ICFO



ICFO Spring School on Open-Source Tools for Quantum Science & Technology

March 18, 2024 to March 21, 2024
ICFO Auditorium

Outline:

This Spring School aims to provide students with a practical introduction to software and hardware tools for both theory and experiments in quantum sciences & technology, including applications in computation & simulation, communications, and sensing.

The program will offer a combination of hands-on lectures and & tutorials led by researchers from ICFO and academic and industry experts and will cover a range of topics aimed at introducing students and researchers to a variety of open-source tools, as well as their use in cutting-edge research and industry.

Topics covered include:

Quantum Computing with IBM Quantum (IBM Quantum)

Neutral Atom Quantum Computing (Pasqal)
Photonic Quantum Computers (Quandela)
Simulating Quantum Networks (Qutech / TU Delft)
Quantum Simulation with Neutral Atoms (ICFO)
Quantum Machine Learning (ICFO)
(Post) Quantum Cryptography (ICFO)
Quantum Simulation & Computing with Rydberg Atoms (Strasbourg)
Quantum programming with PennyLane (Xanadu)

Confirmed Research Workshop speakers include:

Alexia Salavrakos, Quandela
Soeren Wengerowsky, ICFO
Elisa Baumer, IBM Quantum
Joseph Bowles, Xanadu
Teodor Parella Dilme, ICFO
Shannon Whitlock, University of Strasbourg
Julius de Honde, Pasqal
Adam Valles, ICFO
Sandra Buob, ICFO
Kevin Satzinger, Google Quantum AI
Matthias Steffen, IBM Quantum

The school will include a 1-day **Research Workshop** where the lecturers and invited speakers will present their latest results, and a **career development workshop** for masters students led by the ICFO Knowledge and Technology transfer team. There will be opportunities for participating students to share their own work through posters and student talks.

The school will be followed by the annual **Quantum CARLA Careers Symposium**, which will be held at La Pedrera in Barcelona **on Friday 22 March.** Find here the detailed **PROGRAM.**
The Quantum CARLA is organized in collaboration of the Master in Quantum Science and Technology Barcelona, the European Quantum Flagship and DigiQ project

The school is aimed at Masters students, who are interested in familiarizing themselves with the use of these tools.?Advanced undergraduates, starting PhD students, and researchers in the field may also be interested to attend.
There are?**limited places**?available for both the workshop and the symposium. Preference will be given to Masters students.
The school is organized as part of the Master in Quantum Science and Technology Barcelona

in the scope of the DigiQ (Digitally Enhanced Quantum Technology Master) project.
Program:

Monday 18 March - Wednesday 20 March: Spring School & Career Development Workshop
Thursday 21 March: Research Workshop
Friday 22 March: Quantum CARLA Careers Symposium

Registration:
Registrations for the Spring School have now closed.
The registration **to attend in person the Research Workshop on Thursday 21 March are closed**.

Travel Fellowships:
Registrations for the Spring School have now closed. Applicants for travel fellowships will be informed shortly of the outcome
We will offer **up to 10 travel fellowships**?for?**Masters Students**?interested in attending the school. The fellowships will include reimbursement of travel expenses of up to ?350 and accommodation for 5 nights at a local hotel.?
To benefit from a fellowship, you?**must be currently enrolled in a master program**. Priority will be given to students enrolled in a master program at one the partner institutions in the DigiQ - Digitally Enhanced Quantum Technology Master.?
All required application material must be complete in order to be considered. We reserve the right to revoke the fellowship if any of the requested information is false or incorrect.?
Students enrolled in DigiQ may request travel support from their home university, if this is available.
Please contact us at frontiers@icfo.eu if you need assistance with organizing accommodation to attend the school.

Participating Institutions:

ICFO - the Institute of Photonic Sciences, is a young research institution that aims to advance the very limits of the science and technology of light, tackling important challenges faced by society at large in all areas of life, including health, energy, information, safety, security and caring for the environment. ICFO is a member of BIST, the Barcelona Institute of Science and Technology. More information about ICFO can be found?here.??

The **Master in Quantum Science and Technology Barcelona** is aimed at graduates in Physics, Physical Engineering or equivalent degrees who want to continue specialization studies in Quantum Science and Technologies. The master, coordinated by the University of Barcelona,

is a collaborative effort including 3 universities (UB, UAB and UPC) and 4 research centres (ICFO, BSC, IFAE and ICN2), working on quantum communication, computing, materials, sensing, and simulation.

DigiQ (Digitally Enhanced Quantum Technology Master),?a new European initiative coordinated by the University of Aarhus (DK), aims to drive transformation of the education ecosystem by introducing a number of educational innovations and a multinational programme structure to prepare the workforce and talent for future quantum technologies. It is funded by a ?17.6 million grant over four years through the European Commission's Digital Europe Programme. Twenty universities from ten European countries will participate in DigiQ, including partners from the?Master in Quantum Science and Technology Barcelona

Scientific Organizers:

Rob Sewell, Antonio Acin, Leticia Tarruell, Maciej Lewenstein, Hugues de Riedmatten & Valerio Pruneri (ICFO).

Contact Details:

Please contact us at frontiers@icfo.eu if you have any questions.

Sponsorship?&?Acknowledgements:

The school is sponsored by IBM Quantum, an industry leader in quantum computing, working everyday towards achieving quantum advantage.

This project has received funding from the European Union's Digital Europe?Programme?under grant agreement no. 101084035