



नैनो विज्ञान एवं प्रौद्योगिकी संस्थान

(विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार का एक स्वायत्त संस्थान)

Institute of Nano Science and Technology

(An Autonomous Institute supported by Department of Science and Technology, Government of India)



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WALK-IN-INTERVIEW FOR Ph.D. - January 2024 SESSION

[Institute of Nano Science and Technology](#) (INST), Mohali will conduct **Walk-in-Interviews** on the following dates for prospective candidates for admission into its Ph. D. Program for the session beginning in January 2024.

Dates of interviews:

- 4th December 2023 for [Quantum Materials & Device Unit](#)
- 4th December 2023 for [Energy and Environment Unit](#)

Reporting time: 09:00 am

Venue: [Institute of Nano Science and Technology, Sector 81, Mohali 140306, Punjab](#) (near IISER Mohali)

Number of students required for admission GEN (12), OBC (6), EWS (3), SC (3) and ST (2).

Students with an independent source of fellowship, for example, CSIR/UGC-JRF, are eligible to attend the Walk-in-Interview. Selected students will be enrolled in the Ph. D. program of the Indian Institute of Science Education and Research (IISER), Mohali, and the Ph. D. degree will be awarded by IISER, Mohali.

If you have any queries, email apply@inst.ac.in

The major ongoing research areas at INST are given at the end of this document.

a) ELIGIBILITY

- M. Sc. or M. Pharm. or M. Tech. in Basic or Applied Sciences, Engineering or related areas. Students who have appeared for the final year/semester examinations are also eligible, provided that the degree will be granted on or before 20th December 2023.
- Must have qualified for an independent source fellowship like, CSIR/UGC-JRF, ICMR-JRF, DBT-JRF, any other equivalent fellowships or with secured funding.
- Age limit: As per the guidelines of CSIR-UGC and DST.

b) SELECTION PROCEDURE

- Interested candidates are requested to **submit an online synopsis** to express their interest in attending the interview: <https://forms.gle/aoeZ8JncybqZRZCE6>
- Candidates should report by **9 am at Institute of Nano Science and Technology, Sector 81, Mohali**
- All **original documents** in support of date of birth, educational qualifications, fellowship (UGC/CSIR-JRF, DBT-JRF, ICMR-JRF, etc.), reservation (SC/ST/OBC-NCL/PH/EWS), research experience, publications etc. should be produced at the time of interview for verification.
- Candidates should also bring **two passport size photographs** and **one set of photocopy** of the above documents.
- No TA/DA will be paid for attending the interview.
- After the interview, the list of candidates selected for Ph. D. will be uploaded on INST website and the candidates will be intimated by email.
- Selection of students shall be done as per the provisions of The Central Educational Institutions (Reservation in Admission) Act, 2006 and amendments made thereto.
- The candidates are advised to visit INST website frequently to track the latest developments.
- Number of students required for admission GEN/OBC/PH/EWS (11), OBC-NCL (7), SC (5) and ST (3).

c) APPLICATION FEES

- Candidates will be required to remit the application fees online on the date of interview.
- Rs.590/-** for General, OBC and EWS candidates, and **Rs.295/-** for SC, ST and PH candidates.

Research Units at INST

Chemical Biology

Cancer Nanomedicine

- Epigenetic based
- Hyperthermia based
- Photo-thermal therapy
- Photo-therapy
- Combinatorial nanomedicine approach

Nano-therapeutics

- Infectious diseases: tuberculosis, leishmaniosis
- Neurodegenerative diseases: Alzheimer's disease, Parkinsonism
- Lifestyle diseases: rheumatoid arthritis, osteoarthritis
- Autoimmune disease: ulcerative colitis

Bio-mimetic and Tissue Engineering

- Regenerative nanomedicine
- Stem cell nanomedicine
- Supramolecular nanomaterial scaffolds
- Smart hydrogels
- Hybrid organic-inorganic nanomaterials

Biomolecular Phenomenon at Nanoscale

- Disease mechanism
- Self-assembling bio-nanomaterials
- Nano-confinements
- Biological nano-machines

Nano-diagnostic

- Biosensors: SERS, electrochemical or fluorescence based techniques
- Theranostics: biomaterials for theranostics

Agri-nanotechnology

- Nano-fertilizers
- Nano-pesticides

Nano-toxicology

- Cell and tissue toxicity
- Nanomaterial toxicity
- Developmental, neurological, behavioural nano-toxicity

Energy & Environment

Inorganic & Materials Chemistry

- Electrochemistry (fuel cells, batteries & supercapacitors)
- Energy storage & conversion
- Framework materials (COF & MOF)
- Photocatalysis (water splitting & CO₂ reduction)
- Solar cells (perovskites, quantum dots & dye sensitized solar cells)
- Solid state chemistry
- X-ray scattering

Organic & Polymer Chemistry

- Biomaterials & drug delivery
- Chemosensors
- Flexible optoelectronics
- Luminescent materials
- Catalysis (organic transformations, photocatalysis, biomass conversion)
- Nanomotors & micropumps
- Synthetic methodology
- Small molecule & polymer synthesis
- Stimuli-responsive supramolecular materials

Spectroscopy & Physical Chemistry

- Biosensing
- Device fabrication
- Luminescence spectroscopy
- Nanophotonics
- Single molecule spectroscopy
- Ultrafast spectroscopy

Environmental Chemistry

- CO₂ sequestration & N₂ fixation
- Microfluidics based sensing of pollutants
- Sensing
- Waste management
- Water & air purification

Quantum Materials & Devices

Experimental aspects of Material and Device Physics

- Low dimensional materials and artificial superstructures
- Nanoscale piezo, ferro and pyro-electricity
- Photovoltaics
- Micro and nano structured device
- Nano devices and sensors
- Spintronics
- Organic-inorganic hybrid nanostructured devices, self-powered electronics, sensors and actuators
- Flow fabrication of nanostructures for light driven properties
- Microfluidics for sensing and delivery
- Physics in Nanodimension objects

Computational Nanoscience

- Theoretical condensed matter physics
- Exploiting piezoelectricity, electronic charge, spin and valley degrees of freedom at the nanoscale for next-generation electronics
- Nanomaterials and their interfaces for power conversion: e.g., photovoltaics, photocatalysis, sensors
- Designing of spin-interfaces and spintronics materials
- Single molecule magnets and molecular magnetism

Computational Chemistry

- Electron transfer in proteins & enzymatic chemical reactions
- Electron transport at molecular nano-junctions

Computational Biology and Biophysics

- Molecular Dynamics Simulations of Protein and Protein-Ligand Interactions
- Anti-malarial drug activities and drug designing
- Regulation of enzymatic activities of CBS enzymes