

CALL FOR PAPERS



QUEST-IS'25

QUANTUM ENGINEERING SCIENCES &
TECHNOLOGIES FOR INDUSTRY & SERVICES

1st to 4th December - EDF R&D Paris Saclay

From Quantum Engineering to Applications for Citizens

KEY DATES

- › **December 2nd 2024:**
Opening of submission
- › **December 16th 2024:**
Booth booking
- › **April 7th 2025:**
Deadline for abstract
- › **July 7th 2025 :**
Notification of Acceptance
- › **September 15th 2025 :**
Deadline for final paper

SCOPE

QUEST-IS 2025, 1st International Quantum Engineering conference and exhibition will gather many companies in the quantic ecosystem from various countries.

It gives thus ways to technical matters as quantum computing and algorithms, quantum sensors, quantum communications, crypto and internet, including enabling technologies, and obviously Quantum Engineering targeting Applications for Citizens.

This multidisciplinary event place lets attendees from various backgrounds discuss technical challenges of applied quantum technologies and business opportunities with each other.

TECHNICAL VISITS

Technical visits and other events will be proposed on the fourth day.

ABSTRACT SUBMISSION

Prospective authors are invited to submit an abstract before April 7th 2025. Simply scan the QR code, or go to: www.conference-questis.org

EXHIBITION/SPONSORS

To complement the conference an exhibition will be organized during QUEST-IS 2025 at the same venue. This will enable attendees to get **useful contacts** as well as illustrate the wide variety of quantic developments.

It also includes booths where **industries, service providers and labs can show their last developments and innovations**; this exhibit area facilitates discussions between experts from various fields

CO-OPERATING SOCIETIES



Simply scan the QR code, or go to
www.conference-questis.org

Where?

EDF R&D
(Paris Saclay Campus)
7 Boulevard Gaspard Monge
91120 Palaiseau

Contact

QUEST-IS 2025/SEE Office
congres@see.asso.fr
General Chairs
François GERIN (SEE)
Frédéric BARBARESCO (THALES & SEE)
Organizing & Scientific Committee
see QUEST-IS site

Organizer





QUEST-IS'25

QUANTUM ENGINEERING SCIENCES &
TECHNOLOGIES FOR INDUSTRY & SERVICE

CONFERENCE TOPICS / TUTORIALS

Topics to be covered include (but are not confined to):

Quantum Algorithms & Computing

- Quantum Algorithms HW-dependent Optimization (HW compilation)
- HW Agnostic Quantum Circuits Representation & Optimization
- Data Loading (Quantum Memory, I/O, oracle implementation, ansatz optimization, block encoding...)
- Time synchronization (On-the-fly QEC Processing, on chips synchronization, ...)
- Quantum Error Correction Codes to Reduce Physical Qubits/Logical Qubits Ratio (Quantum LDPC, Color Codes,...)
- Resources Estimation (processing time, Qubits, Quantum Gates, energy, Benchmark vs classical, large circuit compilation resource estimates ...)
- Quantum Middleware & Abstract Framework based on basic components (Common Libraries, Quantum Software Patterns,...)
- Quantum Parallel Algorithms (problem modeling)
- QPU/HPC and Classical algo/ Quantum algo Hybridization (Mixed Algorithms, QEC, Programming, ...)
- Quantum program specification, programming, and formal verification environment
- Advances in Qubits Emulation (Tensor networks, MPS, ...)
- Applications-Oriented Benchmarks for Quantum Computing (including computing time estimates)
- Quantum Machine Learning Design & Applications (including data loading)
- Lie Algebra-Based Quantum Algorithms & Quantum Geometry-Informed Machine Learning

- From Classical Problems to Quantum Algorithms Methodologies and Tools (including FTQC decision problems solving algorithms)
- Quantum Cryptanalysis Engineering

Enabling Technologies

- Cryogenic systems for 1000+ qubits accommodation
- Advanced Cryo-Electronics Engineering (cryo-CMOS, SFQ, signals multiplexing, TWPAs, circulators)
- Cabling and connectors miniaturization
- Interconnection-based scalability (QPU interconnection, Qubits chips interconnection, microwave, optical photons, transduction...)
- Room temperature control electronics scalability (FPGA-ASIC, QEC syndrome decoding).
- Overcoming the power limitation of laser source (and reducing phase noise).
- Light control qubits: from optical fibers to optoelectronic efficiency (including photon routing)
- Quantum photonics
- Possible improvement from the material perspective and qubit fabrication
- Signal processing/multiplexing and error corrections
- The feasibility of qubit characterization (tabletop solutions)
- Environmental perturbations and their mitigation (vibrations, electromagnetic pollution, cosmic radiation...)
- Multi-modularity qubits hybridization (interconnection, memory qubits vs computing qubits, qRAM, Supra-Optical/Supra-NV, ...)

Quantum Sensors

- Position navigation and timing, including optical clocks, gravimeters and inertial sensors .
- Quantum entanglement as a resource for quantum metrology
- Quantum imaging and spectroscopy
- Magnetometry and related applications
- Quantum sensing and analysis of RF fields
- Quantum technologies for medical applications
- Future prospects in quantum sensing

Quantum Communications

- Syst: Quantum information network (Network architectures & management protocols, coexistence, sensing, (incl, channel, simulators))
- Syst: Progress in QKD (performance, security proofs, DI QKD, MDI QKD...)
- Syst: Post-quantum cryptography/ QKD hybridization
- Syst: New quantum communication protocols and their uses (distributed entanglement, clock synchronisation, blind quantum computing, quantum money, digital signature and more, distributed quantum computing circuit optimization)
- HW: Toward integration (PIC)
- HW: sources, detectors, new propagation media
- HW: quantum memories and repeaters - all hardware platforms
- Demonstrators: terrestrial & space - projects and results/field trials (Madrid, Paris, DTU...)
- Governmental Agency views on quantum communications

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