Indian Institute of Technology Indore
Discipline of Physics

Advertisement for Admission to Ph.D. Program (2019-2020)

Adv. No.: IITI/Phy/2019/PhD02

Discipline of Physics invites applications for admission to the Ph.D. Program in the following research areas:

A. Condensed Matter Physics (Experimental):

Study of crystal and electronic structure, magnetic properties of functional materials.
Nano materials, Magnetic/electronic materials with multiferroic properties.
Synthesis and characterization (structure/physical) of nanostructured materials/thin film/single crystal/glassy forms of complex oxides/chalcogenides with semiconducting, magnetic and optical properties
Synthesis of composite materials for industrial applications, optical/magnetic multilayer, solar cells.
Study of Surface and Interfaces, Nanomaterials, thin-films, structure property relationship.
Photocatalysis.
Electrical Energy Storage- batteries and supercapacitors – Li and Al ion batteries.
High Pressure techniques in synthesis and characterization.
Raman and photoelectron spectroscopy; Strongly correlated electronic systems.
Material characterization using synchrotron radiation, band structure of complex oxides.

B. Condensed Matter Physics (Theory and Computation):

Development of Codes relevant to DFT and Energy Materials Modelling.
Rashba-Dresselhaus Effect; Spin-Orbit Interaction; Defect Thermodynamics and Electronic Diffusion.
Computational High Pressure Physics and Phase Transition; Topological Insulator.
Hybrid Perovskites and 2D Materials for Solar Cells, Photocatalysis and Batteries.

C. High Energy Physics (Experimental):

Relativistic heavy-ion collision experiments: ALICE experiment at LHC (Large Hadron Collider).
Compressed Baryonic Matter (CBM) experiment at FAIR, GSI .
QCD phase diagram and Critical point.
Phenomenology of Quark Gluon Plasma (QGP); Involvement in detector R&D, data taking, and data analysis at CERN, Switzerland and GSI, Germany.

D. High Energy Physics and Particle physics (Theory):

Dark matter, Higgs physics, Neutrino physics
Generally physics beyond the standard model
String theory, AdS/CFT correspondence.

E. Nonlinear Dynamics, Statistical Physics and Networks (Theory).

- Before applying online, the applicants are encouraged to visit http://physics.iiti.ac.infor detailed profiles of the faculty members. The research area of faculty members, the application procedure and the format of recommendation letter are given as below.
- This is a rolling advertisement. For the upcoming round of shortlisting and interviews, submit online application before **June10, 2019**. Applications received after this date will be considered for subsequent round(s) of interviews depending upon the vacancies available. Description on the admission categories and eligibility can be found on the main page: http://academic.iiti.ac.in/phdadvt.php.

Faculty member	Area of Research	E-mail address
Dr. Ankhi Roy	High Energy Physics Experiment	ankhi@iiti.ac.in
Dr. Krushna R. Mavani	Terahertz spectroscopy of solid materials, Experimental Condensed Matter Physics: Pulsed Laser Deposited nanostructures, thin films and multilayers, Functional oxides, Strongly correlated electron systems, Structure-property relations, Magnetism.	krushna@iiti.ac.in
Dr. Manavendra Mahato	Theoretical High Energy Physics: Gravity and String theory.	manav@iiti.ac.in
Dr. Pankaj R. Sagdeo	Experimental and Theoretical Condensed Matter Physics: Structural, optical, phononic and electronic properties of transition metal oxides, X-ray scattering using synchrotron radiation, Physics of semiconductor devices and solar cell, Physics at nano-scales/ nano-science and nano-technology, Perovskite oxides with magneto-resistance, ferroelectric and multi-ferroic properties, Density functional theory, Instrumentation development	prs@iiti.ac.in
Dr. Preeti A. Bhobe	Experimental Condensed Matter Physics: Study of crystal and electronic structure, and magnetic properties of functional materials; X-ray Absorption Fine Structure (XAFS); Photoemission Spectroscopy (PES)	pbhobe@iiti.ac.in
Dr. Rajesh Kumar	Experimental Condensed Matter Physics: Device physics; Experimental Solid State Physics; Organic and Inorganic Semiconductors; Nanostructures	rajeshkumar@iiti.ac.in,
Dr. Raghunath Sahoo	High-Energy Physics Experiment (ALICE Experiment@ CERN, Switzerland and CBM Experiment@GSI, Germany) Phenomenology of Quark-Gluon Plasma, Exploration of QCD Phase Diagram	raghunath@iiti.ac.in
Dr. Sudeshna Chattopadhyay	Experimental Condensed Matter Physics: Study of Surface and Interfaces – nanomaterials, thin-films, structure property relationship - optical properties, photocatalytic activity, application in solar cell; Soft matter physics; Electrical Energy Storage- batteries and supercapacitors – Li and Al ion batteries.	sudeshna@iiti.ac.in
Dr. Sarika Jalan	Synchronization, Spatially extended systems, Pattern formation, Social networks, Disease and information spreading. Spectral graph theory, Game theory, Optimized evolution, Extreme events, Time evolving networks, Computational biology	sarika@iiti.ac.in
Dr. Subhendu Rakshit	Theoretical High Energy Physics: Dark matter, Higgs physics, neutrino physics, and generally physics beyond the standard model.	rakshit@iiti.ac.in
Dr. Somaditya Sen	Experimental Condensed Matter Physics: Structure correlated physical properties, Ferroelectrics, Magnetic materials, Multiferroics, Magneto-dielectrics, Optoelectronic materials, Light/Gas Sensing materials. Nanomaterials to Single crystals. Simple and Complex oxides: Titanates, Manganites, Vanadates. Dielectric Resonator Antennas, Energy materials.	sens@iiti.ac.in
Dr.Sudip Chakraborty	Development of Codes relevant to DFT and Energy Materials Modelling; Rashba Dressel-haus Phenomena; Defect Thermodynamics; Computational High Pressure Physics; Topological Insulator; Hybrid Perovskites and 2D Materials for Solar Cell, Photocatalytic and Battery Applications.	sudip@iiti.ac.in

Application Procedure:

1. Candidates must apply ONLINE through IIT Indore website. This will generate unique application number for each applicant.
2. After submitting the application online, the candidate is required to send the signed hard-copy of the application along with State bank Collect receipt, recent photograph, self- attested relevant certificates to the DPGC Convener of concerned Discipline/Center/School within 8 days from the date of submission of online application.
3. Candidates should arrange for TWO or more recommendation letters to be sent (the format is given below on the last page) to *'phy_office@iiti.ac.in'* with copy to 'admission-phy@iiti.ac.in'.
4. Application fee should be paid through State Bank Collect only. The candidate may be asked to produce payment slip at the time of interview.
5. The shortlisted applicants will be called by email only for written test and/or interview. Please state your email id carefully.
6. No TA/DA will be provided to the applicants when called for the interview.
7. The decision of the Discipline in all matters will be final.

Recommendation Letter

[Please note that this recommendation letter should be printed / handwritten on the letterhead and signed by the referee with his/her seal. To maintain authenticity and confidentiality, the letter should be scanned and sent to phy_office@iiti.ac.in' with copy to 'admission-phy@iiti.ac.in'. The referee is requested to give name, designation, affiliation and mobile no. at the end.]

(a) Full name of the candidate:
_____

(b) In what capacity do you know the candidate and how well you know him/her (Quite well/Fairly well/Not so well):

(c) Please evaluate the candidate as '**Excellent/Very good/ Good/ Average/ Below average'** for the below mentioned qualities with any remark(s).

General intelligence:_____, Remark(s):

Sincerity as compared to other students you know: _____, Remark(s):

Response in class, if you have taught him/her: _____, Remark(s):

Experimental skills: _____, Remark(s):

Mathematical skills: _____, Remark(s):

Communication skills: _____, Remark(s):

Participation in collaborative / group work in academics: _____,Remark(s):

Independent thinking: _____, Remark(s):

In which range the candidate belong as compared to the other students in the same class (top '5%' / '5% to 10%' / '10% to 20%' / 'less than 20 %') :

(d) If any strong qualities or weaknesses or any kind of psychological matter noticed by you for the candidate, kindly mention details:

(e) If you have recommended more candidates, how would you place the applicant in relation to the other applicants?

(f) In summary, how would you recommend the applicant
(Very strongly/Strongly/Average/With reservation):

(e) Please write your overall observations about the candidate [please attach an extra sheet if required]: