Curriculum Vitae - Simon Goorney - srg51@cantab.ac.uk

My focus is on the development of a community of stakeholders in Quantum Technology (QT) education in Europe (https://qtedu.eu/, 370 members from 43 countries), covering the areas of school, outreach, industry training, and higher education. This community is a seeding ground for experimental Physics education projects, of which I am chiefly responsible for one in higher education, the *QTEdu Open Master* pilot (https://qtom.qtedu.eu/). In this context I am studying the challenges to and solutions for bringing emerging Quantum Technologies into higher education programs across Europe. In the long term, we are developing a roadmap to a "quantum-aware workforce", facilitating a transformation of the European QT Education landscape.

EDUCATION

Sep 2015 - Jul 2019: Christ's College, University of Cambridge

BA (Hons) Natural Sciences (Physics, UK 1st Class/GPA 4.0) MSci Natural Sciences (Physics, UK 1st Class/GPA 4.0)

Sep 2020 - Jun 2021: The University of Manchester

Postgraduate Certificate of Education (PGCE), Secondary Physics With UK Qualified Teacher Status (QTS)

CURRENT RESPONSIBILITIES

Aug 2021 - Present: Scientific Assistant

Department of Physics and Astronomy, Aarhus University

- Research interests include:
- How Quantum Technologies are presented in degree programs
- Undergraduate student conceptual understanding and misconceptions within Quantum Mechanics.
- The use of games and visualisations in teaching Physics throughout different education stages.
- Developed Bachelor, Master, and internship projects in Physics Education Research
- Developed and taught a workshop introducing Quantum Mechanics to high school students using games and simulations.
- Conducted interviews of prospective Master's students and interns.

Aug 2021 - Present: Community Manager

QTEdu: Coordination and Support Action for Quantum Technology Education and QUCATS: Quantum Flagship Coordination Action and Support

- QTEdu supports the activities of the 1.5bn€ EU project *Quantum Flagship* through school, university, and workforce education. On this project my responsibilities so far have included:
- Management of a community of practice of 375 members from 43 countries.
- Co-hosting the QTEdu Working Group Meetings (March 2022).
- Co-chair of WG2: Higher Education and WG5: Equity and Inclusion
- Co-organised the education workshop of the European Quantum Technologies Conference 2021, including international timetabling and conducting scientific review of submitted articles and posters.
- Drafting deliverable reports of the work packages of the QTEdu project.
- Coordination of the 2021-2022 Quantum Technology Open Master (QTOM) pilot scheme. QTOM enables students from across Europe to study modularised Master's courses, attend remote events, and undertake remote projects. The pilot consists of 37 European partner institutions.
- Partner member of the *Quantum Technologies Education for Everyone* (QuTE4E) pilot scheme, involving study design for research on Physics outreach.
- Partner member of the *Quantum Concept Inventory* (QCI) pilot scheme, developing a community inventory for essential concepts in QT.
- Significant strategic contributions to a successful HORIZON funding application for a future Quantum Technology Education project (*QUCATS*, 2022-2024). This will represent the continuation of QTEdu from summer 2022, and form the basis of my PhD research around implementation of QT in European education programs.



UNIVERSITY TEACHING EXPERIENCE

Dec 2021 - Present: Bachelor Student Supervisor

"Transfer of Understanding of the Concept of Potential From the Classical to Quantum Context" Department of Physics and Astronomy, Aarhus University

• Physics Education project I conceived and supervise in the group of Prof. Jacob Sherson, using the games *Potential Penguin* and *Quantum Moves 2* to design and test a workshop-based teaching intervention.

March 2022 - Present: Course Coordinator

"QTOM Fridays: A trip through the world of Quantum Technology" Department of Physics and Astronomy, Aarhus University

• Remotely accessible seminar course available through the *QTEdu Open Master* pilot project. I am responsible for organising the course, scheduling speakers, grading exercise material, setting up the infrastructure, and tracking student participation.

Mar 2021 - July 2021: Guest Lecturer

"Problem Solving for Engineering" 底特律绿色工业学院, Hubei University of Technology [part time, online]

• Designed and delivered an 8-lecture online non-credit course intended to support 1st year Engineering students in their Physics and Mathematics, covering mathematical strategies for problem solving.

PROFESSIONAL AFFILIATIONS

- Coordination team: QTEdu Quantum Technology Education
- Coordination team: Quantum Technology Open Master (QTOM) pilot
- Coordination team: Nordic Physics Education Research Consortium
- **Partner member**: Quantum Technologies Education for Everyone(QuTE4E) pilot
- Partner member: Quantum Concept Inventory (QCI) pilot
- Partner member: Danish University Network, Special Interest Group: DiP Digital Pedagogy and Learning in Higher Education

CONFERENCE AND MEETING PRESENTATIONS

- Mar 2022: QTEdu Working Group Meetings (Co-host)
- Mar 2022: Quantum Information Processing (Co-presented a talk)
- Aug 2018: Variety in Chemistry Education / Physics Higher Education Conference (VICEPHEC, Presented a talk)

SERVICE

- Workshop Organiser and Submission Reviewer, European Quantum Technologies Conference 2021 (EQTC)
- Reviewer for Science and Education
- Reviewer for Journal of Learning Development in Higher Education
- Event Organiser, OIST Science Festival 2019

PREVIOUS RESEARCH EXPERIENCE

Sep 2018 - Jul 2019: MSci Physics Education Research Project

"The Development of a Quantum Mechanics Concept Inventory for Deployment in Undergraduate Physics Courses"

- Developed a quantitative assessment instrument to investigate undergraduate misconceptions in Quantum Mechanics and how they may be addressed.
- Included qualitative research methods such as interviews and thematic analysis.
- Statistically analysed results from deployment of the tool across three UK universities using the programming language R.
- Presented the research at the VICEPHEC18 Physics and Chemistry higher education conference.
- Developed and presented a guest lecture on misconceptions in Quantum Mechanics for second-year undergraduate students at University of Cambridge.

Oct 2019 - Aug 2020: Research Internship

Biological Physics Theory Unit, Okinawa Institute of Science and Technology

- Contributed to a project on "*The Physics of Animal Behaviour*", including experimental set up and data collection using live zebrafish, and analysis using techniques from machine learning.
- Set up and worked in a Linux environment, coding in *Python*.

- Hosted "journal clubs", group meetings, and attended the American Physical Society March Meeting 2020, Denver USA with the group.
- Visited the group's adjunct, Theoretical Biophysics, Vrijie Universiteit Amsterdam for one month (Nov 2019.)

OTHER PREVIOUS TEACHING EXPERIENCE

Jan 2020 - Jan 2021, Jun 2021 - Dec 2021: Physics and Engineering Teaching Consultant 剑藤教育 *Education Consultancy* [part time, online]

• Online role following from experience teaching on summer course the previous year, including the following responsibilities: Individual and small-group tutoring, large class lectures, recorded tutorials and workshops, recruitment of new tutors, and course development.

Oct 2020 - June 2021: Secondary Physics Trainee Teacher

The Manchester Grammar School and William Hulme's Grammar School, Manchester UK

- Part of PGCE undertaken at the University of Manchester.
- Taught Physics, Biology, and General Science for ages 11-18, including marking and moderating final examination papers for school leavers.

Jun 2019 - Sep 2019: Physics Summer Course Teacher

- U-Link College of Shanghai and Guangdong Country Garden School, China
- Taught on a course bridging the gap between A-Level and university, aiming to prepare students to study at top institutions in Europe.

Sep 2017 - May 2019: Physics Teaching Assistant

Hills Road Sixth Form College and Parkside Federation, Cambridge UK

• Through a university scheme (STIMULUS) and Physics Education optional module.

OTHER PREVIOUS EMPLOYMENT

Jul - Sep 2017 and 2018: Regional Placement Coordinator

The Nuffield Foundation

- Arranged and managed research placements for 95 post-16 students in North West England, across 20 different organisations, including universities and industrial firms.
- Judged student reports and posters in the 2017 and 2018 Nuffield Celebration Events.

GRANTS AND AWARDS

- Sep 2020 Jun 2021: Institute of Physics Teacher Training Scholarship
- Sep 2018 Jun 2019: Christ's College Scholarship: Awarded for exam performance.
- Jun 2019: Christ's College Graduate Scholarship: Awarded for exam performance.
- Jun 2019: Christ's College Jopie Kempton Travel Fund: Awarded for research travel to the Netherlands and Japan.