IIT Delhi and AIIA to Jointly Work on Studying Therapeutic Benefits of Herbal Formulations

Education Minister Addresses Students of 1st Batch of ASEAN PhD Fellowship Programme
Dear friends and well-wishers of IIT Delhi,

I am happy to present the February 2021 Issue of the Institute newsletter to you.

The current issue will give you a glimpse of the Academic Achievements, Research & Innovations, Collaborations and Alumni Contributions.

Your comments and suggestions are welcome to make the next issue of the newsletter more interactive.

Warm regards,

V. Ramgopal Rao
Director, IIT Delhi
IIT Delhi celebrated its 63rd Foundation Day on 27th January 2021. Dr. Renu Swarup, Secretary, Department of Biotechnology delivered the Foundation Day Lecture on “The Biotech Revolution: Are we ready for the future?”. Congratulating the IIT Delhi community on the Institute’s Foundation Day, Dr Swarup said that IIT Delhi holds a special place when it is about achievements in terms of leadership and building a very strong education ecosystem. Prof V. Ramgopal Rao, Director, IIT Delhi said, “Given the fact that out of 11,000 students on the campus over 3,000 are PhD students, the Institute is becoming more and more a research oriented kind of university.” On this occasion, the Institute also honored its faculty members with the Faculty Research Awards.

Hyundai Motor India Foundation Signs MoU with FITT, IIT Delhi

Hyundai Motor India Foundation, the philanthropic arm of Hyundai Motor India, has signed a Memorandum of Understanding (MoU) with Foundation for Innovation and Technology Transfer (FITT), IIT Delhi and donated a KONA Electric for Noise, Vibration, and Harshness (NVH) and battery technology research by IIT Delhi. The Centre for Automotive Research and Tribology (CART), IIT Delhi will conduct battery profiling in KONA Electric using external sensors or other gadgets using OBD port to understand the performance of Electric Vehicle during different driving conditions for the purpose of research & training.

IIT Delhi and All India Institute of Ayurveda (AIIA), New Delhi, have come together to work on seven collaborative projects involving faculty members and support from both sides. The projects emanate from an MoU signed earlier between the two institutions for interdisciplinary research in Ayurveda and applying engineering science principles. The collaborative projects include: Effect of the six Ayurvedic rasas (tastes) on gastrointestinal secretions; Develop a ‘dhoopan-yantra’ - a fumigation device for aiding wound healing; Develop a biodegradable, herbal wound dressing etc.

Joint PhD Programme by UQIDAR Aims to Reach 300-Student Mark in Next Three Years

The University of Queensland (UQ), one of the top global universities, and IIT Delhi, an Institution of Eminence, had come together and established the UQ-IITD Academy of Research (UQIDAR) to run a joint PhD programme to support scholars across diverse discipline areas to deliver global impact. The programme, which is now two years old, has already attracted over 65 top PhD scholars in various disciplines. At a steady state, the scale target for the UQIDAR is to have approximately 300 students enrolled in the joint PhD programme in the next three years. In January 2021, a permanent office of the UQIDAR was inaugurated on the campus.

Vanadium Redox Flow Battery based Charging Station for Electronic Devices Inaugurated at IIT Delhi

IIT Delhi’s Sustainable Environergy Research Lab (SERL) at the Department of Chemical Engineering is actively working on Vanadium Redox Flow Battery (VRFB) technology. Recently, a VRFB based charging station, especially designed under Smart Campus Initiative of the Institute, was inaugurated on the campus. The stored energy in the charging station can be used to charge portable electronic devices such as mobile phones, laptops, tablets, and power banks using various charging ports provided in the station. The team has designed it for charging operation of around 9 hours in a day.
UNDP Awards First Prize to Innovation of Plant Based Mock Egg by IIT Delhi Scientist

Innovation of plant based mock egg by Prof. Kavya Dashora, CRDT, IIT Delhi has secured first prize at Innovate4SDG contest by ‘UNDP (United Nation Development Program) Accelerator Lab India’. The award included a sum of USD5000 and was conferred online by Ms Christiane Hieronymus, Head of Economic Cooperation & Development, Embassy of Federal Republic of Germany, New Delhi and Prof K. VijayRaghavan, Principal Scientific Adviser to the Govt of India. According to the UNDP, the mock egg innovation is a perfect innovation that will help in accelerating progress towards the SDGs.

IIT Delhi, NIT Srinagar Sign MoU for Academic and Research Collaboration

IIT Delhi and National Institute of Technology (NIT) Srinagar (J&K) signed an MoU in December 2020 for collaboration on academic and research activities in the areas of mutual interest including collaborative research works, joint supervision of PhD students, joint workshops and seminars, etc. The MoU is part of the IIT Delhi initiative to welcome meritorious UG students from NITs to spend their final year at IIT Delhi, pursue courses, and do a project. The students will go through a rigorous selection process, and subject to their continued excellence, will be considered for an early admission to PhD programs at IIT Delhi.

CSC Partners with IIT Delhi to Set Up Design and Innovation Lab for Rural Entrepreneurs

The Common Services Centre (CSC), under the Union Ministry of Electronics and Information Technology, has partnered with IIT Delhi to promote design and innovation among the Village Level Entrepreneurs (VLEs) managing the CSCs across the country. As per the MoU signed in December between the CSC Academy and IIT Delhi, a design & innovation lab will be set up at the Department of Design, IIT Delhi for conducting research on design-led innovations related to leveraging livelihood and enhancing their all-round entrepreneurial outlook.

Emotive Visual Identity for IIT Delhi Endowment Fund Launched

As IIT Delhi Endowment Management Foundation (IITDEMF) sets up operations, there was a need to create a distinct visual identity to strike an emotive connection with the alumni community and generate awareness of the mission and purpose of the endowment fund. On November 29th, 2020, Prime Minister Shri Narendra while addressing the nation through his monthly radio programme ‘Mann Ki Baat’ hailed the efforts of the IIT Delhi alumni in establishing their endowment fund as a brilliant idea.
IIT Delhi, RCB Faridabad Sign MoU for Academic and Research Collaboration

IIT Delhi and Regional Centre for Biotechnology (RCB) Faridabad have signed an MoU to establish “RCB-IITD Collaborative Platform” for initiating wide-ranging collaborations involving academic, research, and human resource development, which will have a profound social and economic impact for the country. Speaking of the MoU with IIT Delhi, Dr. Sudhanshu Vrati, Executive Director, RCB Faridabad said, “This should encourage multidisciplinary research at the two institutions with the expertise of RCB faculty in biotech sciences and IIT Delhi in engineering and sciences.”

Big Win for IIT Delhi Student-led Automobile Club in International Formula Student Competition

Axlr8r Formula Racing, the automobile club of IIT Delhi, participated in two virtual Formula Student competitions - Formula SAE Australasia 2020 and Formula Bharat 2021 - and achieved splendid results in both. In Australasia, they competed against some of the best international teams and achieved:

- 1st Position in the ‘Cost event’.
- 2nd Position in the ‘Business event’.
- Scored 106/150 in the ‘Design event’

Centre of Excellence (CoE) on Personal Body Armour Inaugurated

Dr G. Satheesh Reddy, Secretary, DDR&D and Chairman, DRDO inaugurated Centre of Excellence (CoE) Personal Body Armour at IIT Delhi in October 2020. The creation of the CoE has been at the behest of NITI Aayog under “Make in India - Personal Body Armour” initiative of the PMO. This is culmination of a joint research initiative of DRDO & IIT Delhi.

Education Minister Addresses Students of 1st Batch of ASEAN PhD Fellowship Programme

Union Education Minister, Shri Ramesh Pokhriyal ‘Nishank’ virtually addressed the students of the various ASEAN member states who were selected for the prestigious ASEAN PhD Fellowship Programme (APFP) funded by the Government of India. He congratulated them on their selection in the IITs, the country’s premiere technological institutions. The Union Education Minister said that the academic and research ties among India and ASEAN member states will be mutually beneficial for both the regions.

IIT Delhi, DAKSH Society Sign MoU to Establish DAKSH Centre of Excellence for Law and Technology

IIT Delhi and DAKSH Society, Bengaluru signed an MoU in October 2020 to establish the DAKSH Centre of Excellence (CoE) for Law and Technology at IIT Delhi. The CoE will conduct inter-disciplinary research on various aspects of the justice system and build solutions drawing from fields such as operations research, data analytics, technology and law, to improve its effectiveness. Speaking of the MoU with IIT Delhi, Shri Surya Prakash BS, Programme Director, DAKSH, said, “This is an exciting partnership that will provide independent, non-partisan inter-disciplinary research to address the most pressing issues in the justice system.”
IIT Delhi Researchers Propose Non-Leachable Antimicrobial Coating to Deal with Implant-Associated Infection

A research group led by Prof. Sampa Saha, Department of Materials Science and Engineering, has proposed a non-leachable antimicrobial coating as a measure to deal with the danger of infections related to medical implants. The study was published in a highly reputed journal, ‘Materials Science and Engineering C’. The research team created a biodegradable 3D printed polymeric implant, which is modified with anti-infective polymer brushes. The implant itself is fabricated from a blend of completely biodegradable polyesters, i.e. polyester of tartaric acid - a natural acid found in tomatoes, grapes and raw mangoes and polylactic acid originated from corn starch. The research team members include Ms Shaifali, Department of Materials Science and Engineering, IIT Delhi; Prof Neetu Singh and Mr Akshay Joshi (Centre for Biomedical Engineering, IIT Delhi).

More details- https://home.iitd.ac.in/news-implant.php

IIT Delhi Faculty Comes Up with Mathematical Model to Implement India’s Vision of Self-Reliant Economy

Prof. Surya Prakash Singh, Management Studies Department, IIT Delhi has come up with a mathematical model for implementing India’s vision of a self-reliant economy. Prof. Singh and his research scholar Shubhangini Rajput in their research paper titled ‘Industry 4.0 Model for circular economy and cleaner production’, published in the Journal of Cleaner Production, have highlighted how the traditional Indian industrial sector is lagging behind in implementing Industry 4.0 concept in their manufacturing processes and has offered a tangible solution for implementing it. The proposed novel model by Prof Singh for Industry 4.0 set-up to achieve circular economy and cleaner production shows how the efficient use of high, medium and low precision machine variants in a non-conventional manufacturing environment can bring paradigm shift for Industry 4.0.


IIT Delhi-incubated Startup Launches Antimicrobial Water Storage Containers ‘AqCure’

Mixing traditional science with nanotechnology, an IIT Delhi-incubated startup ‘Nanosafe Solutions’ has developed a range of antimicrobial i.e. antiviral, antibacterial and antifungal water storage containers and launched it as “AqCure”, which is based on the inherent antimicrobial properties of copper. AqCure is a patented technology in which active nano-copper is released in a sustainable manner from a polymer matrix. The released copper makes the outer and inner surface of the container antimicrobial, reducing transmission of microbes upon direct contact, and making the stored water microbiologically safe. Additionally, the released copper in water is within permissible limits and thus fortifies stored water as copper is also an essential micronutrient, needed for growth. Elaborating the features of AqCure, Dr Anasuya Roy, an IIT Delhi alumna and CEO, NanoSafe Solutions said, “AqCure water containers have >99.99% antibacterial, >99.99% antifungal, and >99% antiviral activity tested as per ISO and ASTM standards. These containers are made from BPA/BPS-free high quality food grade polymers and is ideal for home and office use.”

**Industrial Research and Development**

**Sponsored Research Projects & Consultancy Work Undertaken Through IRD Unit between October - December 2020.**

- 47 Sponsored projects with a total sanctioned value of Rs 57.88 crores
- 88 Consultancy jobs with a total sanctioned value of Rs 7.85 crores

**High Value Sponsored Projects (Sanctioned Value INR 50 Lacs and Above) between October - December 2020**

- "Centre of Excellence for Advance Data Management System for Highways (ADMS Highways)" - Sponsored by National Highways Authority of India (Sanctioned Value: Rs. 1503.36 Lacs).
- "Daksh Centre of Excellence for Law and Technology" - Sponsored by Daksh Society (Sanctioned Value: Rs. 1500.00 Lacs).
- "Delhi Cluster: Delhi Research Implementation and Innovation (DRIIV)" - Sponsored by Office of the Principal Scientific Adviser, GoI (Sanctioned Value: Rs. 993.65 Lacs).
- "Material characterization of brain tissue and development of tissue-device interaction-based neurosurgical simulation tool" - Sponsored by Indian Council of Medical Research (Sanctioned Value: Rs. 426.47 Lacs).
- "Development of Indigenous Simulation Model for Design Validation of OHE Pantage Graph Interaction" - Sponsored by High Speed Railways Innovation Center (HSRIC) Trust (Sanctioned Value: Rs. 138.00 Lacs).
- "RE(Pd/Pt) Bi Thin films: A Multifunctional Experimental Platform for exploring Topological Quantum phenomena & Magnetism" - Sponsored by DST (Sanctioned Value: Rs. 115.39 Lacs).
- "Improving Crop Dynamics and Land-atmosphere Interaction in the Community Land Model for Major Indian agro-ecosystems" - Sponsored by Space Application Centre, ISRO (Sanctioned Value: Rs. 108.00 Lacs).
- "Establishment and application of an AQM model for the Indo-Gangetic Okain (IGP-AQMmod)" - Sponsored by The World Bank (Sanctioned Value: Rs. 100.88 Lacs).
- "Modeling and Simulation of Local Liquid Distribution in Trickle Bed Reactors" - Sponsored by IFP Energies Nouvelles (IFPEN), France (Sanctioned Value: Rs. 72.63 Lacs).
- "Continuous Flow Electrode Capacitive Deionization to Mitigate Water-Energy Nexus Trade-offs in Desalination" - Sponsored by DST (Sanctioned Value: Rs. 66.35 Lacs).
- "Development of functional admixtures for application to sustainable cements" - Sponsored by Chryso SAS (IU), France (Sanctioned Value: Rs. 60.00 Lacs).
- "Topology and Magnetism in Novel Quantum Materials" - Sponsored by DST through DST-International Multilateral Regional Cooperation Division (Sanctioned Value: Rs. 55.98 Lacs).

**Other Significant Research Activities**

**Multi-Institutional Faculty Interdisciplinary Research Project (MFIRP)**

- **University College of London (UCL) and IIT Delhi MFIRP Call 2020**: Six project proposals were approved in the areas of Healthcare Engineering, Cybersecurity, Advanced Materials, Sustainable Environment and Urban Development.
- **All India Institute of Ayurveda (AIITA) and IIT Delhi MFIRP Call-2020**: Seven AIITA-IITD MFIRP project proposals have been funded jointly by both institutes in the research areas of herbal formulation, wellness and dhoopan-yantra.

**Grand Challenges Initiative (GCI) for the Department of Humanities & Social Sciences:**

Under this initiative, eight projects have been sanctioned through a competitive & peer-review model of financial support. Each project proposal will receive an amount up to INR 50 lakh for a five-year duration. This initiative aims to initiate interdisciplinary research activities between the faculty members of the Department of Humanities & Social Sciences and Science & Engineering Departments of the Institute. More than 15 faculty members from other Departments/Schools/Centres are collaborating with Humanities & Social Sciences faculty under this initiative.

**Patents & Startups Generated Out of Research Projects Undertaken Through IRD**

- **Patents**
  - Total 23 patents were filed during this period.

- **Startups**
  - Sparsemind Technology Labs Pvt. Ltd. - Dr Jayadeva, Dept. of Electrical Engineering, IIT Delhi is one of its Founder Directors.
  - Silovo Ecobiz Pvt. Ltd. - Prof. Seema Sharma, Dept. of Management Studies.
  - Green Leisure Technology Pvt. Ltd. - Prof. K. K. Pant, Dept. of Chemical Engineering.
  - Accord Innovations Pvt. Ltd. - Prof. Amit Mehndiratta, Centre for Biomedical Engineering.

**Research Paper**

- 606 Research papers were published in reputed journals during this period.

**Monthly Webinar Series**

Prof. Shashank Deep from the Dept. of Chemistry, IIT Delhi, presented a webinar on "EGCG from Green Tea and a ferin from Aswagandha as a Potential Inhibitor of SARS-CoV-2 Main Protease" in November 2020.

For details of the Covid-19 research at IIT DELHI, pl visit: [https://home.iitd.ac.in/covid19-response.php](https://home.iitd.ac.in/covid19-response.php).
Faculty Awards & Recognition

Faculty Research Awards

Sulochana & Colonel A Krishnaswami VrC VSM Lifetime Research Award

Prof. Anurag Sharma  
Dept. of Physics

Prof. Bodh Raj Mehta  
Dept. of Physics

Prof. Siddharth Pandey  
Dept. of Chemistry

Prof. K. K. Pant  
Dept. of Chemical Engineering

Prof P.C.P. Bhatt Basic Research Award

Prof. Siddharth Pandey  
Dept. of Chemistry

Prof. K.L. Chopra Applied Research Award

Prof. K. K. Pant  
Dept. of Chemical Engineering

Mrs Veena Arora Early Career Research Award

Prof. Amit Gupta  
Dept. of Mechanical Engineering

Prof. Hemant Kumar Kashyap  
Dept. of Chemistry

Prof. (Ms) Leena Nebhani  
Dept. of Materials Science and Engineering

Prof. Mohd. Ali Haider  
Dept. of Chemical Engineering
Prof. B.K. Panigrahi  
Dept. of Mechanical Electrical Engineering

Prof. K.K. Pant  
Dept. of Chemical Engineering

Prof. K. Sreenadh  
Dept. of Mathematics

Prof. Mukesh Khare  
Dept. of Chemical Engineering

Prof. Abhijit R. Abhyankar  
Dept. of Electrical Engineering

Prof. Vipin Kumar  
Centre for Energy Studies

Dr. Manik Varma  
Adjunct Professor at School of IT and CSE Department

Prof. Kaushik Saha  
Centre for Energy Studies

Elected as Fellows of the National Academy of Sciences, India (NASI), Allahabad

Nominated as Full-time member of the Commission on Air Quality Management in NCR and Adjoining Areas by the Government of India

Invited to become a member of the Global Future Council on Clean Electrification, World Economic Forum

Elected a Fellow of the Indian Academy of Sciences (IASc)

Appointed as Guest Associate Editor of the Journal ‘Frontiers in Nanotechnology’ and also be serving as the Topic Editor for ‘Nanomaterials for Energy Applications’

Appointed as Associate Editor for the International Journal of Green Energy
Microsoft India Continues to Support IIT Delhi’s COVID-19 Research

Microsoft India, which earlier supported two COVID-19 researches by IIT Delhi faculties, further strengthened the relationship in October 2020 with another project by Prof. Vivekanandan Perumal, KSBS. The project aims at the development of a dual assay for simultaneous diagnosis of COVID-19 and Influenza A virus.

Prof. Anurag S. Rathore Felicitated with Agilent Thought Leader Award

On 7th December, 2020, Agilent Technologies honored Prof Anurag S Rathore with Agilent Thought Leader Award, for his contributions to the field of biopharmaceutical research and his work with advanced methods for molecular characterization of biosimilars. The Agilent Thought Leader Award program promotes fundamental scientific advances by contributing financial support, products, and expertise to the research of influential thought leaders in the life sciences, diagnostics, and chemical analysis space. Prof. Rathore is the first researcher in India to receive this award.

JETRO Events at IIT Delhi

Inaugural Event

Corporate Relations, IIT Delhi organized an inaugural online event in collaboration with JETRO (Japan External Trade Organization) on 18th Nov 2020. Over 150 participants from various Japanese companies attended the event, which aimed at introducing IIT Delhi to Japanese industries and businesses and extend co-operation in specific domains going forward. This is the key to enhance and develop the IIT Delhi and JETRO initiative of encouraging growth bilaterally.

The inaugural event observed opening remarks by Mr. Kazushige Nobutani, President of JETRO, Japan, and Prof. V Ramgopal Rao, Director, IIT Delhi. Mr. Noriyoshi Fukuoka, Director (South Asia), Trade Policy Bureau, Ministry of Economy, Trade and Industry, Japan and Shri. S K Marwaha, Senior Director MeitY also addressed the conference. Prof. Anurag S. Rathore, Dean, Corporate Relations, IIT Delhi and Mr. Murahashi Yasuyuki, Chief Director, JETRO India gave presentations. A plan to organise technology specific sessions in upcoming months with JETRO themed around Automotive, Healthcare and Artificial Intelligence was also announced.

Online Event with Automobile Industry

The inaugural session was followed by an event, themed around automotive sector, which envisaged to provide a glimpse of the initiatives being taken at IIT Delhi around Autonomous Electric Vehicle Technologies, AI/connected cars, security, and IoT and explore possible collaborations with Japanese companies. Delegates from more than 125 Japanese companies attended this event, which witnessed presentations from Japanese companies, IIT Delhi professors and start-ups working in the automotive sector. This endeavour targeted to provide a single platform to discover key collaboration frontiers across industry and academia in the automotive domain for redefining the business horizons by providing an innovation space for cutting edge technology.
Alumni Affairs & International Programmes

International Meetings

• Virtual meeting with Meshal Aleisa, Director, Ministry of Communication and Information Technology, Saudi Arabia - 03rd Nov 2020.

• MoU signing ceremony (virtual) with UTM, Malaysia led by Prof. Mohd Fadhil Md Din, Director of Campus Sustainability, UTM, Malaysia - 16th Dec 2020.

• Virtual meeting with Ambassador H.E. Yerlan Alimbayev and Ms. Laila Salykova (Director of International cooperation department of Astana IT University), Kazakhstan - 30th Dec 2020.

• A two-member delegation led by Prof. Jacob Opadeyi, Special Project Officer (former Vice Chancellor of University of Guyana) from Guyana visited IIT Delhi on 03rd Dec 2020.

Memorandum of Understanding (MoUs) with:

a. Universiti Brunei Darussalam, Brunei
b. University of Ghent, Belgium
c. Weizmann Institute of Science, Israel
d. University Technology Malaysia

Contributions by Alumni & others

IIT Delhi alumni have come forward in an impressive number to contribute very generously to support the various initiatives of the Institute. Some major contributions received between October to December 2020 are as follows:

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