

Oliver H. E. Philcox MSci MA

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EDUCATION

Department of Astrophysical Sciences, Princeton University, USA

2019 - Present

PhD Candidate

Thesis Advisors: Prof. David N. Spergel & Prof. Matias Zaldarriaga

M.A. in Astrophysics (2020)

Center for Astrophysics | Harvard & Smithsonian, Cambridge, USA

2018 - 2019

Pre-Doctoral Student (Herchel-Smith Scholar)

Advisor: Prof. Daniel J. Eisenstein

Institute of Astronomy, University of Cambridge

2017 - 2018

MSci in Astrophysics

Part III: 1st Class (Rank 1/28, 97%)

Courses: Cosmology (97%), Advanced Cosmology (91%), General Relativity (92%)

Quantum Field Theory (84%), Stellar Structure and Evolution (95%)

Master's Thesis: 'Detection and Removal of B-mode CMB Dust Foregrounds with Signatures of Statistical Anisotropy' (*Advisors: Dr. Blake D. Sherwin & Dr. Alexander van Engelen*)

Institute of Astronomy Prize

Emmanuel College, University of Cambridge

2014 - 2017

BA (Hons) in Natural Sciences, *Senior Scholar*

Part II: 1st Class (Rank 1/20, 90%)

Part IB: 1st Class (Rank 9/578)

Part IA: 1st Class (Rank 6/626)

Holgate Pollard Memorial Prize for Part II Examination Results, 2017

College & Rowley Mainhood Prizes for Achievement, 2015-8

ADDITIONAL RESEARCH EXPERIENCE

Department of Applied Mathematics and Theoretical Physics

May 2020 - Present

Visiting Graduate Student (Virtual) with Dr. Blake D. Sherwin

Cambridge, UK

Max-Planck-Institut für Astronomie

Jul. - Sep. 2017

Summer Intern with Dr. Jan Rybizki

Heidelberg, Germany

Center for Astrophysics | Harvard & Smithsonian

Jun. - Aug. 2016

Undergraduate Research Fellow with Dr. Ákos Bogdán

Cambridge, USA

SELECTED PUBLICATIONS & TALKS

1. **Philcox, O. H. E.**, Massara, E., Spergel, D. N. "What does the Marked Power Spectrum Measure? Insights from Perturbation Theory", *submitted to Phys. Rev. D* (arXiv).
2. **Philcox, O. H. E.** "A Faster Fourier Transform? Computing Small-Scale Power Spectra and Bispectra for Cosmological Simulations in $\mathcal{O}(N^2)$ Time", *submitted to MNRAS* (arXiv).
3. **Philcox, O. H. E.**, Spergel, D. N., Villaescusa-Navarro, F. "The Effective Halo Model: Creating a Physical and Accurate Model of the Matter Power Spectrum and Cluster Counts", *Phys. Rev. D* **101**, 123520 (2020) (arXiv).
4. **Philcox, O. H. E.**, Ivanov, M. I., Simonović, M., Zaldarriaga, M. "Combining Full-Shape and BAO Analyses of Galaxy Power Spectra: A 1.6% CMB-Independent Constraint on H_0 ", *JCAP* 05 032 (2020) (arXiv).

5. **Philcox, O. H. E.**, Rybizki, J. "Inferring Galactic Parameters from Chemical Abundances: A Multi-Star Approach", *ApJ* **887**, 9 (2019) (arXiv).
 6. **Philcox, O. H. E.**, Eisenstein, D. J., "Computing the Small-Scale Galaxy Power Spectrum and Bispectrum in Configuration-Space", *MNRAS* **492** 1214 – 1242 (2019) (arXiv).
 7. **Philcox, O. H. E.**, Eisenstein, D. J., "Estimating Covariance Matrices for Two- and Three-Point Correlation Function Moments in Arbitrary Survey Geometries", *MNRAS* **490**, 5931 – 5951 (2019) (arXiv).
 8. **Philcox, O. H. E.**, Eisenstein, D. J., O’Connell, R., Wiegand, A., "RascalC: A Jackknife Approach to Estimating Single and Multi-Tracer Galaxy Covariance Matrices", *MNRAS* **491**, 3290 – 3317 (2019) (arXiv).
 9. **Philcox, O. H. E.**, Sherwin, B. D., van Engelen, A., "Detection and Removal of B-mode Dust Foregrounds with Signatures of Statistical Anisotropy", *MNRAS* **479**, 5577 – 5595 (2018) (arXiv).
 10. **Philcox, O. H. E.**, Rybizki, J., Gutcke, T., "On the Optimal Choice of Nucleosynthetic Yields, Initial Mass Function, and Number of SNe Ia for Chemical Evolution Modeling", *ApJ* **861**, 40 (2018) (arXiv).
- Aug. 2020 American Statistical Association (Joint Statistical Meeting, invited talk)
Inferring Galactic Parameters from Stellar Chemical Abundances
- May 2020 Berkeley Center for Cosmological Physics (Journal Club)
The Effective Halo Model: Accurate Models for the Power Spectrum and Cluster Counts
- Apr. 2020 NYU / CCA Cosmology X Data Science Group
The Effective Halo Model: Accurate Models for the Power Spectrum and Cluster Counts
- Mar. 2020 Institute for Advanced Study (Cosmology Group)
Constraining Cosmology from Galaxy Surveys: Combining Full Shape and BAO Analyses
- Dec. 2019 Princeton University (Gravity Group)
Detection and Removal of CMB B-mode Dust via Statistical Anisotropy
- Nov. 2019 JINA-CEE Nuclear Astrophysics Seminar
Inferring the Milky Way Stellar Initial Mass Function using Chemical Evolution Modelling
- Jul. 2019 Center for Astrophysics | Harvard & Smithsonian (Daniel Eisenstein’s Group)
Computing Clustering Statistics and Covariances in Configuration Space
- Apr. 2019 Center for Astrophysics | Harvard & Smithsonian (Joint Cosmology Group)
Detection and Removal of CMB B-mode Dust via Statistical Anisotropy
- Sep. 2017 Max-Planck-Institut für Astronomie (Hans-Walter Rix’s Group)
Creating Objective Scores for Nucleosynthetic Yield Tables
- Sep. 2017 Heidelberg Institute for Theoretical Studies (Volker Springel’s Group)
Choosing Nucleosynthetic Yield Tables for Hydrodynamical Simulations

PROFESSIONAL ACTIVITIES

Referee Monthly Notices of the Royal Astronomical Society (2020–)

MISCELLANEOUS

Computing Languages	Python, C++, Bash
Codes Developed	EffectiveHalos, HIPSTER, RascalC, ChempyMulti, HADES
Teaching	5 years of online tutoring in Physics and Astronomy at high-school to graduate level TEFL Qualification in English teaching with 2 months experience in China
Languages	English (Native), Spanish (Conversational), Mandarin (Basic)

REFEREES

References available on request