from Future Weak-Lensing Calibrated Sunyaev-Zel’dovich Galaxy Cluster Counts”, **M. S. Madhavacheril**, N. Battaglia, H. Miyatake, *Physical Review D*, 2017
3. “Internal Delensing of Cosmic Microwave Background Acoustic Peaks”, N. Sehgal, **M. S. Madhavacheril**, B. Sherwin, A. van Engelen, *Physical Review D*, 2017
4. “Measurement of a Cosmographic Distance Ratio with Galaxy and CMB Lensing”, H. Miyatake, **M. S. Madhavacheril**, N. Sehgal, A. Slosar, D. N. Spergel, B. Sherwin, A. van Engelen, *Physical Review Letters*, 2016
5. “Evidence of Lensing of the Cosmic Microwave Background by Dark Matter Halos”, **M. S. Madhavacheril**, N. Sehgal et. al. (ACTPol Collaboration), *Physical Review Letters*, 2015, picked as *Editor’s Suggestion* and selected for *Viewpoint in Physics*

6. “Building unbiased estimators from non-Gaussian likelihoods with application to shear estimation”, **M. S. Madhavacheril**, P. McDonald, N. Sehgal, A. Slosar, *Journal of Cosmology and Astroparticle Physics*, 2015
7. “Current dark matter annihilation constraints from CMB and low-redshift data”, **M. S. Madhavacheril**, N. Sehgal, T. R. Slatyer, *Physical Review D*, 2014

Major contributions

8. “Measuring the Small-Scale Matter Power Spectrum with High-Resolution CMB Lensing”, H. N. Nguyen, N. Sehgal, **M. S. Madhavacheril**, arXiv:1710.03747, submitted to *Physical Review D*, 2017
9. “MassiveNuS: Cosmological Massive Neutrino Simulations”, J. Liu, S. Bird, J. Matilla, J. C. Hill, Z. Haiman, **M. S. Madhavacheril**, A. Petri, D. N. Spergel, arXiv:1711.10524, submitted to *Journal of Cosmology and Astroparticle Physics*, 2017
10. “The Atacama Cosmology Telescope: Two-Season ACTPol Lensing Power Spectrum”, B. Sherwin, A. van Engelen, N. Sehgal, **M. S. Madhavacheril** et. al. (ACTPol Collaboration), *Physical Review D*, 2016

Minor contributions

11. “Non-Gaussianity of secondary anisotropies from ACTPol and Planck”, W. Coulton et. al. (incl. **M. S. Madhavacheril**), arXiv:1711.07879, submitted to *Journal of Cosmology and Astroparticle Physics*, 2017
12. “The Atacama Cosmology Telescope: The Two-Season ACTPol Sunyaev-Zeldovich Effect Selected Cluster Catalog”, M. Hilton, M. Hasselfield, C. Sifn, N. Battaglia et. al. (incl. **M. S. Madhavacheril**), accepted for publication in *Astrophysical Journal Supplement*, 2017
13. “CMB-S4 Science Book”, Abazajian et. al. (incl. **M. S. Madhavacheril**), 2016
14. “The Atacama Cosmology Telescope: Two-Season ACTPol Spectra and Parameters”, T. Louis, E. Grace, M. Hasselfield, M. Lungu, L. Maurin et. al. (incl. **M. S. Madhavacheril**), 2016
15. “Survey strategy optimization for the Atacama Cosmology Telescope”, F De Bernardis, JR Stevens, M Hasselfield et. al. (incl. **M. S. Madhavacheril**), *SPIE Astronomical Telescopes+ Instrumentation*, 2016
16. “Detection of the pairwise kinematic Sunyaev-Zel’dovich effect with BOSS DR11 and the Atacama Cosmology Telescope”, F De Bernardis, S Aiola, EM Vavagiakis, MD Niemack et. al. (incl. **M. S. Madhavacheril**), 2016
17. “Evidence for the kinematic Sunyaev-Zeldovich effect with the Atacama Cosmology Telescope and velocity reconstruction from the Baryon Oscillation Spectroscopic Survey”, E. Schaan, S. Ferraro, M. Vargas-Magaa, K. M. Smith, S. Ho et. al. (incl. **M. S. Madhavacheril**), *Physical Review D*, 2016
18. “The Atacama Cosmology Telescope: measuring radio galaxy bias through cross-correlation with lensing”, R. Allison, S. N. Lindsay, B. D. Sherwin et. al. (incl. **M. S. Madhavacheril**), *Monthly Notices of the Royal Astronomical Society*, 2015
19. “The Atacama cosmology telescope: Lensing of CMB temperature and polarization derived from cosmic infrared background cross-correlation”, A. van Engelen, B. D. Sherwin, N. Sehgal et. al. (incl. **M. S. Madhavacheril**), *The Astrophysical Journal*, 2014
20. “The Atacama Cosmology Telescope: CMB Polarization at $200 < \ell < 9000$ ”, S. Naess, M. Hasselfield, J. McMahon, M. D. Niemack et. al. (incl. **M. S. Madhavacheril**), *Journal of Cosmology and Astroparticle Physics*, 2014