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About IIT Mandi

The Indian Institute of Technology Mandi (IIT Mandi), one of the premier technical institutes in India. IIT Mandi was established in 2009 with the aim of providing world-class education and cutting-edge research in engineering, science, and technology. Since its inception, the institute has strived to achieve excellence in education, research, and innovation.

Located in the scenic town of Mandi in the Himalayan foothills, the institute offers a unique learning experience to its students. With state-of-the-art facilities and world-class faculty members, IIT Mandi provides a conducive environment for research and learning. The institute offers undergraduate, postgraduate, and doctoral programs in various disciplines of engineering, sciences, and humanities.

At IIT Mandi, we believe in fostering an environment of innovation and creativity. Our faculty members are renowned experts in their fields and are committed to providing their students with the best possible education. With our multidisciplinary approach to education, we aim to produce graduates who are well-rounded and equipped to solve real-world problems.

We take pride in our research culture and encourage our students to engage in cutting-edge research in various fields. Our research facilities are equipped with state-of-the-art equipment and resources, providing our students with ample opportunities to explore their interests and pursue their passions.

Institute Webpage: www.iitmandi.ac.in

About Institute of Nano Science and Technology (INST)

Institute of Nano Science and Technology (INST), Mohali (Punjab), an autonomous institution of the Department of Science and Technology (DST), Government of India, has been established under the umbrella of NANO MISSION, initiated by DST to boost research and development in the field of Nanoscience and Nanotechnology in India. INST started its activities on 3rd January 2013 from its transit campus at Mohali, Punjab

Institute Webpage: https://www.inst.ac.in/

About PhD JRDP

The Joint Degree Program (JDP) offers PhD students enrolled in both institutions the chance to collaborate on a multidisciplinary research project with faculty members and research teams from IIT Mandi and Institute of Nano Science and Technology (INST), as well as to take advantage of the facilities and professional development opportunities offered by both institutions.

Important Guidelines for PhD Application

1. Please read the instructions given in the brochure carefully before filling up the applications.
2. Online Application form & Information brochure (Including the admission schedule along with the important dates) is available on the institute website at the following link: https://alliance.iitmandi.ac.in/jrdp/inst/
3. You are required to submit the application form ONLINE. No Downloadable Forms will be available after filling the form, you are advised to take a print of your application for your records.
4. For each project, candidate should submit a separate application with the application fee.
5. The application fee is as follows:

Category	Amount in ₹
General/EWS/OBC/OBC(NCL)/Transgender/Foreign Nationals	200
Women/SC/ST/PwD	100

   a. One application fee is valid for the single application. The application fee is **NON-REFUNDABLE**.

6. OBC candidates may note that the limit for annual income is Rs. 8 Lakhs for determining the creamy layer among Other Backward Classes (OBCs) candidates. The OBC (NCL) certificate issued for the financial year 2026-27 by the Competent Authority in the prescribed format must be uploaded in the ONLIINE application form.
7. Economically Weaker Sections (EWS) candidates may note that the limit for annual income is Rs. 8 Lakhs for determining the eligibility for benefit under Economically Weaker Sections (EWS) reservation. The EWS certificate issued by the Competent Authority in the prescribed format must be uploaded in the ONLINE application form and submitted at the time of admission.
8. Seats are reserved for Economically Weaker Sections (EWS) / Other Backward Class Non-Creamy Layer (OBC-NCL) / Schedules Caste (SC) / Scheduled Tribe (ST) and Person with Benchmark Disability (PwD) categories as per Government of India norms.
9. You should check Institute website for results / important announcements.

10. You should check emails sent to your email address provided in your application for all important communications and announcements if any.
11. Merely fulfilling eligibility criteria does not entitle a candidate to be called for the written test/interview. Decision of Institute authorities will be final. Admission is based on GATE / Written test / Interview performance in addition to general eligibility criterion, the applicants must also satisfy the eligibility criteria specified for the respective Departments / Centres / Schools / Interdisciplinary Groups.
12. Candidates, if called for written test/interview should show/ bring with them (i) Photo ID Card, (ii) Printed copy of the application submitted online, (iii) Thesis / dissertation / report / publications (iv) copy of certificates and mark-sheets.

Important Dates for Admission

Starting date for filling Online Application	26th October, 2026
Last date for filling Online Application	15th November, 2026 (5:00PM)
Declaration of shortlisted candidates list	Will be Published on IIT Mandi and Institute of Nano Science and Technology (INST) website
Shortlisted candidates will be informed by email	

Contact Details

In case of any query related to the Ph.D. Programme admission process you may contact respective school / Centre, the contact details are:

IIT Mandi

Name of School/Centre	Email ID	Contact No.
School of Biosciences & Bioengineering	sbboffice@iitmandi.ac.in	01905-267061
School of Chemical Sciences	scsoffice@iitmandi.ac.in	01905-267277
School of Civil & Environmental Engineering	scene_admissions@iitmandi.ac.in	01905-267180
School of Computing and Electrical Engineering	sceeoffice@iitmandi.ac.in	01905-267071
School of Humanities & Social Sciences	shssoffice@iitmandi.ac.in	01905-267719
School of Management	somoffice@iitmandi.ac.in	01905-267119
School of Mathematical & Statistical Sciences	smssoffice@iitmandi.ac.in	01905-267929
School of Mechanical and Materials Engineering	smmeadmissions@iitmandi.ac.in	01905-267138
School of Physical Sciences	spsoffice@iitmandi.ac.in	01905-267812
Indian Knowledge System and Mental Health Application (IKSMHA)	iksmha@iitmandi.ac.in	01905-267786
Centre Artificial Intelligence and Robotics (CAIR)	cairoffice@iitmandi.ac.in,	----
Centre for Quantum Science and Technologies (CQST)	arvindthapliyal@iitmandi.ac.in	01905-267899

Centre for Human Computer Interaction (CHCI)	chcioffice@iitmandi.ac.in	01905- 267187
Centre for Climate Change and Disaster Management (C3DAR)	c3daroffice@iitmandi.ac.in	01905-267703

Institute of Nano Science and Technology (INST)

Name of School/Centre /Department	Email ID	Contact No.

Academic Structure

Category of admissions:

Presently, two categories of admission are being offered under the IIT Mandi–INST Mohali Joint Research and Development Programme (JRDP) Agreement, as detailed below:

(i) Category A – IIT Mandi as Home Institute and INST Mohali as Host Institute

Under this category, IIT Mandi will be the Home Institute and INST Mohali will be the Host Institute. The candidate will have a Guide from IIT Mandi and a Co-Guide from INST Mohali.

(ii) Category B – INST Mohali as Home Institute and IIT Mandi as Host Institute

Under this category, INST Mohali will be the Home Institute and IIT Mandi will be the Host Institute. The candidate will have a Guide from INST Mohali and a Co-Guide from IIT Mandi.

Program management

A Doctoral Advisory Committee (DC) shall be set up for each JDP Scholar to support and monitor progress of the JDP Scholar throughout the candidature until the thesis has been submitted. The DC shall consist of the following members.

IIT Mandi: Chair/Head of the School/Department of the Home Institute or his/her nominee INST : Chairperson is Director's nominee and Head of the Department	Chairperson
Supervisor from the Home institute	Member
Supervisor from the Host institute (if any)	Member
Co-supervisor (s), if any with justification	Member (s)
Subject Expert (From INST or IIT Mandi)	Member
Additional members may be appointed to meet the requirements	Members

Coursework Requirements

The JDP Scholar shall satisfy the minimum academic coursework requirements of the Home and Host Institution. Additional courses may be taken when recommended by the DC. If a JRDP scholar credits a course in one institution, the credits will be automatically transferred to the other institution and will be counted towards the degree requirement.

Degree Program Structure

- Candidates have a **"Home Institution"** where they begin their studies and spend the majority of time. The expectation is that candidates will spend a minimum of one Year (12 months) at the other, **"Host Institution"** the timing and duration of this will depend on the program of research but in general will be in the second or third year of the degree. Travel to and study at the Host Institution will be subject to the usual requirements of the institute.

- Candidates for the PhD JRDP will be enrolled in a PhD program in parallel at both institutions. The supervisory team will comprise academics from both institutions who will provide guidance and support throughout the doctoral program. Candidates will benefit from the research community, networking, and collaborations of the IIT Mandi – INST Mohali. Through enrolment at both institutions, candidates will have access to services and support provided at IIT Mandi and – INST Mohali, including a variety of professional and personal development opportunities for researchers.

- The primary supervisor shall be from the Home Institution. There must be a Joint supervisor from the Host Institution.

- The PhD JRDP includes a tailored program of progress monitoring to fulfil the requirements of both institutions. On successful completion of the program requirements, candidates will be awarded a PhD degree by IIT Mandi (in association with INST).

Admissions are currently open under the following research projects

Category A: (IIT Mandi Home)

<table>
<tr><td rowspan="3">1</td><td>Project Title.
Experimental and Theoretical Investigation of Phonon and Thermoelectric Transport in Large Unit Cell Materials for High-Efficiency Thermoelectric Devices</td></tr>
<tr><td>Thermoelectric (TE) materials offer a promising route for sustainable energy conversion by directly converting waste heat into electrical energy. However, achieving high thermoelectric efficiency requires the simultaneous optimization of electrical transport and suppression of lattice thermal conductivity. This project aims to investigate the phonon transport and thermoelectric properties of large-unit-cell materials using an integrated experimental and theoretical approach. Materials with complex crystal structures and large unit cells can exhibit low lattice thermal conductivity due to enhanced phonon scattering, low-frequency optical modes, and strong anharmonic interactions, making them attractive candidates for efficient thermoelectric applications. Theoretical studies based on density functional theory, lattice dynamics, and Boltzmann transport calculations will be combined with experimental measurements of structural, thermal, and electronic properties. Particular emphasis will be placed on understanding phonon dispersion, scattering mechanisms, thermal conductivity, and electronic transport. The project ultimately aims to establish structure–property relationships and identify promising materials for the development of high-performance thermoelectric devices.</td></tr>
<tr><td>Home Institute: IIT Mandi
Supervisor: Prof. Ajay Soni
School/Dept.: School of Physical Sciences</td><td>Host Institute: INST Mohali
Supervisor: Dr. Chandan Bera
School/Dept.: Quantum Materials & Devices Unit</td></tr>
<tr><td rowspan="2">2</td><td>Project Title.
Carbon Nitride Based Photocatalytic and Thermocatalytic Upcycling of Biomass and Plastic Waste into Value-added Chemicals and Fuels</td></tr>
<tr><td>The accumulation of plastic waste and the underutilization of lignocellulosic biomass residues pose a combined environmental and resource challenge. Conventional routes such as landfilling, incineration and mechanical recycling lead to greenhouse gas emissions or downgraded materials, and are poorly suited to mixed and contaminated waste streams, while high-temperature pyrolysis and gasification are energy-intensive and yield complex, nonselective product mixtures. Catalytic upcycling under mild conditions, which converts waste directly into hydrogen, fuels and chemical feedstocks, offers a more sustainable alternative. Graphitic carbon nitride (g-C_3N_4) and related polymeric carbon nitrides are metal-free, earth-abundant and chemically robust semiconductors with visible-light absorption, a tunable band structure, abundant basic nitrogen sites and coordination pockets that can anchor single atoms and nanoparticles of transition metals. However, their practical use in waste upcycling is limited by fast chargecarrier recombination, low surface area, weak interaction with solid polymeric substrates (e.g. cellulose, lignin, PET, polyethylene) and a limited mechanistic understanding of product selectivity. To address these gaps, we aim to design carbon nitride catalysts through morphology control, heteroatom doping, defect engineering, heterojunction formation and single-atom metal modification, and to evaluate them in two complementary routes: (i) photocatalytic reforming and selective oxidation of biomass- and plastic-derived substrates under visible or solar light, coupled with H_2 evolution and formation of value added products such as formic acid, acetic acid and lactic acid; and (ii) thermocatalytic and photothermal conversion, including hydrolysis, hydrogenolysis and oxidation at moderate temperatures, using carbon nitrides as metal free catalysts or as supports for dispersed metal sites. In situ spectroscopic studies, product analysis and computational modelling will be combined to</td></tr>
</table>

	establish structure–activity relationships. The study seeks to deliver fundamental design principles for low-cost, metal-lean catalysts that advance waste valorization and the circular economy.	
	Home Institute: IIT Mandi **Supervisor: Prof. Venkata Krishnan** **School/Dept.: School of Chemical Sciences**	**Host Institute: INST Mohali** **Supervisor: Dr. Kamalakannan Kailasam** **School/Dept.: Energy and Environment Unit**
3	**Project Title.** **Mechanistic investigations for Electrochemical reduction of CO_2 and Nitrate**	
	The electrochemical conversion of CO_2 and nitrate into value-added chemicals represents a promising strategy for sustainable chemical synthesis powered by renewable electricity. This joint PhD programme aims to develop efficient and selective electrocatalysts through an interdisciplinary approach combining materials chemistry, electrochemistry, and mechanistic studies. The research will focus on nanostructured, defect-engineered, and heteroatom-modified materials to enhance reactant activation, control reaction intermediates, improve product selectivity, and suppress competing hydrogen evolution. Advanced electrochemical, spectroscopic, and microscopic techniques will elucidate reaction mechanisms and establish structure–property–activity relationships, supporting sustainable carbon and nitrogen valorization.	
	Home Institute: IIT Mandi **Supervisor: Prof. Aditi Halder** **School/Dept.: School of Chemical Sciences**	**Host Institute: INST Mohali** **Supervisor: Dr. Ramendra Sundar Dey** **School/Dept.: Energy and Environment Unit**

Category: (IIT Mandi Home)

4	**Project Title.** **Deciphering RNP/Stress-Granule Dynamics and Associated Extracellular Vesicle RNA Signatures for Disease Diagnosis**	
	The proposed project will investigate disease-associated alterations in RNA-binding proteins (RBPs), ribonucleoprotein (RNP) complexes and stress-granule dynamics and their relationship with extracellular vesicle (EV) RNA signatures. Mechanistic studies will examine alterations in RNA/RNP dynamics under disease-associated cellular stress and identify corresponding changes in EV-associated RNA cargo. Candidate EV-RNA signatures will be characterized and validated for their diagnostic potential and subsequently explored for translation into a nanotechnology-enabled point-of-care detection platform. The project integrates IIT Mandi's expertise in RNA/RNP and stressgranule biology with INST's expertise in extracellular vesicles, nanobiotechnology, biosensing and point-of-care diagnostics.	
	Home Institute: INST Mohali **Supervisor: Dr. Deepika Sharma** **School/Dept.: Chemical Biology Unit**	**Host Institute: IIT Mandi** **Supervisor: Dr. Baskar Bakthavachalu** **School/Dept.: School of Biosciences and Bioengineering (SBB)**
5	**Project Title.** **Emerging Materials for Electrochemical CO2 and Nitrate Reduction**	
	Electrochemical reduction of CO2, and nitrate offers promising routes for converting carbon- and nitrogencontaining molecules into valueadded chemicals using renewable electricity. This joint PhD programme aims to develop emerging materials for efficient and selective CO2, and nitrate reduction through an interdisciplinary approach integrating materials chemistry, electrochemistry, and mechanistic investigations. The research will focus on designing nanostructured, defectengineered, and heteroatommodified materials to regulate reactant activation, reaction intermediates, product selectivity, and competing hydrogen evolution. Advanced electrochemical, spectroscopic, and microscopic techniques will be employed to establish structure-property-activity relationships and	

	elucidate reaction mechanisms, providing comprehensive doctoral training toward sustainable electrochemical carbon and nitrogen valorization.	
	Home Institute: INST Mohali **Supervisor: Dr. Ramendra Sundar Dey** **School/Dept.: Energy and Environment Unit**	**Host Institute: IIT Mandi** **Supervisor: Prof. Aditi Halder** **School/Dept.: School of Chemical Sciences**

General Qualifications

A. Qualifying Degree:

1. Master's or equivalent degree in Engineering/Technology **OR**
2. Bachelor's degree in engineering/technology or equivalent* **OR**
3. Master's or equivalent degree in Science/Arts/Commerce/Management (or allied subjects)*

***For a qualifying degree listed under (2) & (3), candidates must also fulfil ONE of the following additional requirements:**

1. Qualified GATE / NET, including lectureship (Assistant Professorship) or any other equivalent National level examination.
2. Selected through a national-level examination conducted by the MoE or its agencies /institutions, such as UGC/ IIT/ IISc. / IISER/ IIIT etc.
3. Minimum of TWO years of professional experience (acquired after obtaining the qualifying degree and completed before the start of the semester in which admission is sought)

*Exemptions from mandatory requirements of a valid GATE or National Level examination:

1. BTech/BE/BS (or equivalent) degree from CFTI (Centrally Funded Technical Institute)/ any of the top 100 institutes according to NIRF ranking (overall category) at the time of application/ any Himachal Pradesh Govt. institution or universities with CGPA/CPI of at least 7.5 (on a scale of 10) or equivalent# (criteria relaxed for reserved categories)
2. BS-MS/MSc/MA/MBA/equivalent from IITs, IISERs, IISc, IIMs, NITs or any of the top 100 institutes according to NIRF ranking (overall category) at the time of application with a CGPA/CPI of at least 7.5 (on a scale of 10) or equivalent#. (criteria relaxed for reserved categories)
3. NIRF Ranking (within top 100) should be in the overall category granted for the year during which admission is sought.

#CGPA is relaxed as per GoI norms:

1. UR/GEN(EWS):7.5 CGPA
2. OBC (NCL): 7.25 CGPA
3. SC/ST/PwD: 7.0 CGPA

B. Financial Support:

Category A (IIT Mandi -Home): Students joining the PhD regular program may be considered for the HTRA Fellowship (subject to the availability of funds) based on the above admission norms, if recommended by the selection committee.

Category B (INST Mohali -Home): Students joining the PhD regular program may be considered only for national-level fellowships, subject to fulfilling the eligibility criteria prescribed by the respective funding agencies (e.g., CSIR/UGC-NET-JRF, ICMR-JRF, and DBT-JRF), or

available fellowship quota of the respective Scientist, subject to applicable Institute norms and availability of funds.

In addition to general eligibility criterion, the applicants must also satisfy the eligibility criteria specified for the respective Projects/Departments / Centres / Schools / Interdisciplinary Groups. Over and above the general eligibility criteria for admission, candidates need to satisfy additional criteria for financial support / fellowship, as specified under specific admission categories.

The final selection process to Ph.D. JRDP programme for any project will be through written test and/or interview.

Application and Admissions

The admissions process will be managed by the IIT Mandi – Institute of Nano Science and Technology (INST) Joint Admissions Sub-committee (JASC) constituted at the School/Department/Centre level and according to each Institution's admissions procedure. Candidates must meet the admissions requirements of both institutions. The eligibility criteria for enrolling in a joint PhD program will be same as that of a regular PhD program/ERP of the individual institute. The details of the same can be found in the PhD ordinance of the individual institute.

- IIT Mandi : https://iitmandi.ac.in/pdf/ordinances/Ordinances_PhD_2026_onwards.pdf

All applicants will be expected to apply through an online admissions portal.

Fees, Scholarships and Funding

- The admitted Scholar of both categories shall pay the applicable fees at IIT Mandi.
- Unless otherwise indicated, candidates who wish to be admitted onto the PhD JRDP are entitled to receive fellowship meeting the eligibility criteria. The cost of fellowship will be borne by the Home Institute even during the candidate's stay in the Host Institute. However, the student needs to bear the boarding and lodging charges. Scholarships are awarded based on merit, and the value and conditions of any scholarship awarded will be in accordance with the terms and conditions of the awarding institution.

- Regardless of the scholarship awarded, students on the joint PhD program will be personally responsible for the following expenses unless otherwise advised:

    - Incidental fees and charges at either institution
    - Accommodation and living expenses at either institution
    - All personal expenses and non-compulsory additional fees at the host institution
    - All debts incurred by candidates during their stay at either institution
    - Any other debts incurred by candidates during the Joint PhD Program
    - Further the grants in respect of attending conferences will be provided only by the home institute.

Fees details:

- The selected candidate(s) shall pay the Institute fee at IIT Mandi. The Hostel, Mess, and other facility charges shall be paid by the candidate at the respective Institute, as applicable, at the prevailing rates during the actual period of stay. The details of the applicable fee structure are provided below:
  IIT Mandi : https://academics.iitmandi.ac.in/fees

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