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# Meir Shimon

## Curriculum Vitae

## Personal Details

**Name:** Meir Shimon
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## Education

### Undergraduate and Graduate Studies

- PhD: 1998-2005, Tel-Aviv University, Physics, advised by Yoel Rephaeli, "Physical Processes in Clusters of Galaxies"
- MSc: 1994-1998, Tel-Aviv University, Physics, advised by Larry P. Horwitz, "Aspects of 2+1 Dimensional Gravity"
- BSc: 1991-1994, Tel-Aviv University, Physics

### Post-Doctoral Studies

- PhD: 2005-2010, UC San Diego, CASS, mentored by Brian Keating

## Awards, Citations, Honors, Fellowships

- Inaugural CASS Director's Postdoctoral Fellow, 2008-2009
- The Dan David PhD Scholarship Prize, 2003

## Employment

- 2010-present: Researcher, Tel-Aviv University
- 2005-2010: CASS Postdoctoral Fellow, UC San Diego

- 2004-2005: Teaching assistant, Tel-Aviv University
- 1995-2003: Teaching assistant, Tel-Aviv University

## Membership in Past and Present CMB Projects

- Simons Observatory [1]
- POLARBEAR [2]
- EPIC [3]
- CMBPol [4]

### Refereed articles and refereed letters in scientific journals

1. Shimon, M., 2022, *'Possible Resolution of the Hubble Tension with Weyl Invariant Gravity'*, JCAP, **2022**, 048
2. Shimon, M. 2021, *'Weyl-Invariant Gravity and the Nature of Dark Matter'*, CQG, **38**, 085001
3. Shimon, M. & Rephaeli, Y. 2020, *'Parameter interplay of CMB temperature, space curvature, and expansion rate'*, PRD, **102**, 083532
4. Mirmelstein, M., Shimon, M., & Rephaeli, Y. 2020, *'Detection likelihood of cluster-induced CMB polarization'*, Astronomy & Astrophysics, **644**, A36
5. The Simons Observatory Collaboration, 2019, *'The Simons Observatory: Science goals and forecasts'*, JCAP, **1902**, 056
6. Pogosian, L., Shimon, M., Mewes, M., & Keating, B., 2019, *'Future CMB constraints on cosmic birefringence and implications for fundamental physics'*, PRD, **100**, 023507
7. POLARBEAR Collaboration, 2015, *'POLARBEAR Constraints on Cosmic Birefringence and Primordial Magnetic Fields'*, PRD, **92**, 123509

[1] https://simonsobservatory.org/
[2] http://bolo.berkeley.edu/polarbear
[3] http://arxiv.org/abs/0906.1188
[4] http://cmbpol.uchicago.edu/

8. POLARBEAR Collaboration, 2014, *'A Measurement of the Cosmic Microwave Background B-Mode Polarization Power Spectrum at Sub-Degree Scales with POLARBEAR'*, ApJ, **794**, 171

9. POLARBEAR Collaboration, 2014, *'Measurement of the cosmic microwave background polarization lensing power spectrum with the POLARBEAR experiment'*, PRL, **113**, 021301

10. Kaufman, J. P., et al., 2014, *'Self-Calibration of BICEP1 Three-Year Data and Constraints on Astrophysical Polarization Rotation'*, PRD, **89**, 062006

11. POLARBEAR Collaboration, 2014, *'Evidence for Gravitational Lensing of the Cosmic Microwave Background Polarization from Cross-correlation with the Cosmic Infrared Background'*, PRL, **112**, 131302

12. Molnar, S., Broadhurst, T., Umetsu, K., Zitrin, A., Rephaeli, Y., & Shimon, M. 2013, *'Tangential Velocity of the Dark Matter in the Bullet Cluster from Precise Lensed Image Redshifts'*, ApJ, **774**, 70

13. Shimon, M., Itzhaki, N., & Rephaeli, Y. 2013, *'Bias-Limited Extraction of Cosmological Parameters'*, JCAP, **3**, 9

14. Keating, B. G., Shimon, M., & Yadav, A. P. S. 2013, *'Self-Calibration of CMB Polarization Experiments'*, ApJL, **762**, L23

15. Shimon, M., Sadeh, S., & Rephaeli, Y. 2012, *'CMB Anisotropy Due to Filamentary Gas: Power Spectrum and Cosmological Parameter Bias'*, JCAP, **10**, 38

16. Yadav, A. P. S., Shimon, M., & Keating, B. G. 2012, *'Revealing Cosmic Rotation'*, PRD, **86**, 083002

17. Shimon, M., Rephaeli, Y., Itzhaki, N., Dvorkin, I., & Keating, B. G. 2012, *'Constraints on the Neutrino Mass from SZ Surveys'*, MNRAS, **427**, 828

18. Dvorkin, I., Rephaeli, Y., & Shimon, M. 2012, *'Sunyaev–Zel'dovich power spectrum and cluster numbers from an extended merger-tree model'*, MNRAS, **421**, 2648

19. Su, M., Yadav, A. P. S., Shimon, M., & Keating, B. G. 2011, *'Impact of Instrumental Systematics on the CMB Bispectrum'*, PRD, **83**, 103007

20. Shimon, M., Sadeh, S., & Rephaeli, Y. 2011, *'Neutrino Mass Inference from SZ Surveys'*, MNRAS, **412**, 1895

21. Miller, N. J., Shimon M., Kishimonto C. T., Smith C. J., Fuller G. M., Keating B. G., 2010, *'Using Big Bang Nucleosynthesis to extend CMB probes of neutrino physics'*, JCAP, **5**, 37

22. Luzzi, G., Shimon, M., Lamagna, L., Rephaeli, Y., De Petris, M., Conte, A., De Gregori, S., & Battistelli, E. S. 2009, *'Redshift Dependence of the CMB Temperature from S-Z Measurements'*, ApJ, **705**, 1122

23. Shimon, M., Rephaeli, Y., Sadeh, S., & Keating, B. 2009, *'Power Spectra of CMB Polarization by Scattering in Clusters'*, MNRAS, **399**, 2088

24. Miller, N. J., Shimon, M., & Keating, B. G. 2009, *'CMB Polarization Systematics due to Beam Asymmetry: Impact on Cosmological Birefringence'*, PRD, **79**, 103002

25. Miller, N. J., Shimon, M., & Keating, B. G. 2009, *'CMB Beam Systematics: Impact on Lensing Parameter Estimation'*, PRD, **79**, 063008

26. Shimon, M., Keating, B., Ponthieu, N., & Hivon, E. 2008, *'CMB Polarization Systematics due To Beam Asymmetry: Impact on Inflationary Science'*, PRD, **77**, 083003

27. Rephaeli, Y., Sadeh, S., & Shimon, M. 2006, *'Modeling Integrated Properties and the Polarization of the Sunyaev-Zeldovich Effect'*, New Astronomy Review, **51**, 350

28. Shimon, M., Rephaeli, Y., O'Shea, B. W., & Norman, M. L. 2006, *'Cosmic Microwave Background Polarization due to Scattering in Clusters'*, MNRAS, **368**, 511

29. Shimon, M. & Rephaeli, Y., 2004, *'Quantitative Description of the Sunyaev – Zeldovich Effect: Analytic Approximations'*, New Astronomy, **9**, 69

30. Battistelli et al. 2003, *'Triple Experiment Spectrum of the Sunyaev-Zeldovich Effect in the Coma Cluster: $H_0$ '*, ApJ, **598**, L75

31. Battistelli et al. 2002, *'Cosmic Microwave Background Temperature at Galaxy Clusters'*, ApJ, **580**, L101

32. Shimon, M. & Rephaeli, Y., 2002, *'Cosmic Microwave Background Comptonization by Energetic Nonthermal Electrons in Clusters of Galaxies'*, ApJ, **575**, 12

33. Shimon, M., 1999, *'Generalized Law of Addition of Accelerations'*, PRD, **59**, 067501

**Papers Submitted for Publication**

1. Shimon, M., 2022, *'Cosmology in a locally scale invariant gravity'*, arXiv:2205.07251
2. Shimon, M., 2022, *'Elucidation of 'Cosmic Coincidence"*, arXiv:2204.02211
3. Shimon, M., 2021, *'Locally Scale-Invariant Gravity'*, arXiv:2108.11788

**Papers in Preparation**

1. Shimon, M., Rephaeli, Y., 2022, *'Testing Weyl-Invariant Gravity with the Sunyaev-Zeldovich Effect'*
2. Shimon, M., 2022, *'Scale factor duality and the Hubble Tension'*

**White Papers**

1. Chang et al., 2022, *'Snowmass2021 Cosmic Frontier: Cosmic Microwave Background Measurements White Paper'*, arXiv:2203.07638
2. The Simons Observatory Collaboration, 2019, *'The Simons Observatory: Astro2020 Decadal Project Whitepaper'*, Bull. Am. Astron. Soc. **51** (2019) 147
3. Bock, J., et al., 2009, *'Study of the Experimental Probe of Inflationary Cosmology (EPIC) – Intermediate Mission for NASA's Einstein Inflation Probe'*, arXiv:0906.1188
4. Smith, K. M. et al., 2008, *'CMBPol Mission Concept Study: Gravitational Lensing'*, arXiv:0811.3916

**Proceedings Papers**

1. Arnold, K., Ade, P. A. R., Anthony, A. E., et al. 2012, *'The bolometric focal plane array of the Polarbear CMB experiment'*, SPIE proceedings, 8452, arXiv:1210.7877
2. Kermish, Z. D., Ade, P., Anthony, A., et al. 2012, *'The POLARBEAR Experiment'*, SPIE proceedings, 8452, arXiv:1210.7768

3. Keating, B., Moyerman, S., Boettger, D., et al. 2011, *'Ultra High Energy Cosmology with POLARBEAR'*, DPF 2011 conference proceedings, arXiv:1110.2101

4. The Polarbear Collaboration, Errard, J., Ade, P. A. R., et al. 2010, *'The new generation CMB B-mode polarization experiment: POLARBEAR'*, 2010 Rencontres de Moriond proceedings, arXiv:1011.0763

5. Rephaeli, Y., Sadeh, S., & Shimon, M. 2005, *'The Sunyaev-Zeldovich Effect'*, Background Microwave Radiation and Intracluster Cosmology, 57

6. Battistelli, E. S. et al. 2003, *'Cosmic microwave background temperature evolution by Sunyaev –*
*Zel'dovich effect observations'*, Memorie della Societa Astronomica Italiana, **74**, 316

## Selected Talks

1. *'Cosmological Implications of Weyl-Invariant Gravity'*, 2021/2022, BIU, Ariel University

2. *'Weyl-Invariant Gravity and the Nature of Dark Matter'*, 2021 (Zoom) Weizmann Inst., BGU, HUJI, UCSD, TAU, BIU, & a 5 min talk in the 16th Patras Workshop

3. *'Conformal Higgs Gravity'*, 2018, TAU HEP seminar

4. *'Flat Spacetime Cosmology in a Scalar-Tensor Theory of Gravity'*, 2015, UCSD, Aspen Center for Physics

5. *'Bias-Limited Extraction of Cosmological Parameters'*, 2013, Weizmann Inst., Princeton, Johns Hopkins Uni.

6. *'Constraints on the Neutrino Mass from SZ Surveys'*, 2012, BGU, Technion

7. *'SZ Number Counts and Power Spectrum: Neutrino Mass Constraints and Bias of Cosmological Parameters'*, 2012, TAU

8. *'Forecasts for Neutrino Mass Constraints from SZ Surveys'*, 2011, HUJI, TAU, Technion

9. *'Constraining Neutrino Masses and Degeneracy Parameters with Future CMB Experiments'*, 2010, Arizona State Univ., UCSD, University of Arizona

10. *'CMB and Fundamental Physics'*, 2009, UC Berkeley, BGU, HUJI, UC Irvine, TAU, Weizmann Inst.

11. *'Cosmology with the SZ Effect'*, 2008, Enrico Fermi School, HUJI, Weizmann Inst.

12. *'In-depth Introduction to CMB Lensing'*, 2008, UCSD

13. *'CMB Polarization Systematics Due to Beam Asymmetry: Impact on Inflationary Science'*, 'Cosmic Cartography' Chicago Univ. (2007), Aspen Center for Physics (2008)