

Director's Message



Dear Friends,
Congratulations!!!
You have made it. It is your hard work, guidance and sustained support over a long period which has been the driving force in putting IIT Ropar as one of the top 10 Engineering institutes of the country according to the

recently announced National Institutional Ranking Framework (NIRF) by the Ministry of Human Resource Development, Government of India. What is even more satisfying for us is the fact that in two of the key parameters in this ranking namely Teaching, Learning and Resources (TLR) and Graduation Outcome (GO), IIT Ropar came out first among the top 10 institutes beating even the reputed large older IITs like Delhi, Bombay, Kanpur, Madras and Kharagpur. This is no less an achievement for a young institute like ours which is still in the phase of its initial development. The faculty, students, staff, deans along with the former Director Prof. M. K. Surappa should be congratulated for this. Our Chairperson, Mrs. Lila Poonawala, has been a constant inspiration behind this. We have also done reasonably well in research. The details of the ranking also reveal

that we are lagging behind in the perceptual score. I think the delay in building campus and institutional capacity expansion are factors behind this. We are going very aggressively in these fronts and I request you to convey the message to peers, public and media at your level so that in future the perception about IIT Ropar improves.

The current ranking will definitely give us better opportunities to attract brilliant students, scholars and quality faculty members. Already we are in an aggressive mode to hire faculty for which in addition to our usual efforts, we are sending a team of faculty and experts to UK, Canada and USA to hold offshore interviews and attract high quality faculty. The academic and other activities of IIT Ropar such as inauguration of Civil Engineering department, Task Force report on course and curriculum, formation of bio-research consortium with IIT Mandi and PGIMER Chandigarh, encouraging student initiatives such as centre of innovation and pushing forward Technology Business Incubator (TBI) sanctioned by Government of India are some of the prime activities of the last quarter.

I am sure, with the variety of initiatives and activities and the recognition of our performance through the National Ranking, we will be able to perform even better in the days to come. I need your blessings and support to realize this dream.

Jai Hind!

- Sarit Kumar Das

National Ranking - IIT Ropar Comes Out of The Shadows

In the first set of India Rankings 2016 released on April 4, 2016 by the Hon'ble Minister for Human Resource Development in New Delhi, IIT Ropar ranked No.9 in Research and Teaching Institutions in Engineering category amongst several other similar institutions in India that participated in the ranking exercise.

The National Institutional Ranking Framework (www.nirfindia.org), created by the Ministry of Human Resources Development, Govt. of India in 2015, outlines a methodology to rank institutions across the country. The parameters used for ranking broadly cover:

- (1) Teaching, Learning & Resources
- (2) Research, Professional Practice & Collaborative Performance
- (3) Graduation Outcome
- (4) Outreach & Inclusivity and
- (5) Perception

- (1) **Teaching, Learning & Resources (TLR):** (Weightage: 0.30)

Parameters related to the core activities of any place of learning. These lay emphasis on measuring numbers and quality of faculty, library and laboratory resources and general facilities for development of young persons.

- (2) **Research, Professional Practice & Collaborative Performance (RPC):** (Weightage: 0.30)

Excellence in teaching and learning is closely associated with the scholarship of the faculty and students. Equally, faculty members are

expected to make their knowledge and expertise available to benefit the society and industry. These parameters, therefore, attempt to measure the quantity and quality of research output as seen through international data bases, IPR generation and interface with industry



and fellow professionals.

- (3) **Graduation Outcome (GO):** (Weightage: 0.15)

This parameter forms the ultimate test of the effectiveness of the core

teaching/learning activity, and measures the student graduation rate and their success in finding appropriate placement in industry and Government or taking up higher studies.

(4) Outreach & Inclusivity (OI): (Weightage: 0.15)

The Ranking framework lays special emphasis on representation of women and socially challenged persons in student and/or faculty populations, and also on outreach activities of the institution.

(5) Perception (P): (Weightage: 0.10)

The ranking methodology gives a significant importance to the perception of the institution by its stakeholders. This will be accomplished through Stakeholder Surveys.

Process for Peer Rating in Category (PR)

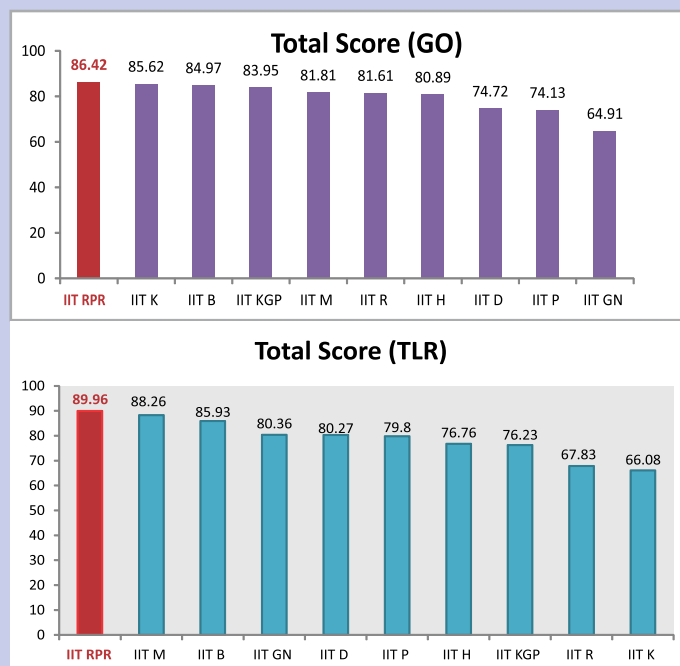
IIT Ropar stands at the Ninth position with weighted score of 74.89. Its rank on different parameters categorized above among top 10 institutes is given in Table 1. It is worth noting that IIT Ropar has secured No.1 rank in the teaching and learning resources (TLR) and graduation outcome (GO) parameters among top 10 institutions in the first ever MHRD's ranking. In research, professional practice & collaborative performance, it has done reasonably well with 8th rank while in outreach & inclusivity and perception scored last rank in the ranking of top 10 institutes.

Rank and score of IIT Ropar in various parameters among top 10 institutes

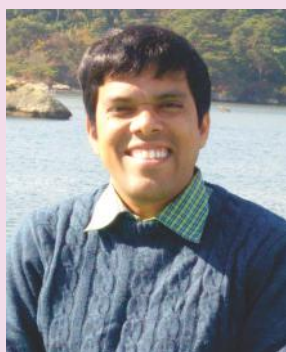
Parameter	TLR	RPC	GO	OI	PR
Rank	1	8	1	10	10
Score	89.96	73.56	86.42	60.67	38

From the score obtained in the sub-parameters, it is evident that IIT

Ropar's (i) IPR and Patents and (ii) Footprint of projects and professional practice are in the lower scale in the RPC parameter which has reflected in the overall rank of 25 among all institutes. In graduation outcome, it has done average due to low score in entrepreneurship sub-parameter with overall rank of 11. In the outreach and inclusivity parameter, IIT Ropar has scored low marks in the sub-parameters of continuing education and service, percentage of women students/faculty, and facilities for physically challenged students. Finally, IIT Ropar perception score is found to be 38.35 which is very low among top 10 institutes and in 99th rank among all the institutes which has brought down the IIT Ropar's overall ranking to 9th.



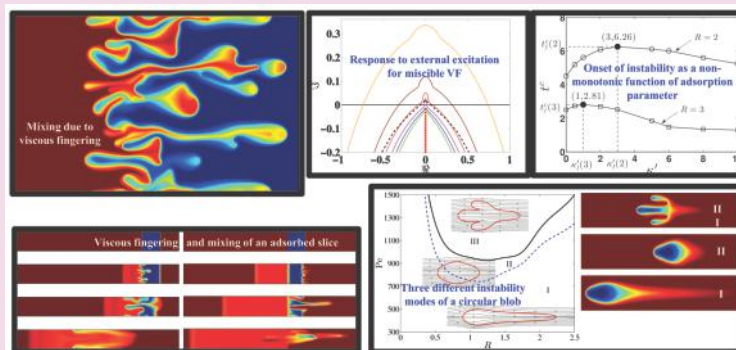
Know Our Faculty



Dr. Manorajan Mishra, Department of Mathematics

Hydrodynamic instabilities at miscible liquid-liquid interfaces in a displacement flow through porous media are the focus of our research group. We study the nonlinear dynamics and the pattern formation at such liquid-liquid interfaces due to underlying physicochemical mechanism (convection, diffusion, adsorption, chemical reactions etc.) for Rayleigh-Taylor, double-diffusive and viscous fingering (VF) instabilities. We model the fluid flow and mass transfer, analyze the mathematical model, compute numerical solutions, and compare the results with the available experimental data. We developed a novel non-modal stability analysis method for dynamical systems with a time-dependent base flow. This method captures the onset of VF instability in consistent with the experiments and the physics of the problems. A state-of-art numerical technique is developed based on the Fourier pseudo-spectral method to solve the coupled nonlinear PDEs. Using this numerical technique, mixing due to viscous fingering in both linear and Langmuir adsorption effects are

studied. Further, it enables to show that for a circular blob the dynamics and width of mixing zone are not intuitive to figure out and can strongly differ from the classical behavior of a planar interface. It is observed that the double-diffusive convection, or the presence of a magnetic field alters the fingering patterns significantly. With the help of a new scaling analysis developed in our group, it is shown that both the favorable and unfavorable viscosity contrasts act against the classical Rayleigh-Taylor instability. This scaling analysis has also been successful to explain instabilities in many chemical systems exhibiting transient interfacial tension. Our results help to address the engineering challenges related to hydrodynamic behavior of various industrial, and environmental processes, such as enhanced oil recovery, separation processes in chromatography column, geological carbon-capture and storage, contaminant transport in aquifers, mixing in microfluidic devices, etc.



FiLMI 2016

The Department of Physics recently organized a two-day National Conference on "Frontiers in Light-Matter Interaction (FiLMI 2016)" during March 4-5, 2016, partially funded by SERB-DST, Govt. of India and IIT Ropar. In continuation to the 'International Year of Light'



announced at the UN General Assembly, this conference focused on cementing the gap between different avenues of light-matter interactions towards bringing the optics and photonics research in India to the next level. The conference covered important topics like Non-Linear Optics & Laser Spectroscopy, Nano – Photonics & Meta Materials, Quantum Optics & Quantum Computing among others.

Speaking at the conference, Director

Prof. Sarit K. Das said that the science of light-matter interaction is a very important subject of research internationally. This conference has opened up new avenues of research and discussion to prove how the science of light, photonics and related technologies is the key to sustainable development in practically all sectors including energy,



agriculture and health. Experts on different subjects have discussed various

possibilities of putting the research of light-matter interaction to end use.

The two-day event at IIT Ropar attracted more than 20 experts in different areas of optics & photonics across India and also more than 50 students working in these areas, participating in the conference. Lectures on controlling atoms and molecules using ultra-fast lasers have been intensely discussed by plenary speakers. Several lectures

have been given by the experts in different aspects of light-matter interactions over the two days and intense poster sessions were arranged for students to broadcast their research findings. In addition, three best student poster awards were also presented during the event. The event concluded with a lot of stimulating discussions on the future trends in the field of light-matter interactions.



Bio - X Consortium

The second Bio-X Consortium meeting was held at IIT Ropar on March 12 -13, 2016. This project is a brainchild of Prof. S. K. Das and Prof. T. A. Gonsalves on Bio-X consortium between IIT Ropar and IIT Mandi, with expansion plans to include PGIMER Chandigarh in the near future. Bio-X endeavors to address big challenges in the field of healthcare and medicine. The consortium aims to facilitate and encourage collaboration between engineering and technological experts from IIT Ropar and Mandi with medical experts of PGIMER to develop low cost diagnostics and therapy for prevalent diseases affecting large number of people in India. Current focus areas of the consortium include (but not limited to): Biomedical Imaging, Biomechanics, Biomedical Nanotechnology, Biomedical Instrumentation and Cancer Diagnostics & Therapy.

Both the directors of IIT Ropar and Mandi have pledged to support the consortium by providing seed grants to projects with significant potential to initiate preliminary studies and attract extramural funding. With sizeable participation from PGIMER, the meeting was productive and successful in forging new and inter-institutional collaborations between mutually interested faculty members. Furthermore, 3 of the 6 project proposals presented during the meeting were awarded seed grants totaling Rs. 48 Lakhs. PGIMER faculty members, attended the meeting for the first time, commended the efforts of the consortium and recognized that such multi-institutional and interdisciplinary collaborations are the need of the hour.



Teaching - Learning Workshop

The Institute conducted a workshop on "Teaching & Learning Skill" in order to implement best methods in teaching students. Various renowned faculty members across older IIT's and reputed Universities participated and shared their experience with our faculty members. Prof. Sarit K. Das, Director, while inaugurating this workshop felt the need for such workshops in order to update our faculty members in the various skills and techniques adopted in teaching.

Prof. Sanjay Mittal (Department of Aerospace Engineering, IIT Kanpur) discussed about the issues in the area of 'Course Planning & Activities', Prof. Sunil R. Kale (Department of Mechanical Engineering, IIT Delhi) gave presentation on 'Effective Teaching Techniques', and Prof. Samir K. Saha (Dean Academics, MCKV Institute of Engineering, Howrah) addressed the faculty members on the topic of 'Motivation for Learning'. Prof. Mangala Sunder Krishnan (Department of Chemistry, IIT Madras) addressed on the issue of Teaching Methods through video conferencing. The workshop ended with group discussion and valedictory session.



Cultural Events

Rashmi

Rashmi is the annual poetic festival of IIT Ropar celebrated with the aim to let the budding poets and connoisseurs of poetry come on



stage and showcase their talent. This time the event witnessed a wide range of poetic performances covering all main genres of

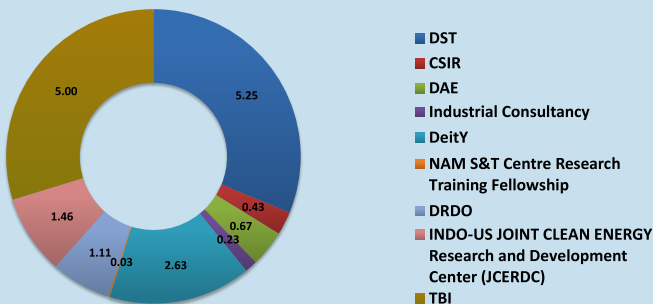
poetry right from comical and romantic to motivational and patriotic. The event saw some of the most creatively written poems being recited passionately by the students. Rashmi's popularity in terms of participation from students has been expanding year after year and every time. The poem recitation was followed by a brief address by the chief guest and distribution of prizes to each participant.

IBCC

The month of April also brings along with it one of the most awaited student championships of IIT Ropar – the **Inter Batch Cultural Championship**. In this two day mega event, students belonging to different years or batches, including B.Tech, M.Tech and PhD scholars fight tooth and nail to win the inter batch trophy. The events comprise of dance, music, literary, debating, drama and fine arts competitions. This time many fun events and inspirational talks are interspersed between these competitions most notable of them being eminent journalist Rifat Jawaaid's talk on the - 'What happens when the media's priority is profit?' and distinguished writer Ravi Nawal's talk on - 'Entrepreneurship and Indian youth'. At the end of this two day championship, results of the competitions were declared and congratulations were showered on the students of 2015 batch for bagging the IBCC'16 trophies.



External Funded Projects / Industrial Consultancy



Total Amount Rs. 16.81 crores (FY 2015-16)

New Joinings



Dr. Neeraj Goel
Assistant Professor
Computer Science & Engineering



Prof. Hans-Jürgen Wollersheim
Visiting Professor
Department of Physics



Dr. Purbarun Dhar
Visiting Faculty
Mechanical Engineering

New Campus

Work on the permanent campus site is going on in full swing. In the first phase of construction of the permanent campus, three 450-bed hostels for boys and a 250-bed hostel for girls are being built.



Perspective view of Boys Hostel



Site photograph of Girls Hostel