Oliver H. E. Philcox MSci

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EDUCATION

Department of Astrophysical Sciences, Princeton University, USA *2019 - Present*
Graduate Student

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

Center for Astrophysics | Harvard & Smithsonian, Cambridge, USA *2018 - 2019*
Pre-Doctoral Student (Herchel-Smith Scholar)

Courses: Radiative Processes in Astrophysics (A), Astrophysical Fluid Dynamics (A)
Advanced Scientific Computing: Stochastic Methods (A)
Research Projects: 'Estimating Covariance Matrices for the Two- and Three-Point Galaxy Correlation Functions in Arbitrary Survey Geometries' & 'Configuration-Space Estimators for Small-Scale Anisotropic Power Spectra and Bispectra' (*Advisors: Prof. Daniel J. Eisenstein & Dr. Ross O'Connell*)

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%)
Courses include: Cosmology, Stars, Galactic Dynamics, Fluids, Relativity, Quantum Mechanics
Part IB: 1st Class (Rank 9/578)
Courses: Maths (86%), Physics A (94%) and Physics B (85%)
Part IA: 1st Class (Rank 6/626)
Courses: Maths (94%), Physics (89%), Chemistry (84%) and Earth Sciences (73%)
Holgate Pollard Memorial Prize for Part II Examination Results, 2017
College & Rowley Mainhood Prizes for Achievement, 2015-8

RESEARCH EXPERIENCE

Department of Astrophysical Sciences Sep. 2019 - Present
Graduate Student with Prof. David N. Spergel & Prof. Matias Zaldarriaga *Princeton, USA*

Center for Astrophysics | Harvard & Smithsonian Sep. 2018 - Jun. 2019
Pre-Doctoral Student with Prof. Daniel Eisenstein *Cambridge, USA*

Institute of Astronomy Oct. 2017 - Jun. 2018
Master's Student with Dr. Blake 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

Philcox, O. H. E. "A Faster Fourier Transform? Computing Small-Scale Power Spectra and Bispectra for Cosmological Simulations in $\mathcal{O}(N^2)$ Time", *in prep.*
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", *submitted to PRD* (arXiv)
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", *submitted to JCAP* (arXiv)
Philcox, O. H. E., Rybizki, J. "Inferring Galactic Parameters from Chemical Abundances: A Multi-Star Approach", *ApJ* **887**, 9 (2019) (arXiv)
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).
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).
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)
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).
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*
Apr. 2020	Berkeley Center for Cosmological Physics (Journal Club) *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*
Mar. 2018	CMB-S4 Conference (Argonne) *Modeling Dust Foregrounds* (Contributed slides)
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