

MAXIMILIAN H. ABITBOL

Curriculum Vitae

University of Oxford
Department of Physics
Denys Wilkinson Building
Keble Rd, Oxford OX1 3RH, UK

maximilian.abitbol@physics.ox.ac.uk
physics.ox.ac.uk/contacts/people/abitbol
mabitbol.github.io

CURRENT POSITION

University of Oxford
Postdoctoral Researcher

2018 – present

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

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

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

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. Flanigan, 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. Flanigan, 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, Re-combination, 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