INSTAR

Quantum Technologies Roadmap

Shaping international standards for advanced technologies

INSTAR is a European funded Coordination and Support Action funded under the Horizon Europe Programme of the European Commission that aims to shape international standards in key emerging technologies by collaborating with relevant entities from Australia, Canada, Japan, Singapore, South Korea, Taiwan and the USA.

What are the European Task Forces (ETFs)?

The INSTAR ETFs are groups of European standardisation and domain experts who are actively contributing to innovate the **AI, Cybersecurity, Digital ID, IoT, 5G, 6G, Quantum Technologies,** and **Data Technologies** domains.

ETFs Roadmap

The INSTAR roadmaps serve as strategic frameworks that identify and align the EU's priorities with those of international partners, creating actionable pathways to influence global ICT standardisation. Aligning on international standardisation roadmaps is critical for Europe to ensure its priorities are reflected in global standards, paving the way to more innovation and increased competitiveness. These roadmaps are specifically designed to engage experts from standardisation bodies, policymakers, and industries, providing a common platform to guide collaboration, harmonise objectives, and shape the future of global ICT standards. This proactive approach allows Europe to lead and remain a key player in the development of standards that underpin technology adoption, interoperability, and fair market conditions on a global scale.

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The priorities listed in this fact sheet reflect the current state of discussions. The priorities will be continuously updated throughout the project.

Quantum Technologies Standardisation Priorities

Quantum Communication Networks:
- Conduct security assessments of QKD devices and QKD networks.
- Develop standards for the metrology characterization of QKD devices, focusing on implementation security.
- Integrate and standardize QKD with Post-Quantum Cryptography (PQC) for secure communication.
- Standardize architectures for both satellite and terrestrial quantum communication networks.
- Establish interoperability standards to support compatibility between different QKD suppliers.
- Define standards for QKD internal components, such as QRNG.
- Enable interoperability of QKD networks across domains and countries.
- Define authentication and trust models for quantum communications.

Quantum Computing:
- Develop application-oriented benchmarks to quantify the performance of specific use cases on different quantum hardware platforms.
- Create a standardised layer model for quantum computation.
- Enable hybridization by integrating quantum computers with classical high-performance computation systems.

Quantum Metrology and Sensing:
- Establish standards for high-precision metrology, such as optical clocks.
- Define standards for NV-Centers in nanodiamonds.
- Standardize single-photon and entangled sources.
- Create standards for single-photon detectors and quantum-enhanced imaging.

How to contribute to the ETFs

To contribute to INSTAR's goals and our European Task Forces, subscribe to our newsletter and make sure to follow both our LinkedIn and X accounts to stay updated on the ETFs next steps and input requests!

Learn more about the ETFs

Our consortium

Coordinator

BluSpecs · Fraunhofer · fortiss · Alliance for IoT and Edge Computing Innovation · Trialog

TUDelft · Trust-iT services communicating to markets · COMMpla Communication Platforms and Online Solutions · AIT AUSTRIAN INSTITUTE OF TECHNOLOGY · DEMOKRITOS