

MAXIMILIAN H. ABITBOL

Curriculum Vitae

University of Oxford
Department of Physics
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CURRENT POSITION

University of Oxford Postdoctoral Researcher	2018 – present
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EDUCATION

Columbia University , New York, NY	
Ph.D., Physics	2018
M.Phil., Physics	2016
M.A., Physics	2015
Johns Hopkins University , Baltimore, MD	
M.A., Mathematics	2013
B.S., Physics & Mathematics	2013
Phillips Academy Andover , Andover, MA	2009

HONORS, AWARDS AND GRANTS

Dennis Sciama Junior Research Fellowship, Wolfson College, University of Oxford	2020 – 2022
Beecroft Fellowship in Theoretical Cosmology, University of Oxford	2018 – 2021
PI, Green Bank Telescope Observing Proposal GBT17A-259, 22 hours	2017
Dean's Fellowship, Columbia University	2013 – 2018
Dean's Undergraduate Research Award, Johns Hopkins University	2012 – 2013

LEADERSHIP POSITIONS

Co-leader, BB Analysis Working Group, Simons Observatory	2020 – 2022
Preceptor, Columbia University (head teaching assistant for Physics)	2014 – 2015

TEACHING

Queen's College, University of Oxford , Lecturer Electromagnetism and Optics (second year physics A2)	Michaelmas 2018 – Trinity 2019
Columbia University , Teaching Assistant	
Advanced Physics Lab (Physics 4008)	Fall 2016 – Spring 2018
Electromagnetic Waves & Optics (Physics 3008)	Spring 2016, Spring 2017
Classical and Quantum Waves (Physics 1403)	Fall 2015
General Physics I (Physics 1201)	Spring 2015, Fall 2016
General Physics I/II Lab (Physics 1291/2)	Fall 2013 – Spring 2015
Johns Hopkins University , Teaching Assistant	
Differential Equations (Math 302)	Spring 2013
Linear Algebra (Math 201)	Fall 2012
Calculus III (Math 202)	Spring 2012
Calculus II (Math 109)	Fall 2011

ADVISING

University of Oxford

Susanna Azzoni (Oxford D.Phil.), co-adviser	2019 – present
James Truley (Hobart undergraduate), summer research project	2020
Richard Grumitt (Oxford D.Phil.), co-adviser	2018 – 2020
Darsh Kodwani (Oxford D.Phil.), co-adviser	2018 – 2020
Gabriele Montefalcone (Princeton undergraduate), summer research project	2019
Alexander Gough (Oxford undergraduate), summer research project	2019

PUBLIC ENGAGEMENT AND OUTREACH

Mentor, Simons Observatory - National Society of Black Physicists Scholars Program	2020
Teacher, Reading Team Harlem	2017 – 2018
Volunteer, APS Women in Physics Conference	2018
Volunteer, Girls Science Day	2015, 2016, 2017
Volunteer, Physics Demonstration for Columbia Secondary School	2014
Volunteer, Johns Hopkins Annual Physics Fair	2012

REFERENCES

David Alonso, STFC Ernest Rutherford Fellow, University of Oxford
david.alonso@physics.ox.ac.uk

Jens Chluba, Royal Society University Research Fellow, University of Manchester
jens.chluba@manchester.ac.uk

Bradley Johnson, Assistant Professor of Astronomy, University of Virginia
bj6fu@virginia.edu

Lam Hui, Professor of Physics, Columbia University
lh399@columbia.edu

Colin Hill, Assistant Professor of Physics, Columbia University
Associate Research Scientist, Center for Computational Astrophysics
jch2200@columbia.edu

PUBLICATIONS AND PRESENTATIONS

My publications can also be found on my [ADS library](#).

Primary author refereed journal articles

26. **M. H. Abitbol**, et al. *The Simons Observatory: Bandpass and polarization-angle calibration requirements for B-mode searches*. 2020, submitted to the Journal of Cosmology and Astroparticle Physics. [arXiv:2011.02449](#)
25. **M. H. Abitbol**, J. C. Hill, J. Chluba. *Measuring the Hubble constant from the cooling of the CMB monopole*. 2020, The Astrophysical Journal 893, 1. [arXiv:1910.00465](#)
24. **M. H. Abitbol**, B. R. Johnson, G. Jones, C. Dickinson, S. Harper. *Constraining the Anomalous Microwave Emission Mechanism in the S140 Star Forming Region with Spectroscopic Observations Between 4 and 8 GHz at the Green Bank Telescope*. 2018, The Astrophysical Journal 864, 1. [arXiv:1805.00465](#)
23. **M. H. Abitbol**, J. Chluba, J. C. Hill, B. R. Johnson. *Prospects for Measuring Cosmic Microwave Background Spectral Distortions in the Presence of Foregrounds*. 2017, Monthly Notices of the Royal Astronomical Society 471, 1126. [arXiv:1705.01534](#)
22. **M. H. Abitbol**, J. C. Hill, B. R. Johnson. *Foreground-Induced Biases in CMB Polarimeter Self-Calibration*. 2016, Monthly Notices of the Royal Astronomical Society 457, 1796. [arXiv:1512.06834](#)

Contributing author refereed journal articles

21. S. Azzoni, **M. H. Abitbol**, D. Alonso, A. Gough, N. Katayama, T. Matsumura. *A minimal power-spectrum-based moment expansion for CMB B-mode searches*. 2020, submitted to the Journal of Cosmology and Astroparticle Physics. [arXiv:2011.11575](#)

20. G. Montefalcone, **M. H. Abitbol**, D. Kodwani, R. D. P. Grumitt. *Inpainting CMB maps using Partial Convolutional Neural Networks*. 2020. [arXiv:2011.01433](#)
19. S. Aiola, et al. incl. **M. H. Abitbol**. *The Atacama Cosmology Telescope: DR4 Maps and Cosmological Parameters*. 2020. [arXiv:2007.07288](#)
18. S. K. Choi, et al. incl. **M. H. Abitbol**. *The Atacama Cosmology Telescope: A Measurement of the Cosmic Microwave Background Power Spectra at 98 and 150 GHz*. 2020. [arXiv:2007.07289](#)
17. B. Thorne, et al. incl. **M. H. Abitbol**. *Removal of Galactic foregrounds for the Simons Observatory primordial gravitational wave search*. 2019. [arXiv:1905.08888](#)
16. The EBEX Collaboration, et al. incl. **M. H. Abitbol**. *The EBEX Balloon Borne Experiment - Detectors and Readout*. 2018, Astrophysical Journal Supplement 239, 1. [arXiv:1803.01018](#)
15. H. McCarrick, et al. incl. **M. H. Abitbol**. *Design and performance of dual-polarization lumped-element kinetic inductance detectors for millimeter-wave polarimetry*. 2018, Astronomy and Astrophysics 610, A45. [arXiv:1710.02239](#)
14. J. Chluba, J. C. Hill, **M. H. Abitbol**. *Rethinking CMB Foregrounds: Systematic Extension of Foreground Parameterizations*. 2017, Monthly Notices of the Royal Astronomical Society 472, 1195. [arXiv:1701.00274](#)
13. G. Jones, et al. incl. **M. H. Abitbol**. *High quality factor manganese-doped aluminum lumped-element kinetic inductance detectors sensitive to frequencies below 100 GHz*. 2017, Applied Physics Letters 110, 222601. [arXiv:1701.08461](#)
12. D. Flanagan, et al. incl. **M. H. Abitbol**. *Magnetic field dependence of the internal quality factor and noise performance of lumped-element kinetic inductance detectors*. 2016, Applied Physics Letters 109, 143503. [arXiv:1609.06352](#)
11. D. Flanagan, et al. incl. **M. H. Abitbol**. *Photon noise from chaotic and coherent millimeter-wave sources measured with horn-coupled, aluminum lumped-element kinetic inductance detectors*. 2016, Applied Physics Letters 108, 083504. [arXiv:1510.06609](#)
10. D. Watts, et al. incl. **M. H. Abitbol**. *Measuring the Largest Angular Scale CMB B-mode Polarization with Galactic Foregrounds on a Cut Sky*. 2015, The Astrophysical Journal 814, 103. [arXiv:1508.00017](#)

Conference proceedings & white papers

9. J. Delabrouille, et al. incl. **M. H. Abitbol**. *Microwave Spectro-Polarimetry of Matter and Radiation across Space and Time*. 2019, ESA Voyage 2050 white paper. [arXiv:1909.01591](#)
8. J. Chluba, et al. incl. **M. H. Abitbol**. *New Horizons in Cosmology with Spectral Distortions of the Cosmic Microwave Background*. 2019, ESA Voyage 2050 white paper. [arXiv:1909.01593](#)
7. The Simons Observatory Collaboration, et al. incl. **M. H. Abitbol**. *The Simons Observatory: Astro2020 Decadal Project Whitepaper*. 2019, Astro2020 Decadal Project white paper. [arXiv:1907.08284](#)
6. A. Kogut, et al. incl. **M. H. Abitbol**. *CMB Spectral Distortions: Status and Prospects*. 2019, Astro2020 Decadal Project white paper. [arXiv:1907.13195](#)
5. J. Chluba, et al. incl. **M. H. Abitbol**. *Spectral Distortions of the CMB as a Probe of Inflation, Recombination, Structure Formation and Particle Physics*. 2019, Astro2020 Decadal Science white paper. [arXiv:1903.04218](#)
4. B.R. Johnson, et al. incl. **M. H. Abitbol**. *Development of Multi-Chroic MKIDs for Next-Generation CMB Polarization Studies*. 2017, Journal of Low Temperature Physics. [arXiv:1711.02523](#)
3. **M. H. Abitbol**, et al. *CMB-S4 Technology Book, First Edition*. 2017, arXiv pre-print. [arXiv:1706.02464](#)
2. H. McCarrick, et al. incl. **M. H. Abitbol**. *Development of dual-polarization LEKIDs for CMB observations*. 2016, Proc. SPIE 99140O. [arXiv:1607.03448](#)
1. B.R. Johnson, et al. incl. **M. H. Abitbol**. *Polarization sensitive multichroic MKIDs for CMB Studies*. 2016, Proc. SPIE 99140X. [arXiv:1607.03796](#)

Ph.D Dissertation

- **M. H. Abitbol.** Advisor, Bradley Johnson. *Studying the effects of galactic and extragalactic foregrounds on cosmic microwave background observations.* 2018. <https://doi.org/10.7916/D8B86RXC>

Scientific Presentations

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|---|----------------|
| 21. Contributed talk, CMB S4 workshop, online. | August 2020 |
| 20. Invited talk, Simons Observatory collaboration meeting, online. | July 2020 |
| 19. Poster, B-modes from Space conference, Max Planck Institute for Astrophysics. | December 2019 |
| 18. Invited lecture, Oxford Undergraduate Physics Society, University of Oxford. | October 2019 |
| 17. Invited talk, Simons Observatory collaboration meeting, University of California, Berkeley. | July 2019 |
| 16. Contributed talk, IAS coffee seminar, Institute for Advanced Study. | March 2019 |
| 15. Invited talk, ACT collaboration meeting, Princeton University. | March 2019 |
| 14. Invited talk, gravity group seminar, Princeton University. | March 2019 |
| 13. Invited talk, cosmology group meeting, JBCA University of Manchester. | December 2018 |
| 12. Contributed talks (2), CMB foregrounds for B-mode studies conference, Tenerife, Spain. | October 2018 |
| 11. Invited talk, CMB foregrounds workshop, CCA Flatiron Institute. | June 2018 |
| 10. Invited talk, Probing fundamental physics with CMB Spectral Distortions, CERN Theory Institute. | March 2018 |
| 9. Contributed talk, KIPAC tea talk, Stanford University. | December 2017 |
| 8. Contributed talk, cosmology journal club, University of Pennsylvania. | October 2017 |
| 7. Contributed talk, CAS seminar, Johns Hopkins University. | October 2017 |
| 6. Contributed talk, cosmology group meeting, CCA Flatiron Institute. | September 2017 |
| 5. Contributed talk, cosmology lunch, Princeton University. | September 2017 |
| 4. Contributed talk, AstroFest, Columbia University. | September 2017 |
| 3. Poster, CMB-S4 workshop, Harvard University. | August 2017 |
| 2. Contributed talk, American Astronomical Society conference, San Diego, CA. | June 2016 |
| 1. Poster, American Physical Society conference, Denver, CO. | April 2013 |