NEWS RELEASE

Cryogenics Allow MIT Scientists to Capture the First Images of Quantum Interactions

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Technology, Space & Energy

In a breakthrough that may define a new era in computing, **MIT researchers have captured the first-ever images of quantum interactions** - made possible by cryogenics. Using helium to cool their system to temperatures close to absolute zero, thermal noise is virtually eliminated, allowing sensors to operate with unprecedented precision, helping the team to unlock new levels of imaging clarity.

Quantum computing relies on qubits, which must operate in an environment virtually free of heat and interference. Cryogenics, particularly cooling systems powered by helium, are critical to maintaining these fragile quantum states. At temperatures below 15 millikelvin, superconducting materials like niobium and aluminum exhibit zero resistance, allowing qubits to remain stable long enough to perform operations once thought impossible. Without helium, these quantum states - and the machines that rely on them - wouldn't exist.

2025, declared the **International Year of Quantum Science and Technology**, marks a global inflection point. Governments are waking up to the reality that current cryptography methods will be obsolete in a post-quantum world. The stakes? National security, financial systems, and digital privacy. Cryogenics - and by extension, helium - sit at the core of this quantum arms race.

One example of this momentum is **PsiQuantum's recently announced collaboration with Linde Engineering** to build one of the world's largest cryogenic cooling plants for a utility-scale quantum computer in Brisbane, Australia. The facility will support tens of thousands of photonic quantum chips, underscoring the scale of infrastructure now being mobilized to enable the quantum era.

China, recognizing the stakes, has already surged ahead with a staggering **$13.8 billion state-backed venture fund**, outpacing both the U.S. and EU in quantum R&D and prompting rising urgency in Western capitals amid reports of breakthroughs. This seems to suggest that those who control the infrastructure behind quantum technologies

could shape the next digital era - an infrastructure that, in part, depends on helium, a finite and non-substitutable resource.

Smart capital understands that investing in helium supports the foundational infrastructure enabling next-generation computing, global security, and scientific innovation. Quantum computing is fast emerging as the next battleground for global technological leadership - and cryogenics is the enabler. As quantum science moves into the mainstream and demand for quantum computing and military-grade cryptography accelerates, the need for helium will rise alongside it. With a focus on secure, transparent jurisdictions like the U.S. and Greenland, Pulsar is positioned where it matters most.

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