

# MAXIMILIAN H. ABITBOL

## *Curriculum Vitae*

University of Oxford  
Department of Physics  
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### CURRENT POSITION

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**University of Oxford**  
Postdoctoral Researcher

2018 – present

### EDUCATION

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**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

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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

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Co-leader, BB Analysis Working Group, Simons Observatory 2020 – 2022

Preceptor, Columbia University (head teaching assistant for Physics) 2014 – 2015

### TEACHING

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**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

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### 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

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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

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**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

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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, 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     |