

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION NO. 2206
ANSWERED ON 18/12/2025

QUANTUM COMMUNICATION NETWORKS

2206 SHRI S.R. SIVALINGAM:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

- (a) the steps taken by Government to support the development and deployment of long-distance quantum communication networks, including collaborations with the Indian Army and use of existing optical fiber infrastructure;
- (b) the initiatives proposed by Government for expanding quantum key distribution infrastructure across strategic locations nationwide leveraging advancements from the National Quantum Mission; and
- (c) the measures adopted by Government to promote the National Quantum Mission, details of funding allocations and the expected impact of these quantum communication advancements on national digital security and technological sovereignty?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE
MINISTRY OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) to (b): The National Quantum Mission sets explicit deliverables for long-distance secure quantum communications across strategic locations nationwide — including inter-city Quantum Key Distribution (QKD) over 2,000 km using wavelength-division multiplexing (WDM) on existing optical-fibre infrastructure, satellite-based secure quantum links between ground stations (range 2,000 km within India), and multi-node quantum networks with quantum memories, entanglement swapping and synchronized quantum repeaters. To realise these goals, a Thematic Hub (T-Hub) on Quantum Communications is established at IIT Madras in association with C-DoT under National Quantum Mission. The T-Hub comprises of five Technical Groups focussing on developing terrestrial fibre-based QKD architectures, repeater and memory technologies, and satellite QKD systems—working with national R&D laboratories, academic partners and industry.

The Department of Science and Technology has also supported a startup namely QuNu Labs for deploying long-distance QKD over the Indian Army's optical-fiber network, including development of a scalable Quantum Key Distribution Network (QKDN). NQM facilitated coordination with the Indian Army's Southern Command, enabling the successful demonstration of a 500+ km secure QKD link using existing military fibre infrastructure.

(c) NQM has established four Thematic Hubs comprising of 14 Technical Groups and 17 Project Teams having 152 researchers from 43 institutions across 17 States and 2 Union Territories. The Quantum Communications T-Hub at IIT Madras is sanctioned ₹614.31 crore and is fully operational and is engaged in a range of activities including technology development, human resource development, entrepreneurship and international collaborations. Quantum communication initiatives under NQM strengthen national digital security by enabling quantum-resilient secure links and supporting the transition to post-quantum cryptography. Indigenous development of QKD systems enhances technological sovereignty, reduces external dependence and catalyses start-ups, industry participation and high-value employment in emerging technology sectors.
