



## DEPARTMENT OF CIVIL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ROORKEE - 247 667 (UTTARAKHAND) INDIA

# E-Newsletter

## Vol. 5

## Jul-Dec 2022



### From the HOD's Desk



Dear Colleagues,

*New Year 2023 is the beginning of a new chapter. This is your year. Make it happen. May the coming year be full of grand adventures and opportunities. It is time to forget the past and celebrate a new start. Life is short. Dream big and make the most of 2023. On New Year's Eve, the whole world celebrates the fact that a date changes. Let us celebrate the dates on which we change the world. The first step towards getting somewhere is to decide you're not going to stay where you are. Wishing you a Happy New Year, bursting with fulfilling and exciting opportunities. And remember, if opportunity doesn't knock, build a door.*

Best wishes

Thanks  
Prof. Praveen Kumar

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## ACHIEVEMENTS IN BRIEF

- 05 Research projects were sanctioned at total cost of ₹284.40 lacs.
- A total of 10 students were awarded their Ph.D. degrees.
- The faculty published 66 Research Publications in peer reviewed journals.
- 379 numbers of Consultancy projects from various government agencies and private organizations were carried out at total value of ₹2804.86 lacs.
- The Endowment Fund for the Chair sponsored by the Ministry of Road Transport and Highways (MoRTH) has been enhanced from Rs 1 Crore to 7 Crores.

## AWARDS AND RECOGNITIONS (FACULTY)



### Prof. Praveen Kumar

- Nominated as Visitor's Nominee (President of India Nominee) IIT Bhubaneshwar and IIT Hyderabad.
- Renominated as Visitor's Nominee (President of India) on the selection committee for appointment of academic staff in NITs and IEST, Shibpur for Engineering and Technology Group for three years.



### Prof. Satyendra Mittal

Awarded International Academic Achiever Award – 2020-22 under the category “Award for Teachers with Highest Potential” as approved by the International Award Committee at Dubai University.



### Prof. Rajat Rastogi

Fellow, Indian Geotechnical Society, New Delhi and The Institution of Engineers, India



### Prof. Kaustav Chatterjee

Awarded IEI Young Engineers Award 2021-22 by The Institution of Engineers, India.



### Prof. R. Vinnarasi

Awarded the Distinction in Doctoral Research for the year 2019.



### Prof. Sonalisa Ray

Appointed as Coordinator of IIT Roorkee NBCC.

### 81वाँ वार्षिक अधिवेशन

### 1 Session Indian Roads Congress



### Prof. Praveen Kumar

Awarded the **Best Paper on Road Research Award of Indian Roads Congress (Bihar PWD Medal)** for the year 2018-19. The award was conferred by **Mr. Nitin Gadkari, Union Cabinet Minister of Ministry of Road Transport and Highways** to him during Inaugural function of 81st Annual Session held at Lucknow (UP) on October 08, 2022.

**Title:** “Effects of Using Waste Plastic on Fatigue and Rutting Characteristics in Flexible Pavements”

### Prof. Sanjay Kumar Ghosh

Awarded the most prestigious award "**Satish Dhawan Award 2021**" from the **Indian Society of Remote Sensing**, the only society in the country, for his research and capacity building contribution in the area of Remote Sensing, GIS, Image Processing and Geospatial Technology. The award was conferred by **Mr. Gajendra Singh Shekhawat, Union Cabinet Minister of Jal Shakti Mantralaya** to him at the Annual Conference of the Society held at Hyderabad on November 15, 2022.



### Prof. Nikhil Saboo

Awarded the **Certificate of Merit Award for Bio-Bitumen** developed at IIT Roorkee by his research team. It has now been used in a National Highway (NH) section having a design traffic of more than 200 million standard axles (msa). This NH trial section (approx. 650 m in length) is the first in the world that have been constructed using this technology. The award was conferred at the 2nd Global Road Construction and Safety Conference held on November 30, 2022 at Taj Palace New Delhi.



### Prof. Siddhartha Khare

- His startup received award at India's biggest Geospatial platform from former ISRO Chairman Dr. A.S. Kiran Kumar. The Idea was selected as a Bronze Award Winner for ICON-ISRS Contest 2022 held at HICC Hyderabad during GeoSmart India conference.

- His start-up has won another competition and secured first rank in AABTonics National level Geospatial Competition organized by leading GIS multinational company AABSys IT. As a winning team (**Dr. Siddhartha Khare, Mr. Tushar Bhardwaj and Mr. Akash Kumar Pandey**), they received Rs. 50000/- as a prize money and invitation to pitch in front of investors.

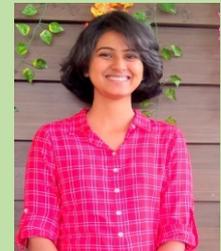


## AWARDS AND NOMINATIONS (STUDENTS)



- **Mr. Prateek Tripathi**, a Ph.D. Student working under the supervision of **Prof. Rahul Dev Garg** from the Department of Civil Engineering recently worked on activities that support Artemis III to the moon as per NASA objectives, organized and funded by the Lunar and Planetary Institute (LPI) and NASA Johnson Space Centre in Houston, Texas, USA.
- He is also selected for a **fully funded trans-national access visit sponsored by the Europlanet 2024 research infrastructure**. He will work on **Apollo 16** sample and **Lunar meteorite** at the Planetary Spectroscopy Laboratory (PSL), Institute of Planetary Research, DLR – German Aerospace Center (Berlin).
- He is working on the geology and mineralogy of Earth, Moon, and Mars, worked as a Double Asteroid Redirection Test (DART) Boarder during **NASA's DART investigation** team meeting in January 2022. **The US Double Asteroid Redirection Test (DART)** is the world's first mission to test technology for defending Earth against potential asteroid or comet hazards. Prateek was among nine Early career scientists/senior grad students selected worldwide to observe the DART Team meeting.
- And also worked as **Insight Seer** to observe Science Team Meeting for **NASA's InSight mission to Mars**. The Interior Exploration using Seismic Investigations, Geodesy, and Heat Transport (InSight) mission is a robotic lander designed to study the deep interior of the planet Mars and was launched on May 5, 2018 by NASA and landed on Mars on November 26, 2018. He was selected for this meeting among the early career scientists to get the experience of working on an international and interplanetary mission science team.

**Ms. Pritipadmaja**, a Ph.D. Student working under the supervision of **Prof. Rahul Dev Garg** from the Department of Civil Engineering has been granted the **SPIE Student Conference Support** to attend SPIE Sensors + Imaging 2022 in Berlin, Germany, from September 5th to 7th to present her paper "Spatio-Temporal Pattern of Urbanisation and its Effect on Land Surface Temperature using Geospatial Technology". As a part of this cover, Pritipadmaja awarded up to \$1000 for airfare and/or lodging as well as a conference registration fee waiver.



**Mr. Ankit Sharma** a PMRF Research Scholar under the Supervision of **Prof. G.D. Ransinchung R.N., Prof. Praveen Kumar and Dr. DSNV Amar Kumar** has been awarded the **Best Paper Award** in the 6th International Conference on Building Materials and Materials Engineering (ICBMM 2022) & The 6th International Conference on Structural and Civil Engineering (ICSCE 2022) held in Barcelona, Spain during September 15-17, 2022

**Title:** "Mixing Law Compatibility and Recycling Ability of Aged Bitumen Binder.

**Ms. Ghazal Srivastava**, a Ph.D. Student working under the supervision of **Prof. A. A. Kazmi** from the Department of Civil Engineering has been awarded the **"Best Oral Presentation Award"** in the "International Symposium of Sustainable Urban Environment (ISSUE-2022)" in session 'Water' held in the UPES (University of Petroleum and Energy Studies) Dehradun campus on October 14, 2022. She has also achieved the **Excellent Abstract Award with International Travel Support** at the 13th International Symposium on Southeast Asian Water Environment (SEAW-13) at Asian Institute of Technology Conference Centre (AITCC), Bangkok, Thailand held on December 13-15, 2022.



**Mr. Gowtham Balasundaram**, a Ph.D. Student working under the supervision of **Prof. A. A. Kazmi** from the Department of Civil Engineering has been awarded the **Second Prize** in the 7th India Water Week Conclave, organised by Department of Jal Shakti, Government of India held in India Expo Centre Greater Noida during November 1-5, 2022.

**Oral Presentation Title:** "Coupled Steam Explosion with Anaerobic Digestion to Produce Class A Biosolids in Municipal Wastewater Treatment Plants in India".

**RESEARCH PROJECTS AWARDED**

| Name of the Principal Investigator/ Co- PI  | Research Project  | Sponsoring Agency  | Amount (₹ Lacs) |
|---|---|--|-----------------|
| <br><b>Prof. Saurabh Vijay</b>   | Identifying current and future GLOF risk over contrasting topographic and climate zones of Indian Himalaya using earth observation data and modelling | Ministry of Earth Sciences                                       | 18.62           |
|   | 21st CEnTury Evolution of small glaciers and their impact on regioNAL hydrology in the HIMalayas (ETERNALHIM)   | Ministry of Earth Sciences and Swiss National Science Foundation | 150.00          |
|   | Interlinked seasonal evolution of supraglacial lakes and ice velocity changes in Greenland  | Indian Space Research Organization                               | 24.18           |
| <br><b>Prof. Nikhil Saboo (PI)</b><br><br><b>Prof. Praveen Kumar (Co-PI)</b> | Development of Specifications for Use of Waste Plastic in Asphalt Mixtures: A Major Step towards Building Sustainable Road Infrastructure             | National Rural Infrastructure Development Agency                 | 55.08           |
| <br><b>Prof. Nikhil Saboo</b>  | Assessing the Suitability of warm mix asphalt (WMA) Technology Using Tribological and Performance Characteristics                                     | Science and Engineering Research Board (SERB), India             | 36.70           |

**EVENTS****WORKSHOPS/CONFERENCES/SHORT TERM COURSES****Technical Seminar on Bitumen: July 28, 2022**

One-day technical Seminar on Bitumen was organized jointly by the Department of Civil Engineering, Indian Institute of Technology Roorkee and Indian Oil Corporation Limited, Bareilly DO, UPSO-II on 28th July 2022 coordinated by Prof. Praveen Kumar & Prof. G.D. Ransinchung R.N. and Shri Narendra Kumar, Sr. Manager (Institutional Bussiness), Indian Oil Corporation Limited (IOCL), Haridwar. Shri Ashish Kumar, DGM IOCL Noida, Shri I. Devotta, DGM R&D IOCL, and Shri Prakash Bharati, Divisional Head IOCL Bareilly were also present in the Technical Seminar discussion.

During the interaction session the following points were discussed: (i) Importance of bitumen and its roles in highway construction, (ii) Usage of Cold Mix/Warm Mix in road construction, (iii) Usage of Poly-packed bitumen and (iv) Single use plastic in road construction. Elaborate discussion was held on poly-packed bitumen and trials conducted with 600 bags at Moradabad, Shimla and Dharamsala at UP/HPPWD sites replicating actual working conditions sharing the satisfactory results of the technology among PWD with the fact that usage of poly-packed bitumen is not limited to only ease handling & transportation but also proven environmentally friendly. Discussion was also extended to the study conducted to evaluate the effect of different amount of shredded waste plastic on bituminous concrete performance using VG 30 grade/CRMB 55 as binder.

## 2<sup>nd</sup> International Conference on "Transportation Infrastructure Projects Conception to Execution" (TIPCE - 2022): September 14-17, 2022



The Transportation Engineering Group at the Department of Civil Engineering, IIT Roorkee, organized the 2nd International Conference on Transportation Infrastructure Projects: Conception to Execution (TIPCE-2022) during September 14-17, 2022. The aim of the conference was to bring together the industry and academia involved in the transportation sector on a common platform to encourage a two-way learning process and share new ideas. The focus of the conference was on generating an understanding of how transportation infrastructure projects are conceptualized, designed, and executed to bring desired development in an area. The final day of the conference on September 17, 2022, was jointly organized by Transportation Engineering Group, IIT Roorkee, and iHUB DivyaSamparak, IIT Roorkee. The conference was attended by professionals in academia, the construction industry, consulting organizations, and students working on transportation infrastructure projects of significance.

Sh. S.K. Nirmal, Director General (RD) and SS, MoRTH, Government of India and Secretary General, IRC, inaugurated the conference on September 14, 2022, and emphasized the need to organize such international conferences to boost ideas and promote research collaborations for development in the field of transportation engineering. The first plenary session was organized as a special session for Indian Roads Congress. Conveners of H-7, H-10, H-6, and B-4 IRC Committees delivered expert talks. In total, 25 plenary talks were delivered in 7 plenary sessions by many international and national experts from the Industry (Tobbi Pro, AECOM, IBI, DMRC, IWAI, MoRTH, CGE, 3M, CSIR-CRRI, NCRTC, WEF, CSIR-AMPRI, DRA Infracon) and academia (Thi-Qar University, IISc, Tel Aviv University, New Castle University, UNSW, University of Peradeniya, University of Tokyo, IIT Bombay). More than 250 submissions were received, of which only 90 submissions are included the 7 thematic areas after double-blind review. The acceptance rate of the papers varied from 24% to 50% in different themes. Apart from the keynote sessions, a panel discussion was also organized on September 17, 2022. The topic of the discussion was "Challenges and Opportunities for Smart Transportation Systems in India" in which the panelists were, Mr. Amit Sinha, Director (ITDA) & ADG (Police Telecom), Dehradun, Prof. Dilum Dissanayake, Senior Lecturer, Newcastle University, UK, Prof. Itzhak Benenson, Professor, Tel Aviv University Israel, Mr. Venkata Chundururu, Director, IBI Group, Mr. Akhilesh Shrivastava, Project Head, India Road Safety 2.0, World Economic Forum and IT Advisor, Government of Uttarakhand and Mr. Pradeep Kushwaha, Business Unit Head- Public Safety, NEC Corporation India Pvt. Ltd. Seven Best Paper awards were given in each of the seven themes during the valedictory ceremony of the conference on September 17, 2022. The third version of this conference is scheduled for 2025.

## 9<sup>th</sup> "International Symposium On Hydraulics Structures" (ISHS - 2022): October 24-27, 2022

The event, being organized by the Department of Civil Engineering, IIT Roorkee, provided a distinctive opportunity for engineers and researchers working in this area to present their works and share recent advancements in the field of hydraulic structures. Addressing the conference, Prof. K. K. Pant, Director, IIT Roorkee, said, "IIT Roorkee is proud to host the 9th International Symposium on Hydraulic Structures first time in India. It is a great opportunity for the Institute's students and researchers to interact with national and international experts in hydraulic structures.

Delivering the welcome address, Prof. Praveen Kumar, Head, Department of Civil Engineering, said, "The Department of Civil Engineering at IIT Roorkee is the oldest and the largest in the country and is considered as the best in the country for the education in Civil Engineering. The department is producing several eminent engineers who are making notable contributions in the planning and execution of Civil Engineering projects in India as well as abroad." Conference Chair Prof. Zulfequar Ahmad, Department of Civil Engineering, IIT Roorkee, Prof. Sebastien Erpicum, Liege University, Belgium, and other eminent experts spoke on the occasion. A technical tour to Upper Ganga Canal was conducted on 24th October and a workshop was organised on 25th October 2022 on sustainable design and construction of 'non-linear weirs.' Prof. Sebastien Erpicum, Liege University, Belgium, and Prof. Brian M. Crookston, Utah State University, USA, conducted the symposium. The workshop was followed by a hands-on experiment on the Hydraulic Laboratory of the Dept. of Civil Eng which was conducted by Prof. Z Ahmad and Research Scholars.



## Seven Days Training Program on Total Quality Management Including Quality Control Tests: October 31 - November 6, 2022



A training course on Total Quality Control including Quality Control Tests was organised on October 31 to November 6, 2022 for 20 Engineers by Prof Praveen Kumar, Prof P K Gupta and Prof Nikhil Saboo. It was a combination of Road Works and Bridge Works. The course included lectures on Theory and hands on practice in laboratory. It was sponsored by Ministry of Road Transport and Highways.

## Specialist Lectures And Practical Session On Application Of Geosynthetics For Dam Safety And Rehabilitation: November 11-13, 2022

The Department of Civil Engineering and Department of Hydrology, IIT Roorkee organised specialist lectures and practical session on "Application of Geosynthetics for Dam Safety and Rehabilitation" by Shri Vivek Kapadia, Director Sardar Sarovar Narmada Nigam Ltd. and Secretary to Government of Gujarat, from 11 to 13 November 2022. Prof. B. K. Yadav, head of Hydrology Department and Prof N.K. Goel, coordinator for M. Tech. Dam Safety and Rehabilitation program were present during the inaugural session. The short course comprised of lectures, laboratory testing and one-to-one interactions. The lectures and sessions were attended by 17 participants enrolled in M. Tech. Dam Safety and Rehabilitation program that includes sponsored officers from organisations such as Central Water Commission, Damodar Valley Corporation, State irrigation departments, etc. The closing session was attended by Prof. Praveen Kumar, Head of the Civil Engineering Department, Prof. N.K. Samadhiya, President of Indian Geotechnical Society and Prof. N.K. Goel. The specialist lectures were organised as part of DS-518 module and coordinator of this course was Prof. Akanksha Tyagi.



## Geomatics Survey Camp: November 27 - December 10, 2022



Geomatics Survey Camp was held during November 27 - December 10, 2022 in Chandi Ghat Area of Haridwar with 180+ B.Tech Civil Engineering Students, 13 M. Tech Geospatial Engineering Students. The camp was organized by Prof. Siddhartha Khare and Prof. Saurabh Vijay. It was more than 125 hours of survey with Total Station, GPS, Drone and Satellite Remote Sensing Data. HCED Prof. Praveen Kumar, Prof. P. K. Garg, Prof. S. K. Ghosh, Prof. R. D. Garg, Prof. Alok Bhardwaj made visits to the camp area and shared their experience with students.

## GIAN Course on Water Sensitive Urban Design and Integrated Urban Water Management: December 19-23, 2022

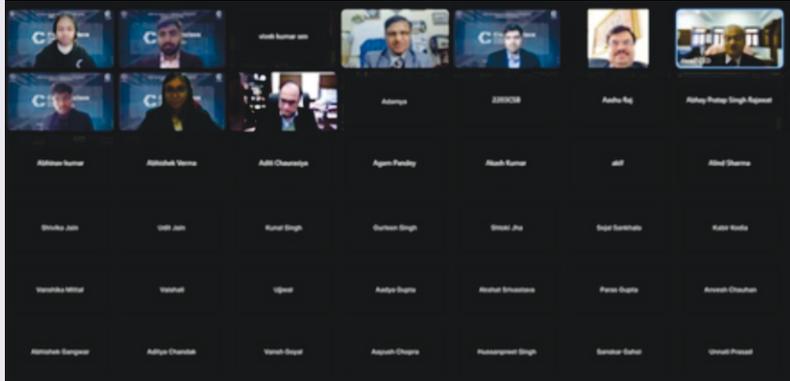
The GIAN (Global Initiative of Academic Networks) course on "Water Sensitive Urban Design & Integrated Urban Water Management" was organized by the Department of Civil Engineering, Indian Institute of Technology Roorkee, during December 19-23, 2022, under the aegis of Ministry of Human Resource Development (MHRD), Government of India. The course emphasized the theme of Urban Water Management. At the outset, Prof. Praveen Kumar, Head of Civil Engineering Department, IIT Roorkee, inaugurated the course and highlighted that the contemporary world is facing increasing demand for water and its judicious use.



Prof. Ashok Sharma, Course Instructor and Foreign Expert, Victoria University, Australia; Prof. Pramod Kumar Sharma, Course coordinator, IIT Roorkee; Prof. Zulfequar Ahmad, IIT Roorkee and Prof. Inderdeep Singh, GIAN course local coordinator, provided valuable insights of the GIAN course and addressed the current and future research in the Urban Water Management, need for the creation of dialogue among stakeholders, develop new skills for early career researchers and the need to optimal use of water in urban as well as rural areas to make a sustainable future.

The course was attended by 34 participants from different parts of India, including faculties, experts, early career researchers and students. The Course Instructor, Prof. Ashok Sharma, Local Coordinator Prof. Priti Maheshwari and Course Coordinator, Prof. Pramod Kumar Sharma, summarized the 5-day activities and appreciated the team effort and support of different departments, which led to the success of the GIAN course. The valedictory session ended with a vote of thanks presented by Prof. Pramod Kumar Sharma.

### Civil Conclave 2022: December 24-26, 2022



Civil Engineering Consortium(CEC) within Civil Engineering Department organized a 3-day Inter-IIT Civil Conclave starting from 24th December, for Civil engineering students across all IITs. The event was sponsored by various civil engineering firms like "SFC Environment Technologies" as the Gold Sponsor and "YG Consulting and Engineers" and "RK Engineers" as the Bronze Sponsor. This virtual event was organised under the theme "Fortifying Future" keeping in mind the idea of using cutting edge technologies for advancing into the future.

More than 200 participants from more than 15 IITs like IIT Madras, IIT Patna, etc. took part in events like Case Study competition, PG Research Work, Seek the Civil Geek, Design Different, Guest Lectures, etc. The total cash prize pool of the event was 1.75 lakh rupees. The problem statements provided by various companies like GR Infraprojects, Forest Survey of India, ONGC and others were designed in a way to tickle the brains of the participants and also to find solutions to present day issues. "Revamping Forest" was one such case study directed towards modern-day environmental problems. The event was graced by the Chief Guest, Shri G P Upadhyay, Chief Secretary of the Govt. Of Sikkim. Being an alumnus of IIT Roorkee he shared his experiences when he was a student at IIT Roorkee, how he topped the college in 1985 and his journey of becoming the Chief Secretary of Govt. of Sikkim inspite of belonging to a small town in Uttar Pradesh.

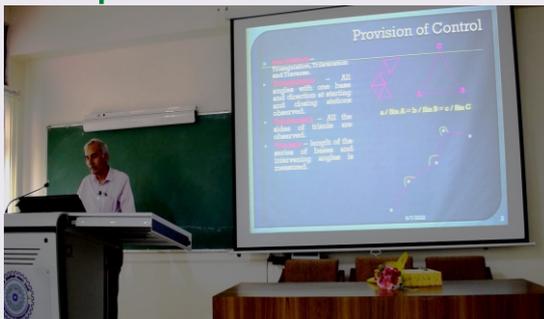
The inauguration ceremony was also graced by IIT Roorkee's honorable director Prof. K. K. Pant; Prof. Praveen Kumar, Head of the Civil Department, IIT Roorkee and professors of the department namely Prof. Satyendra Mittal, Prof. Kamal Jain, Prof. Gargi Singh etc. "For the development of sustainable future, knowledge and researches are required not only in the field of Civil Engineering but also in other fields such as Big Data, AI among others and IIT Roorkee will always step forward to support such developments and startups for strengthening the future." said Prof. K. K. Pant, Director, IIT Roorkee. The Conclave witnessed guest lectures from NIC, AECOM and Bentley Systems

The valedictory ceremony was graced by Chief Guest Shri Abhishek Ruhela, DM, Uttarkashi. Being an alumnus of IIT Roorkee, he was really happy to serve as the chief guest of the valedictory. Prof. Praveen Kumar, Head of the Civil Department, IIT Roorkee and many professors of the department were also present during the valedictory ceremony. The 2nd runner up for Inter IIT Civil Conclave 2022 was IIT Guwahati, first runner up being IIT Jammu and the overall championship was bagged by IIT Indore.



## GUEST LECTURES/AWARD CEREMONIES

### "Geospatial Lecture Series" Lecture 1: September 07, 2022



**Title of Talk :** "Indian Geodetic Reference Frame" first lecture of Geospatial Lecture Series was delivered by Dr. Upendra Nath Misra Deputy Surveyor General, Survey of India, Dehradun on September 07, 2022 in Conference Room of Department of Civil Engineering, IIT Roorkee. The lecture started with the basics of surveying was mapping and its significance in Civil Engineering projects. It has been emphasized that the quality of engineering surveying depends primarily on accuracy of Control points.

It was explained how after the advent of Global Positioning

System, India adopted its datum and reference frame to be compatible with the Global Positioning System. Also, it was deliberated upon how new series of levelling line known as Redefined Indian Vertical Datum (RIVD) level lines to overcome the deficiencies of the first level lines. Focus of the lecture was on GCPs and RIVD of India which constitute the component of modern geodetic reference frame of India and related



issues such as types of datums (both horizontal and vertical), types of earth's surfaces, ITRF, WGS84 systems, tidal gauge observatory etc. Prof. Praveen Kumar HoD, Civil Engineering Department presented him a token of appreciation, and the event was coordinated by Prof. Jayanta Kumar Ghosh.

### "Geospatial Lecture Series" Lecture 2: September 28, 2022



**Title of Talk:** "Artemis III- Role of Remote sensing & GIS techniques to evaluate lunar landing site" second lecture of Geospatial Lecture Series was delivered by Mr. Prateek Tripathi Research scholar (Geomatics Engineering) under the supervision of Prof. R. D. Garg on September 28, 2022 in Conference Room of Department of Civil Engineering, IIT Roorkee. The Lecture started with brief description of the Artemis program which is a robotic and human Moon exploration program led by NASA, ESA, JAXA and CSA; its major components, long-term goal etc.

It was explained how samples from different missions like Apollo, Chandrayaan-1, Chandrayaan-2, Lunar Prospector, Kaguya, Lunar Reconnaissance Orbiter, etc plays a crucial role in formulating the objectives for Artemis missions and that utilize the Orion crew vehicle (spacecraft), the Deep Space Gateway, the Human Landing System, and robotic assets on the lunar surface. The lecture explained how combination of remote sensing observations, GIS techniques, and geological information gets integrated for exploration activities adopted by mission architects and spacecraft engineers. How activities involve assessments of landing sites and traverse plans for multiple destinations responsive to Artemis mission and NASA objectives. Following the huge involvement of Indian researchers and the crucial contribution of Chandrayaan-1 and Chandrayaan-2, the lecture focused on the Artemis constellation program and the contribution of Remote sensing observations in formulating its objectives. The contribution of Remote sensing- GIS techniques to the formulation of a global lunar landing site to provide the scientific context for exploration of the moon has also been focused. Prof. P. K. Garg presented him a token of appreciation, and the whole event was coordinated by Prof. Jayanta Kumar Ghosh.



### Guest Lecture by Mr. Vaibhav Jindal Mr. Ajay Meena Asst. Directors Bureau of Indian Standards: September 30, 2022



A guest Lecture was delivered by Mr. Vaibhav Jindal, Asst. Director, BIS and Mr. Ajay Meena, Asst. Director, BIS on September 30, 2022 in OP Jain Auditorium, Department of Civil Engineering, IIT Roorkee. The lecture was on the topic Standardization in Water Resource Engineering in association with Civil Engineering Consortium (CEC). Prof. Praveen Kumar, Head Civil Engineering Department and Prof. Satyendra Mittal honoured them with presentation of memento.

### "Geospatial Lecture Series" Lecture 3: October 19, 2022

**Title of Talk:** "Analysis of Groundwater resources using GRACE satellite data" third Lecture of Geospatial Lecture Series was delivered by Dr. Vivek Agarwal Lecturer, North Umbria University Newcastle, United Kingdom on October 19, 2022 in Conference Room of Department of Civil Engineering, IIT Roorkee. The lecture started with an explanation of how important water is for society and its different uses. Followed by explanations of its availability, consumptions all over the world & significance of its monitoring and management for its prudent utilisation.



Subsequently, the speaker introduced about the GRACE mission which is being used for regional and global climate change study based on space-based gravity measurement. Then, he explained the significance of the different places of gravity measurement and how the different precision place of gravity measurement are related to gravitational attraction, rotation and ellipticity of the earth, luni-solar tides, local atmospheric pressure, polar motion, hydrology, oceanic tidal loading, free inner core nutation, free inner nutation etc. He also, explained the different levels of data available from GRACE mission. Finally, explained how GRACE data are used for different climate change studies such as TWS, hydrology, glacial study, drought, flood etc. followed by a case study of London subsidence study. The event was coordinated by Prof. Jayanta Kumar Ghosh.

## “Prof. R J Garde Endowment Lecture”: November 09, 2022



### Title of Talk: “Understanding Synthetic Aperture Radar”

Prof. R. J. Garde Endowment Lecture was delivered by Dr. Tapan Misra, D.Sc. on November 09, 2022 in OP Jain Auditorium, Department of Civil Engineering, IIT Roorkee. The programme was graced by chief guest Prof. K. K. Pant, Director IIT Roorkee who welcomed the speaker Dr. Tapan Misra, by presenting him a token of love. The lecture on Understanding Synthetic Aperture Radar (SAR) started with a brief history of development of RADAR technology. Subsequently, the basic concept of SLAR, Side Looking Air-borne Radar has been explained to understand/ appreciate the background of SAR technology.

It was followed by a detailed explanation of SAR imaging process and then, took the audience through experiences and understanding derived out of the hands on experiences in bringing India in the forefront of SAR technology. How RISAT has been introduced first time in the world, how Hybrid Polarimetry, Dual band SAR etc. got introduced in Indian space has been explained. Also, explained how NI-SAR (Nasa India SAR) has come up and will measure and assess deformation, Ecosystem and dynamics of ice etc.



Finally, a lot many SAR images were displayed with detailed explanations of features such as polarization, backscattering, shadow, structure, roughness etc. relating interpretation of many civil engineering problems/solutions like subsidence, flood, watershed etc. The event is coordinated by Prof. Jayanta Kumar Ghosh.

## Guest lecture by Dr. Venkatesh Mohan Merwade, Professor, Hampton Hall of Civil Engineering Purdue University West Lafayette: November 14, 2022



A guest lecture was delivered by Prof. Venkatesh Mohan Merwade on November 14, 2022 in Conference Room of Department of Civil Engineering, IIT Roorkee. The event was presided over by Prof. Praveen Kumar, Head Department of Civil Engineering, IIT Roorkee. Prof. Merwade talked on the topic “Integrated Modeling of Floods at Multiple Spatial and Temporal Scales”. The talk was attended by large number of students, and faculty members.

## UPCOMING EVENTS

**GIAN Course on Flow and Contaminant Transport through Subsurface February 20-24, 2023.** Under the aegis of Global Initiative of Academic Networks (GIAN) organized by the Civil Engineering Department. An initiative of the Ministry of Education (MoE). The instructor of course is Dr. Rao S. Govindaraju. The coordinator of the courses are Dr. K.S. Hariprasad & Dr. P.K. Sharma respectively. For more details, go to link below.

[https://civil.iitr.ac.in/assets/PDF/Event/GIAN\\_February-20-24-2023.pdf](https://civil.iitr.ac.in/assets/PDF/Event/GIAN_February-20-24-2023.pdf)



**5<sup>th</sup> 15 days Road Safety Auditors Certification Course** in association with the Ministry of Road Transport & Highways and Indian Roads Congress is going to be organized by Indian Institute of Technology Roorkee as per the latest course content and guidelines prepared by MoRTH and IRC for fulfilling eligibility requirements of Road Safety Auditors. This course will be an excellent opportunity for Engineers, Consultants, Practitioners, Researchers, etc., with Civil Engineering background to enhance their knowledge and skills, and certify themselves in the domain of Road Safety Engineering and Auditing. Examination/evaluation will be conducted for the issuance of accreditation from IRC. As advised by the Ministry, the 5th RSA course will be held physically from 20th February to 06th March 2023 at IIT Roorkee. For more details, go to link below.

<https://civil.iitr.ac.in/road-safety-course>

## VISITORS



### Prof. Sudhir K Jain, Vice Chancellor of Banaras Hindu University, Varanasi

has made a visit at the Civil Engineering Department, IIT Roorkee on August 10, 2022. He had a very delightful conversation with the faculty members of the Department about the challenges he faced in his career and shared his ample experience of teaching as well as administration on the occasion of the Distinguished Alumnus Award Ceremony.

**Ms. Pauline Bonnard from ESTP Paris, France** visited Civil Engineering Department, IIT Roorkee on September 20, 2022 for an Exchange Programme organized by the Civil Engineering Department. In which she introduced opportunities to various engineering programmes in ESTP Paris and have a healthy interaction with students and faculty members.





**Prof. Prashant Kumar of University of Surrey, UK** visited Civil Engineering Department, IIT Roorkee on December 26, 2022. The visit was to strengthen them further by brainstorming on the proposals for joint doctoral degree programs, faculty exchange and student mobility for the same. From IIT Roorkee, Prof. Partha Roy (Dean of Resources & Alumni Affairs), Prof P Arumugam (Dean, International Relations) & Dr. Ravikant Ranjan (International Relations Office) interacted with the faculty members of University of Surrey, Prof. Jhuma Sadhukan (Centre for Environment and Sustainability, Department of Chemical and Process Engineering, Prof Prashant Kumar (Associate Dean (International), Professor and Chair in Air Quality and Health; Founding

Director, Global Centre for Clean Air Research (GCARE) and Prof Paul Stevenson, Head of the Theoretical Nuclear Physics Group. Both partner institutes had long discussions regarding the opportunities available at IIT-Roorkee for faculty & student exchanges, and research collaborations, including joint degree programmes. For research collaboration, Prof Jhuma requested a letter of support from Prof Arumugam. Later Prof. Kumar accompanied the IITR delegates to different research facilities of University of Surrey and apprised the visiting delegates about various opportunities for collaboration and mobility. Prof. Arumugam invited the host university members to visit IIT Roorkee, to continue the discussions to strengthen cooperation.

## Alumni Connect

### 12 Civil Engineering Alumni Of 1967 Visited The Department And Shared Their Memories And Experiences With The Faculty Members Of The Department: October 28, 2022



### 15 Civil Engineering Silver Jubilee Alumni Of 1997 Visited The Department And Shared Their Memories And Experiences With The Faculty Members Of The Department. November 14, 2022



### 24 Civil Engineering Golden Jubilee Alumni Of 1972 Visited The Department And Shared Their Memories And Experiences With The Faculty Members Of The Department. November 24, 2022



## 8 Civil Engineering Diamond Jubilee Alumni 1962 Visited The Department And Shared Their Memories And Experiences With The Faculty Members of The Department: November 27, 2022



### INFRASTRUCTURE (NEW LAB INSTRUMENTS)



#### Gantry-Based 3D Concrete Printer ₹ 44.39 lacs

This gantry-based 3D concrete printer is equipped with a 3-axis nozzle allowing 3D printing of laboratory-scale concrete/mortar structures on a flat surface using extrusion technology. The printer has a build volume measuring 1.0 m (L) x 1.0 m (W) x 0.5 m (H), and the printing speed ranges from 0 to 100 mm/s. A separate nozzle arrangement for concrete and mortar mix is present in the system with the 360-degree rotation. Three types of nozzles (square, rectangular and circular) are available for printing, and their size varies from 10 mm to 40 mm. The width of each printed layer can range from 3 mm to 20 mm. Different instruments are available for pumping the concrete mix (with aggregate size up to 10 mm), and mortar (mix with aggregate size below

2mm). They are respectively called extrusion pump and mortar pump. This printer has a complete CNC control mechanism and a fully integrated concrete mixing and pumping system.



#### Rowe Cell Testing System ₹ 36.00 lacs

The Rowe cell system herein incorporates mainly large diameter consolidation cell, automatic pressure controllers (maximum pressure and volume up to 1000kPa and 250cc respectively), five pore water pressure transducers, and vertical displacement sensor. The de-aired water tank provided is used to remove the entrapped air from the sample. The Rowe Cell has the diameter of 250 mm and height 90 mm. The large diameter cell allows testing for soil types, which are susceptible to large settlements, such as clay slurries, organic soils, or heterogeneous materials, such as mine tailings. The system can also measure the radial consolidation. In addition, the falling head permeability can also be

conducted at different effective stresses, this feature is custom-fabricated in this equipment.

#### FTIR Spectrometer ₹ 14.38 lacs

FTIR stands for Fourier Transform InfraRed, the preferred method of infrared spectroscopy. In infrared spectroscopy, IR radiation is passed through a sample. The sample absorbs some infrared radiation, passing some through (transmitted). The resulting spectrum represents the molecular absorption and transmission, creating a molecular fingerprint of the sample. No two unique molecular structures produce the same infrared spectrum as a fingerprint. It makes infrared spectroscopy useful for several types of analysis. Fourier transform infrared spectroscopy (FTIR) is a technique used to obtain the infrared spectrum of absorption, emission, and photoconductivity of solids, liquids, and gas. It is used to detect different functional groups in PHB. FTIR spectrum is recorded between 4000 and 400  $\text{cm}^{-1}$ .





**Calorimeter**  
₹ 1.50 lacs



**Deep Freezer**  
₹ 1.50 lacs

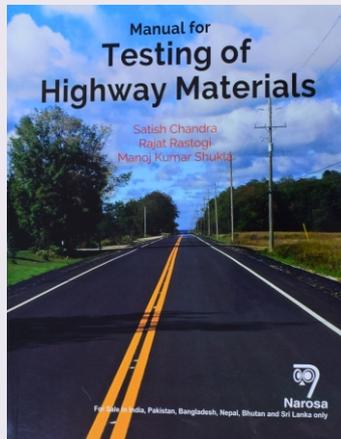


**Bitumen Extractor**  
Motorized with  
Variable Speed  
₹ 0.49 lacs



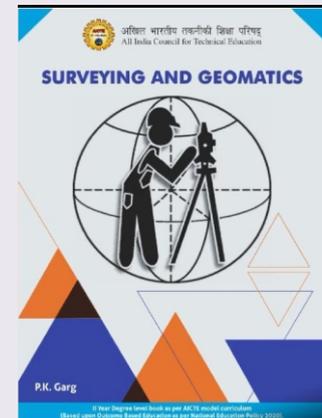
**Drum Type Wet  
Gas Meter (RITTER)**  
₹ 4.00 lacs

## BOOK PUBLISHED



A manual for **Testing of Highway Materials** co-authored by **Satish Chandra, Rajat Rastogi and Manoj Kumar Shukla** is published by Narosa Publishing House, New Delhi. The manual covers the testing procedures related to road materials like Soil, stone aggregates and Bituminous Materials and Mixes as relevant to road construction. It incorporates latest specifications as per BIS codes and Ministry of Road Transport and Highways. The manual will be a useful document for students and Highway Professionals. Each Chapter is provided with a table for recording of the observations which will be helpful for both students and researchers.

AICTE Outcome-based Engineering book titled **Surveying and Geomatics**, authored by **Dr. Pradeep Kumar Garg**, Professor, Civil Engineering Department, IIT Roorkee.



## MOU'S

### MoU with MoRTH



The Endowment Fund for the Chair sponsored by the Ministry of Road Transport and Highways (MoRTH) has been enhanced from Rs 1 Crore to 7 Crores. The interest from this Endowment Fund will be utilized for various new projects in the department. Presently Prof. Praveen Kumar is holding this chair.

## FAREWELL



Smt. Shashi Prabha, Senior Assistant in Departmental Library has been retired. The Department of Civil Engineering wishes her happy and healthy retirement life.

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