



**GOVERNMENT OF INDIA**  
**MINISTRY OF SCIENCE & TECHNOLOGY**  
**DEPARTMENT OF SCIENCE & TECHNOLOGY**  
**NATIONAL PROGRAMME ON NANO SCIENCE AND TECHNOLOGY (NPNST)**

**Call of Proposals on Advanced Materials**

The Department of Science & Technology is pleased to announce the call for proposals under the scheme “Advanced Materials” under National Program for Nano Science and Technology (NPNST) to promote the basic research activities on the thrust research areas of advanced materials, R&D infrastructure/facilities confined to advanced materials research for meeting-up the highly increasing demand of these materials towards various sectors in the coming years. Considering the important role of advanced materials, this scheme encourages and supports to proposals on the basic, applied research and translational research for the development of products.

**2. Preamble:**

Climate change, environmental pollution, and untenable living practices are global challenges that need urgent attention to make our planet healthy and liveable. From the materials science perspective, the usage of sustainable materials, or what are known as advanced materials, to design and manufacture products can significantly help overcome these challenges. Advanced materials can be defined as materials that are deliberately created or designed to exhibit extraordinary functionalities tailored for specific applications. The scientific breakthroughs of the last two centuries, especially the discovery of atoms, the understanding of materials at the atomic level, and quantum principles paved the way to create newer advanced materials to benefit a sustainable world. A combination of several materials covering a vast dimensional range, including nanoscale, the advanced materials are more complex than conventional materials. These materials, with finetuned properties and engineered into valuable products, are crucial for a variety of applications related to harvesting/transportation/storage of clean energy, green computing, non-invasive medical diagnostics, control of air/water pollution, etc., and hence the exponential growth of scientific research in this field. The main characteristic of advanced materials is sustainability: some of the prerequisites for the starting materials that go into the making of advanced materials are abundance, minimal carbon footprint, recyclability, low cost, and occupational safety and health considerations. It is to be emphasized that materials developed for specific applications with incremental improvement in properties and hardly sustainable do not fall under the category of advanced materials. The development of such materials, starting with visualization of the desired properties to

successfully employing them in applications, involves expertise from various disciplines, making the field of research highly multidisciplinary.

### **3. Program details:**

#### **3.1. Objectives:**

- To design and develop new materials with superior characteristics to use in various sectors.
- To nurture basic research at high quality and relevance to develop new frontiers in advanced materials.
- To develop the pool of highly trained researchers in the area of advanced materials in the country.
- To develop indigenous capacity and intellectual property needed to support and enable a self-reliant ecosystem in advanced materials.

#### **3.2. Three-year Core research projects:**

The research funding under this category is purely for academic purpose for eminent scientists who practice the fundamental and technological aspects of science and engineering at the national academic and R&D institutions. The support is provided to individual principal investigators to carry out basic research activities any of the six subthemes stated below, related to 'structural' and 'functional' aspects of advanced materials with a focus on industry-related problems.

#### **3.3. Thematic research areas:**

- Affordable and sustainable materials processing
- Engineered low dimensional materials for optical and electronic applications
- Structural materials for mobility applications
- Bio-inspired materials for sensing and diagnostics
- High performance materials for energy conversion
- Theory/computational design of materials for the above verticals

### **4. Proposal Formats and Submission:**

Five-page pre-proposals may be submitted to NPNST, DST through the portal (<https://onlinedst.gov.in/>) in the prescribed format (as attached at Annexure-I) along with other requisite documents before the closing date of the call. **The total cost of the proposal should not exceed Rs.2 Cr.** These will be evaluated by an Expert Committee. The Principal Investigators (PIs) of the shortlisted proposals will be invited to submit a detailed proposal in the desired format. After a detailed review of the proposals, the PIs will be asked to present the same before the committee of experts. The final selection will be made based on the recommendations of the committee of experts. *Note: (1) PI is eligible to apply for only one proposal at a time during the call. (2) The proposal and all relevant documents should be submitted as a single pdf at <https://onlinedst.gov.in/>.*

**5. For any queries on submission of proposal, please contact:**

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**6. Important Dates:**

Call Opening Date: 1<sup>st</sup> September 2024

Call Closing Date: 30<sup>th</sup> September 2024

**Format for proposal to be submitted**

1.	<b>Title of the proposal</b>	
2.	<b>Focus Area of the proposal</b>	
3.	<b>Executive Summary</b> <i>(in ~500 words)</i>	
4.	<b>Principal Investigators along with address</b> <i>(with phone, fax, e- mail, Mob. numbers details, DoB, Gender)</i>	
5.	<b>Objectives</b>	
6.	<b>Outline of the Proposal</b> <i>(Not in more than 2000 words)</i>	
7.	<b>Duration (in months)</b>	
8.	<b>Total cost</b>	
9.	<b>Novelty and relevance of the proposed R&amp;D with reference to the existing state-of-the-art knowledge. How will the proposed R&amp;D close the gap between national and global capabilities, or enhance the national advantage, in R&amp;D on the focused theme?</b>	
10.	<b>Brief outline of the methodology, time schedules and target milestones to achieve each of the objectives/ deliverables</b>	