QUANTUM STRATEGY
Europe, Italy & the Italian Quantum Alliance

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AQI – Italian Quantum Alliance

QUANTUM@INFN - MILANO

FEBRUARY 3, 2026

Premises

DEFINITION

- Quantum technologies

corresponds to a wide range of emergent technologies that exploit the ability **to manipulate single quantum degrees of freedom** in order to carry out **specific functions**.

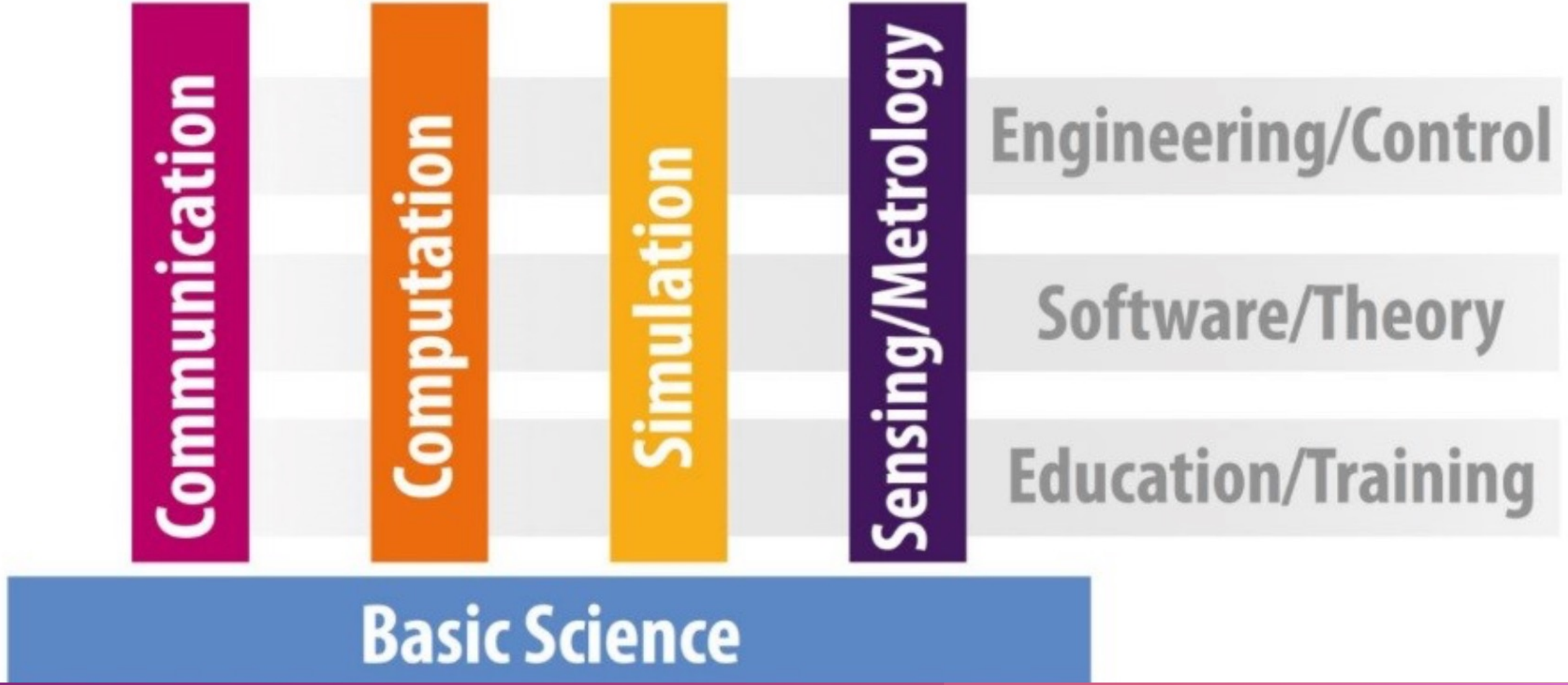
- For such technologies,

superposition and **entanglement** are used as **resources** to reach performances that have no equivalent in the classical world.

QUANTUM
FLAGSHIP

The future is Quantum.

nd Quantum Revolution is unfolding now, exploiting the
vancements in our ability to detect and manipulate single
The Quantum Flagship is driving this revolution in


Communication
Computation
Simulation
Sensing/Metrology
Engineering/Control
Software/Theory
Education/Training
Basic Science

THE PILLARS

The European framework

Signatories of the

QUANTUM DECLARATION

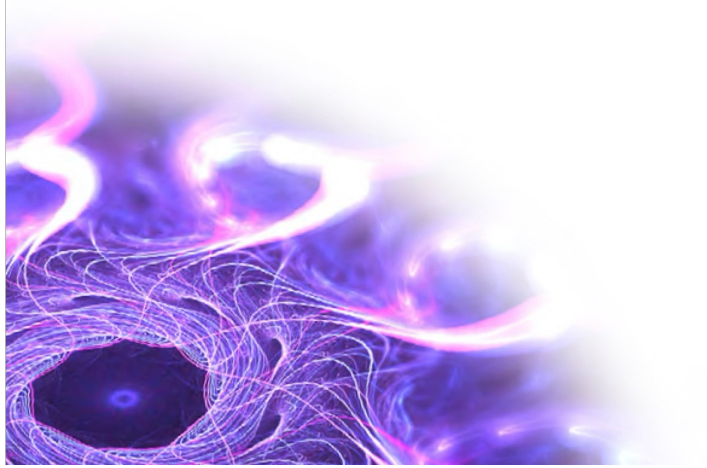
Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden recognise the strategic importance of quantum technologies for the scientific and industrial competitiveness of the EU and commit to collaborating on the development of a world-class quantum technology ecosystem across Europe, with the ultimate aim of making Europe the 'quantum valley' of the world, the leading region globally for quantum excellence and innovation.

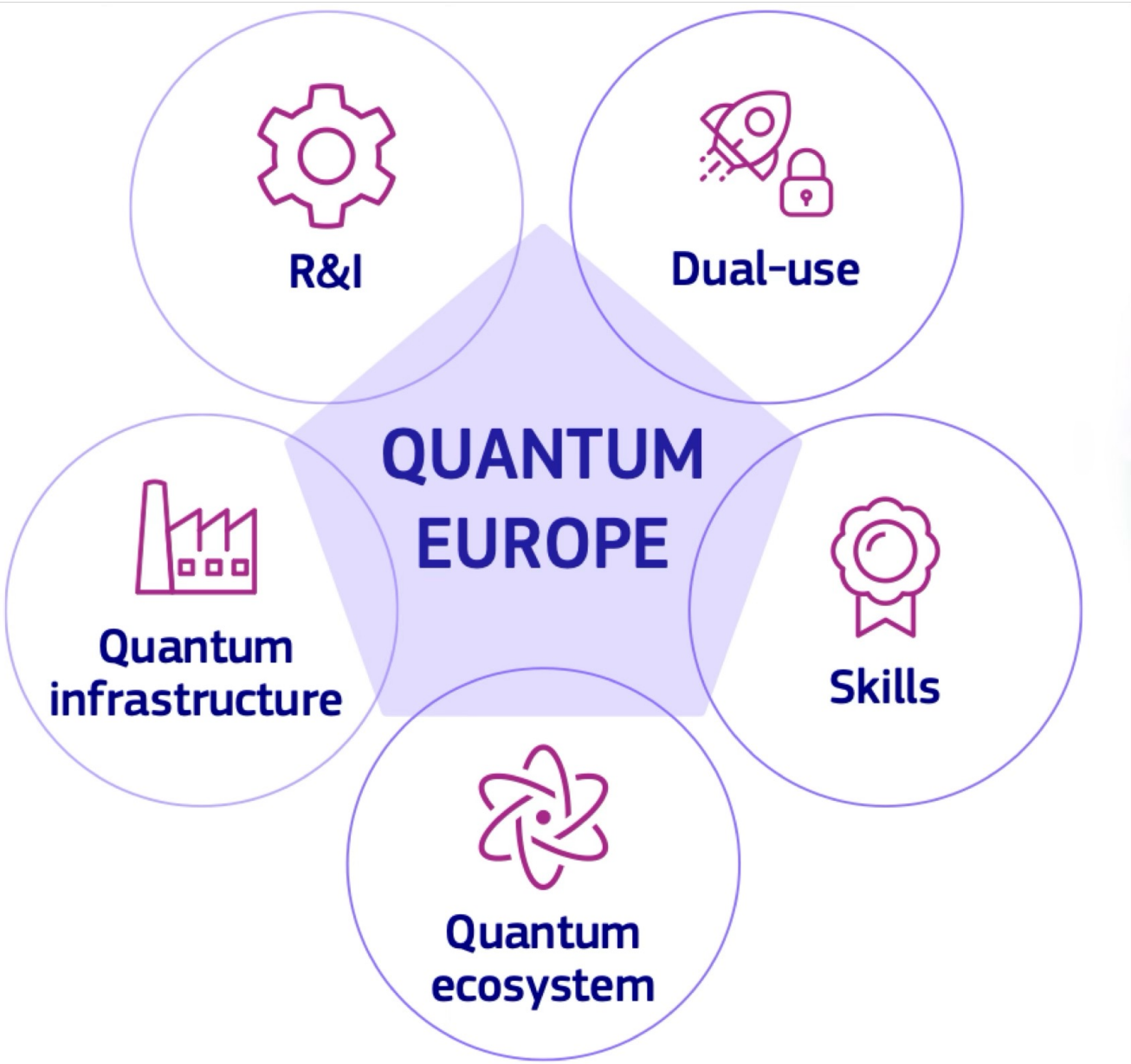
(2024)

European Commission

Quantum Europe Strategy

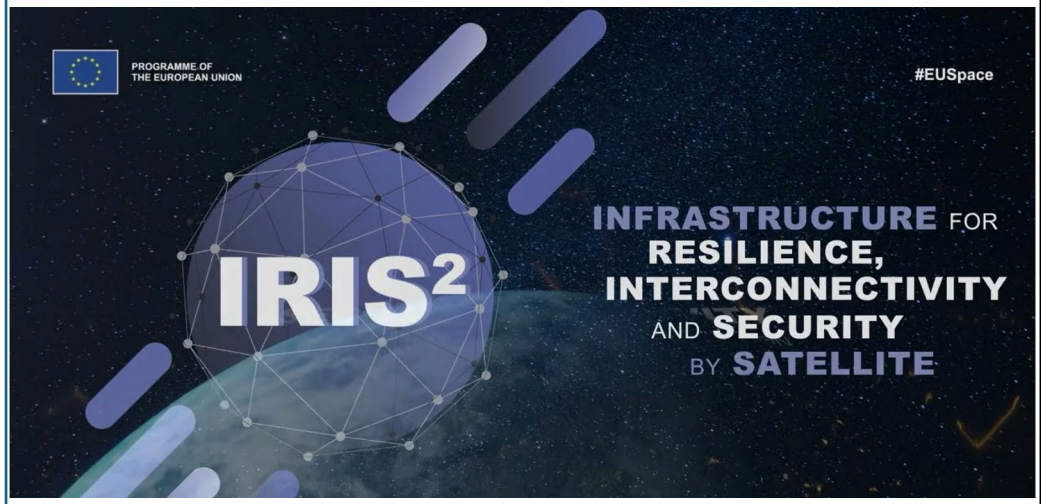
FIVE TARGETED AREAS





(2025)

European Commission


PROGRAMME OF
THE EUROPEAN UNION
#EUSpace
IRIS²
INFRASTRUCTURE FOR
RESILIENCE,
INTERCONNECTIVITY
AND SECURITY
BY SATELLITE

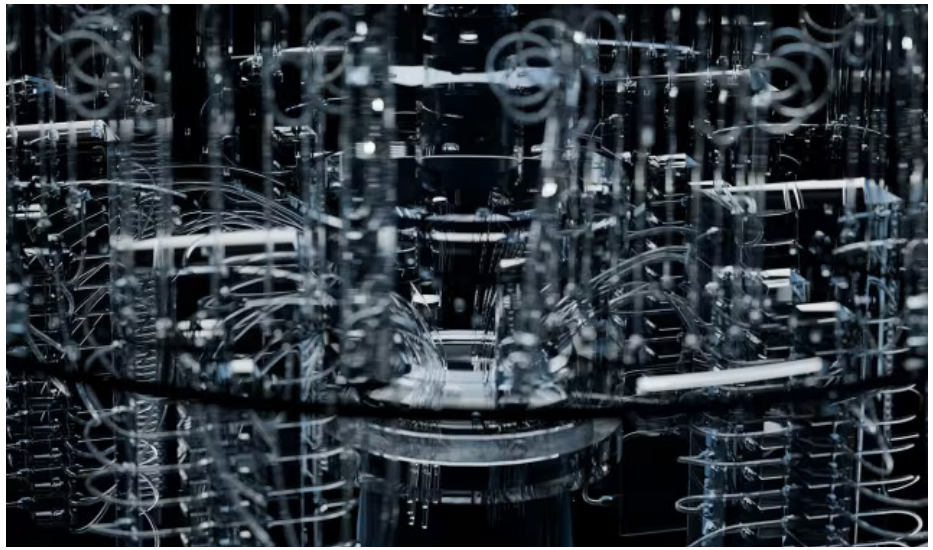

European Chips Act:
The Chips for Europe
Initiative
European Chips Act:
Security of supply and
resilience
European Chips Act:
Monitoring and crisis
response
EUROPEAN
CHIPS ACT

EuroQCI

QUANTUM KEY DISTRIBUTION

QUANTUM CRYPTOGRAPHY

QUANTUM NETWORKS



EuroHPC
Joint Undertaking

SUPER-CONDUCTING

NEUTRAL ATOMS

TRAPPED IONS

PHOTONIC

Q-ANNEALERS

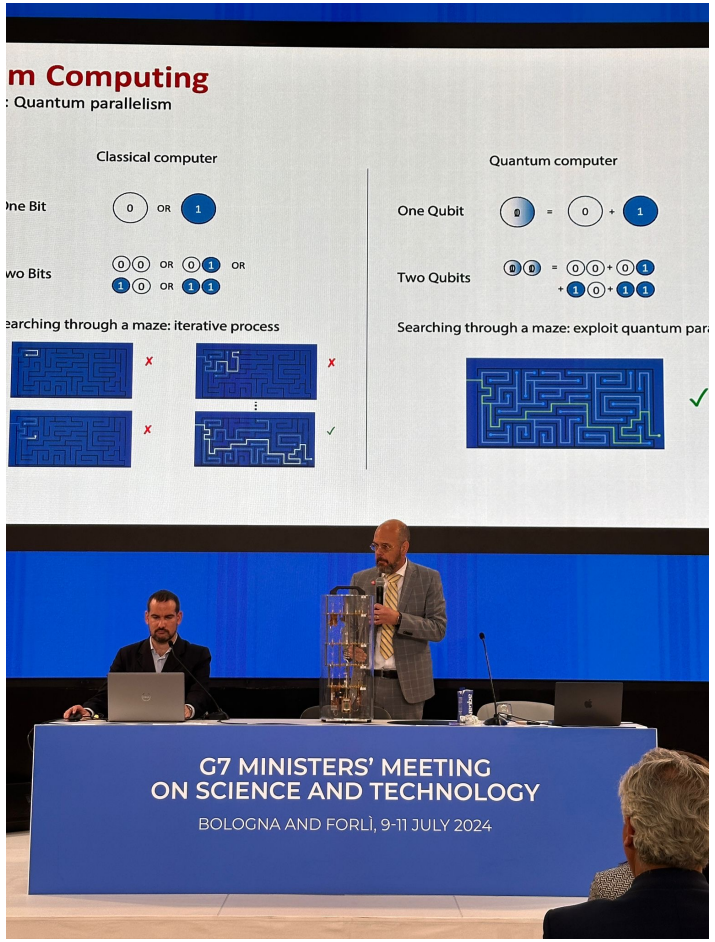
INTEGRATION WITH HPC

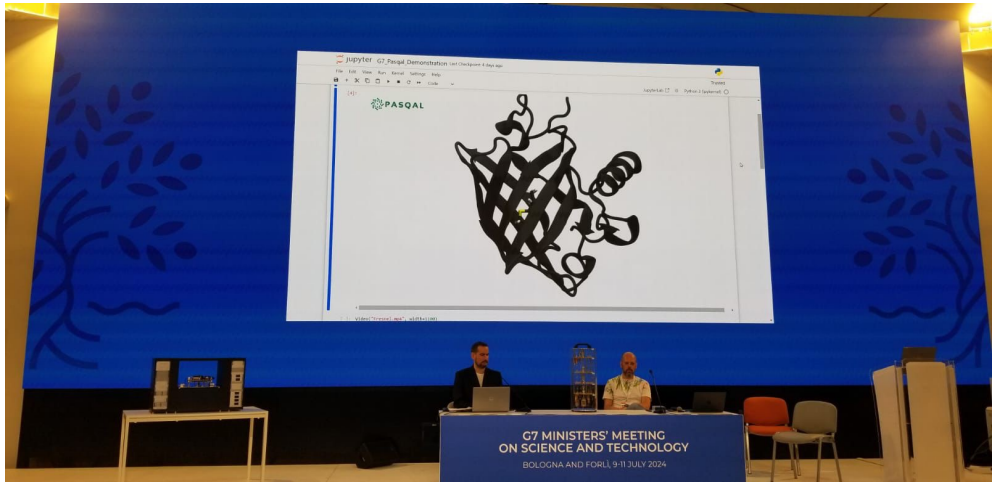
European Quantum Act | Updates **2026**

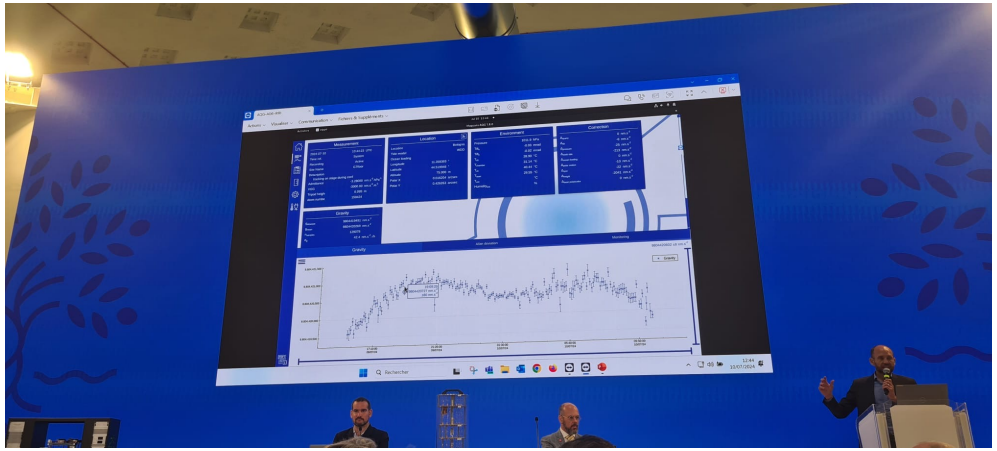
G7 ITALIA: Riunione S&T, Bologna 2024

Dimostrazione dal vivo di un calcolo **di screening della tossicità** in remoto su un processore quantistico

Misura in diretta della **variazione dell'accelerazione di gravità** dovuta al moto della Luna







July 2025

ITALIAN STRATEGY FOR QUANTUM TECHNOLOGIES

WORKING GROUP

Joint initiative of

MUR

MIMIT

DEFENCE

MAECI

ACN (National Cybersecurity Authority)

DTD (Dept. Digital Transformation)

+

experts of scientific community

Coordinator: Prof. Tommaso Calarco

Gruppo di lavoro	
Tommaso Calarco	Università di Bologna – coordinatore
Sanzio Bassini	CINECA
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Bruno Levati	Ministero della Difesa
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Stefano Luvini	Ministero delle Imprese e del Made in Italy
Chiara Macchiavello	Università di Pavia
Emanuele Nastri	Ministero delle Imprese e del Made in Italy
Luca Nicoletti	Agenzia per la Cybersicurezza Nazionale
Elisabetta Paladino	Università di Catania
Gioacchino Massimo Palma	Università di Palermo
Michela Pellegatta	Ministero dell'Università e della Ricerca
Vincenzo Pullez	Ministero della Difesa
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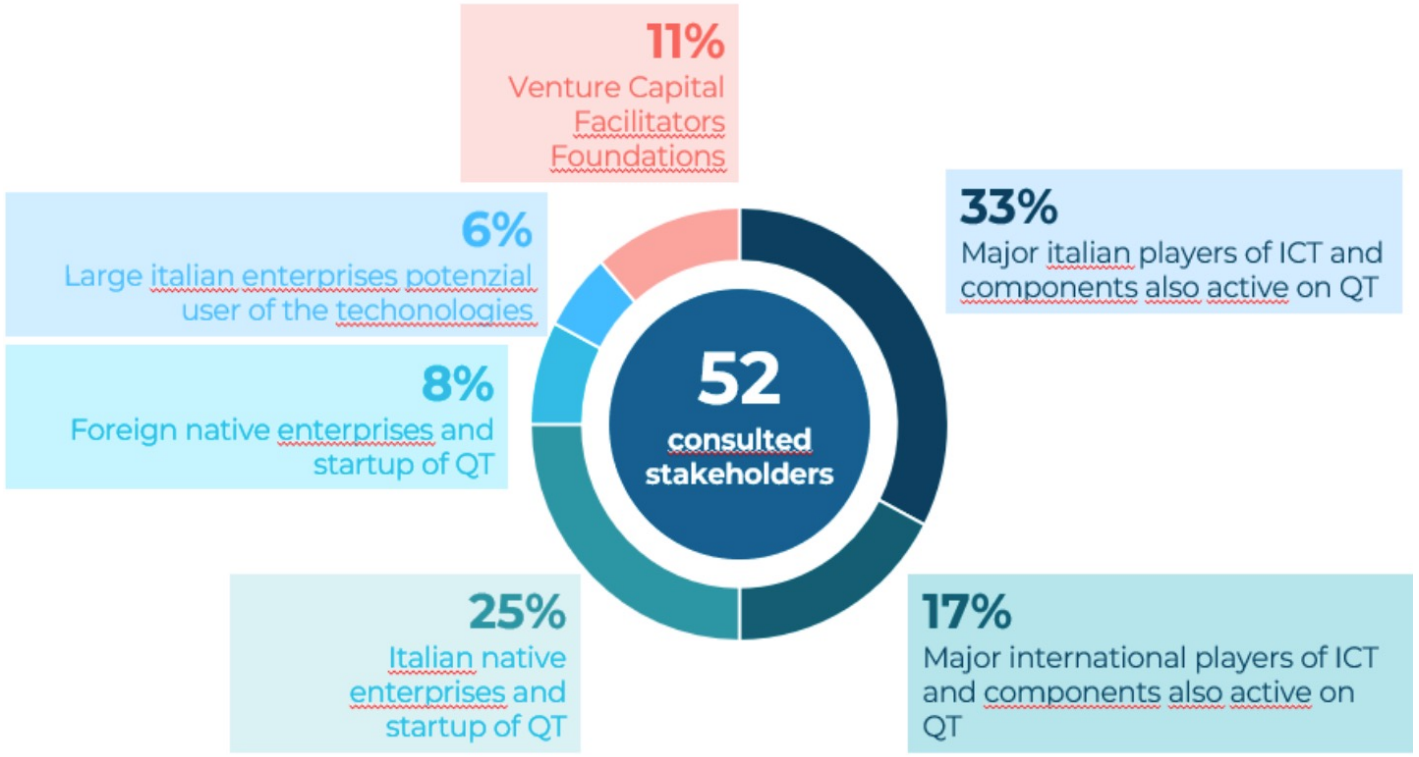
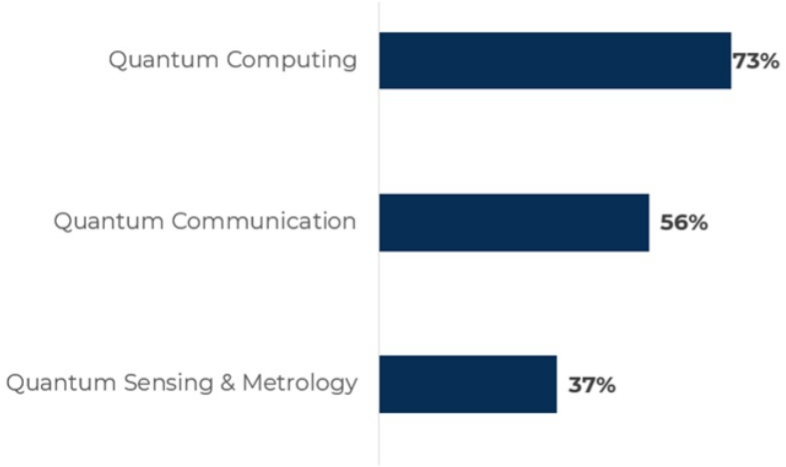
Costanza Toninelli	CNR-INO
Melissa Valentino	Ministero dell'Università e della Ricerca
Valeria Vinci	Ministero delle Imprese e del Made in Italy
Antonio Zoccoli	Istituto Nazionale di Fisica Nucleare

Italian Quantum Strategy

- **THE ITALIAN ECOSYSTEM**
- **SWOT ANALYSIS**

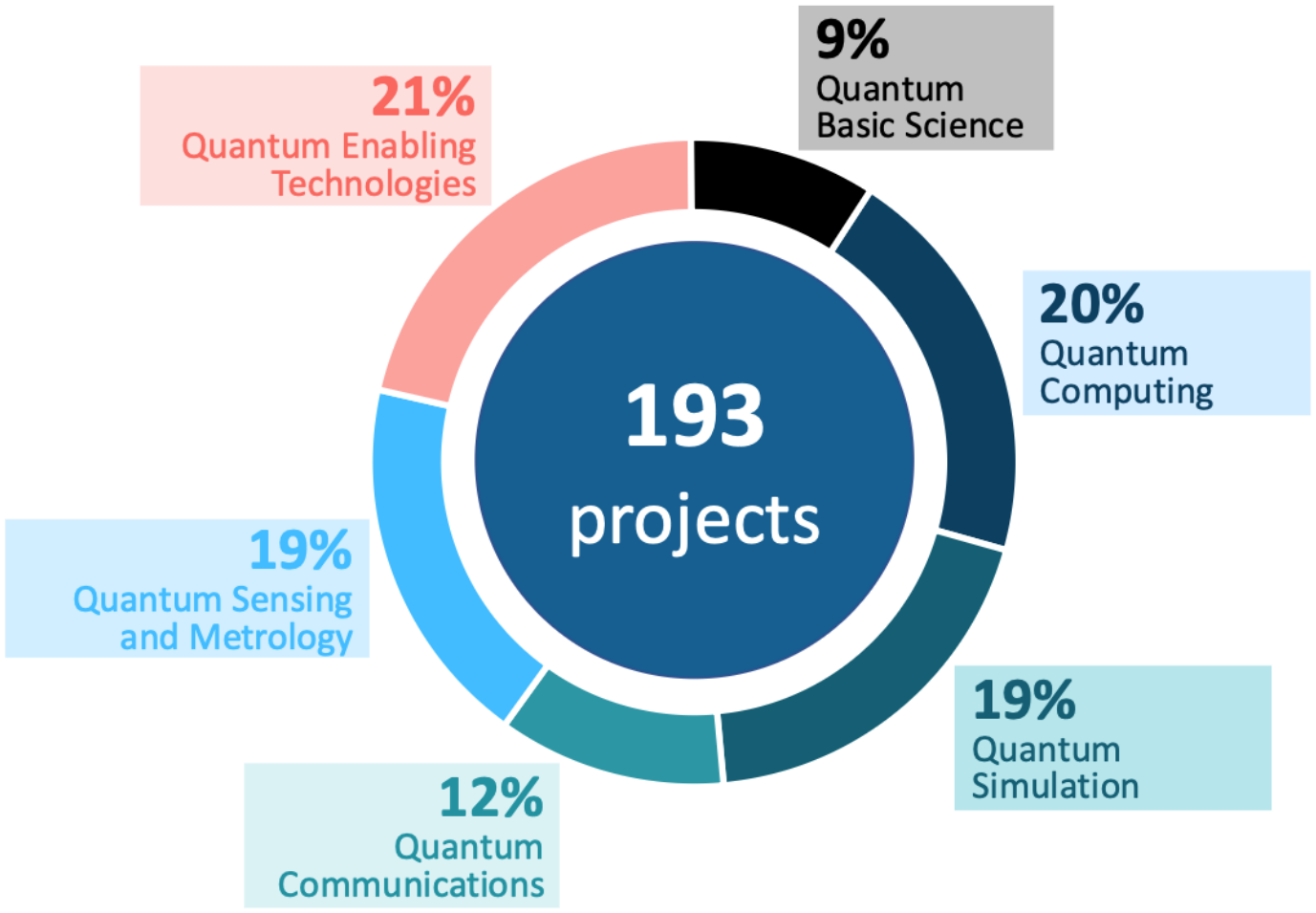
Responsibility	Activity
MIMIT	Mapping of stakeholders
MUR	Mapping of public research funding
WG	Mapping of research interests

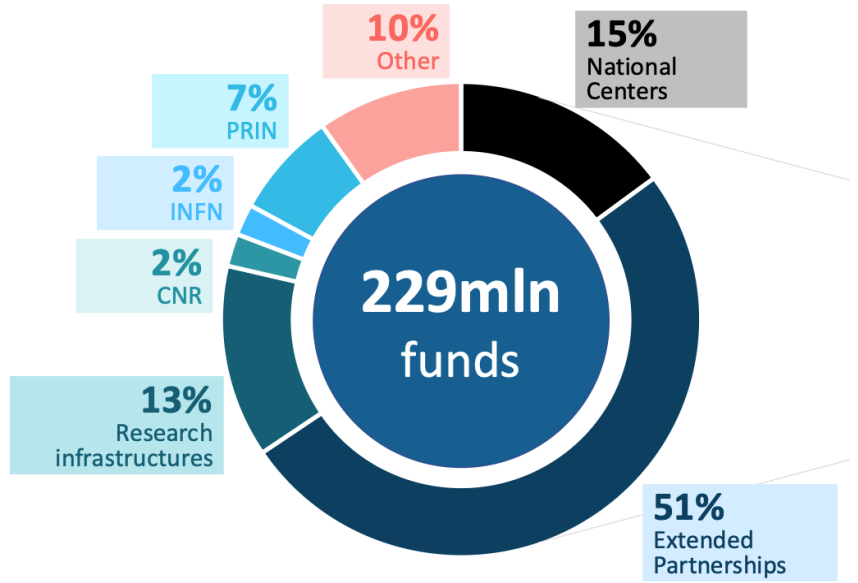




Distribution of the type of organization participating in the MIMIT consultation on QTs

Source: Data processing MIMIT-Osservatorio quantum computing & communication del Politecnico di Milano





Public funding for QT projects (2021-2024) (national resources and recovery funds managed by MUR).

Source: Ministry of University and Research

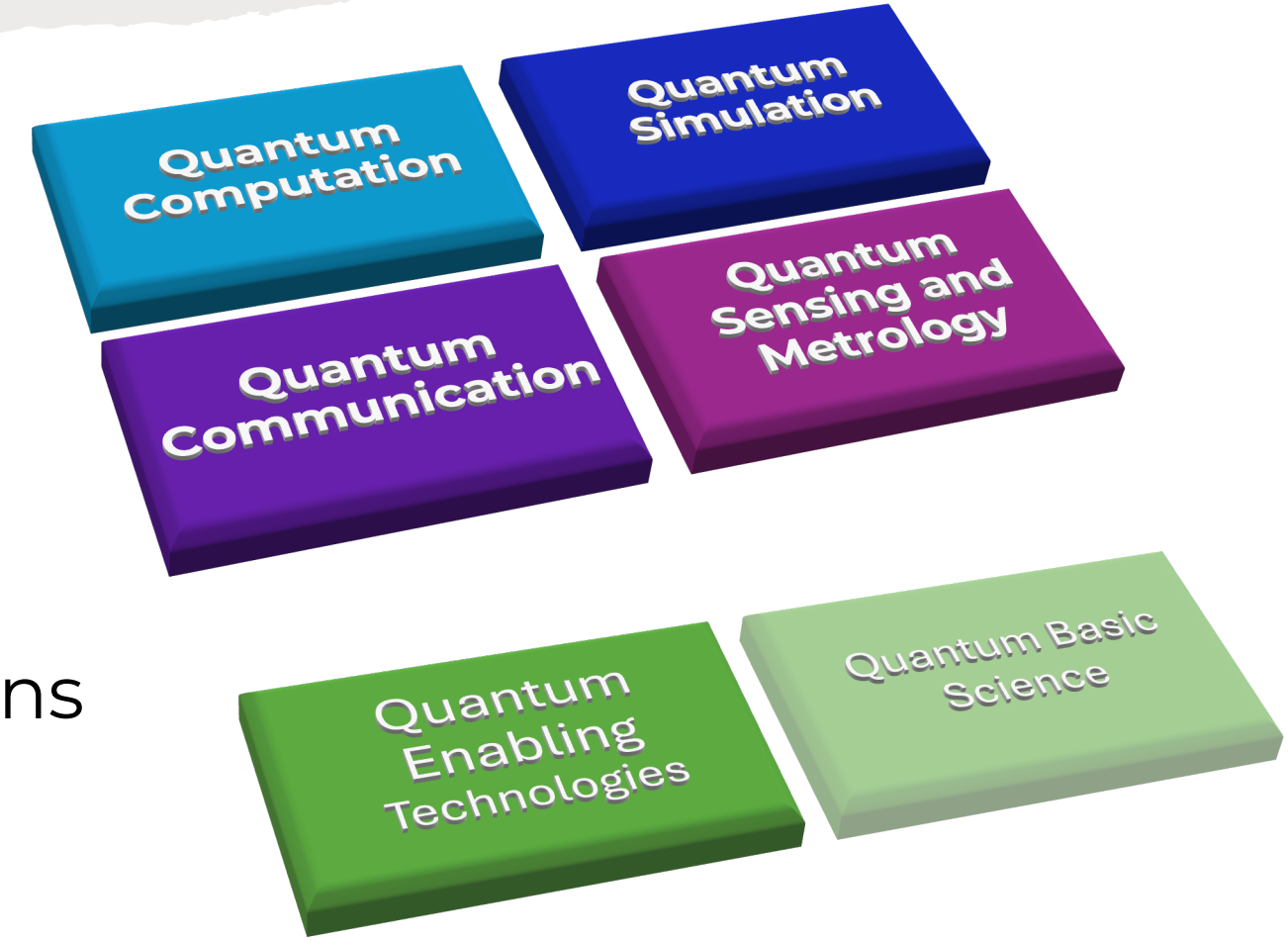
Personnel of universities and EPRs engaged in quantum sciences and technologies in Italy (the size of the spheres is proportional to the commitment of personnel

Source: Ministry of University and Research

Italian Quantum Strategy

The pillars

- State of the art
- Goals
- Scientific Recommendations



STRATEGIC ACTIONS: OBJECTIVES

- Research and innovation ecosystem
- Technology transfer
- Higher education and vocational training system
- Communication and outreach
- Industry

STRATEGIC ACTIONS: TOOLS

- Funds
- Governance

* CONSULTATION PROCESS

Alleanza Quantistica Italiana

Kick-off Meeting – December 1, 2025

Università di Bologna
Università di Padova
UNiversità di Palermo
Università di Pavia
Università di Trieste
Politecnico di Milano
SISSA Trieste
Istituto Nazionale di Fisica Nucleare
Istituto Nazionale di Astrofisica
Istituto Nazionale di Ricerca Metrologica
CINECA

(+ Università di Bari, Università dell'Insubria, Fondazione Links, Centro Nazionale HPC Big Data Quantum Computers)

BOARD of DIRECTORS: Elisa Ercolessi (President) Simone Montangero (Vicepresident) Davide Calonico Paolo Cremonesi Alessandra Poggiani

In accordance with the European Quantum Strategy and the Italian Strategy for Quantum Sciences and Technologies, AQI aims to create a **cohesive national ecosystem**, capable of competing at an international level and enhancing Italian excellence by integrating **academia, science, industry, and policy into a single vision**, ensuring that Italy can play a leading role in quantum technologies worldwide.

It operates across all the main areas of quantum technologies, including **quantum computing, quantum simulation, quantum communication, quantum networking, quantum sensing, quantum metrology, quantum artificial intelligence.**

Its main objectives are to:

- Foster strategic synergies between **research** institutions and industry by promoting joint initiatives at the local, national, and international levels, and by contributing to the development of advanced national and pan-European quantum infrastructures;
- Promote education and skills development through dedicated **training** and qualification programs aligned with the needs of research and the labor market;
- Support **technology transfer** by strengthening collaboration between research centers and industry, and by encouraging the creation of startups and spin-offs;
- Organize **outreach** and communication activities aimed at raising public awareness of quantum technologies through transparent, fact-based dialogue.

thank you