Gabriele Johannes Giuli

Otto-Stern-Weg 1, Zurich 8093, CH ⋄ +41 44 633 32 40 ⋄ ggiuli@ethz.ch

EDUCATION

ETH Zürich - PhD in Physics *May 2024 - Present*

- Advisors: Prof. Dr. Jonathan Home and Prof. Dr. Tobias Donner

ETH Zürich - Student Exchange Programme *Sep 2021 - Sep 2022*

- Year abroad at **ETH Zürich** as part of the ***MEng Electrical & Electronic Engineering with a Year Abroad*** programme at **Imperial College London**

Imperial College London - MEng Electrical & Electronic Engineering *Oct 2018 - Oct 2022*

- Awarded **four *Dean's List for Academic Excellence* (every year)** certificates and ***prize for outstanding performance on the MEng***. Achieved overall average of **First Class (86.07%)**
- Repeatedly among **top 5%** of the entire cohort

RESEARCH EXPERIENCE

Doctoral Researcher at ETH Zürich TIQI Group (Zürich, Switzerland) *May 2024 - Present*

- Working on the *Dual Isotope Crystal Experiment* within the *Trapped Ion Quantum Information* (TIQI) group
- Worked on **precision spectroscopy** on dual-isotope crystals for **beyond standard model effects** investigation
- Contributed to develop **laser stabilization** infrastructure and quantum optics experiment **control library**

Masters Project at ETH Zürich Photonics Laboratory (Zürich, Switzerland) *Feb 2022 - Sep 2022*

- Developed instrumentation and software necessary to initialize, control and read the spin state of **NV^- centers** in diamond nanocrystals. Showed **optically detected magnetic resonance**
- Designed and built high voltage/frequency inverter for driving digital **quadrupole ion traps** for levitating nanoparticles in time-varying electric fields

Research Assistant at Politecnico di Milano (Milan, Italy) *Apr 2021 - Sep 2021*

- Worked in the department of *Aerospace Science and Technology* on efficient **dynamic inversion** flight control algorithms for **quad-copter** unmanned air vehicles
- Developed **analytical linear models** for the flight control algorithm, capturing **structured model uncertainty** of the aircraft dynamics

PRESENTATIONS

Ion Trap Quantum Computing Group (Oxford, United Kingdom) *Apr 2025*
Talk: "Exploring Physics Beyond the Standard Model with a Cryogenic Dual-Isotope Ion Trap"

Quantum Computing Scalability Conference (Oxford, United Kingdom) *Apr 2025*
Poster: "Exploring Beyond-Standard-Model Physics with a Cryogenic Dual-Isotope Ion Trap"

Swiss Quantum Days (Arosa, Switzerland) *Jan 2025*
Poster: "Search for a Fifth Force Using High Precision Isotope Shift Frequency Measurements of Calcium in a Trapped Ion Experiment"

Quantum Optics and Spectroscopy Group Retreat (Obergurgl, Austria) *Sep 2024*
Talk: "Cryogenic Trapped Ion Setup for Dual-Isotope Operation"

AWARDS AND PRIZES

- **Terry Whodcoat Memorial Prize** for outstanding performance on the MEng with a year abroad in 2022
- Awarded **four *Dean's List for Academic Excellence* (every year)** certificates
- Runner-up prize for ***Best Community Hack*** at ***Imperial College Hackathon*** in 2020
- Bronze medal for the ***Italian National Physics Olympiad*** in 2018
- Graduated **cum laude** from Italian high school (esame di maturità) in 2018, receiving a merit-based award
- Received ***Grade 12 Honours with Distinction*** certificate from Ross Sheppard high school in 2017

TEACHING EXPERIENCE

Trapped Ion Quantum Physics (ETH Zürich), *Teaching Assistant* *Spring 2025*

- Created **Jupyter Notebooks** on theory of trapped ions. Topics included: optical Bloch equations, ponderomotive potentials and normal motional modes analysis

Experimental Techniques in Quantum and Electro-Optics (ETH Zürich), *Teaching Assistant* *Fall 2024*

- Created and presented practical demonstrations on laboratory techniques. Demonstrations included: table-top radar, PID-stabilized mechanical oscillator, instrumentation amplifier for heartbeat sensing
- Held sessions on linear systems theory, noise theory and control theory

Electromagnetism Lab (Imperial College London), *Undergraduate Teaching Assistant* *Spring 2020*

- Took part in creating and teaching an **electromagnetic fields experiment** about magnetic and electric fields, lumped transmission line models and antennae radiation

Matlab Programming (Imperial College London), *Undergraduate Teaching Assistant* *Spring 2025*

- Took part in creating a practical course on *MATLAB* programming. Topics included: numerical methods, signal processing, differential equations and data visualization

WORK EXPERIENCE

Software Engineer at Tracebit (London, United Kingdom) *Aug 2023 - Oct 2023*

- Joined **early-stage cybersecurity startup** as **first employee**. Worked on product management and software development
- Used *.NET* and *C#* to develop full-stack code with a focus on scalability, maintainability and latency

Visiting Investment Analyst & Engineer at Picus Capital (Munich, Germany) *Jan 2023 - May 2023*

- Carried out in-depth research on **generative AI** and **deep technologies**, contributing to the refinement of the firm's investment hypothesis
- Led development of novel tools for **data-driven deal-sourcing** and **venture assessment** in the open-source environment. Software developed using *python*, *ReactJS* and *Amazon AWS*

Engineering Intern at CERN (Prévessin-Moëns, France) *Aug 2020 - Sep 2020*

- Worked as trainee for TE-EPC-LPC, a section that develops **power converters** for the LHC particle accelerator's superconducting magnets
- Developed ***LTSpice*** and **averaged small signal linear models** of a phase shifted DC/DC power converter running in *PWM*, *peak current* and *average current* control modes
- Worked with a **team** to produce a **closed loop control card** and measured the real-world 2 kA converter

PERSONAL PROJECTS (PARTIAL LIST)

MIT OpenCourseWare Radar *Summer 2019*

- Self-funded independent research project about radar systems. Based on a ***MIT OpenCourseWare*** project
- Fully functional radar system, capable of detecting speed (continuous wave mode) and range (frequency modulated continuous wave mode) of small targets

Cosmic Ray Detector *Jan 2018 - Jun 2018*

- Self-funded and independent research project about cosmic radiation and radiation detectors. Experimented with a condensation chamber at first as a basic way of detecting radiation
- Built a fully **electronic muon detector** based on two *Geiger-Muller* tubes and an *Arduino* for data collection. Built high voltage power supply inspired by a conference about cosmic radiation

LANGUAGES, OTHER ACHIEVEMENTS AND EXTRACURRICULAR ACTIVITIES

Italian (Native), English (Advanced), Spanish (Advanced), German (Beginner), *European Driving Licence*, *Italian Limited Boat Licence*, *PADI Deep Diver* scuba-diving certification, Airplane *Private Pilot Licence* (PPL)

- **Led preparatory course** on **Electromagnetism** for students participating in the regional *Physics Olympiad*
- Was part of **committee** of *Imperial College Gliding Society* and *Imperial College Italian Society*
- Sports & Hobbies: Tennis, Skiing, Golf, Rock Climbing, Scuba Diving, Photography and Gliding