

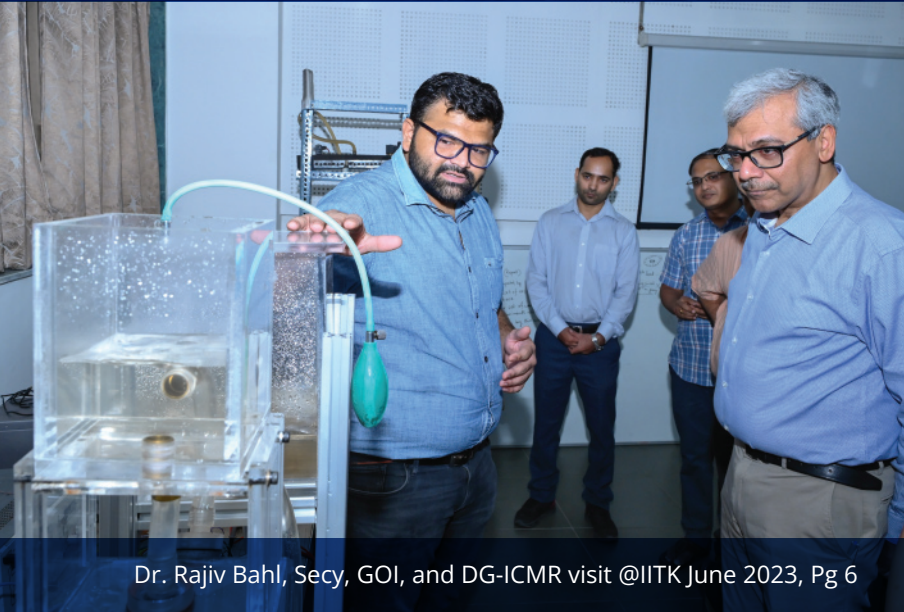


Biannual Newsletter

# स्वास्थ्य

Volume: 01 | Issue: 02 | Svasthya

GANGWAL SCHOOL OF MEDICAL SCIENCES AND TECHNOLOGY, IIT KANPUR



Dr. Rajiv Bahl, Secy, GOI, and DG-ICMR visit @IITK June 2023, Pg 6

## Inside this issue

- 2 Flagship Projects
- 3 Collaboration and Association
- 4 Workshops
- 5 Visits and Discussions
- 7 Lectures
- 8 Distinguished Visiting Professors

## About the School

The Indian Institute of Technology Kanpur (IIT Kanpur) has a long history of successfully attempting innovative approaches in education, technology, and research projects impacting society. The Gangwal School of Medical Sciences and Technology of IIT Kanpur will be the first of its kind in the country with the potential to create an impact on society and the economy on a local, national, and global scale. With its strong track record and infrastructure in MedTech Innovation, IIT Kanpur wishes to address this gap by establishing a medical school to bring a paradigm shift in approach toward medical research, academics, and innovation. The medical school will pursue academics and research at the intersection of technology and medicine to train and nurture next-generation medical practitioners and engineers for the country. The school will have world-class patient care facilities that will work closely with various academic and research units. The faculty members of IIT Kanpur associated with the centers of excellence of the medical school have initiated cutting-edge Med Tech research and innovations in collaboration with the medical fraternities from different medical schools and institutes. The medical school will have patient care facilities, a 450-bed Yadupati Singhania Super Speciality Hospital, and a 50-bed cancer care facility.



## Flagship Projects

An internal call for proposals was announced to escalate the research and innovation in the Gangwal School of Medical Sciences and Technology (GSMST). There was a selection process with experts from clinical and technical backgrounds and six flagship proposals were selected for funding by the Indian Institute of Technology Kanpur, for developing low-cost Med Tech innovations. The projects are:

### Percutaneous Mechanical Circulatory Support

A miniature device to pump blood from the left ventricle to the ascending aorta is mapped out. The planned device will have several subsystems that may form critical components of other medical devices and interventions such as intravascular lithotripsy, intra-arterial balloon pumps, stent delivery, dental equipment, etc.

### Development of Autonomous Stairs/Escalator Climbing & Self-navigating Smart Wheelchair

An autonomous wheelchair is designed with unique features that can climb the escalators, will have a human-machine interface embedded in the prototype, and features to detect falls, SOS, a monitoring system, and a secured data communication system.

### Development of 3-D Printed Porous Interbody Spacer for Spinal Deformity

The design of porous interbody spacers is under development for spinal deformities that can be accurately fitted into the intervertebral disc. The unique fabrication process will have the mechanical properties to overcome stress, shielding, and subsidence during implantation.

### Non-invasive Imaging and Diagnostics

A single optical fiber-based endoscope is being developed with sub-150-micrometer-diameter fibre that can play a significant role in multiple procedures, including brain surgery. This involves both hardware and software development to obtain real-time 3D renditions of 2D images.

### Rapidly Deployable Cardiac Digital Twin

Better predictive models from the Magnetic Resonance Imaging and Electrocardiogram of the patients' data are being analyzed for the digital twin approach, to solve the problem of Sudden Cardiac Deaths due to ventricular arrhythmias. This can assist in radiofrequency ablation and can be a future tool for doctors to ablate for particular predictions.

### Technology Platform for Rapid and Total Eradication of Tropical Gram-negative Bacteria via Plasmonic Heating

A platform is being developed for the rapid eradication of tropical Gram-negative bacteria by plasmonic photothermal therapy on the skin wound with the help of optical excitation-induced local heat generation by plasmonic agents.



## Signing of MOU

between



Apollo Hospitals Chennai  
Indian Institute of Technology Kanpur



Apollo Hospital Groups and IIT Kanpur MoA @Apollo Hospital Chennai January 2023

## Collaboration and Association

### Apollo Hospitals Group

A meeting with Dr. Prathap C Reddy, Chairman of Apollo Hospitals Group & Ms. Preetha Reddy, Vice Chairperson of Apollo Hospitals Group, was held on January 4th, 2023 to discuss the mutual synergies of making the health care system more advanced by introducing disruptive technology and pioneering research. IIT Kanpur signed a Memorandum of Agreement with Apollo Hospitals, for research in the clinical application of Artificial Intelligence, Telemedicine, Genomics, and other areas of mutual interest in healthcare technology.

### Laurus Labs

Indian Institute of Technology Kanpur signed a Memorandum of Agreement with the leading pharmaceutical company Laurus Labs on June 19th, 2023. Under this partnership, novel drugs based on gene therapy assets will be developed, focusing on the affordable treatment of disorders such as retinal degeneration, hemophilia, and muscular dystrophy, in India and the emerging world. Laurus Labs will also establish a state of art manufacturing facility for preclinical and clinical trials at IIT Kanpur's Techno Park.



Laurus Labs and IIT Kanpur MoA @IITK June 2023

## Workshops



National Students' Research Convention on Healthcare and Medtech @IITK March 2023

The Academics and Career Council of IIT Kanpur organized the 5th National Students' Research Convention on Healthcare and Medtech, sponsored by the Gangwal School of Medical Sciences and Technology from March 3rd - 5th, 2023. Dr. D. Nageshwar Reddy, Chairman & Chief of Gastroenterology, of AIG Hospitals, Hyderabad, delivered the inaugural plenary address. 140 participants from within and outside IIT Kanpur were actively engaged in the hands-on sessions, discussions, and displays of the research and innovations.

The Pant Workshop Series on Medical Technology and Future Medicines on "Advances in Designing and Manufacturing Technologies for Orthopaedic Biomaterials" was organized by the Center of Excellence for Orthopaedics and Prosthetics, Gangwal School of Medical Sciences and Technology and Biological Sciences and Bioengineering Department of IIT Kanpur, from March 13th - 14th, 2023. There were interactive sessions with clinicians, researchers & industry partners for developing advanced bone materials and substitutes.

The Gangwal School of Medical Sciences and Technology and the Italian Institute of Technology, Genoa, conducted The Pant Workshop Series on Medical Technology and Future Medicines on "Healthcare Robotics and Technologies" on June 16th, 2023, with 40 participants. Discussions were mainly focused on Rehabilitation robotics, Occupational exoskeletons VR, AR and Haptics, Biomedical Robotics, VR and AR for enhanced awareness during surgery, Compressive image scanning microscope, Deep learning for upper aero-digestive tract videomics, Autonomous computer-assisted laser microsurgery, Dual Robot collaborative system for autonomous venous access, and many more topics related to Health Care Robotics and Technologies.

Advances in Designing and Manufacturing Technologies for Orthopaedic Biomaterials @IITK March 2023





Symposium on S20-Aligned Focal Themes: Energy, Health, and Society @IITK March 2023

## Visits and Discussions

Professor Bushra Ateeq attended the symposium on S20-Aligned Focal Themes: Energy, Health, and Society. She presented on the “Current Challenges in Cancer Prevention and Treatment”, on March 4th, 2023.

There was a discussion between the faculty members of IIT Kanpur and Dr. Navin Saxena, and Mr. BA Patil of Rusan Pharma Ltd. on April 28th, 2023 on the Synthesis of APIs, Drug delivery, Biomaterials for medicine, Adhesive patches/ microneedles, and Musculoskeletal/3D Bio-printing.

Dr. R S Sharma, Chairman, Geospatial Data Promotion and Development Committee (former Chairman, of the Telecom Regulatory Authority of India and former Chief Executive Officer of the National Health Authority) visited the Indian Institute of Technology Kanpur from May 1st-3rd, 2023. The faculty members and the administration of IIT Kanpur had several rounds of discussions on the research and academic vision of the medical school. Faculty members from each of the eleven centers of excellence of the medical school presented ongoing research and innovations.



Rusan Pharma Ltd visit @IITK April 2023



Dr. R S Sharma, Chairman, Geospatial Data Promotion and Development Committee visit @IITK May 2023



Dr. Rajiv Bahl, Secy, GOI, and DG-ICMR visit @IITK June 2023

Dr. Rajiv Bahl, Secretary to the Government of India, Department of Health Research, and Director General, Indian Council of Medical Research (ICMR), visited IIT Kanpur. Faculty members, students, and start-ups of IIT Kanpur participated in the meeting to discuss and display the flagship projects of the medical school on June 10th, 2023. Dr. Bahl discussed the ways of strengthening the clinical validation of the innovations in collaboration with ICMR. Dr. Rajiv Bahl, Professor Abhay Karandikar, Director, Professor S Ganesh, Deputy Director, Professor Sandeep Verma, Professor-in-charge GSMST, Professor A.R. Harish, Dean, Research and Development and Professor Amitabha Bandyopadhyay, along with other faculty members, discussed on future possibilities of association and collaboration with ICMR, for strategizing the academics for the medical school, and Bio design and Bioengineering research and innovation in the medical school.



Shri Awanish Awasthi and Dr. GN Singh, special advisor CM UP, visit @IITK June 2023

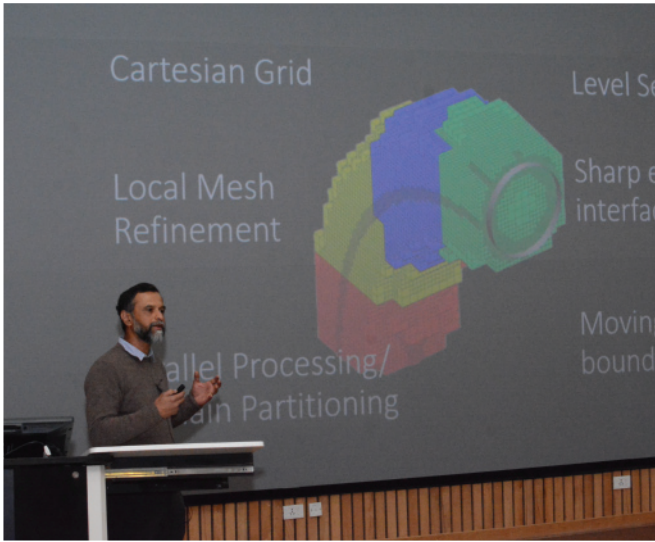
Shri Awanish Awasthi and Dr. GN Singh, Special Advisors to the Hon'ble Chief Minister of Uttar Pradesh, visited IIT Kanpur on June 19th, 2023, and discussed the future roadmap for the medical school. The discussions were mainly related to innovation in Biomedical technologies, shaping up the academics for the medical school, and introducing novel health technologies in Uttar Pradesh.

The delegation from IIT Kanpur, associated with the medical school visited Apollo Hospital Hyderabad, and a hybrid workshop was organized on June 22nd, 2023. Professor K. Ganapathy of Apollo Telemedicine Networking Foundation & Apollo Telehealth Services initiated the workshop, which involved several rounds of discussions with the eminent doctors of the Apollo chain of hospitals, on remote healthcare, AI-driven monitoring, and treatment of oncology, neuropathies, machine learning in disease prevention and progression using genomics databases, fall prevention, detection and medication errors, and redressal of grievances.

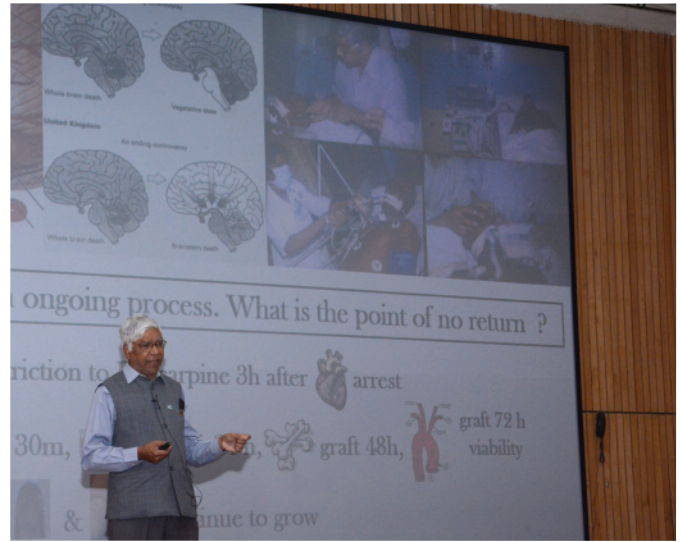
IITK delegation visit @Apollo Hospital Hyderabad, June 2023



# Lectures



Prof. H.S. Uday Kumar University of Iowa, USA, delivered a talk on “Image-based modeling of cardiovascular systems using a level-set based Cartesian grid solver”, on January 13th, 2023.



Professor K. Ganapathy of Apollo Telemedicine Networking Foundation & Apollo Telehealth Services delivered a talk on “Is Quality of Death as important as Quality of Life”, on February 15th, 2023.



Prof. V. Ganesan National Institute of Mental Health & Neurosciences, Bengaluru, presented on “Understanding the Phantastic Brain in Schizophrenia: A Computational Psychiatry Narrative”, on March 20th, 2023.



Dr. A. S. Prasad, Senior Orthopedic and joint replacement surgeon, delivered a talk on “Clinical Translation of Biomedical Materials for orthopedic implantation”, on March 27th, 2023.

## Distinguished Visiting Professors



Professor Pratap S. Khanwilkar, Founder /CEO, Ignition Key LLC- Advancing Healthcare, Fair Oaks Ranch, Texas, United States, was appointed as Visiting Professor of Practice.



Professor Dr. med. Martin J. Lohse of the Institut für Pharmakologie und Toxikologie, Universität Würzburg, Germany, was appointed as Distinguished Visiting Professor.



Professor Richard Anthony Strugnell of the Department of Microbiology and Immunology, The University of Melbourne, at the Peter Doherty Institute of Infection and Immunity Melbourne, Australia, was appointed as Distinguished Visiting Professor.



Professor Jaideep Srivastava of the Department of Computer Science and Engineering, University of Minnesota, USA, was appointed as Distinguished Visiting Professor.

## Contact Us

GANGWAL SCHOOL ADMINISTRATIVE OFFICE

DIRECTORATE

INDIAN INSTITUTE OF TECHNOLOGY KANPUR, KANPUR-208016, INDIA

PHONE: (+91) 05122597351

Email: [smrt@iitk.ac.in](mailto:smrt@iitk.ac.in)

Website <https://gsmst.iitk.ac.in/>