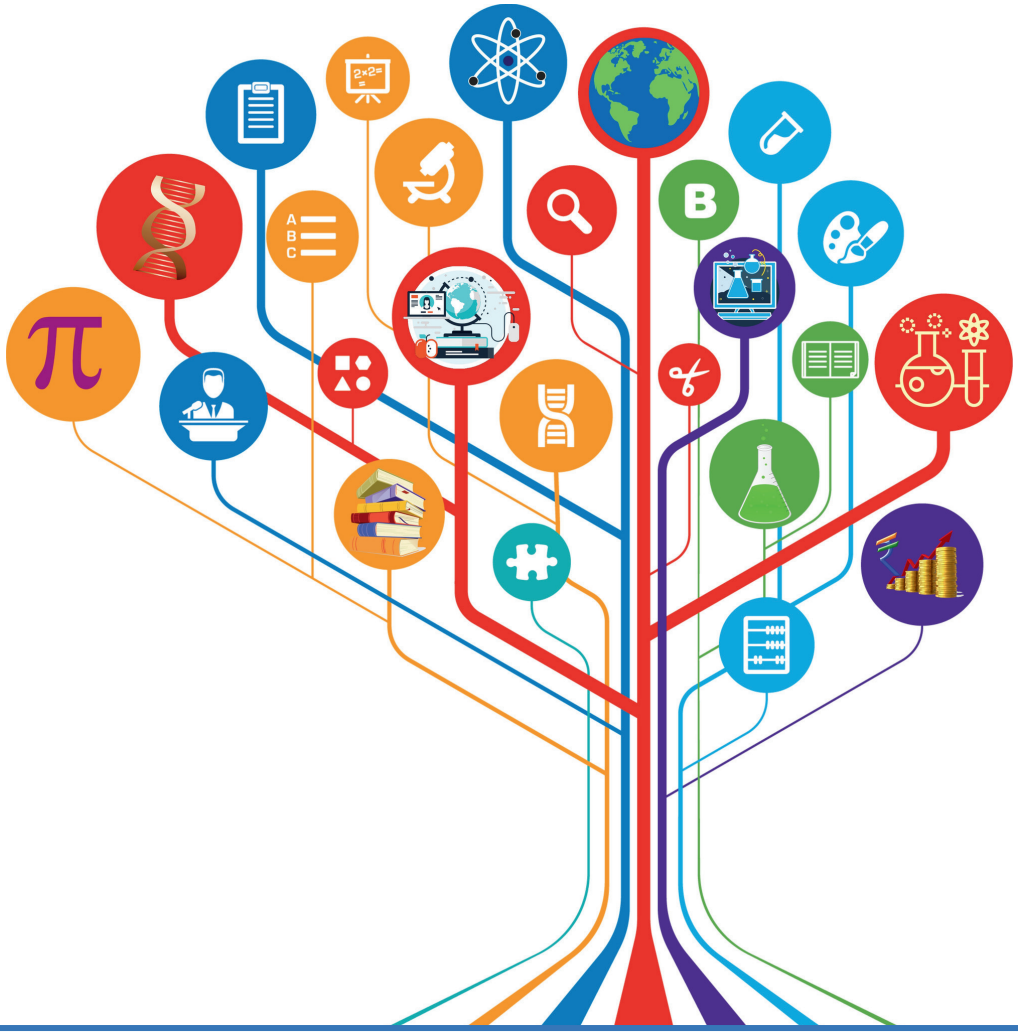

# INFORMATION BROCHURE

2024

## Indian Institute of Science Education and Research Bhopal

Bhopal Bypass Road, Bhauri
Bhopal 462 066, Madhya Pradesh, INDIA
www.iiserb.ac.in



# Table of Content

# Director's **Message**

**PROF. GOBARDHAN DAS**

Director, IISER Bhopal

I am pleased to present this information booklet of the Indian Institute of Science Education and Research (IISER) Bhopal. The Institute was established in 2008 and is amongst the seven IISERs that were created through a proclamation of the Ministry of Education (then Ministry of Human Resource Development), Government of India, to promote quality education and research in science and allied areas. IISER Bhopal is committed to delivering top-notch education to its students enrolled in various programs from the undergraduate level to doctoral studies. We also aspire to contribute to society, through our teaching and research, to help achieve global sustainability.

The education and research at IISER Bhopal are not only targeted at training professionals in specific domains but also at creating leaders in academia and industry. Students are nurtured and skilled to work on problems that cut-across conventional disciplinary boundaries, in addition to gaining expertise in specific areas of science, engineering, and humanities. The Institute's teaching and research are very well aligned with the National Education Policy 2020 (NEP 2020), and we are currently strengthening these programs to truly realize the goals of this policy in word and in spirit. Our world-class faculty together with our students, who are amongst the best minds in the nation, are well on their way to building an Institute of excellence that will stand the test of time.

The Institute is steadfast in its commitment to creating an atmosphere that nurtures innovation, creativity, and excellence amongst its students. Looking ahead, in alignment with our motto 'Vidyayā amṛutaṃ aśnute' (Be immortal through knowledge), I am confident that IISER Bhopal will persist in its brilliance, shaping the future by producing the next generation of research leaders and innovators, dedicated to serving not only the nation but the entire world. I am confident that IISER Bhopal will deliver on its promise of extending the benefits of education and research to the society. I welcome you all to explore this booklet to get a glimpse of our activities and to be a part of our exciting journey.

**Jai Vigyan! Jai Hind!**

# Genesis

The Indian Institute of Science Education and Research Bhopal (IISER Bhopal) was established by the Govt. of India on February 20, 2008 and the first academic session of IISER Bhopal began on August 16, 2008 from the transit campus. The Institute is currently governed by the NITSER (Amendment) Act, 2017 and the Statutes of IISERs.

Though the Institute was youngest of the first five IISERs established, in a very short span of time, in the first decade itself, received several distinctions, duly carving out its own position in the national and international arena.

# Vision

The vision of the Institute is to provide high-quality education to undergraduate, postgraduate, and doctoral students. The Institute also aspires to contribute to the society through teaching and research to help achieve global sustainability. Further, the Institute aims to produce leaders in science and related disciplines.

# Mission

- To establish, build, and sustain an Institution of the highest caliber by the complete integration of teaching and state-of-the-art research
- To make learning in science and other knowledge streams exciting through excellent integrative teaching strategies driven by curiosity and creativity
- To facilitate and promote entry into research at an early age through a flexible borderless curriculum and research projects
- To impart and nurture a variety of skills that prepare students for outstanding careers in the world, in various areas, including academia

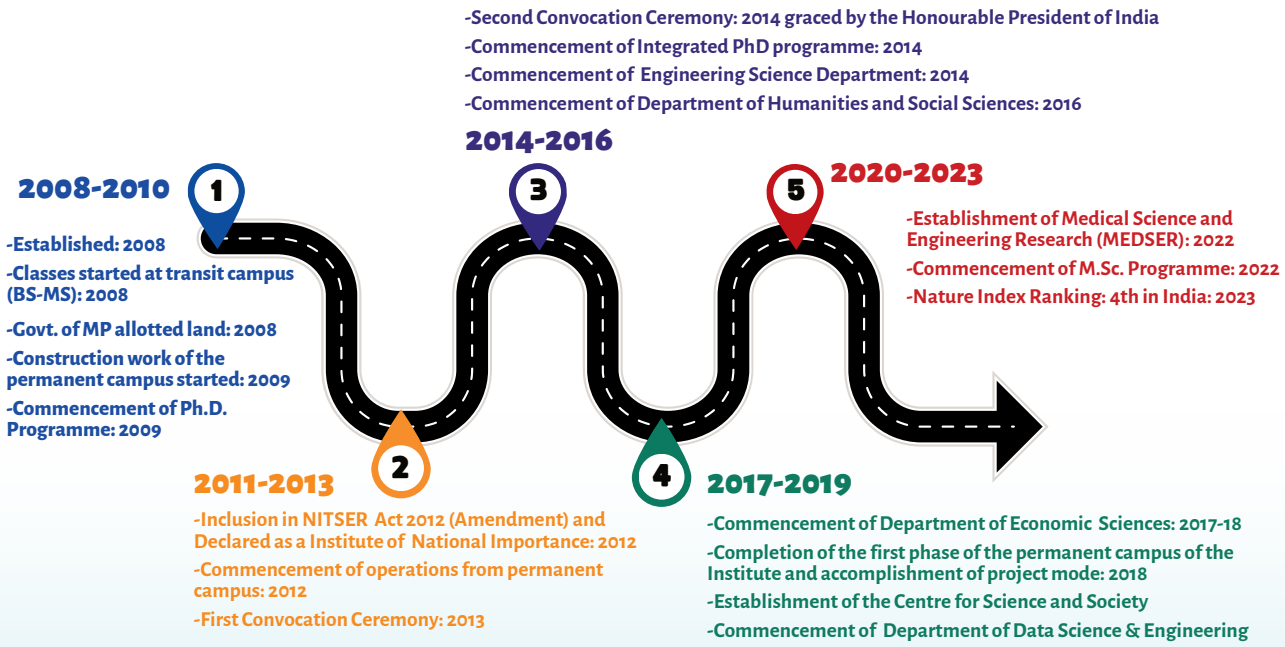
# The First IISER to have been declared by the MoE for Project Completion

A plot of 200 acres of land was allocated at Bhauri village for the permanent campus and the foundation stone was laid on October 8, 2008. All the functional offices started moving into the permanent campus in May 2013 in different phases and the campus was completed in the year 2016 as per the report submitted by the Appraisal Committee on August 4, 2016, in accordance with the Detailed Project Report approved by the Union Cabinet of India. The Govt. of India approved a total cost of ₹441.00 Crores for construction works, ₹ 187.00 Crores for equipment besides recurring expenditure, towards granting aid for salaries for the completion of the project in a very successful manner.

IISER Bhopal is one of the earliest developed campuses and the Govt. of India formally declared that the project was completed in its full sense on April 9, 2018.

## Journey of IISER Bhopal

2008–2024



# The Ranking with International Recognitions

6th overall rank in India and 4th in academic category

60th in the overall ranking in India of NIRF 2023

In the promising band of Innovation Ranking (ARIIA)

QS University rankings 2023, 601-630 for chemistry

Overall rank 351-400, South Asia Rank - 90 and India Rank 55 in 2024

Times Higher Education 2024 world ranking - National Rank (India) - 64th overall out of 77 in the top 1500 Global rank - 1201-1500 (only 77 Indian Institutions /Universities are in the worlds top 1500)

# Courses

## Bachelor of Science (BS)

- Chemical Engineering
- Data Science and Engineering
- Economic Sciences
- Electrical Engineering and Computer Science

## Bachelor of Science-Master of Science (BS-MS) Dual Degree

- Biological Sciences
- Chemistry
- Earth and Environmental Sciences
- Mathematics
- Physics

## Master of Science (M.Sc.)

- Biological Sciences
- Chemistry
- Mathematics


## Integrated Ph.D.

- Mathematics
- Physics

## Ph.D.

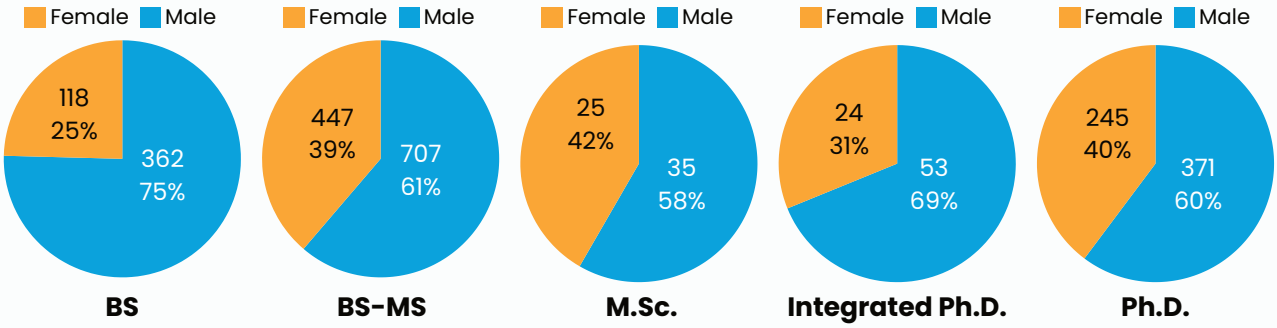
- All Academic Departments

Students who have completed a postgraduate programme in a relevant discipline and meet the eligibility criteria can apply.

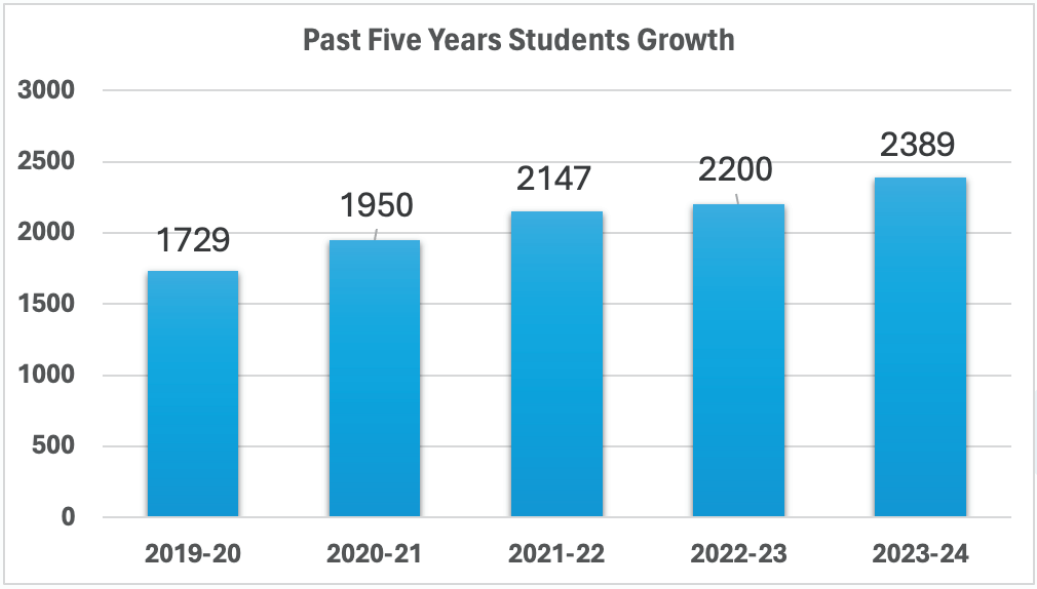
For more details, visit the website https://www.iiserb.ac.in/doaa/programmes

# The Admission Methodology through Multi-layer System

The admissions for the undergraduate programme are done through three channels: JEE (Advanced) and IISER Aptitude Test (IAT). Currently, the registered student strength in the Institute is 2387, out of which 480 are BS, 1154 BSMS, 60 M.Sc., 77 Integrated Ph.D. and 616 are Ph.D. The percentage of female students in the Institute is about 36%.



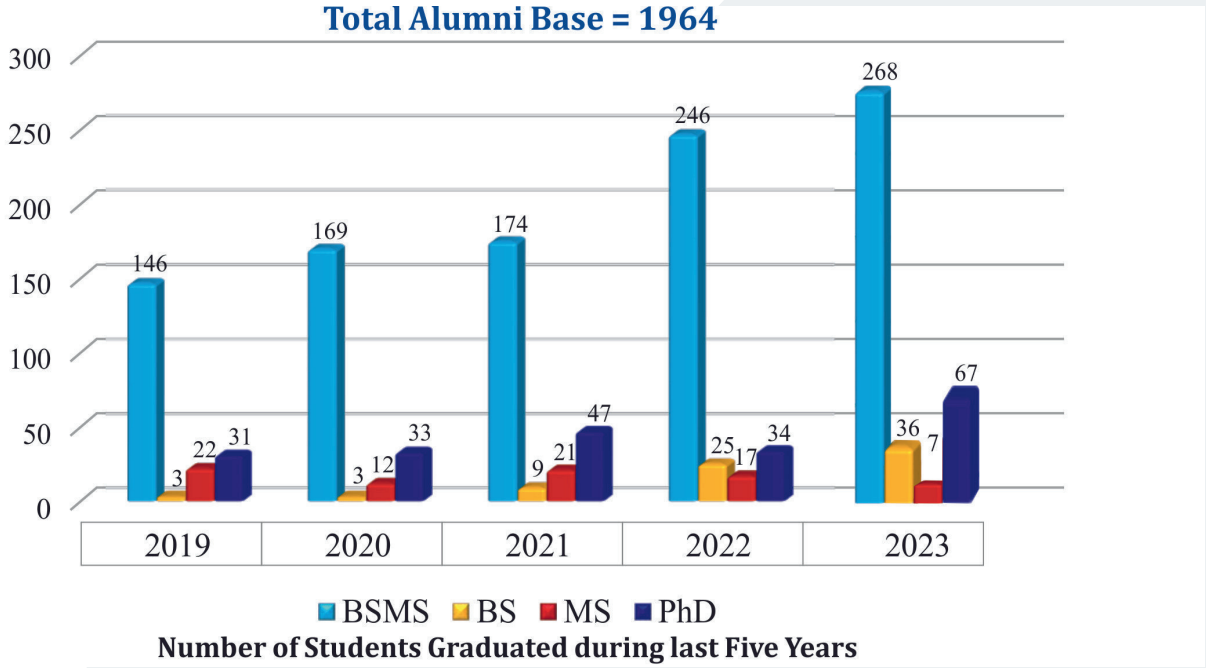

# The Students' Strength and Growth Plans




IISER Bhopal has the potential and plans to increase the student strength in the normal mandate i.e. from 2147 to 3200 in the next 5 Academic years, commencing from 2020-21 up to 2024-25 in order to achieve the National objectives of increasing the gross enrolment ratio and utilizing the resources in an optimal manner.

# The Graduate Outcome

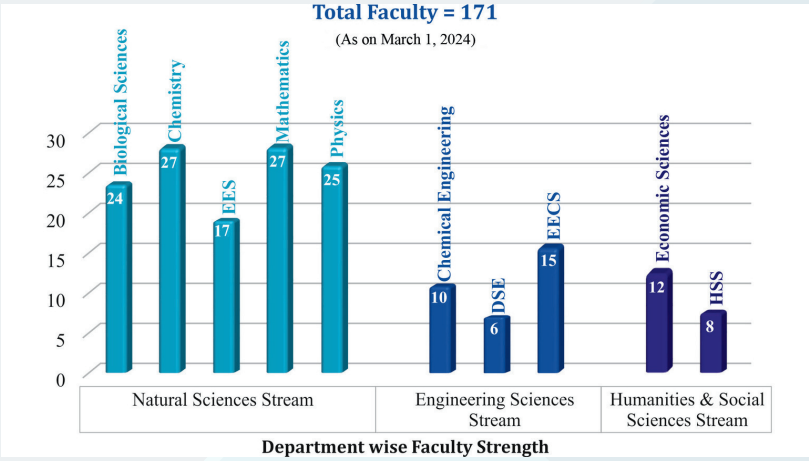
A total of 80 BS, 1452 BS-MS, 110 MS, 322 Ph.D. students have graduated with a total alumni base of 1964, having secured placement of more than 80% overall of the graduates, including securing research and academic fellowships from various national and international Institutes of high repute, so far.



Number of Students Graduated during last Five Years

# The Faculty Strength and Human Resource

There is a continuous drive to recruit faculty members in all disciplines keeping in mind the global academic requirements and to meet the ever-increasing demand of quality teaching and research. The current faculty strength in the Institute is 171 including visiting, adjunct faculty and offered faculty positions.

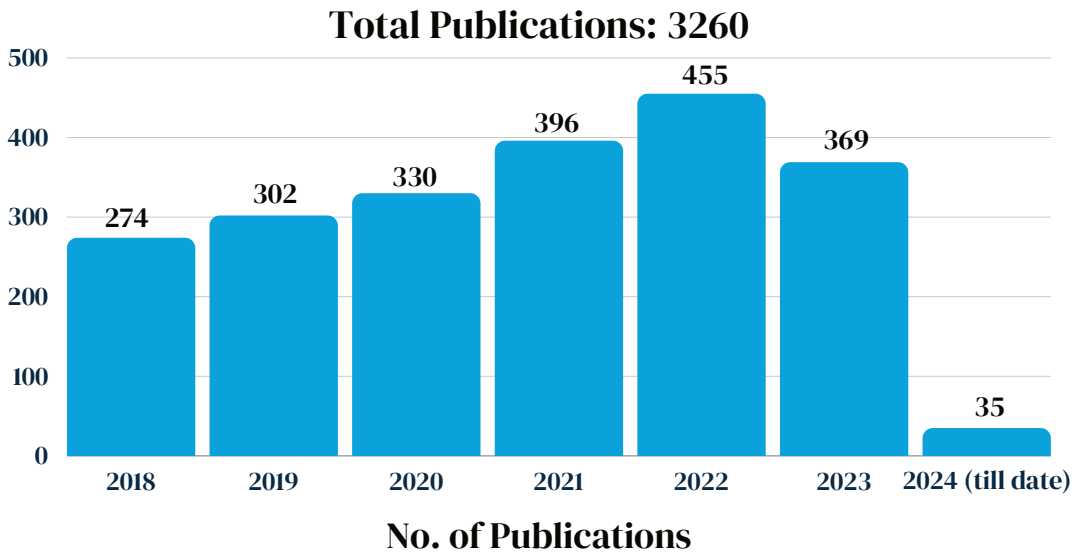


Department wise Faculty Strength

The current non-teaching staff strength is 110. Besides the regular staff strength, there are several research and scientific staff members hired for specific period to exclusively help the research and consultancy projects funded by several Government and Non-government Institutes/agencies.

# The Research Publications in International Journals of Repute, Patents and MoUs

The Institute has published about 3260 research articles in SCI-indexed journals of international repute as on 26 February 2024 as per the data obtained from the Web of Science website. About 36 patents have been filed and 07 patents have been granted. A total of 42 national and international MoUs have been entered in for forging alliances with academic and research Institutes of high repute across the globe.



# Departments

## BIOLOGICAL SCIENCES

### *Major Facilities:*

ABI DNA sequencer, Beckman floor model centrifuge, Confocal with two photon imaging, Live cell Confocal microscope, Floor model ultracentrifuge, FACSARIA III-4laser benchtop fixed aligned sorter system and CD Spectropolarimeter. Visit our website for more details.

| | |
|---|---|
| Full-Time Faculty | 20 |
| Visiting/Adjunct Faculty | 04 |
| Staff | 08 |
| PhD Graduated | 86 |
| Publications (IISERB) | 457 |
| Publications (All) | 481 |
| Sponsored Research Projects | 120 |

*THRUST AREAS*

- Tuberculosis Biology
- Plant Molecular Biology
- Microbiology and Molecular Biology
- Metagenomics, Genomics and AI
- Immunology and Virology
- Cell and Develpomental Biology
- Ecology and Evolutionary Biology
- Chemical Biology, Structural Biology and Biochemistry
- Epigenetics and Cancer Biology
- Biophysics and Structural Biology

Web: https://bio.iiserb.ac.in/index.php

## CHEMICAL ENGINEERING

| | |
|---|---|
| Full-Time Faculty | 09 |
| Staff | 05 |
| PhD Graduated | 02 |
| Publications (IISERB) | 77 |
| Publications (All) | 150 |
| Sponsored Research Projects | 15 |

### *Major Facilities:*

- High-Performance Liquid Chromatography
- Gas Chromatography
- Ion Chromatography
- Fourier Transform Infrared Spectroscopy
- Ultraviolet-Visible Spectroscopy
- Optical Microscope
- Automatic Film Coating Machine
- High Frame Rate Thermal Camera
- Scanning Electrochemical Microscope
- Freeze-Dryer/Lyophilizer
- Total Organic Carbon Analyzer

Web: https://che.iiserb.ac.in/

*THRUST AREAS*

- Energy Conversion and Storage
- Environment and Sustainability
- Reaction Engineering and Catalysis
- AI in Chemical Engineering
- Multiphase Transport
- Water and Wastewater Treatment

## CHEMISTRY

### *Major Facilities:*

TEM facility, Common instrumentation facility, Cell culture facility, Cold room facility, Spectroscopic instruments for steady state and time resolved measurements, FT-IR spectrophotometer, CD spectrometer, Time resolved confocal microscope, Potentiostat + Spectro electro chemistry set up, Microwave synthesizer, Lyophilizer, H-cube hydrogenator, BET gas sorption analyzer and others. Visit our website for more details.

| | |
|---|---|
| Full-Time Faculty | 26 |
| Visiting/Adjunct Faculty | 03 |
| Staff | 07 |
| PhD Graduated | 123 |
| Publications (IISERB) | 1109 |
| Publications (All) | 1164 |
| Sponsored Research Projects | 135 |

**THRUST AREAS**

- Bioinorganic Chemistry
- Biophysical Chemistry
- Chemical Biology
- Chirality in Molecules and Materials
- Inorganic & Organometallic Catalysis
- Material Science
- Synthetic Organic Chemistry
- Organic Material and Supramolecular Chemistry
- Spectroscopy
- Theoretical and Computational Chemistry

Web: https://chm.iiserb.ac.in

## DATA SCIENCE AND ENGINEERING

### *Major Facilities:*

- UG Lab with 50 GPU based Computer Workstations
- Seven A100 NVIDIA servers with either 80 GB or 40 GB GPUs and 256 GB or 512 GB RAM
- Five different LABs with well-equipped computer workstations for PhD students and research scholar
- Network Attached Storage (NAS) of size 120 TB
- Remote sensing sensors
- State of the art data repository

| | |
|---|---|
| Full-Time Faculty | 05 |
| Visiting/Adjunct Faculty | 01 |
| Staff | 01 |
| PhD | 11 |
| Publications (IISERB) | 30 |
| Publications (All) | 32 |
| Sponsored Research Projects | 02 |

**THRUST AREAS**

- Biomedical Data Science
- Computer Vision and Image Processing
- Geospatial Artificial Intelligence for Urban Planning
- Machine Learning on High Resolution Remotely Sensed Data
- Medical Image Processing
- Model Compression and Efficient Deep Learning
- Natural Language Processing
- Biometrics Recognition
- Trustworthiness and Fair Artificial Intelligence
- Generative Neural Networks

Web: https://dse.iiserb.ac.in/

## EARTH & ENVIRONMENTAL SCIENCES

### *Major Facilities:*

Gradient Ion Chromatograph, Isocratic Ion Chromatograph, Bench Top Spectrophotometer, Quadrupole ICP-MS, Multi Collector ICP-MS, Epsilon 5 ED-XRF, Petrological Microscope Facility, Computational Facility Lab, LA-ICP-MS, Rock Cutting and Crushing Facility, Shimadzu TOC analyzer, Equilab Fluxer Fusion beads Preparation unit, Mettler Tollado Seven2Go pH /Ion meter S8-Fluoride-Kit and others. Visit our website for more details.

| | |
|---|---|
| Full-Time Faculty | 15 |
| Visiting/Adjunct Faculty | 02 |
| Staff | 06 |
| PhD Graduated | 22 |
| Publications (IISERB) | 233 |
| Publications (All) | 233 |
| Sponsored Research Projects | 51 |

### *THRUST AREAS*

- Atmospheric Aerosols Greenhouse Gas Modeling
- Monsoon Dynamics and Interactions
- River Engineering and Science Environmental Geochemistry
- Fluvial Geomorphology Seismology
- Geostatistics
- Regional Earth System Modeling
- Surface and Statistical Hydrology Geoinformatics
- Isotope Geochemistry Chemical Oceanography
- Petrology Geodynamics
- Structural and Petroleum Geology

Web: https://ees.iiserb.ac.in/index.php

## ECONOMIC SCIENCES

| | |
|---|---|
| Full-Time Faculty | 09 |
| Visiting/Adjunct Faculty | 03 |
| Staff (shared) | 01 (shared) |
| PhD Students | 11 |
| Publications (IISERB) | 33 |
| Publications (All) | 47 |
| Sponsored Research Projects | 02 |

Web: https://eco.iiserb.ac.in/

### *Major Facilities:*

- Database subscriptions
  - Consumer Pyramids Dx - CMIE
  - ProwessIQ - CMIE

### *Thrust Areas*

- Behavioural Economics, Agriculture Economics, Environment & Resource Economics, Industrial Organisation, International Economics, Public Economics, Applied Econometrics, Behavioural Economics, Game Theory, Mechanism design under incomplete information, Microeconomics, Performance Evaluation using Efficiency and Productivity Analysis, Data Envelopment Analysis, Applied Econometrics, Issues Related to Indian Industry, Survey Methodology, Applied Microeconomic Theory, Political Economy, and Public Economics

# ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

## *Major Facilities:*

- Quantum Computing and Information Systems (QuCIS) Lab
- Systems and Informatics Research Laboratory
- Multi-Robot Autonomy Laboratory
- i-Lab
- Quantum NanoDevice Lab
- Sixth Sense Lab
- Electronic Design and Integrated Circuit Testing

| | |
|---|---|
| Full-Time Faculty | 14 |
| Staff | 02 |
| PhD Graduated | 01 |
| Publications (IISERB) | 92 |
| Publications (All) | 250 |
| Sponsored Research Projects | 26 |

**THRUST AREAS**

- Cryptography
- Algorithms
- Robotics & Control Systems
- Social Networks Sensing and Analytics
- Software Modelling & Verification
- Design & Analysis of Algorithms
- Machine Learning for Software Engineering
- Device Circuits & Sensors
- Quantum Information Processing
- Communication & Signal Processing

Web: https://eecs.iiserb.ac.in/

# HUMANITIES AND SOCIAL SCIENCES

## *Major achievements:*

- Dr. Renny Thomas has been invited for the 'Taki Visiting Global Professorship' at New York University, New York, 2024-25
- Dr. Antara Chatterjee has been selected for the Charles Wallace India Trust Research Grant for doing archival research in London, United Kingdom, 2023-24

## *Thrust Areas*

- Literature - South Asian Anglophone Writing, South Asian Diasporic Literature, Critical Theory, Modernist Literature, Greek and Latin Literature, Gender Studies, Feminist Theory, Dalit Studies, Memory Studies, Environmental Humanities, City and Literature, Literature of Displacement, Medical Humanities
- Philosophy - Greek and Roman Philosophy, Continental Philosophy, History and Philosophy of Science, Ethics
- Sociology and Social Anthropology: Religion, Social Justice, Rationality
- Science and Technology Studies (STS)
- Cognitive Science

| | |
|---|---|
| Full-Time Faculty | 08 |
| Visiting/Adjunct Faculty | 01 |
| Staff (shared) | 01 (shared) |
| PhD Students | 19 |
| Publications (IISERB) | 47 |
| Publications (All) | 59 |
| Books (authored & edited) | 06 |
| Invited Fellowships/ Professorships | 05 |

Web: https://hss.iiserb.ac.in/

**Journal articles: 38 (IISERB), 50 (All), Book chapters: 9**

# MATHEMATICS

THRUST AREAS

- Group action on Surfaces Algebraic Geometry and K-theory
- Differential Geometry Commutative Ring theory
- Low-dimensional / Geometric Topologycal Biology
- Operator Algebras, K-theory Functional Analysis
- Partial Differential Equations, Inverse Problems
- Representation Theory Algebraic Geometry
- Automorphic Forms-Number Theory
- Topology and Geometry Number Theory
- Inverse Problems and Partial Differential Equations
- Harmonic Analysis Probability Theory
- Numerical Analysis and Scientific Computing
- Dynamical Systems and Ergodic Theory

| | |
|---|---|
| Full-Time Faculty | 22 |
| Visiting/Adjunct Faculty | 04 |
| Staff | 02 |
| PhD Graduated | 15 |
| Publications (IISERB) | 117 |
| Publications (All) | 142 |
| Sponsored Research Projects | 26 |

## *Major achievements*

Book titled `Functional Analysis' by Dr. Prahlad Vaidyanathan was published by Cambridge University Press in September 2023

Web: https://maths.iiserb.ac.in/

# PHYSICS

| | |
|---|---|
| Full-Time Faculty | 24 |
| Visiting/Adjunct Faculty | 01 |
| Staff | 09 |
| PhD Graduated | 65 |
| Publications (IISERB) | 453 |
| Publications (All) | 589 |
| Sponsored Research Projects | 55 |

Web: https://phy.iiserb.ac.in/

## *Major Facilities:*

- SQUID Magnetometer
- Powder/Thin film XRD
- Ultrafast Laser System
- Physical Properties Measurement System
- High field low temperature Raman spectrometer
- Single Crystal growth facility
- Tera-Hz spectrometer
- High energy/angle resolved photoemission spectrometer
- NV center magnetometry setup
- 2D coherent spectroscopy
- Departmental high performance computing facility
- 14 inch fully steerable optical telescope

## *Thrust Areas*

Cosmology & High Energy Physics, Experimental Condensed Matter Physics and Theoretical Condensed & Soft Matter Physics

# Centres of Excellence

## i. Centre for Science and Society ($CS^2$)

The Centre for Science and Society ($CS^2$) is amongst the many Centres at the Indian Institute of Science Education and Research (IISER) Bhopal, which aims to strengthen various themes in teaching, research, and service pursued by the Institute and aspires to contribute to society through teaching and research to help achieve global sustainability. $CS^2$ embraces an universal approach to contributing to society, but also by identifying qualified and motivated faculty and students of IISER Bhopal as resource persons.

IISER Bhopal's vision is to provide high-quality education to undergraduate, postgraduate, and doctoral students. Further, the Institute aims to produce leaders in science and related disciplines.


## ii. Innovation and Incubation Center for Entrepreneurship (IICE)

IICE is a Technology Business Incubator at IISER Bhopal. It's supported by DST under NIDHI TBI scheme and aims to create an entrepreneurial ecosystem on campus. IICE provides research, development, training, and mentorship in state-of-the-art incubation space and technology platforms to facilitate innovation and Entrepreneurship. Additionally, it promotes faculty and student-led start-ups and helps them take their innovation to the next level.

### INNOVATION AND ENTREPRENEURSHIP ECOSYSTEM

Ideation → Preincubation → Incubation → Acceleration

Entrepreneurship Cell

I GEM

DUDE Lab

IICE — Innovation and Incubation Centre for Entrepreneurship (IICE)

DST NIDHI

Catalysed and Supported by DST, NIDHI TBI


## Thrust Areas

- Health-Tech and Biotech
- Agri-Tech
- Computational Sciences & Information Technology (IT)
- Environment and Agriculture
- Internet of Things (IoT)
- Artificial Intelligence (AI)
- Clean Technology
- Social & Rural Development
- Other Technologies

**Start-ups**

Plabeltech

Intisen

Adit Bioscience

KONARQ TECHNOLOGIES

mBIOSYS PRIVATE LTD

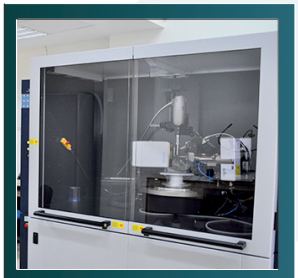
REACH US AT iice.iiserb.ac.in
iice@iiserb.ac.in

# Central Instrumentation Facility (CIF)

The Central Instrumentation Facility (CIF) at IISER Bhopal, is an interdisciplinary shared user facility housing sophisticated state-of-the-art instruments needed for cutting-edge research. It was created to provide a central facility for the latest and most advanced analytical instruments for research and to promote interdisciplinary research. Please visit our website for more details https://www.iiserb.ac.in/cif/glance

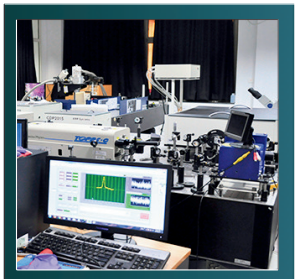
Nuclear Magnetic Resonance (NMR)

NANO-LC MALDI TOF/TOF Spectrometer



Single Crystal XRD

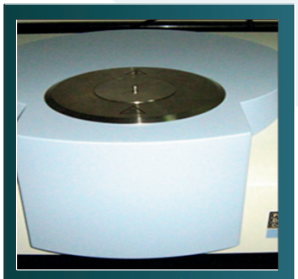
HR FESEM With EDAX



Ultrafast Laser System

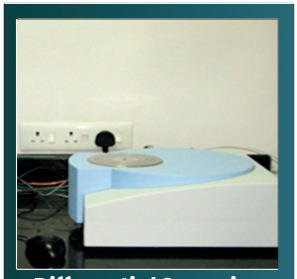
Size Exclusion Chromatography

Dynamic Light Scattering / Zeta Potential Measurement

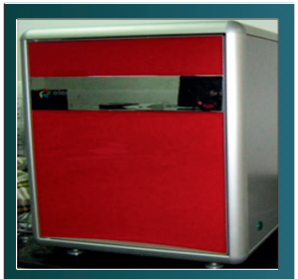


Thermogravimetric Analyzer

Isothermal Titration Calorimeter



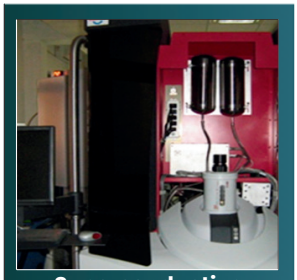
Differential Scanning Calorimeter



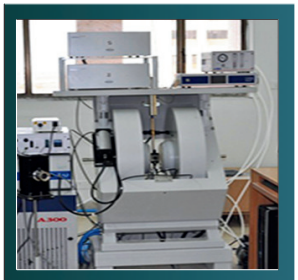
CHNSO Analyzer

Atomic Force Microscope

BET Surface Area Measurement



Superconducting Quantum Interference



EPR

Rheometer

# IISER Bhopal Alumni Around The Globe


# Our Esteemed Recruiters

amazon
lucidata
SIEMENS Healthineers
Dr.Reddy's
Morgan Stanley
Infosys
intel
BÆRLOCHER
भा प अ कें BARC
इसरो isro
ओएनजीसी ONGC
Deloitte.
NOMURA
WILEY EDGE
BARCLAYS
TATA CONSULTANCY SERVICES
भारतीय रेल INDIAN RAILWAYS
Unilever
Next. Education Transforming Education
ZS
nurture.farm

# Internship Partners

Australian National University
MAX-PLANCK-INSTITUT FÜR KOLLOID- UND GRENZFLÄCHENFORSCHUNG
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
DAAD Deutscher Akademischer Austauschdienst German Academic Exchange Service
1794 ENS ÉCOLE NORMALE SUPÉRIEURE
BIOSANTEXC
FRANCE EXCELLENCE CHARPAK
mitacs

# Student Activity Council

Computing & Networking Council

Student Development Council

ESIC

Sports Council

Cultural Council

Science Council

FALC

Representatives Council

# Campus Amenities

Central Library

Technology Enabled Lecture Halls

Computer Centre

Conference Halls and Seminar Rooms


Shopping Centre


Health Centre

Student Gymkhana


Hostels & Dinning halls

Sports Complex

# Nature @ IISER Bhopal








# Contact Us

www.iiserb.ac.in

+91 755 269 2316

+91 755 269 2343

directoroffice@iiserb.ac.in

registraroffice@iiserb.ac.in

**IISER BHOPAL**