

Nano Mission - UPSC Nanotechnology Notes for Science & Technology

In this article, we talk about the Nano Mission developed by the Government of India under the Department of Science and Technology. Science and Technology can be related to various topics in Current Affairs important for the [IAS Exam](#).

Science and Technology related topics are crucial in the [UPSC Syllabus](#). Science & Technology, which is a part of General Studies paper-3 are scoring topics for the UPSC Exam.

Nano Mission (Nano Science and Technology Mission - NSTM)

The Government of India launched the Nano Mission in 2007 under the Department of Science and Technology. The Ministry of Science and Technology allocated upto 1000 crores to this mission in order to fulfil its following objectives:

- Basic Promotion of Nanotechnology
- Infrastructure Development
- Establishment of R&D in Nanoscience Applications
- Establishment of Development Centre for Nanosciences
- Human Development in Nanotechnology
- International Collaborations

India has been able to rank amongst the top 5 countries in the world for Scientific Publications in Nanoscience & Technology due to the efforts led by the Nano Mission.

The Nano Mission has established national dialogues to promote R&D in the development of standards for nanotechnology and for laying down a National Regulatory Framework Road-Map for Nanotechnology (NRFR-Nanotech).

Nanotechnology (UPSC Science and Technology)

- Nanotechnology (also called nanotech) is the technology that involves the manipulation of matter on atomic, molecular and supramolecular scales. This includes particles of a scale 1 to 100 nanometers.
- The invention of the Atomic Force Microscope (AFM) made it possible for nanotechnology to become reality. Nanotechnology has come a long way since then and now affects many industries. It is an interdisciplinary field converging many streams of engineering and science.
- This technology grew beyond boundaries in this century, because of its quantum size and variety of applications in medical science, space, telecommunications, food processing and environmental protection fields.
- Nanotechnology promotional activities are carried out as a part of the Nano Science and Technology Initiative (NSTI).

Read more on [Nanotechnology](#) at the linked article.

Nanotechnology in Agriculture

Nanotechnology is used in various fields today. Some of the uses of nanotechnology in Agriculture are discussed below.

- Nano fertilisers
- Hybrid polymers are used in packaging and to reduce spoilage
- Sensors for food-borne pathogens
- Nanoemulsions – to reduce bacteria on produce
- Nanoparticles based on titanium dioxide – used as antimicrobial agents

Nano Science and Technology Initiative (NSTI)

In 2001, the Department of Science and Technology launched the Nano Science and Technology Initiative (NSTI) in order to focus on R&D in Nano-Science and Nanotechnology. The programme supports R&D projects, strengthening of characterization and infrastructural facilities, creation of a centre of excellence, generation of trained manpower, joint projects between educational institutions and industry for application development, etc.

COVID-19 Nano Coating

The Department of Science and Technology and the Science and Engineering Research Board (SERB) called for a Short-term Research Grant for Nano Coating COVID-19 in April 2020.

This rapid project was necessary for the emerging health care requirements in order to combat the [COVID-19](#) Pandemic. The goals of the project are to focus on the following areas:

- Antiviral Nano-coatings
 - It will be coated/used on the appropriate material for producing anti-COVID-19 Triple Layer Medical masks and N-95 respirator or better masks in large quantities.
- All components of Personal Protective Equipment (PPE)
 - PPEs are used for safeguarding the health of all health care workers against COVID-19.
 - The department will deal with industrial partners for scaling up production.

Project duration should be for a maximum of up to 1 year with a maximum budget limit of Rs. 25-30 lakhs (including overheads) for developing the Nano-coating and new nano-based material for the components of PPE, which can be transferred to the partnering Industry or a Start-up.

Also, read [Science and Technology Decoded for UPSC Exam](#)

ICONSAT 2020

The International Conference on NanoScience and NanoTechnology (ICONSAT) is a series of biennial international conferences held in India under the aegis of the Nano Mission, Department of Science and Technology (DST).

Objectives of ICONSAT

- Bringing out Cutting-Edge Nano Technology for the development of Physics, Chemistry and Material domains.
- Integration of 5Ms - Mechanical, Material, Machines, Manufacturing and Manpower with the help of NanoScience and NT.
- Integration of NT with Sustainable Development.
- Emphasizing the need to create a network of experts in nano-science and to collaborate the knowledge across sectors like energy, agriculture, transport, health and so on.

- Providing a potential platform for young researchers and students from within the country and abroad to keep pace with the latest development in the emerging areas of Nano Science and Technology.

The International Conference on NanoScience and NanoTechnology (ICONSAT) 2020 was organized during 5th-7th March at Kolkata (West Bengal).

Click on the link to download free [Science & Technology Notes For UPSC – General Science Notes For IAS Preparation](#)

AWSAR Scheme

It is Augmenting Writing Skills for Articulating Research scheme, launched by the DST. It is aimed at tapping the potential of 20,000 Ph.D. scholars to communicate and popularise their research through blogs, newspapers, social media, magazines, etc. It gives a monetary incentive to encourage popular science writers. The AWSAR scheme was highlighted at the ICONSAT event.

UPSC Questions related to Nano Mission

What is Nano Science and Technology Mission (NSTM)?

The Government of India launched the Nano Science and Technology Mission (NSTM) in 2007 under the Department of Science and Technology in order to promote research and development in Nanotechnology.

What is nanotechnology used for?

Nanotechnology is used in various fields today. Some of the uses of nanotechnology are Electronics, Energy, Healthcare and Medicine, Agriculture and Food and many more segments of the industry.