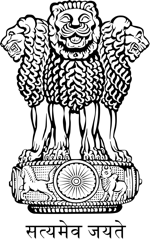
**NATIONAL QUANTUM MISSION (NQM)**

## Call for Proposals for Quantum Algorithms Technical Group

##### [Collaborative proposals are invited in the domain of Quantum Algorithms under the Quantum Computing T-Hub]

****

**GOVERNMENT OF INDIA**

**Ministry of Science & Technology Department of Science & Technology**

**NATIONAL QUANTUM MISSION (NQM)**

**Call for Proposals for Quantum Algorithms Technical Group *Collaborative Proposals are invited in the domain of Quantum Algorithms under the Quantum Computing T-Hub***

#### BACKGROUND

The National Quantum Mission (NQM) is a landmark initiative aimed at propelling India to the fore- front of quantum research, innovation, and applications. The aim of the Mission is to seed, nurture and adopt scientific and Industrial R&D to create and demonstrate a vibrant and innovative ecosystem in Quantum Technologies in India.

Towards this aim, 4 Thematic Hubs (T-Hubs) have been set up under the mission:

* Quantum Computing
* Quantum Communication
* Quantum Sensing & Metrology
* Quantum Materials & Devices

In order to ensure a holistic approach towards development of quantum capabilities in India, the NQM has identified a need to expand the scope of current Quantum Computing T-Hub, by adding project teams focusing on Quantum Algorithms.

#### ANNOUNCEMENT

Under the NQM, Academic institutions/R&D Labs are invited to submit innovative proposals, in con- sortium mode, for carrying out work in the area of Quantum Algorithms. Each proposal should aim to focus and deliver specific technology outcomes in **any one** of the areas under Quantum Algorithms, listed below:

1. Quantum Transpilers, Simulators and Performance Tools
2. Quantum Information and Complexity Theory
3. Quantum Optimization Algorithms
4. AI/ML Integration with Quantum Technologies
5. Quantum Simulations
6. Hybrid Quantum-High Performance Computing (HPC) Systems
7. Any other areas not covered above These areas are further detailed in Section 3.

#### AREAS UNDER QUANTUM ALGORITHMS

Following is an elaboration of the various areas under the Quantum Algorithms umbrella:

##### Quantum Transpilers, Simulators and Performance Tools:

*Focus of this area broadly relates to:*

* + - *Development of tools (Transpilers/Cross-Compilers) to convert Classical Computer Code into Quantum Instructions across various platforms.*
    - *Simulation of small-scale quantum systems on classical computers to adapt and optimize quantum circuits.*
    - *Develop tools and techniques for assessing the performance, noise, and behavior of qubits and gates in a quantum system.*

This area includes, but is not limited to, the following work examples:

* Transpiler/Cross-Compiler for Superconducting, Photonic/Optical, and Cold Atoms/Ions- based Quantum Computers (QCs).
* Classical Simulation Platforms for Quantum Circuits and Hardware (Superconducting, Photonic/Optical, and Cold Atoms/Ions-based QCs).

##### Quantum Information and Complexity Theory:

*Focus of this area broadly relates to:*

* + - *Developing (optimizing) novel (new or existing) quantum algorithms for a wide range of problems in quantum computing*

Following is a non-exhaustive list of examples of such work that could be carried out under this area:

* + - * Searching, sorting, factorization, optimization, prediction etc. on numbers & graphs
      * Quantum Error Detection and/or Correction (QEC, QED, QEDC) in 2D & 3D Qubit Systems for logical Qubits, storage etc.
      * Complexity theory & Scaling Behavior of Quantum Algorithms
      * Blind Quantum Computing

##### Quantum Optimization Algorithms:

*Focus of this area broadly relates to:*

* + - *Identifying sophisticated hybrid approaches (classical + quantum) to address real world scenarios where quantum optimization can outperform the classical methods.*

Examples of work that could be carried out under this area include Logistics and Supply Chain opti- mization, Air, Rail, Road etc. route planning, scheduling, Resource allocation etc.

##### AI/ML Integration with Quantum Technologies:

*Focus of this area broadly relates to:*

* + - *Building new AI/ML models or Quantum Neural Networks capable of leveraging the unique properties of qubits in Quantum Computers/HPC systems*

Following is a non-exhaustive list of examples of such work that could be carried out under this area :

* + - * Financial Trends Analysis & Forecasting
      * Weather Trends Analysis & Forecasting
      * Image &/or Video Processing for Defect/Exception detection
      * Biological Image processing for Disease Detection & Classification
      * Astronomical Image Processing for Phenomena detection and classification

##### Quantum Simulations:

*Focus of this area broadly relates to:*

* + - *Leveraging quantum computers to analyze the behavior of complex quantum systems, which are critical to study, but remain challenging with available classical/quantum computational methods*
    - *Developing (optimizing) efficient novel (existing) quantum algorithms for efficient and reliable computations in the respective subdomains*

Examples of work that could be carried out under this area include Drug discovery, Protein folding, Genome mapping, Industrial chemistry, Material science and financial & risk simulation.

##### Hybrid Quantum-High Performance Computing (HPC) Systems:

*Focus of this area broadly relates to:*

* + - *Developing algorithms for Hybrid Computing Systems by integrating classical array/supercomputing architectures with GPU & ANN Chips, alongside QPUs as Accelerators for specific tasks*
    - *Developing a cloud-based platform that combines job scheduling tools, integrated development environments (IDEs), and open-source libraries, while providing secure access to quantum computers. Performing in-depth benchmarking studies to assess the effectiveness of quantum algorithms integrating classical computing methods with quantum computing functionalities*

These hybrid architectures under the area of Hybrid Quantum HPC could be used in collaborative efforts with one or more of the other areas.

##### Any other area not covered above:

Proposals falling under this category pertain to the broad scope of Quantum Algorithm in areas which may be important in the context, but specifically not covered in any of the preceding areas.

#### IMPLEMENTATION MODEL

The implementation strategy for the current initiative involves a dynamic model that fosters collabo- rative synergy among Academic Institutions/ R&D Labs with a provision for the involvement of startups/industry.

* Proposals are invited from Academic Institutions/R&D Labs for carrying out technology development work in the area of Quantum Algorithms. Each proposal will focus on technology development in **any one** area under the Quantum Algorithms umbrella. The areas are detailed in Section 3.
* Institutes interested in proposing technology development in more than one area, should submit a separate proposal for each of the area.
* Each team may have at least one industry/user agency as a collaborator who is willing to take forward the outcome of the work in the form of a “final technology package” for commercialization. Roles and responsibilities of the collaborating industry/user agency should be clearly outlined in the proposal.
* The Proposing Team will be led by a Principal Investigator (PI), with the other members of the Proposing Team acting as Associate Principal Investigators (APIs). The PI and APIs will collaborate to focus on the proposed work. The PI will act as the main point of contact for

collaboration and coordination among the APIs within the team. The PI will also submit the detailed proposal on behalf of the entire Proposing Team.

* The institute of the PI will be considered as the Lead Institution and institute of the API will be considered as the member institute.
* PI of a proposal cannot be PI or API in any other proposal. However, API of a proposal can be API in at most one other proposal. The existing LPIs under the NQM can neither be PI or API in any proposal. However, existing MPIs can submit the proposal either as PI or API in at most one proposal.
* All submitted proposals will go through a selection process that may involve multiple stages. As a part of this process, proposals may need to go through revisions that may involve modifications in the scope of work to align with the NQM goals, revision of proposed budgets, merging with other proposals etc.
* The selected groups will be entrusted with the pivotal role of driving progress in advancing and demonstrating developments and innovations in the area of Quantum Algorithms.
* An institution can submit only one proposal in each of the identified areas mentioned in section 2.

#### PROPOSED TECHNOLOGY DEVELOPMENT

The proposed scope of work, over the duration of the National Quantum Mission, should focus on one or more of the following:

1. *Translational Research & Development:* The proposed Translational Research & Development should have excellent potential to lead to real-world, commercially viable products. A synergic integration of the technologies developed and demonstrated, including their application by other TGs across all T-Hubs, and the industry, will be the responsibility of the PI of the selected proposal. The end-deliverables of Translational Research & Development are expected to be at high Technology Readiness Levels (TRLs).
2. *Directed Research & Development:* Under this component, the Proposing Team may collaborate with other academic institutes, research institutions, and industry, to carry out major research programs to specifically meet the requirements of line Ministries, Departments, Agencies and Industry. The end-deliverables of Directed Research & Development are expected to be at high TRLs.
3. *Applied Research*: All proposed Applied Research carried out should ideally be triggered by the requirements of either Translational Research & Development or Directed Research & Development.

#### SHORTLISTING CRITERIA FOR PROPOSALS

##### Eligibility Criteria for Team members of the Proposing Team

A detailed outline of eligibility criteria for the consortium members of the Proposing Team is given below:

1. The Consortium members of the Proposing Team (which include Principal Investigator (PI) and Associate Principal Investigators (APIs) should:
   * have regular positions, relevant academic credentials and research expertise in the specific quantum area they propose to contribute
   * have a strong record of research publications/filed and granted patents/demonstration of prototypes/proof of concept in the relevant Quantum Algorithm area, showcasing the PI’s and API’s contributions to knowledge creation and innovation
   * have collaborations with industries or startups, demonstrating an ability to bridge the gap between academia and practical applications of Quantum Technologies
   * be affiliated with reputed research and academic institutions that support their involvement in the proposed work
   * preferably commit significant part of time to the proposed work
2. The Lead and Member Institutions (LI & MIs) of the Proposing Team, if Academic Institutions, should have a respectable National Institutional Ranking Framework (NIRF) ranking
3. The LI and MIs should possess the necessary infrastructure, laboratories, equipment and resources to support advanced research, experimentation, and collaboration within the given technology area.

#### GENERAL GUIDELINES/INSTRUCTIONS

1. The institutes of all PIs and APIs within the Proposing Team must provide support in the form of infrastructure, i.e., core facility and implementation structure, with a commitment to providing covered space as required for the proposed work.
2. Institutes should commit to free significant part of time of the PIs and APIs for the proposed work
3. Each Associate PI will furnish the Utilization Certificate (UC) and Statement of Expenditure (SE) to the PI. The PI will compile the documents and submit the consolidated UC&SE to the T-Hub.
4. The proposal submitted shall be consistent with the scope of work being undertaken vis-à-vis time duration and the budget proposed.

#### INSTRUCTIONS AND GUIDANCE FOR PREPARATION AND SUBMISSION OF PROPOSAL

Following Instructions and Guidance for the Preparation and Submission of Proposals have been put in place to ensure clarity, coordination, and effective execution:

1. Proposal is to be submitted by the designated PI, adhering to the format provided in Annexure I.
2. The Proposing Team may consist of multiple Institutes / PIs joining together to carry out the proposed work.
3. Proposal should be submitted online through https://onlinedst.gov.in by the Head of the Institution.
4. The proposal should outline the roles and responsibilities of the PI and APIs.
5. The proposal must clearly define the Technology Development activities to be undertaken. Measurable milestones and well-defined timelines are essential components to be provided so as to ensure accountability, effective project management, and achievement of goals.
6. Each PI and API should provide an endorsement and commitment in the appropriate template provided in Annexure II adhering to the overarching guidelines and directions set forth for establishing and operating such a group.

#### SUBMISSION PROCESS

All proposals must be submitted online through https://onlinedst.gov.in on or before July 31st, 2025. No submissions will be accepted after the closing date of the submission of proposals. The format for submitting proposals can be downloaded from the link - [https://onlinedst.gov.in/Projectproposalformat.aspx.](https://onlinedst.gov.in/Projectproposalformat.aspx) For convenience, the format for the Proposal is given at Annexure I.

#### DOCUMENTS TO BE SUBMITTED IN PDF

All the documents provided in Annexure II as Templates 1 to 7 need to be appropriately submitted by PI/APIs/consortium Members.

* Template 1: Profile of PI.
* Template 2: Profiles of APIs.
* Template 3: Endorsement of PI institute.
* Template 4: Endorsement of API institutes.
* Template 5: Consent letter from PI.
* Template 6: Consent letter from APIs.
* Template 7: Demonstration of Prototypes / Proof of Concept by PI/APIs.

#### EVALUATION OF THE PROPOSAL

Presentation/discussion sessions may be organised to deliberate on proposals shortlisted for further consideration. DST may suggest restructuring the proposals and reorganisation of the members of the team based on the merits and technology requirements. Accordingly, it may request revised detailed project proposals.

##### For any clarification, you may contact:

Shri Anurag Mishra, Scientist-C,

National Quantum Mission (NQM), Department of Science and Technology, Ministry of Science and Technology, Technology Bhawan,

New Mehrauli Road, New Delhi -110016.

Email Id: [anurag.dbt@nic.in](mailto:anurag.dbt@nic.in)

## Annexure-I

**National Quantum Mission**

**FORMAT FOR SUBMISSION OF PROPOSALS IN THE AREA OF QUANTUM ALGORITHMS**

# CONTENT

|  |  |  |
| --- | --- | --- |
| **S. No** | **ITEM** | **Page No(s)** |
| I | Proposal Summary |  |
| II | Core Proposal |  |
| III | Short Bio-Data of Principal Investigator (PI), Associate Prin-  cipal Investigators (APIs) and National & International Col- laborators |  |
| IV | Profile of Lead Institute, Partner Institutes and Indus-  try Partners |  |
| V | Endorsement from Lead Institute and Partner Institutes |  |
| VI | Consent Letters from Consortium Members |  |

**Mark the Area covered by the proposal:**

|  |  |
| --- | --- |
| **Quantum Algorithm Area** | **Tick any one** |
| Quantum Transpilers, Simulators and Perfor- mance Tools |  |
| Quantum Information & Complexity Theory |  |
| Quantum Optimization Algorithms |  |
| AI/ML Integration with Quantum Technologies |  |
| Quantum Simulations |  |
| Hybrid Quantum-HPC Systems |  |
| Others (Please specify) |  |

# PROPOSAL SUMMARY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | Project Title |  | | |
| 2. | **Quantum Algorithm Area** |  | | |
| 3. | Project cost *(Amount in Crores)* | Recurring / General: | Non-Recurring / Capital: | Total*:* |
| 4. | Duration *(in years)* | *6 years* | | |
| 5. | Principal Investigator (PI)/Coordinator of the Team   * Name: * Institute: |  | | |
| 6. | Associate Principal Investigators (APIs)   * Name: * Institute: |  | | |
| 7. | Lead Institute: |  | | |
| 8. | Member/ Partner institutions(s) |  | | |
| 9. | Objectives (500 words) | ***(Precise and quantified)*** | | |
| 10. | Methodology (2000 words) | ***(Highlight only novelty and unique aspects of the proposal)*** | | |
| 11. | Deliverables (500 words) | ***(Specify expected deliverables)*** | | |

1. **CORE PROPOSAL**
2. **Executive Summary (500 words)**

### [(i) Description of the work proposed to be carried out (ii) integration with other TGs in NQM, (iii) short and long-term research and translation goals]

1. **Keywords** *(max 6)*
2. **Lead Institute and Member Institute details**
3. **PI and APIs details**
4. **Previous Experience in the proposed area**

### (List the research undertaken, projects implemented/ongoing, prototypes/proof of concept, collaborative initiatives. Specifically provide information on the type of QPU, GPU or CPU hardware that you have used, and the number of QPU minutes utilized on IBM, AWS, Azure, Nvidia or any other platform)

|  |  |  |  |
| --- | --- | --- | --- |
| Brief Description of Problem | Hardware Used | Usage (hrs/min) | Publication Refer- ence [doi, arXiv, etc] |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. **Objectives (500 words)**
2. **Detailed Methodology**
3. Knowledge Generation

*(Description of Translational/Directed/Applied Research to be undertaken; include current status of research and development in the proposed area, scientific rationale and impact of the proposed work)*

1. Technology/Product Development

*(Description of the proposed technologies/ products to be developed, the need, risks associ- ated, competitive advantage, market opportunity, licensing opportunity and plan for com- mercialization)*

1. *Estimated Quantum Cloud Usage*

|  |  |  |  |
| --- | --- | --- | --- |
| Title of Problem  (as per planned activities) | Proposed Hardware | Estimated  Usage (minutes) | When re-  quired (Yr1, Yr2, etc) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. **Industry Collaboration/ Partnership**

*(Details of existing collaboration/ partnership in the proposed domain area, objectives, targets, kind of support, etc.)*

|  |  |  |  |
| --- | --- | --- | --- |
| Problem statement | QA Area | Industry Partner | Support provided by industry |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. **Deliverables for 6 years with 6 monthly targets (Qualitative/Quantitative)**

|  |  |  |  |
| --- | --- | --- | --- |
| Deliverable | Yrs 1-2 | Yrs 3-4 | Yrs 5-6 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. **Facilities**

*(Mention the facilities and resources available with the lead institute and partner institutes that could be shared for the proposed work and facilities planned to be created with DST Support)*

1. **Team Expertise**

*(Area of expertise of team members, their role and contribution to demonstrate that the team has the capability to accomplish the objectives in Sections 11.1 and 11.2).*

* 1. **Expertise available with the team members in executing the project**

*(The PI and each APIs should clearly mention their past experience in meeting target dates of their projects done).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.**  **No.** | **Team Member (s)** | **Previous Project on QA** | **Amount, Agency** | **Start-End Years** |
|  |  |  |  |  |
|  |  |  |  |  |

* 1. **Summary of roles and responsibilities of all team members including PI and APIs** *(Assume a full time equivalent (FTE) of 50 working hours per week)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.**  **No.** | **Name of Team Member (s)** | **Area of Expertise** | **Sub-areas of Area** | **Roles/ Responsibilities** | **FTE (%)** |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |

1. **Budget Details (Both Recurring and Non-Recurring):**

*Human Resource Development: JRF/SRF/RA, etc as per DST norms*

*Technology Development: GPU, CPU, lab infrastructure, etc. Do not include QPU credits*

**Total Budget: (Amounts in Lakhs)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Budget Head | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Total (INR) |
| Recurring |  |  |  |  |  |  |  |
| Non-Recurring |  |  |  |  |  |  |  |
| Grand Total |  |  |  |  |  |  |  |

**Budget breakup for the Lead Institute (LI): (Amounts in Lakhs)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Budget Head | Items | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Total (INR) |
| Non-recurring | Equipment’s |  |  |  |  |  |  |  |
| Sub-Total |  |  |  |  |  |  |  |
| Recurring | Manpower |  |  |  |  |  |  |  |
| Consumables |  |  |  |  |  |  |  |
| Travel (Do-  mestic) + Contingency |  |  |  |  |  |  |  |
| Overheads (Excluding Domestic Travel, Man- power &  Contingen- cies) | as per DST norms | | | | | | |
| Sub Total |  |  |  |  |  |  |  |
| Head Total (Non- recurring + Re- curring) |  |  |  |  |  |  |  |  |
| Grand Total | Non-Recur- ring |  |  |  |  |  |  |  |
| Recurring |  |  |  |  |  |  |  |
| Total (INR) |  |  |  |  |  |  |  |

**Budget breakup for each Member Institute (MI) (Amounts in Lakhs)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Budget Head | Items | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Total (INR) |
| Non-recurring | Equipment’s |  |  |  |  |  |  |  |
| Sub-Total |  |  |  |  |  |  |  |
| Recurring | Manpower |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Consumables |  |  |  |  |  |  |  |
| Travel (Do-  mestic) + Contingency |  |  |  |  |  |  |  |
| Overheads (Excluding Domestic Travel, Man- power & Contingen- cies) | as per DST norms | | | | | | |
| Sub Total |  |  |  |  |  |  |  |
| Head Total (Non- recurring + Re- curring) |  |  |  |  |  |  |  |  |
| Grand Total | Non-Recur- ring |  |  |  |  |  |  |  |
| Recurring |  |  |  |  |  |  |  |
| Total (INR) |  |  |  |  |  |  |  |

1. **Activity plan: Targets, Milestones on Timeline / GANTT Chart**

*(Milestones targeted for six years may be outlined)*

1. **Other relevant information of the proposal has to be uploaded as a single PDF file, not more than 10 MB, as Technical Document**

## Documents Required (in PDF)

1. Brief Profile of PI.
2. Brief profiles of APIs.
3. Endorsement of Lead Institute.
4. Endorsement of Member Institutes.
5. Consent letter from PI.
6. Consent letter from APIs.
7. Demonstration of Prototypes / Proof of Concept by PI / APIs

**Annexure II**

**NATIONAL QUANTUM MISSION (NQM)**

**TEMPLATES OF DOCUMENTS**

*Templates of Certificates / Endorsements/ Consents to be provided by all the members)*

All the documents listed in Annexure II need to be appropriately submitted in the format provided in Templates 1 to 7 by the PI, APIs & other Consortium Members as listed below:

* Template 1: Profile of PI.
* Template 2: Profiles of APIs.
* Template 3: Endorsement of Lead Institute.
* Template 4: Endorsement of Member Institutes
* Template 5: Consent letter from PI.
* Template 6: Consent letter from APIs.
* Template 7: Demonstration of Prototypes / Proof of Concept by PI/APIs.

***Template 1***

# NATIONAL QUANTUM MISSION (NQM)

**PROFORMA FOR PROFILE OF PRINCIPAL INVESTIGATOR (PI)**

1. **Name of the Principal Investigator (PI):**
2. **Contact Information:**

Email:

Phone Number:

Address:

1. **Personal Information:**

Date of Birth:

Gender:

1. **Professional Affiliation:** Current Position/Designation Name of the Institute/Organization Department/Faculty
2. **Academic Qualification (Undergraduate Onwards)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Degree | Year | Subject | University/Institu-  tion | % of  Marks |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Ph.D. Thesis Title :

Guide’s Name :

Institution :

Year of Award :

1. **Work Experience (in chronological order)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Position held | Institution | From | To | Pay Scale |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Research Experience:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Position held | Institution | From | To | Research Fo-  cus/Inter- ests |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Expertise in Quantum Algorithms**

Provide a summary of your expertise and experience in the specific quantum algorithm area relevant to the proposal. Include details about your involvement in related research projects, demonstration of prototypes/proof of concept (Fill Template 7), collaborations, or contributions to the field.

1. **Professional Recognition/ Awards/ Prizes/ Certificates/ Fellowships received**

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Name of Award | Awarding Agency | Year |
|  |  |  |  |
|  |  |  |  |

1. **Notable Publications (List of papers published in SCI Journals, in year wise descending order).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.No. | Authors | Title | Journal | Volume | Pages | Year |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. **Details of Patents filed/granted**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.No. | Patent Title | Name of Applicant(s) | Patent No. | Award Date | Agency/Coun- try | Status |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. **Books/Reports/Chapters/General articles etc. in the field of Quantum and related technologies**

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Title | Publisher | Year of Publication |
|  |  |  |  |
|  |  |  |  |

1. **Research Grants and Projects**
   1. Details of sponsored Projects in progress

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Title | Cost (Rs. in Lakhs) | Project Duration | Role (PI/Co-PI) | Funding Agency |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

13.2 Details of sponsored Projects completed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Title | Cost (Rs. in Lakhs) | Project Duration | Role (PI/Co-PI) | Funding Agency |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Any other relevant Information (maximum 500 words)**

Include any additional information that you believe is pertinent to your qualifications and suitability for leading the proposed consortium.

***Template 2***

# NATIONAL QUANTUM MISSION (NQM)

**PROFORMA FOR PROFILE OF ASSOCIATE PRINCIPAL INVESTIGATOR (API)**

**(Please provide separate profiles for each API)**

1. **Name of the Associate PI:**
2. **Contact Information:**

Email:

Phone Number:

Address:

1. **Personal Information:**

Date of Birth:

Gender:

1. **Professional Affiliation:** Current Position/Designation Name of the Institute/Organization Department/Faculty
2. **Academic Qualification (Undergraduate Onwards)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Degree | Year | Subject | University/Institution | % of  Marks |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Ph.D. Thesis Title :

Guide’s Name :

Institution :

Year of Award :

1. **Work Experience (in chronological order)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Position held | Institution | From | To | Pay Scale |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Research Experience:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Position held | Institution | From | To | Research Fo- cus/Interests |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Expertise in Quantum Algorithms**

Provide a summary of your expertise and experience in the specific Quantum Algorithm area relevant to the proposal. Include details about your involvement in related research projects, demonstration of prototypes/proof of concept (Fill Template 7 if applicable), collaborations, or contributions to the field.

1. **Professional Recognition/ Awards/ Prizes/ Certificates/ Fellowships received**

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Name of Award | Awarding Agency | Year |
|  |  |  |  |
|  |  |  |  |

1. **Notable Publications (List of papers published in SCI Journals, in year-wise descending order).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.No. | Authors | Title | Journal | Volume | Pages | Year |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. **Details of Patents filed/granted**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.No. | Patent Title | Name of Applicant(s) | Patent No. | Award Date | Agency/Coun- try | Status |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. **Books/Reports/Chapters/General articles etc. in the field of Quantum and related technologies**

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Title | Publisher | Year of Publication |
|  |  |  |  |
|  |  |  |  |

1. **Research Grants and Projects**
   1. Details of Projects in progress

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Title | Cost (Rs. in Lakhs/ Crores) | Project Duration | Role (PI/Co-PI) | Funding Agency |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

13.2 Details of Projects completed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Title | Cost (Rs. in  Lakhs/ Crores) | Project Duration | Role (PI/Co-PI) | Funding Agency |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. **Any other relevant Information (maximum 500 words)**

Include any additional information that you believe is pertinent to your qualifications and suitability for the proposed consortium.

***Template 3***

# NATIONAL QUANTUM MISSION (NQM)

**Endorsement of Lead Institute (LI)**

*This Endorsement Certificate should be signed by the competent authority of the Lead Institutes and include the institute's seal or stamp. It serves as a formal commitment to adhere to the guidelines and directions provided by the National Quantum Mission for consortium establishment and operation.*

This is to certify that *[Lead Institute Name*], hereinafter referred to as the “Lead Institute”, is fully committed to adhere to the overarching guidelines and directions set forth by the National Quantum Mission (NQM) for undertaking and carrying out the work proposed in this proposal.

## Commitment and Compliance:

1. The PI of the group will act as the main point of contact for Mission Secretariat.
2. The Lead Institute acknowledges that it has carefully reviewed and understood the guidelines and directions provided by the NQM for setting up the consortium and the associated responsibilities and expectations.
3. The Lead Institute affirms its commitment to collaborate effectively with other partnering institutions within the consortium to achieve the objectives set forth by NQM for advancing the technology in the area of Quantum Algorithms.
4. The Lead Institute will actively participate in the planning, execution, and management of research and development (R&D) activities, as outlined in the proposal submitted to NQM.
5. The Lead Institute will diligently manage the disbursement of funds received from the Department of Science and Technology (DST) to partner institutions within the consortium, in accordance with the approved project plan.
6. PI will be responsible for submitting the proposal and presenting the detailed proposal on behalf of the entire Proposing Team.
7. The Lead Institute will maintain transparency and accountability in financial reporting, including the submission of Utilization Certificates (UC) and Statements of Expenditure (SE) to the relevant authorities.
8. The Institution shall submit progress reports, statement of expenditure, utilization certificate as per GFR rules. The institution shall settle the financial accounts to DST as per prescribed guidelines within three months of completion of the project.
9. The Lead Institution will provide the infrastructure, other required facilities and administrative support for successful implementation of the proposed work.
10. The institute should commit to free up significant part of time of the PI for the proposed work.
11. The Lead Institution assures to undertake financial and other management responsibilities of the proposed work.
12. The grant-in-aid support by DST will be used exclusively to meet the expenditure on the project and for the period for which the project has been sanctioned as indicated in the sanction order.
13. No administrative or other liability will be implicated upon DST at the end of the project.
14. The Institution will take into its books of accounts, all assets received under this sanction and their use/ disposal after the completion of the project would be at the discretion of DST.
15. The Lead Institution must undertake to meet the yearly targets agreed upon.

## Signature of the Head of the Institution:

Name: Designation: Date:

Seal/Stamp of Consortium Lead Institute:

***Template 4***

# NATIONAL QUANTUM MISSION (NQM)

**Endorsement of Member Institute**

*This Endorsement should be signed by the Competent Authority of the Member Institute and include the institute's seal or stamp. It serves as a formal commitment to adhere to the guidelines and directions provided by the National Quantum Mission for consortium establishment and operation.*

This is to certify that [*Member Institute Name*], hereinafter referred to as the “Partner Institute”, is fully committed to adhere to the overarching guidelines and directions set forth by the National Quantum Mission (NQM) for undertaking and carrying out the work proposed in this proposal.

## Commitment and Compliance:

1. The Member Institute acknowledges that it has carefully reviewed and understands the guidelines and directions provided by the NQM for setting up the consortium and the associated responsibilities and expectations.
2. The Member Institute affirms its commitment to collaborate effectively with other partnering institutions within the consortium to achieve the objectives set forth by NQM for advancing the area of Quantum Algorithms.
3. The Member Institute will actively participate in the planning, execution, and management of research and development (R&D) activities, as outlined in the proposal submitted to NQM.
4. The Member Institute will diligently manage the funds received from the Department of Science and Technology (DST), in accordance with the approved project plan.
5. The Member institute will work in tandem with its lead institute and extend its full support to achieve the overall goals of NQM.
6. The Member Institute will maintain transparency and accountability in financial reporting, including the submission of Utilization Certificates (UC) and Statements of Expenditure (SE) to the relevant authorities.
7. The Institution shall submit progress reports, statement of expenditure, utilization certificate as per GFR rules. The institution shall settle the financial accounts to DST as per prescribed guidelines within three months of completion of the project.
8. The Member Institution will provide infrastructure, other required facilities and administrative support for successful implementation of the proposed work.
9. The institute should commit to free significant part of time of the Associate PIs for the proposed work.
10. The grant-in-aid support by DST will be used exclusively to meet the expenditure on the NQM approved project and for the period for which the project has been sanctioned as indicated in the sanction order.
11. No administrative or other liability will be implicated upon DST at the end of the project.
12. The Institution will take into its books of accounts, all assets received under this sanction and their use/ disposal after the completion of the project would be at the discretion of DST.
13. The Member Institution must undertake to meet the yearly targets agreed upon.

## Signature of the Head of the Institution:

Name: Designation: Date:

Seal/Stamp of Partnering Institute:

***Template 5***

# NATIONAL QUANTUM MISSION (NQM)

**CONSENT LETTER FROM**

**Principal Investigator (PI)**

*(This Consent Letter should be signed by the*

*Principal Investigator (PI) who will contribute significant part of time to the proposed work. It serves as a formal commitment to actively participate in the proposed work.*

To, [Date]

The Secretary, DST

**Subject: Consent and Commitment to Participate in the Proposed Work**

Dear Sir,

I, (PI full name) working in (Your institution name) hereby provide my formal consent and commitment to actively participate in the proposed work in the area of Quantum Algorithms under the National Quantum Mission (NQM).

Full Name:

Designation:

Organization/Company:

Contact Information:

I understand and acknowledge that the consortium's objectives align with the mission of advancing quantum technology and fostering innovation in the area of Quantum Algorithms. I am committed to devote significant part of my time in addition to rendering my knowledge, expertise, and efforts toward the successful execution of research and development (R&D) projects and initiatives within the consortium.

My areas of expertise and research interests relevant to the consortium's focus on Quantum Algorithms include:

[*List your specific areas of expertise and research interests*]

We will actively collaborate with fellow faculty academic members, researchers, and industry partners within the consortium to achieve the desired outcomes and milestones outlined in the proposal submitted to NQM.

We are aware of the guidelines, directions, and responsibilities set forth by NQM for consortium members, and I am committed to adhering to them diligently. Please consider this letter as our formal consent and commitment to partner in the consortium's activities and contribute to the success of NQM's mission in advancing quantum technology.

Thank you for the opportunity given to me to be a part of this transformative initiative. Sincerely,

[PI Signature] Signature of the Head of Organization

[Full Name] Seal

***Template 6***

# NATIONAL QUANTUM MISSION (NQM)

**CONSENT LETTER FROM**

**Associate Principal Investigators (APIs)**

*(This Consent Letter should be signed by the*

*Associate Principal Investigators (APIs)/Consortium Members who will contribute significant part of time to the proposed work.*

*It serves as a formal commitment to actively participate in the proposed work.*

To, [Date]

The Secretary, DST

**Subject: Consent and Commitment to Participate in the Consortium's Activities**

Dear Sir,

I, (API/Consortium Member full name) working in (Your institution name) hereby provide my formal consent and commitment to actively participate in the proposed work in the area of Quantum Algorithms under the National Quantum Mission (NQM).

Full Name:

Designation:

Organization/Company:

Contact Information (Email, Phone):

I understand and acknowledge that the consortium's objectives align with the mission of advancing quantum technology and fostering innovation in the chosen quantum area. I am committed to devote significant part of my time in addition to rendering my knowledge, expertise, and efforts toward the successful execution of research and development (R&D) projects and initiatives within the consortium.

My areas of expertise and research interests relevant to the consortium's focus on Quantum Algorithms include:

[*List your specific areas of expertise and research interests*]

We will actively collaborate with fellow faculty academic members, researchers, and industry partners within the consortium to achieve the desired outcomes and milestones outlined in the proposal submitted to NQM.

We are aware of the guidelines, directions, and responsibilities set forth by NQM for consortium members, and I am committed to adhering to them diligently. Please consider this letter as our formal consent and commitment to partner in the consortium's activities and contribute to the success of NQM's mission in advancing quantum technology.

Thank you for the opportunity given to me to be a part of this transformative initiative. Sincerely,

[APIs/Consortium Member's Signature Signature of the Head of Organization

[Full Name] Seal

***Template 7***

**NATIONAL QUANTUM MISSION (NQM)**

**Demonstration of Prototypes/Proof of Concept by**

**/ Principal/Associate Principal Investigators Overview**

*(This document serves the purpose of providing comprehensive information on prototypes or proof of concept demonstrations conducted by the Principal/Associate Principal Investigators, related to the proposed work. It is imperative to note that only demonstrations that* ***have not been published or patented*** *are to be detailed here. Each prototype/proof of concept demonstration should be summarized within 1 pages, accompanied by relevant images, data, and the funding source for the respective project. A separate form is required for each Principal/Associate Principal Investigator.)*