

Benjamin Stratton

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An enthusiastic and ambitious aspiring scientist. Demonstrated diligence and commitment throughout my career and hence developed as a promising physicist, as shown by consistent academic achievements and publications. Conducted research within the field of quantum information theory, written software for research purposes and excelled in taught modules in advance quantum mechanics, quantum computation and quantum information theory, among others. Currently studying for a PhD at the University of Bristol within the quantum information theory group as a member of the Quantum Engineering Centre for Doctoral Training.

EDUCATION

University of Bristol

Bristol, UK

Quantum Engineering Centre for Doctoral Training (QE-CDT)

September 2021 - Current

- Fully funded by the EPSRC for 4 years (1 MRes year + 3 PhD years)
- Undertook courses in the preliminary year in Quantum Light and Matter (89%), Applied Quantum Theory (pass), Quantum Systems Engineering (78%) and Nano-fabrication (89%).

University of Bristol

Bristol, UK

Masters of Science (MSci) in Physics

September 2016 - July 2020

- Awarded degree with first class honours (Average 77%)
 - Units Include: Advance Quantum Mechanics (87%), Quantum Information Theory (78%), Quantum Computation (80%), Advance Computational Physics (78%), General Relativity (82%).

Okehampton College

Okehampton, UK

GCSE and A-levels

2011 - 2016

- **A-levels:** Mathematics A*, Further Mathematics A, Physics A, Chemistry A (AS only)
- **GCSEs:** 6 A*, 3A. Including Mathematics and Physics at A*.

EXAMPLE RESEARCH PROJECTS

The University of Bristol

Bristol, UK

A Quantum Algorithm For Measuring the α -Renyi Stabilizer Entropies

- Designed a quantum algorithm to measure the so-called α -Renyi Stabilizers entropies — a method for quantifying the non-stabilizerness of quantum states.
- Used QISKIT to model and benchmark the algorithm.
- Currently a pre-print.

The University of Bristol

Bristol, UK

Operational Interpretation of the Choi Rank Through k -State Exclusion

- Developed necessary conditions for the existence of a POVM to perform k -state exclusion on a set of states, defining the notion of weak and strong exclusion in the process.
- Used this condition, along with the introduction of a novel quantum communication task, to give the Choi-rank an operational interpretation.
- This work was published in PRA as a Letter.

The University of Bristol**Bristol, UK***Dynamical Resource Theory of Informational Non-equilibrium Preservability*

- Developed a framework for comparing the ability of quantum channels to preserve informational non-equilibrium (purity).
- Applied the results to thermodynamics, high-level noise models and classical communication.
- The framework was published in PRL

The University of Bristol**Bristol, UK***Software Tools for Integrated Photonic Spatial Filter Design*

- Developed a fast and efficient ray tracer for use in the design of spatial filters used to scatter excess pump light in integrated photonic circuits.
- Acquired knowledge in both just-in-time compilation and parallelisation.
- Created the foundations of a design toolkit using the ray tracer by testing the effectiveness of the filters for parameters such as length, width, size and density.

DESY Summer School**Hamburg, Germany***Implementing Remote Control of a Spectrometer on a Laser Heating Table. June - September 2019*

- Wrote the backend and frontend code for the remote control of a spectrometer used for measuring temperature of samples on a laser heating table.
- Extensively used python and learnt other hardware specific macrolanguages.

WORK EXPERIENCE

Creator Fund**Remote***Venture Fellow**September 2023 - September 2024*

- Sourcing deals, assessing technology and performing due diligence for the largest student lead venture capital firm in Europe.
- Focusing on deep tech deals with a particularly emphasis on quantum technologies.

The University of Bristol**Bristol, UK***Tutor**September 2021 - Current*

- Improving my skills in communicating complex information by educating postgraduates on quantum information theory and undergraduates on topics in the foundations of physics.

On Call Africa**Livingstone, Zambia***Volunteer Coordinator**Jan 2021 - August 2021*

- Provided technical and logistical support to volunteer doctors running health clinics in rural areas.
- Succeeded in designing and creating an interactive map using javascript for marketing and logistics.
- Gained experience in team management by coordinating teams collecting data in remote locations, often off grid for weeks at a time.

LEADERSHIP AND EXTRACURRICULAR ACTIVITIES

Quantum Resources**Online***Founder**April 2024 - Current*

- Publishing notes on a range of topics relevant to quantum information science for use in both research and education.

Careers in Quantum, 2024**Bristol, UK***Event Organiser**June 2023 - March 2024*

- Co-organising Careers in Quantum, the largest student led quantum careers fair in the UK.

National Quantum Computing Centre Hackathon 2023**Birmingham, UK***1st Place**July 2023*

- Successfully understood the Variational Quantum Linear Solver algorithm and ran it on multiple different quantum hardware and simulators to access its performance, earning my team 1st place in the competition.

Chaos, Bristol Physics Society

Vice-President

Bristol, UK

June 2019 - June 2020

- Co-managed the award-winning Chaos committee of 18 individuals to run talks, trips and socials for our 700 members.
- Under my leadership Chaos won the ‘committee excellence’ award at the National Society and Volunteering awards as well as ‘best academic society’ at the Bristol SU society awards.
- Instrumental in the implementation of ‘cup-less’ Fridays into our society run coffee shop as part of my 3-year plan to improve sustainability.

REFERENCES

Dr Paul Skrzypczyk, Associate Professor, H.H.Wills Physics Laboratory, The University of Bristol.
PhD Supervisor. paul.skrzypczyk@bristol.ac.uk

Dr Jorge Barreto, Senior Lecturer, Department of Electrical & Electronic Engineering, The University of Bristol. *QE-CDT Director.* G.Barreto@bristol.ac.uk.

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