



**Italy: State of
Quantum –
August 2025
*Precision
Meets
Progress in
the Quantum
Renaissance***

Executive Summary

In a world where tech headlines clamor for attention, Italy has chosen a different rhythm—less a sprint, more a quietly orchestrated suite. As of August 2025, Italy is no longer a supporting actor in Europe's quantum narrative. It's stepped into the role of co-architect, leaning on a legacy of scientific elegance, refined research infrastructure, and a talent for meaningful partnerships. This isn't just quantum for quantum's sake—it's quantum with soul, tethered to semiconductors, simulation, and shared sovereignty.



National Strategy & Infrastructure

Italy's national quantum strategy is less about spectacle and more about scaffolding—solid, enduring, and designed for continuity. Since the creation of the *Italian Quantum Technologies Hub (IQTH)* in 2023, the country has built a collaborative backbone that fuses state, academia, and industry into something stronger than the sum of its parts. Anchored by the Ministry of Enterprises and Made in Italy (MiMIT) and the National Research Council (CNR), the IQTH is deliberately crafted—not cobbled—bringing coherence to a field often fragmented by urgency.

The €240 million investment via the *National Recovery and Resilience Plan (NRRP)* didn't just fund equipment; it clarified priorities:

- **CINECA's Bologna Center** now houses Italy's first hybrid quantum-classical machine—a symbolic and strategic pairing of old-world computing prowess and new-world potential.
- **Rome's Photonics District** is less of a lab and more of a living experiment in light manipulation and communication.
- **Semiconductor-linked quantum R&D hubs in Agrate and Catania** blur the lines between chip and qubit—where classical architecture meets quantum promise.

Public / Private Collaboration & Academic Firepower



Italy's intellectual depth has always leaned toward the contemplative—Galileo, Fermi, Levi. That spirit persists in its quantum trajectory. Universities like Pisa, the Normale, Politecnico di Milano, and Sapienza have turned quantum theory into practical blueprints, particularly in chemistry, algorithms, and error correction. There's a kind of deliberate patience here: research not rushed, but ripe.

And now, industry is catching up.

Leonardo S.p.A. isn't just dipping its toes in; it's staking its reputation on defense-oriented quantum research.

STMicroelectronics and **Thales Alenia Space** are moving from components to constellations—quantum sensors and QKD satellites.

Meanwhile, startups like **QBT in Naples** and **QTI** are not just participating—they're scaling.

There's a distinct narrative tension here: the old guard and the new vanguard, not in opposition, but in layered conversation.

International Relationships & Funding



Italy's strength isn't isolation—it's integration. Tied deeply into the *Quantum Flagship*, *EuroQCI*, and *Horizon Europe*, it leverages Brussels not as a bureaucratic necessity but as a platform for shared imagination. In 2025, Italy increased its share of *Digital Europe* co-funding, securing €80+ million that isn't just money—it's movement.

Key collaborations include:

Working with **France and Germany** on simulation protocols.

Quantum key distribution pilots with Switzerland, where neutrality meets encryption.

Hosting the **EuroQCI Mediterranean node**—a strategic gesture, not just geographic placement.

Italy isn't simply receiving quantum infrastructure. It's shaping how—and where—it lands.

G7 Summit & Strategic Alignment

At the **G7 Summit hosted in Puglia in June 2025**, quantum technologies were named as a "critical area for shared innovation and digital sovereignty." Italy led discussions on ethical AI and post-quantum cryptography, securing a G7 agreement to explore **interoperable quantum networks** among member states.

The summit emphasized:

- Trust frameworks for quantum-augmented AI systems.
- Investment coordination for quantum startups.
- Resilience in supply chains for quantum-enabled chips.

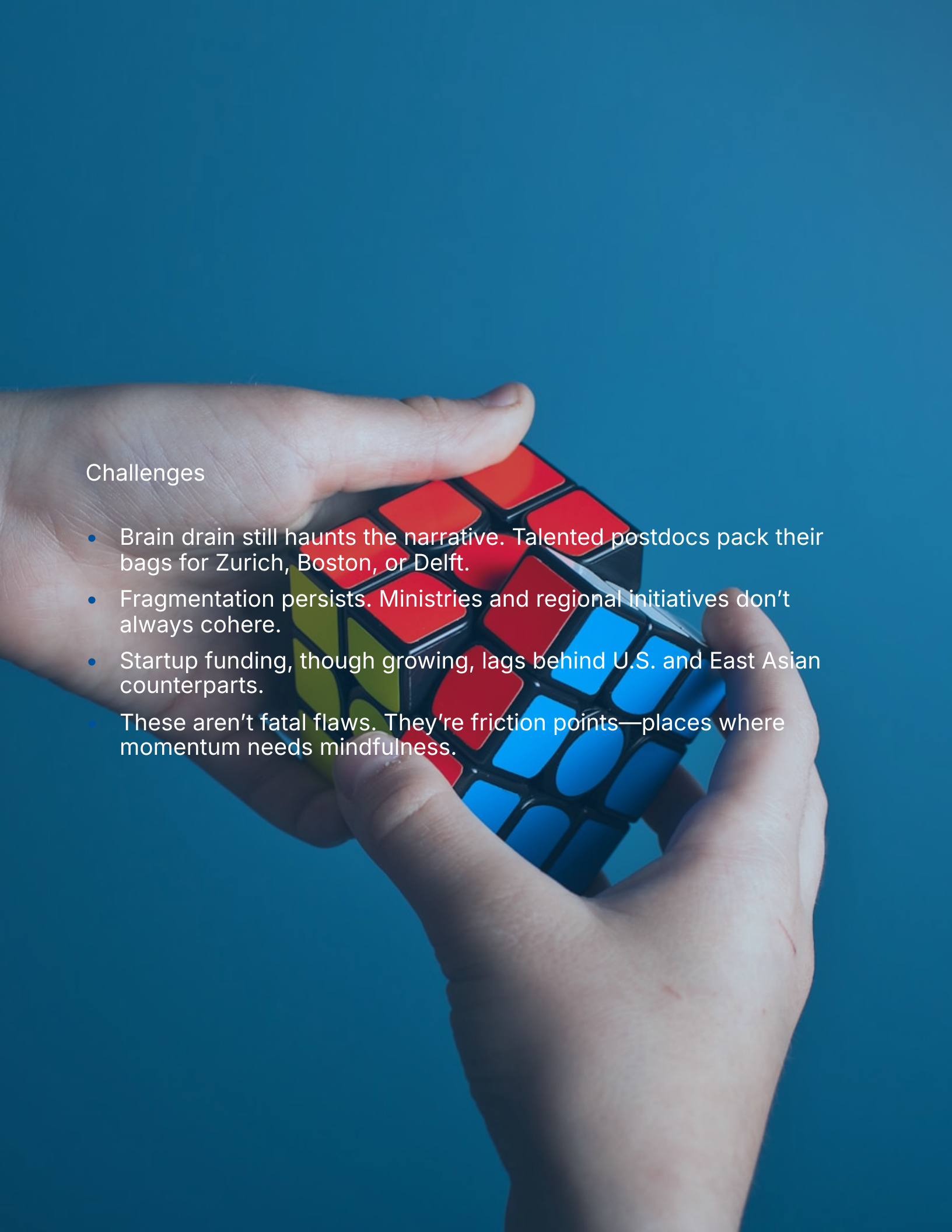


Opportunities and Challenges

Opportunities:

Opportunities

- Italy's photonics mastery isn't niche—it's foundational. Quantum sensing and secure comms are ripe for Italian leadership.
- As a bridge across the Mediterranean and deeper into North Africa, Italy can become a relational hub—where science meets diplomacy.
- With aerospace, automotive, and pharma sectors in its orbit, Italy can test quantum where it counts: in real-world scenarios.

A close-up photograph of a person's hands holding a Rubik's cube. The cube is partially solved, with red, blue, and yellow faces visible. The background is a solid, deep blue. The lighting is soft, highlighting the texture of the skin and the plastic of the cube.

Challenges

- Brain drain still haunts the narrative. Talented postdocs pack their bags for Zurich, Boston, or Delft.
- Fragmentation persists. Ministries and regional initiatives don't always cohere.
- Startup funding, though growing, lags behind U.S. and East Asian counterparts.
- These aren't fatal flaws. They're friction points—places where momentum needs mindfulness.

Outlook for 2025 & Beyond

Italy's quantum journey is pragmatic, persistent, and quietly poetic. With planned expansions at the Bologna center, a 2026 startup fund in development, and a seat at NATO's quantum sensing table, Italy is not just keeping pace—it's strengthening its presence. Later this year, a *National Quantum Talent Strategy* is expected. If it succeeds in inter-industry training, gender inclusion, and researcher mobility, it could be the key Italy needs to attract and retain its next wave of innovators. In this emerging field, where novelty often outweighs nuance, Italy offers something rare: measured ambition built to last.



Final Reflection

Italy's quiet but unmistakable rise in advanced technology is notable. While others seek headlines, Italy focuses on alignment. There's a hint of Renaissance spirit—not just in art but in philosophy, emphasizing integration. Seeing science as an art form, driven by precision and momentum. By August 2025, Italy has shifted from the sidelines, not with fanfare but with purpose. And that may be the most significant move of all.

