Foundation for QC Innovation

An initiative under the National Quantum Mission of DST

Promoted by the Indian Institute of Science, Bengaluru

QUANTUM COMPUTING

Call for Startup Innovation

Eligibility criteria for Startups:

To be eligible for funding under the NQM, your startup must meet the following criteria:

- **DPIIT Registration:** The startup should be registered by DPIIT at the time of application. Funds will only be released after successful DPIIT registration if not already registered.
- **Business Idea:** The startup must have a business idea to develop a product or service with a market fit, viable commercialisation, and scope for scaling.
- **Technology-Centric:** The startup should be using technology in its core product, service, business model, distribution model, or methodology to solve the targeted problem.
- **Indian Company:** The startup must be defined as an 'Indian Company,' meaning it is a holding company registered in India, its Intellectual Property (IP) resides in India, and it is majority- owned in India.
- **Indian Promoter Shareholding:** Shareholding by Indian promoters in the startup must be at least 51%, as per the Companies Act, 2013, and SEBI (ICDR) Regulations, 2018. Any future change in 'Indian Company' status is subject to specific guidelines.

Application Submission

- T-Hubs/Technical Groups Recommendations: T-Hubs or Technical Groups within T-Hubs may recommend startups they are closely working and have innovative ideas. Such recommendations will be supported based on merit.
- An online call for applications will be hosted on an ongoing basis. Applicants will be asked to submit details such as team profile, problem statement, product/service overview, business model, customer profile, market size, quantum of funds needed, and projected utilisation plan for funds.

Selection Criteria and Process

- The selection process is open, transparent, and fair.

Evaluation Criteria:

Eligible applications will be evaluated by the IEMC based on the following criteria:

- **Need for the Idea:** Market size, market gap filled, and whether it solves a real-world problem.
- **Feasibility:** Reasonability of technical claims, methodology for Proof of Concept (Poe) and validation, and product development roadmap.
- **Potential Impact:** Customer demographic, technology's effect on them, and national importance (if any).
- **Novelty:** Unique Selling Proposition (USP) of the technology and associated Intellectual Property (IP).
- **Team:** Strength of the team, including technical and business expertise.
- **Fund Utilisation Plan:** Roadmap for money utilisation.
- **Fund Raised:** Funds raised from other organisations, including private and government sources.
- **Additional Parameters:** Any other appropriate parameters.
- **Presentation:** Overall assessment.

Evaluation Process Steps:

- **Pre-screening:** Applications are pre-screened for eligibility, followed by screening by a Committee of Technical Experts. Shortlisted startups may present to technical experts/jurors.
- **Second Round of Interactions:** Shortlisted applicants will have a second round of interactions with the IEMC, along with business leaders, VC fund representatives, angel investors, and other domain experts. This round evaluates business viability and suggests a rough company valuation. Legal and financial due diligence will be conducted in parallel.

Decision Making:

- For investments under Slabs A & B, the T-Hub's HGB and BoD are authorised to make the final investment decision.
- For investments under Slab C, an additional evaluation step by a centrally constituted IEMC is required. This central IEMC will review recommendations from all four T-Hubs for Slab C investments periodically.

Timeline: The entire process from application receipt to fund disbursal may take up to a maximum of 3 months. Rejected applicants will be notified via email.

Legal and Financial Due Diligence: Selected applicants undergo legal and financial due diligence by a professional legal team.

Agreement and Approval: Final selected applicants are submitted to the Project Directors (PD) or CEO of T-Hub for further due diligence, including signing an Equity Agreement and obtaining necessary approvals from the BoD/HGB41. Upon Board approval, T-Hub will engage in equity-sharing discussions.

Funding Mechanism:

- Funding is provided at various stages of the technology lifecycle, including product validation and certification. The support is provided in tranches, purely based on progress shown against milestones. The recovery of financial support is through "Equity participation" as per the Companies Act. The quantum of equity will be approved by the BoD/HGB of T-Hub.
- Funds are disbursed through the T-HUB, and applicants must enter into an Equity Agreement with them.

Funding Slabs:

Track	SLAB & FUNDING AMOUNT	T-Hub Fee/Equity	PURPOSE
Track 1: For early-stage startups with no VC funding so far. (Seed Funding up to Rs. 5 Crore with incubation Equity)	Slab A: Up to Rs. 1 Crore	T-Hubs get up to 3% equity as an incubation gee. Negotiated case-by-case. *	For supporting the matured idea stage (For Idea to PoC)
	Slab B: Above Rs. 1 Crore, and upto Rs. 5 Crores	T-Hubs get up to total 4.5% equity as an incubation gee. Negotiated case-by-case. *	For supporting the development of the Prototype stage, testing, validation, and product development (For PoC to product/customer pilot)
Track-2 For startups with one or more rounds of VC funding (Equity or CCPS upto Rs. 25 Crore)	Slab C: Upto Rs. 25 Crores**	**a) T-Hub as Lead Investor:** Equity linked instrument (CCPS) Conversion of equity @15-30% discount to next round, depending on time elapsed. **b) T-Hub as co-investor alongside a VC** VC sets valuation & T-Hub invests at same terms with corresponding equity %. Or at CCPs terms set by VC.	For scaling up technology, product development and for commercialization

* If a Startup gets Rs. 1 Crore initially and then Rs. 4 Crore, the total incubation fee will not exceed 4.5% for both fundings combined.
* *The Governing Board (MGB) may approve higher funding to startups based on merit and requirements.

Mentoring Startups:

High-quality mentoring is crucial for the success of quantum startups. T-Hubs are required to identify and assign one tech mentor and one business mentor to each invested startup, especially for those receiving investments under Slabs A, & B. Startups may also offer equity to mentors if their services are needed, in exchange for participation in mentoring sessions. For Slab-C and beyond investments, mentoring arrangements can be need-based and mutually agreed upon.

Progress Monitoring & **Management**

- **Fund Utilisation Monitoring:** T-Hub will monitor the rightful use of funds, with financial audits conducted every three months. Poor performance may lead to the discontinuation of seed fund support and further action. Legal action will be taken if grants are used for unauthorised purposes.
- **Access to Facilities:** T-Hub or Technical Groups are encouraged to allow startups access to their facilities on a reasonable payment basis if requested.
- **Change of 'Indian Company' Status**: Quantum Technology is a national priority, and any change in a startup's 'Indian Company' status (e.g., due to large foreign investment) is handled carefully.
- **For investments under Slabs A & B:** The startup must notify the T-Hub in writing about the likely change, providing full reasons and details. The T-Hub will then notify its BoD/HGB and the centralised IEMC. If the change is due to foreign funding, the T-Hub (with central IEMC approval) has a "first right of refusal" to make a matching counteroffer within 30 days. If the T-Hub declines, the startup can proceed with its funding plans. If the change is unrelated to funding, the startup must provide reasons, and the T-Hub (and central IEMC) may deny the request if the reasons are unsatisfactory.

Government Support to Startups:

Startups supported by the Government may receive preference in tendering processes (e.g., GeM) and other government procurement methods for their products/services. T-Hub will involve relevant user agencies (government/private) early on to build confidence in the products developed by startups. Periodic "Demo Days" will be planned to showcase innovative quantum startups to the government and private sectors.

Guidelines for Fund Usage:

Quantum Computing T-Hub can provide funds to Start-ups for their technology development and business needs. The Promoters/Company shall ensure that the funding shall be used solely for the purpose of the needs as mentioned in their application.

Broadly, the support can be sanctioned for the following purposes:

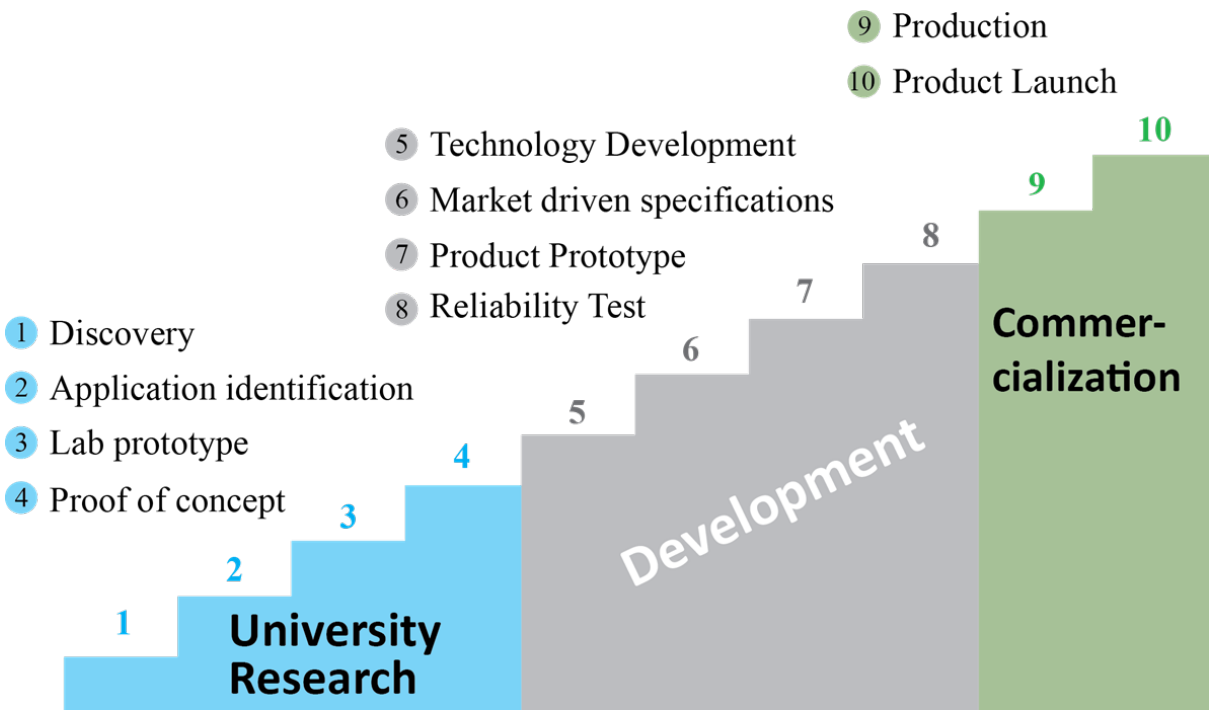
- **R&D and Prototyping:** This includes expenses related to research, design, and development of quantum sensing and metrology technologies.
- **Equipment Purchase:** Procurement of specialised instruments and infrastructure necessary for the development, assembly, and calibration of quantum systems.
- **Salaries/ Human Resources:** Remuneration for scientific, engineering, and support personnel involved in quantum sensor development. Salary to promoters shall not exceed 20% of the fund support unless explicitly approved by the Committee.
- **Testing/Validation/Certification:** Expenditure for rigorous testing, technical validation, environmental trials, and third-party certification of quantum devices to ensure precision, stability, and compliance with regulatory standards.
- **Marketing & Outreach:** Support for field trials, technical showcases, test marketing, and business development efforts to promote quantum technology products.
- **Contingencies/Overrun:** This shall not exceed 10% of the fund support. For any other business purpose which needs to be justified in the application itself, and as recommended/ approved by the committee from time to time.

Focus area:

- Quantum Computing hardware
- Quantum Hardware Prototyping Tools
- Sub-systems for quantum computing system
- Quantum algorithms
- Domain-Specific Quantum Algorithms
- Quantum Compiler and Error Correction Tools
- Control and drive electronics for quantum systems

And other quantum computing related technologies.

TRL Chart



Components and subsystems that may need industry involvement

- External cavity diode lasers and control electronics for laser cooling and trapping
- High-power single-mode laser for optical tweezer for neutral atoms
- Spatial light modulator
- Acousto-optic Modulator
- Electro-optic modulator drivers
- High-resolution time taggers for the photonic system
- High quantum efficiency, fast triggerable CCD camera
- High-power ultra-stable lasers for Rydberg excitation in neutral atoms
- Hz level stability laser for qubit operations
- Single-photon detectors and counters
- Optical components such as wavelength filters, high-efficiency mirrors, beamsplitters, polarisers and analysers.
- FPGA-based control electronics for digital (TTL) and analogue control of the instruments
- ultra-high vacuum chambers, glass cells and components

- Ion pumps and Non-Evaporable Getter (NEG) pumps
- Fibres and fibre docks and collimators
- high numerical aperture imaging optics for single-atom detection with sub-micron resolution
- Optical and optomechanical components, including polarisation-sensitive components
- Low-noise electronics components specifically for controlling atom and ion-based quantum computing hardware
- Dilution refrigerator down to mK cryogenic temperature
- Cryogenic temperature-compatible twisted wire pair (TWP)
- Cryogenic temperature compatible coaxial wiring for up to 30 GHz freq.
- Cryogenic temperature-compatible chip packaging technologies
- High-temperature superconducting materials
- Fabrication processing tools such as metallisation, dielectric processing, Dry etching and lithography tools
- Quantum processor-to-user interface software.