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)
- Usha-India Physics Prize, Physics Department, St. Stephen's College, Delhi (2009)
- Science Meritorious Award, University of Delhi (2009)

Teaching Experience

- Co-adviser for undergraduate researcher Nam Ho Nguyen at Stony Brook University (2016)
- Co-adviser for undergraduate researcher Danylo Yakymiv at Stony Brook University (2015)
- 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 *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)
- Hyper Suprime-Cam (HSC) survey
- Simons Observatory - lensing and SZ working groups
- CMB Stage IV - lensing and Dark Energy working groups
- LSST Dark Energy Science Collaboration

Talks and Posters

- APEC Seminar at Kavli IPMU, Kashiwa, Japan, 04/16
- Contributed Talk at *Future Challenges in Shear Estimation*, University of Pennsylvania, PA 11/15
- LSST-DESC Meeting *Theory and Joint Probes* Work Update, Argonne National Lab, IL 10/15
- 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
- LSST-DESC *Theory and Joint Probes* Working Group Update, Pittsburgh, PA 04/15
- 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
- *CMB Polarization 2015*, Minneapolis, MN (Poster) 01/15
- Department of Physics & Astrophysics Seminar, University of Delhi, India 08/14
- *PCTS Dark Matter Workshop* (Poster), Princeton University, NJ 10/13

Publications

First or Second Author

1. "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, submitted to *Physical Review Letters*, 2016
2. "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
3. "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
4. "Current dark matter annihilation constraints from CMB and low-redshift data", **M. S. Madhavacheril**, N. Sehgal, T. R. Slatyer, *Physical Review D*, 2014

Collaborating Author

5. "CMB-S4 Science Book", Abazajian et. al. (incl. **M. S. Madhavacheril**), 2016

6. "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
7. "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
8. "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
9. "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
10. "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
11. "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
12. "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

Skills Experienced in Python, C/C++ and Modern Fortran programming. Some familiarity with SQL, pandas and R.

References

Prof. Neelima Sehgal	neelima.sehgal@stonybrook.edu
Dr. Anže Slosar	anze@bnl.gov
Prof. David Spergel	dns@astro.princeton.edu