

Richard Aguiar

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Personal Profile

5th-year Physics master's student looking for a PhD program to further develop my research skills and kickstart my academic career. My research interests include AMO physics, Quantum Optics and Photonics. My set of experimental and theoretical physics skills make me a perfect candidate for doctoral research in these fields as shown by my years of lab experience with state-of-the-art physics research groups.

Education

University of Strathclyde

Glasgow, UK

MPhys Physics with Specialisation in Quantum Optics

Sept 2017 - Current

- **5th Year Core Modules:** Research Skills; Advanced Topics in: Quantum Optics, Quantum Information, and Laser-Plasma Physics.
- **4th Year Core Modules:** Topics in: Quantum Optics; Atomic, Molecular And Nuclear Physics; Theoretical Physics; Photonics; Nanoscience, and Solid State Physics.

Universidad de La Laguna

Santa Cruz de Tenerife, Spain

EBAU (University Admissions Test)

Jun 2017

- Mathematics (9), Physics (8), Spanish (10), English (10)

IES Viera y Clavijo

Santa Cruz de Tenerife, Spain

Bachillerato (GCE equiv.)

Sept 2015 - Jun 2017

- Physics (8), IT (10), Mathematics II (8), English (10), Electrotechnics (10), Earth Science (7)

Work Experience

Institute of Physics (IOP)

Glasgow, UK

Academic Undergraduate Mentor

Jan 2021 - Mar 2021

- Mentor for Year 12 students in the Improving Gender Balance (IGB) research trial of the Institute of Physics. Supporting the development of young and underrepresented people in their physics academic path. More information at iop.org/IGBtrial.
- This mentoring program was held online to support female students to develop knowledge and confidence in order to aid them in completing their A-levels.
- Went above and beyond to find resources, and reach out in an empathetic manner and developed a professional relationship with the mentee.
- **Technical Skills:** Brightside Online Mentoring platform, Writing.
- **Soft Skills:** Proactive approach in supporting young people, Communication, Development of others, Leadership Competency, Time Management, Teaching, and Awareness of the barriers of progression in Physics.

Scottish Centre for the Application of Plasma-based Accelerators (SCAPA)

Glasgow, UK

Summer Research Intern

Jun 2019 - Oct 2019

- The SCAPA research centre is a state-of-the-art laser laboratory that is focused on the development of next-generation accelerator technologies.
- Worked with a research team studying Laser-Wakefield Acceleration to generate high acceleration gradients by harnessing the power of a 350 TW ultra-short laser.
- Used target characterisation techniques to measure the density profile of a gas nozzle using wavefront sensors and allow for accurate simulation of the laser-plasma interaction.
- Developed a detailed experimental procedure to perform this measurement for reference and teaching purposes.
- Performed a Particle in Cell (PIC) simulation in EPOCH to analyse the laser-wakefield behaviour.
- **Technical Skills:** Optical alignment, GNU/Linux, EPOCH software, MATLAB, \LaTeX typesetting.

Hennes & Mauritz LTD

Glasgow, UK

Sales Team Leader

Apr 2020 - Present

- Admin Cash Office Responsible in a flagship fashion retail store. Managed H&S operations, daily checks, banking and staff training.
- Provided outstanding customer support and guaranteed detailed product knowledge.
- Experience in staff recruitment, group interviews and organising career development events.
- Ensured a heightened level of loss prevention and guaranteed GDPR and PCI compliance at the branch level.
- **Technical Skills:** MS Excel, Retail POS software, Cash Office Procedures, First Aid Training.
- **Soft Skills:** Customer service, Working under pressure in a fast-paced environment, Leadership and Management of a large team.

University Projects

Theoretical Modelling of Magneto-Optical Traps

Glasgow, UK

Experimental Quantum Optics and Photonics Group (EQOP)

Sep 2022 - Dec 2022

- Supervisor: Dr Aidan Arnold
- Wrote a numerical model in Python to predict the number of atoms trapped in a standard ^{87}Rb MOT.
- Performed multi-variable optimisation to find trap parameters and increase efficiency.
- Expanded on the theoretical understanding of Grating Magneto-Optical Traps to further develop an accurate model.
- **Technical Skills:** Python (Matplotlib, NumPy, SciPy, SymPy), Jupyter Notebook, Git, \LaTeX typesetting.
- **Soft Skills:** Time Management, Presentation skills, Report writing.

Magneto-Optical Trap Modelling

Glasgow, UK

Experimental Quantum Optics and Photonics Group (EQOP)

Sep 2021 - Apr 2022

- Supervisor: Dr Aidan Arnold
- Analysed the behaviour of a standard 6-beam MOT taking a numerical approach from first principles.
- Established physical relationships between trap parameters in order to optimise for a large number of atoms.
- Studied modern approaches to achieve miniaturisation for use of cold atomic clouds in a range of applications, such as the Pyramid MOT (PMOT) and the Grating MOT (GMOT) developed at Strathclyde.
- **Technical Skills:** Python (Matplotlib, NumPy, SciPy, SymPy), \LaTeX typesetting.
- **Soft Skills:** Critical Thinking, Time Management, Presentation skills, Report writing.

Volunteering Experience

STEM Equals - Glasgow Life

Glasgow, UK

STEM Researcher Role Models

Apr 2021 - May 2021

- Participated in the STEM Equals See Yourself in Stem impact project focused on creating more inclusive STEM communities for women and LGBTQ+ people in both academia and industry.
- Organised several talks with S1 students at Smithycroft Secondary School focused on Climate Change, Meteorology, Environmental Protection and Recycling.
- See Yourself in STEM Profiles and more information here: stemequals.ac.uk.
- **Soft Skills:** Teamwork, Teaching, Communication, Presentation skills.

Strathclyde Students' Union

Glasgow, UK

President of the Strathclyde Physics Society

Apr 2021 - May 2022

- Lead a group of outstanding volunteers to engage Strathclyde students interested in Physics in an environment of inclusion and joined responsibility.
- Planned a series of academic talks in liaison with the Strathclyde Physics department to showcase the latest research being done in the university and provide a platform for teaching staff to reach out to students for many opportunities.
- Organised a plethora of social events, including trips, programming workshops, Q&As with students and Physics News Articles on social media.
- Joined the Institute of Physics Societies Framework increasing student engagement with the IOP in outreach and funding opportunities.
- **Technical Skills:** Social Media Management, Administration.
- **Soft Skills:** Leadership, Event Planning.

Skills

Programming	Windows and GNU/Linux: Debian, Ubuntu, Fedora; Jupyter; Python: NumPy, SciPy, SymPy, Matplotlib; MATLAB; GitHub; \LaTeX typesetting; MS Office. Limited use of Julia and Mathematica.
Miscellaneous	Management, Administration, Health & Safety Procedures, Data Collection and Analysis, Teaching, Tutoring, and Presenting.
Soft Skills	Time Management, Teamwork, Problem-solving, Critical Thinking, Event Planning, Hard-working and Highly Motivated.

Languages

English	Bilingual Proficiency
Spanish	Native Proficiency
French	Minimum Professional Proficiency
BSL	Limited Working Proficiency

References available upon request.