

JACOB KNIGHT

Wild Oak, Gills Hill, Radlett, WD7 8BZ

07720 607313 jwk32@cam.ac.uk

EDUCATION

Gonville and Caius College, University of Cambridge	2016 - 2020
Natural Sciences (Physics) MSc	
First Class Honours in First, Second, Third and Fourth years	
Recipient of the BP Nevill Mott Prize for the best Theoretical Physics Masters project	
Haberdashers' Aske's Boys' School	2009 - 2016
A levels: Mathematics (A*), Further Mathematics (A*), Physics (A*), Chemistry (A*)	2016
AS levels: History (A)	2015
GCSEs: A* grades in 10 subjects, including Mathematics, English and German	2014

TECHNICAL SKILLS

Computer Languages & Software	Python, C, L ^A T _E X, Mathematica (working knowledge) C++ & MATLAB (basic knowledge)
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EXPERIENCE

Masters Project: Optimising Phase Transitions in Active Matter November 2019 - May 2020
Soft Matter Group, DAMTP, Cambridge

- Worked closely with Dr. Etienne Fodor to design a systematic approach for optimizing finite-time protocols in stochastic field theories, with a focus on Active field theories
- The project involved a combination of analytical and numerical work:
 - Applied recent results developed for microscopic systems to a coarse-grained, field-based description of a system of Brownian particles
 - Developed a numerical simulation of the system in C, with further analysis conducted in Python and Mathematica

London Center for Nanotechnology July - August 2019
Quantum Devices Group

- Designed, modelled and built prototypes of an RF parametric amplifier based on a novel ferroelectric varactor, for use at 6mK
 - A literature review was undertaken into parametric amplification to investigate the theoretical gain and noise characteristics
 - A variety of circuits were modelled in Python and LTSpice which were subsequently built and characterised using a Vector Network analyser and a Spectrum analyser

Third Year Computing Project October 2018-April 2019

- Created a simulation in Python of two galaxies colliding in three dimensions, each consisting of up to 20,000 stars
 - The project brief suggested simulating just 200 stars per galaxy in two dimensions - my work went significantly beyond this
 - Code and results can be viewed here: <https://github.com/JWK32/Galaxy-collision>

Centrica Summer Internship Scheme

June - August 2018

Business Analyst

- Participated in a ten-week program during which I worked as an Analyst on several projects based across the UK
- Received highly positive feedback throughout and was offered a place on the Centrica Graduate Scheme at the end of my placement

RELEVANT COURSES

Third Year

Thermal and Statistical Physics
Classical Field Theory
Advanced Quantum Physics
Electrodynamics and Optics
Computing Project

Fourth Year

Theoretical Physics of Soft Matter
Phase Transitions
Advanced Statistical Mechanics
Quantum Field Theory
Gauge Field Theory

ACADEMIC ACHIEVEMENTS AND SKILLS

- Received the BP Nevill Mott Prize for the best Theoretical Physics Masters Project in my cohort (2020)
- Ranked 39th out of 600+ students in Natural Sciences first year exams (2017)
- Received the Jeston Academic Scholarship from the Haberdashers' Foundation (2016)
 - Presented to one student at Haberdashers' Aske's Boys' School each year in recognition of outstanding academic achievement
- Competed twice in the national finals of the UK Space Design Challenge competition, presenting to an audience of 300 people (2014, 2015)
 - Took on a leadership role on both occasions, directing the activities of a seven person sub-team and acting as an intermediary between the team leader and group

EXTRA-CURRICULAR

- Played the drums since the age of 11, in numerous Jazz bands and an alternative rock band, M.U.X
 - Performed at several London venues including the O2 Academy Islington
- Past treasurer of Cambridge University Kickboxing Society (2018-19)
- Head of Caius Jazz Society, organising termly concerts featuring leading UK Jazz musicians
 - Most recently we have hosted Jasper Høiby, Kit Downes and Tim Garland

REFEREES

Dr. John Ellis

Reader in Surface Physics
University of Cambridge
je102@hermes.cam.ac.uk

Dr. Etienne Fodor

Oppenheimer Research Fellow
DAMTP, University of Cambridge
epf22@cam.ac.uk