Philip Clarke

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Profile

My background is in theoretical cosmology, where I developed new computational and analysis methods and implemented them in practical software tools. I value effective communication, and have much experience communicating complex ideas to both experts and non-experts alike, through research presentations, teaching and volunteer work. I am excited to apply both my technical and communication skills in the field of data science.

Education and Research

Oct 2017– **PhD Theoretical Physics**, *DAMTP, University of Cambridge*.

- **Designed and lead research program** with results and novel methods published in peer reviewed journal JCAP, titled "Probing Inflation with Precision Bispectra".
- **Vastly improved computational methods** for connecting a model signature of the very early universe to experimental observations—can handle more data than previous methods, is more broadly applicable, and is ≥ 1000 times faster. This enabled a more accurate constraint on a theoretical model.
- **Designed and wrote software** in Python and Cython, to be released as PRIMODAL.

2016–2017 **Masters in Mathematics (MASt, Part III)**, *University of Cambridge*.

- **Academic excellence in internationally recognised masters** achieving pass with Merit, 74%; rank 101 (of ~ 250). Cosmology 95%, Advanced Cosmology 87%, Essay 85%. Received an early Cambridge PhD offer based on performance in selective exam.
- **Successful transition of specialisation** from symmetry-restricted quantum mechanical systems to observationally-linked cosmology; gave student seminars on both topics. Essay on cosmological inflation driven by two fields, including a literature review and novel formulations of calculations from the literature.

2012–2016 **B.A. Mathematics**, *Trinity College, University of Dublin*.

- **Consistent academic excellence** achieving overall grade of first class honours, gold medal. Top of year in Theoretical Physics scholarship exam, ranked among the top 12 students in the university that year.
- **Wide variety of independent projects** including cutting edge computational methods of the conformal bootstrap, exact eigenvalue methods for quantum mechanical oscillators, and experiments to measure viscosity. Results presented in reports, posters and talks which were graded highly, including a prize for best presentation.

2007–2012 **Secondary level**, *St. Mary's Diocesan School, Drogheda*.

- **Achieved highest mathematics result in Ireland 2012** joint with two others out of ~ 50000 students; obtained 600 (of 625) points, highest in the school. Studied Mathematics, Physics, Economics, French, Irish, English, Design and Communication Graphics.

Skills

Technical Experienced in **Python**, particularly **NumPy** and **SciPy**. Working knowledge of **Scikit-learn**, **Pandas** and **Cython**. Regularly use **SSH**, **Git**, **Bash**, **Slurm**. Code projects on **pc559.github.io**.

Interpersonal Extensive experience in a wide variety of contexts from teaching, outreach and volunteering. Also instigated and organised a regular group tea-break, to provide a casual, welcoming environment for newer PhD students to ask questions and gain knowledge during the lockdown.

Collaboration Scientific projects, outreach side-projects with friends, volunteer committee work.

Awards and Scholarships

2017	Cambridge European Scholarship	*PhD funding award*
2016	Robert Gardiner Memorial Scholarship	*Masters, PhD funding award*
2014	Trinity College Foundation Scholarship	*Top 12 in university*
2012	Accenture Analytics Mathematical Excellence Award	*Top Maths result in Ireland (joint with two others)*