Duncan Joseph Watts

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EMPLOYMENT:

2024–Present:
Researcher
Principal Investigator: COSMOGLOBEHD Project

2020–2024:
Postdoctoral Fellow
University of Oslo
Supervisors: Ingunn K. Wehus and Hans Kristian Kamfjord Eriksen

2018–2020:
Assistant Research Scientist
Johns Hopkins University
Supervisors: Tobias A. Marriage and Charles L. Bennett
Projects: Data analysis for the CLASS experiment and
quantifying cosmological discordances

EDUCATION:

Johns Hopkins University
2012–2018, Ph.D. Physics and Astronomy
Advisor: Tobias A. Marriage
Thesis: Methods and Projections for Joint Foreground and
Cosmological Parameter Estimation for the CLASS Experiment
2012–2014, M.A. Physics and Astronomy

Harvard University
2008–2012, A.B. Departmental Honors, Physics and Astronomy
Advisor: Douglas P. Finkbeiner
Thesis: An Investigation of Gamma-Rays in the Galactic Center

TEACHING AND OUTREACH

2012–2018, Volunteer, JHU Physics and Astronomy Graduate Student Public Outreach Group
2013–2016, Maryland Space Grant Observatory Fellowship
Fall 2016, Teaching Assistant/Lecturer, Graduate Cosmology
Fall 2012, Teaching Assistant, Introductory Physics Recitation and Laboratory

COLLABORATIONS:

2013–, The Cosmology Large Angular Scale Surveyor (CLASS) Collaboration

2020–, COSMOGLOBE

CONFERENCE PRESENTATIONS AND TALKS

1. Institute for Theoretical Physics, Heidelberg Cosmology and Particle Physics Seminar *Cosmoglobe DR1: Improved WMAP maps through joint analysis, October 2023*

2. Windows on the Universe: Rencontres du Vietnam *Cosmoglobe DR1: Better Data Through Joint Analysis*, August 2023
3. Mission: Spectro-polarimetry of the Microwave Sky *Improving FIRAS data processing through joint analysis*, November 2022
4. Johns Hopkins University, CAS Seminar BeyondPlanck to Cosmoglobe – An end-to-end reanalysis of WMAP data, November 2021
5. CMB-S4 Workshop, *Projected Constraints on Optical Depth to Reionization and Neutrino Mass from the CLASS Experiment*, August 2017
6. Great Lakes Cosmology Workshop, *Measuring CMB B-mode Polarization with Galactic Foregrounds on a Cut Sky*, June 2016
7. AAS Winter Meeting *Galactic foreground cleaning in support of a primordial CMB B-mode measurement*, January 2014

Advising and Mentoring

1. Metin San (Graduate, Fall 2020–Present)
2. Maksym Brilenkov (Graduate, Spring 2021–Summer 2023)
3. Johannes Røsok Eskilt (Graduate, Fall 2020–Fall 2023)
4. Oliver Wolff (Undergraduate, Fall 2019–Spring 2021)
5. Keyi Chen (Undergraduate, Fall 2019–Spring 2020)
6. Rui Shi (Graduate, Fall 2019–Spring 2020)
7. Yunyang Wang (Graduate, Fall 2018–Spring 2020)
8. Mario Aguilar (Graduate, Fall 2018–Fall 2019)
9. Bingjie Wang (Graduate, Fall 2016–Spring 2019)
10. Keisuke Osumi (Graduate, Fall 2015–Spring 2018)
11. Yajing Huang (Graduate, Fall 2014–Spring 2016)

Main-author Publications:

1. **Watts, D. J.**, Basyrov, A., Eskilt, J. R. et al., 2023, *Cosmoglobe DR1 results. I. Improved Wilkinson Microwave Anisotropy Probe maps through Bayesian end-to-end analysis*, A&A, 679, A143
2. **Watts, D. J.**, Galloway, M., Ihle, H. T. et al., 2023, *From BeyondPlanck to Cosmoglobe: Preliminary WMAP Q-band analysis*, A&A, 675, A16
3. **Watts, D. J.**, Addison, G. A., Bennett, C. L. and Weiland, J. L., 2019, *Beyond optical depth: Future determination of ionization history from the CMB*, ApJ (in press), arXiv:1910.00590
4. **Watts, D. J.**, Wang, B., Ali, A. et al., 2018, *A Projected Estimate of the Reionization Optical Depth Using the CLASS Experiment's Sample Variance Limited E-mode Measurement*, ApJ, 863, 121
5. **Watts, D. J.**, Larson, D., Marriage, T. A. et al., 2015, *Measuring the Largest Angular Scale CMB B-mode Polarization with Galactic Foregrounds on a Cut Sky*, ApJ, 814, 103
6. Weiland, J. L., Osumi, K., Addison, G. E., Bennett, C. L., **Watts, D. J.**, Halpern, M. and Hinshaw, G., 2018, *Effect of Template Uncertainties on the WMAP and Planck Measures of the Optical Depth Due to Reionization*, ApJ, 863, 161
7. Addison, G. E., **Watts, D. J.**, Bennett, C. L., Halpern, M., Hinshaw, G. and Weiland, J. L., 2018, *Elucidating ΛCDM: Impact of Baryon Acoustic Oscillation Measurements on the Hubble Constant Discrepancy*, ApJ, 853, 119
8. Switzer, E. R. and **Watts, D. J.**, 2016, *Robust likelihoods for inflationary gravitational waves from maps of cosmic microwave background polarization*, Phys. Rev. D, 94, 063526
9. Addison, G. E., Huang, Y., **Watts, D. J.**, Bennett, C. L., Halpern, M., Hinshaw, G. and Weiland, J. L., 2016, *Quantifying Discordance in the 2015 Planck CMB Spectrum*, ApJ, 818, 132