GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
LOK SABHA
UNSTARRED QUESTION NO. 2635
ANSWERED ON 11/12/2024

NATIONAL QUANTUM MISSION

†2635. Smt. Vijaylakshmi Devi:

Will the Minister of SCIENCE AND TECHNOLOGY विज्ञान और प्रौद्योगिकी मंत्री **be pleased to state:**

(a) the specific aims and objectives of National Quantum Mission along with the estimated timeline to achieve these objectives;

(b) the major fields of research and development being focused upon under the mission;

(c) the details of funds allocated for the mission; and

(d) whether any step has been taken by the Government to encourage female scientists and if so, the details of schemes beneficiaries, if any, in this regard particularly in Bihar, district-wise?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) OF THE MINISTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES

(DR. JITENDRA SINGH)

विज्ञान और प्रौद्योगिकी तथा पृथ्वी विज्ञान मंत्रालय के राज्य मंत्री (स्वतंत्र प्रभार)

(डॉ. जितेंद्र सिंह)

(a) The National Quantum Mission (NQM) is for a period of eight years. However, the implementation broadly has three timelines, i.e. 3 years, 5 years and 8 years. Following are the specific aims and objectives of the mission:

1. **Develop intermediate scale quantum computers with 20-50 physical qubits (3 years), 50-100 physical qubits (5 years) and 50-1000 physical qubits (8 years) in various platforms like superconducting and photonic technology.**
2. **Develop satellite based secure quantum communications between two ground stations over a range of 2000 kilometres within India as well as long distance secure quantum communications with other countries.**

3. **Develop inter-city quantum key distribution over 2000 km with trusted nodes using wavelength division multiplexing on existing optical fibre.**
4. **Develop multi-node Quantum network with quantum memories, entanglement swapping and synchronised quantum repeaters at each node (2-3 nodes).**
5. **Develop magnetometers with 1 femto-Tesla/sqrt(Hz) sensitivity in atomic systems and better than 1 pico-Tesla/sqrt(Hz) sensitivity in Nitrogen Vacancy-centers; Gravity measurements having sensitivity better than 100 nano-meter/second^2 using atoms and Atomic Clocks with 10^{-19} fractional instability for precision timing, communications and navigation.**
6. **Design and synthesis of quantum materials such as superconductors, novel Semiconductor structures and topological materials for fabrication of quantum devices for development of qubits for quantum computing and quantum communication applications, single photon sources/detectors, entangled photon sources for quantum communications, sensing and metrological applications.**

(b) The major fields of research and development being focused upon under the mission are Quantum Computing, Quantum Communication, Quantum Sensing & Metrology and Quantum Materials & Devices.

(c) The National Quantum Mission was approved by the Union Cabinet at an outlay of Rs.6003.65 Crores for a period of eight years.

(d) Yes, Sir. National Quantum Mission is a pan India initiative under which four Thematic Hubs (T-Hubs) have been established, comprising of 14 Technical Groups across 17 states and 2 Union Territories, including Bihar. The activities undertaken by these hubs - technology development, human resource development, entrepreneurship development, industry collaborations, and international collaborations-are national in scope. Female scientists from all states and districts, including Bihar, are encouraged to participate in and benefit from the Mission's programs.

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