

National Quantum Mission (NQM)

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Why in News?

India's National Quantum Mission has deployed a 1,000 km secure quantum communication network in under 3 years.

***Quantum technology** is a broad field of physics and engineering that develops new devices and systems by directly harnessing the unique principles of quantum mechanics.*

- **Launched in** - April 2023.
- **Duration** - 2023-2031.
- **Aim** - To seed, nurture, and scale scientific R&D in quantum technologies (QT).
- **Implemented by** - The Department of Science and Technology (DST) through 4 thematic hubs.
 - **Thematic Hubs (T-Hubs)** -
 - IISc Bengaluru - Quantum Computing.
 - IIT Madras & C-DOT - Quantum Communication.
 - IIT Bombay - Quantum Sensing & Metrology.
 - IIT Delhi - Quantum Materials & Devices.
- **Nodal Ministry** - Ministry of Science and Technology
- **Quantum Technology Cell (QTC)** - A specialized division responsible for overseeing and implementing the National Quantum Mission (NQM).

***Quantum Diamond Microscope (QDM)** is India's first indigenous QDM was recently launched by the IIT Bombay T-Hub for advanced magnetic field imaging.*

• Types of Quantum Technology -

	Meaning	NQM's Role
Quantum Computing	Uses qubits and quantum mechanics to solve problems too complex for classical supercomputers.	Develop intermediate-scale quantum computers with 50-1,000 physical qubits using superconducting and photonic platforms.
Quantum Communication	Uses quantum states to create secure, unhackable channels for transmitting information.	Establish 2,000 km of satellite-based secure quantum communication between ground stations
Quantum Sensing	Uses atomic-level sensitivity to achieve ultra-precise measurements of motion, gravity, and magnetic fields.	Develop high-sensitivity magnetometers and ultra-precise atomic clocks for applications in navigation and precision timing.
Quantum Simulation	Uses one quantum system to model and study the behaviour of another complex quantum system	Build high-fidelity simulators to model complex materials, drug interactions, and chemical processes for industrial self-reliance

References

1. [PIB | NQM](#)
2. [DST | NQM](#)