

PROFILE

Graduate student undertaking the UCL CDT in Delivering Quantum Technologies with a focus in Quantum Computing. Background in Mathematical & Theoretical Physics with degrees from Oxford & UCL. Interested in quantum error correction research incorporating ideas from theoretical physics and looking into techniques aimed at bringing forward the useful near-term applications of quantum computers such as hamiltonian simulation.

EDUCATION

University College London - CDT in Delivering Quantum Technologies *London, UK*
PhD Quantum Technologies (starting in Sept 2022) *2022-2025*

- Thesis project will be chosen towards the end of the MRes phase of the CDT programme.

University College London - CDT in Delivering Quantum Technologies *London, UK*
MRes Quantum Technologies (current) *2021-2022*

- MRes thesis: *'tbc'*
- Research Case Studies (literature review projects with a report and presentation)
 - I: *'Quantum Compilation for NISQ computers'* with Prof. Dan Browne
 - II: *'Ansatz Choice for VQAs for Quantum Chemistry in the NISQ era'* with Prof. Peter Coveney
 - III: *'tbc'*
- Advanced taught courses in Quantum Information, Quantum Computation, Quantum Cryptography, Quantum Error Correction, Theory of Open Quantum Systems & experimental applications including different qubit technologies.
- Training in Research Software Engineering using Python (version control, collaborative code development, packaging, documentation, etc.)
- Postgraduate teaching assistant for undergraduate second-year maths course, *Mathematical Methods III*.

University of Oxford, Exeter College - Mathematical Institute *Oxford, UK*
MSc Mathematical & Theoretical Physics *2020-2021*

- MSc thesis: *'Quantum Machine Learning for Space Debris & Collision Avoidance'* with Dr. Stefano Gogioso and in collaboration with European Space Agency (grade: distinction).
- Courses: Quantum Field Theory, Advanced QFT, Groups & Representations, Topological Quantum Theory, Introduction to Quantum Information, Standard Model & Beyond I, Conformal Field Theory

University College London - Dept of Physics & Astronomy *London, UK*
BSc Theoretical Physics, First Class Honours *2017 - 2020*

- Ranked second in graduating 2019/20 cohort for BSc Theoretical Physics with an average of 85.67%.
- Courses: Quantum Mechanics, General Relativity, Cosmology, Electromagnetic Theory, Nuclear & Particle Physics, Solid State Physics, Theory of Dynamical Systems, Practical Mathematics & Computing, and other elementary physics/maths courses.
- Developing Effective Communication (Year 1&2 course): STEM outreach, writing articles, group projects, team-work, individual and group presentations.

TED Northern Cyprus College *Nicosia, Cyprus*
High School Diploma *2013 - 2017*

- Ranked first in graduating cohort, GPA: 10.00/10.00.
- A-Levels: Physics, Maths, Further Maths, Chemistry, Biology, Turkish (5 A*s and 1 A)
- GCSEs: 9 A*s (including German)

RESEARCH EXPERIENCE

- Oxford MSc Thesis in collaboration with the European Space Agency** 2021
‘Quantum Machine Learning for Space Debris’ with Dr. Stefano Gogioso
- Modelled the time evolution of combined covariance matrices describing the uncertainty in position of ESA satellites and tracked debris objects by designing a parameterised quantum circuit.
 - Developed intuitive encoding and decoding techniques of covariance matrices (classical data) into and out of unitary quantum circuits based on considering their eigendecomposition together with my supervisor.
 - Introduced to the theory of hybrid quantum-classical computation, variational circuit design, optimisation algorithms as well as experiments on simulator and hardware backends of quantum computers.
 - Familiarity with Qiskit & PennyLane and compilation of quantum algorithms to NISQ computers.
- Summer Research Project in Mathematical Physics** 2020
‘Covariant derivative of a spinor in a metric-affine space’ with Dr. Christian Böhmer
- 3-month mathematical research project in collaboration with Lodovico Scarpa.
 - Studied works of Schouten, Corson & Hehl in differential geometry and relativistic quantum mechanics.
 - Introduced to the generalisation of ideas of GR to spaces of torsion and non-metricity and worked out the covariant derivative of spinors in such spaces.
- UCL Third Year Physics Group Project** 2020
‘Developing Machine Learning Algorithms for text classification’ with Prof. Paul Bartlett & Dr. Kirsty Dunnett
- 3-month long software project with frequent board meetings.
 - Worked on the technical side of this physics education research project which aimed to analyse UCL physics intake questionnaires on laboratories.
 - Developed a Python algorithm utilising machine learning & natural language processing techniques to automatically assort open-ended questionnaire responses into (multiple) categories giving an indication of the accuracy of the model in the report.
- UCL Second Year Computational Physics Project** 2019
‘Modelling Fluid Flow’ with Dr. Patrick Guio
- Utilised computational methods to find numerical solutions to non-linear partial differential equations relating to fluid flow.
 - Plotted graphs to illustrate the fluid flow pattern and interpreted the results physically.

AWARDS

- UCL Research Studentship** 2021-2022
EPSRC funded PhD studentship in the Department of Physics, UCL/London Centre for Nanotechnology
- UCL Mathematical and Physical Sciences Faculty Dean’s List for 2020** 2020
Awarded to top 5% of graduating class of the faculty.
- Merit-based scholarship from North Cyprus government** 2017-2020
National award given to top 10 scoring students in their A-levels throughout their studies.
- EU Scholarship for Turkish Cypriot Community implemented by the British Council** 2017
1-year scholarship granted to selected prospective undergraduate students.
- High Honor Certificate and Full Academic Scholarship from TED College** 2013-2017
1st place in graduating class after 4-year high-school programme.
- Outstanding Cambridge Learner Award** 2016
Top in Cyprus for IGCSE Chemistry.

ACHIEVEMENTS

Cyprus Youth Entrepreneurship Summer Institute

Summer Programme at George Washington University funded by the US Embassy in Cyprus

Washington DC, USA

Aug 2017

EUROSCOLA Programme at the European Parliament

MEP for a day

Strasbourg, France

Nov 2015

Creating Friendships for Peace

A year-long peace-building programme with a cultural exchange component in the US

Cyprus and NH, USA

July 2015

SKILLS

Website: Created my own website, www.hsrevisionnotes.com.

Programming skills: Python, MATLAB, Mathematica

Language skills: English (Fluent), Turkish (Native), German (Intermediate)

REFEREES

Available on request.