

Quantum Satellite

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About Quantum Satellite:

- **Definition:** A quantum satellite is a communications satellite that uses **quantum physics** to secure its signals.
- **Purpose:**
 - **Enhance Signal Security:** Protect against threats from quantum computing.
 - **Facilitate Quantum Key Distribution (QKD):** Enable unbreakable encryption through QKD.

Quantum Cryptography and Quantum Key Distribution (QKD)

- **Quantum Cryptography:** Uses the principles of quantum physics to secure messages.
- **Quantum Key Distribution (QKD):**
 - **Function:** Securely share encryption keys such that any eavesdropping can be detected, aborting the transmission if compromised.
 - **Mechanisms:**
 - **Quantum Measurement:** Measuring a photon changes its state, thus revealing any eavesdropping.

- **Quantum Entanglement:** Entangled photons instantly reflect changes in one another, ensuring secure key distribution.

National Quantum Mission (NQM)

- **Objective:** The NQM is a program by the **Department of Science & Technology** designed to accelerate the use of quantum physics in developing advanced communication and sensing systems.
- **Budget and Duration:** The Union Cabinet approved it in April 2023, with a budget of **₹6,000 crore**, to be implemented from **2023 to 2031**.

Micius

- The world's first quantum communications satellite was launched by China in 2016.
 - **Function:** Acts as the source of pairs of **entangled photons**, whose properties remain intertwined regardless of the distance.
 - **Significance:** This entanglement forms the basis of the most secure forms of quantum cryptography.
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Q1: What is Quantum Technology, and how does it work?

Quantum technology harnesses the principles of quantum mechanics, such as superposition, entanglement, and quantum tunnelling, to develop advanced technologies. Unlike classical systems, quantum systems can process information exponentially faster, offering breakthroughs in computing, secure communication, and sensing.

Source: [What is the quantum satellite for India's National Quantum Mission? | Explained - The Hindu.](#)

Source: <https://vajiramandravi.com/current-affairs/quantum-satellite-2/>

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