



Indian Institute of Technology Guwahati  
भारतीय प्रौद्योगिकी संस्थान गुवाहाटी  
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# चिंतन

The Monthly Newsletter of IIT Guwahati  
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Srijan 2020... The first edition of Annual Art Exhibition IIT Guwahati, inaugurated by Prof. T. G. Sitharam, Director in presence of the Deputy Director, Registrar and other officials and students

## IIT Guwahati, AOTS Japan, Suzuki Motor Corporation & Maruti Suzuki India Limited sign Agreement for promotion of technical education and training

Indian Institute of Technology Guwahati (IITG), The Association for Overseas Technical Cooperation and Sustainable Partnerships (AOTS) Japan, Suzuki Motor Corporation (SMC) Japan and Maruti Suzuki India Limited (MSIL) today announced a collaboration for the promotion of technical education and training.

In light of the above, an inaugural ceremony for the Japanese Endowed Course was held at IIT Guwahati on March 03, 2020, and MoU was exchanged among the above four parties in the presence of His Excellency, Mr. Satoshi Suzuki, Ambassador of Japan to India. The MoU exchange ceremony was also graced by Mr Ashok Kumar Chawla, Advisor-Japan, Ministry of External Affairs, Government of India, Prof. T.G. Sitharam, Director IIT Guwahati, Mr. Kenichi Ayukawa, Managing Director & CEO, Maruti Suzuki India Limited, deans, faculty members and officials from Maruti Suzuki, IIT Guwahati and AOTS.

This first-of-its-kind institutional collaboration facilitates the promotion of education and training covering engineering course and internship programmes in both India and Japan. It will also promote research for next generation technologies for benefit of both the countries.

The following initiatives are authorised by the Ministry of Economy, Trade and Industry, Government of Japan, as Japanese Endowed Course:

**A. Suzuki Endowed Course:** An engineering course, primarily related to automobiles, will be conducted by SMC and MSIL by providing training to students through lectures. As part of the curriculum Japanese language course will be conducted by AOTS. This course will be provided to students of IITG. AOTS, SMC and MSIL will arrange for faculty to conduct these at IITG.

**B. Suzuki Internship Program:** Eligible students will be provided with an opportunity of being placed for an internship at SMC's facility in Japan as well as at MSIL in India. This program will help students gain both local and global exposure.

The MoU exchange ceremony, coordinated by the office of the Dean Alumni & External Relations, IIT Guwahati was preceded by an interactive session between students and faculty of IIT Guwahati with the hon'ble Ambassador of Japan. Following the Interactive session, the delegation visited different facilities at IIT Guwahati which included the E-Mobility Lab, Department of Electronics & Electrical Engineering; Robotics Lab, Department of Mechanical Engineering and the Centre of Excellence for Sustainable Polymers (Coe-SusPol).



## Supercomputing facility of Compute Power of 650 TF to be installed at IIT Guwahati

The Technical Advisory Committee of National Supercomputing Mission (NSM-TAC) has approved the installation of a Supercomputing facility of the compute power of 650 TF (approx. 838TF Peak, 70:30 CPU & GPU Hybrid Supercomputing system) at the Indian Institute of Technology Guwahati, Assam. A supercomputer is a computer that has very high speed in its operation and higher memory. This supercomputing system can perform assigned tasks including multiple tasks at very high speeds than any other normal personal computer (PC) and in many cases are able to operate at speeds that are millions of times faster than ordinary PCs.

The installation of this supercomputing system at IIT Guwahati has been initiated under the National Supercomputing Mission (NSM). The Department of

Science and Technology (DST) along with the Ministry of Electronics and Information Technology (MeitY) are coordinating the mission and the Center for Development of Advanced Computing (C-DAC), Pune, and Indian Institute of Science (IISc), Bengaluru, are the implementing agencies of the mission.

Speaking about the Supercomputing facility, Dr. T. G. Sitharam, Director, IIT Guwahati, said, "New Supercomputer at IIT Guwahati with 650 TFLOPS is more powerful and a technologically superior facility, which will play an important role in the field of scientific and engineering applications such as quantum mechanics, climate research, oil and gas exploration, molecular modelling, weather forecasting, spacecraft aerodynamics, computational systems biology and detonation simulations including the handling of large databases using Artificial intelligence models. IIT Guwahati has a large HPC user base already involved in solving many crucial problems that require more computational resources than that provided by using the existing 250 TFlops Param Ishan super computer at our computer center. IIT Guwahati will organize training courses to popularise the use and applications of supercomputers in the north eastern region and other major missions of the Government of India. IIT Guwahati is also planning to link this facility with our new interdisciplinary master programme on data sciences jointly initiated by EEE, CSE and Mathematics departments."

C-DAC, Pune, will install the Supercomputing facility using the build approach of NSM in IIT Guwahati, which will provide necessary Data Centre space, power with back up, cooling, etc. for the facility. This new hybrid Supercomputing system will not only boost the HPC usages and research environment in the Institute but also enhance the research capability of the Northeast Region since around 40% of the compute power will be allocated to the external users as per the guidelines approved by the NSM-TAC. This is also aligns with the policy of IIT Guwahati to build a "Network of Excellence" among the institutes of Northeastern region.

IIT Guwahati has been connected through dual redundant NKN connectivity with 10Gbps bandwidth and already has another supercomputer "PAR-AM-ISHAN" of 250TF computing power, inaugurated by then Hon'ble Minister of Human Resource and Development, Shri. Prakash Javadekar on 19th September 2016. This facility has been extensively used by the faculty and researchers of the Institute to solve

complex problems in the field of Chemical Engineering, Computational Fluid Dynamics (CFD), Biotechnology, Quantum High Energy Physics, Cosmology, Molecular Dynamics, Nanotechnology and Environment. Software like GROMACS, NAMD, WRF, LAMPPS, COMSOL, Ansys, OPENFOAM, GERRIS etc are available in the system for various uses.

Prior to the "PARAM-ISHAN", IIT Guwahati was the active partner for the GARUDA Grid Computing project, India's national grid computing initiative, a CDAC programme funded by the Department of Information Technology (DIT) to deploy a distributed networked infrastructure for universities, research laboratories, industry and government throughout India.

The National Supercomputing Mission envisages empowering the national academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of more than 70 high-performance computing facilities.

## IIT Guwahati is in the forefront to fight novel coronavirus

Indian Institute of Technology Guwahati has been in the forefront in the fight to stop the spread of novel coronavirus and has been providing scientific support, extension of sophisticated instrument facilities as well as involved in the immediate development of life-saving equipment to Assam State and Guwahati Medical College and Hospital (GMCH).

Since the initial days of this outbreak, IIT Guwahati has prepared hand sanitizers at its various departments and academic centres and is in the process of preparing at least 5000 sanitizer bottles and provide them to GMCH and Assam government. The Institute has provided two real-time PCR machines to GMCH for the diagnosis of Coronavirus. These machines would help in ramping the testing process by analysing 1000 samples if run for 12 hours continuously and 2000 samples in 24 hours.

On the research front, multiple efforts are being made for vaccine development at the Department of Bioscience & Bioengineering. Various other departments are involved in developing multiple routes to have a diagnostic and therapeutic approach for the early detection of various viral infections. The faculty members of Bioscience & Bioengineering and Chemistry

Departments and Center for Nanotechnology have also initiated research proposals to combat COVID-19 against the urgent calls of the Government of India.

In addition, the Departments of Mechanical Engineering and Electronics & Electrical Engineering are making efforts to develop several state-of-the-art technologies which include, robot-based drug/food carrying unit to work in isolation wards and robot-based screening units, large and high capacity autoclave machine, handheld temperature measuring units, hospital beds including ICU beds, ventilators, medical waste disposal in the isolation wards, shower for disinfection, WHO specified masks and hand sanitizers. The Departments of Chemistry and Bioscience & Bioengineering are developing prototype protective gears with antiviral and superhydrophobic coatings while the Department of Chemical Engineering is working to develop Biodegradable plastic based Medical Textile. The Department of Design has developed a prototype 3D printed full face shield including head gear which can be scaled up immediately.

Further, faculty members also have developed a PCR machine in-house which has been patented and is ready for commercialization whereas portable OFET sensors fabricated at the Institute could be integrated for COVID diagnosis. In addition, the Institute is also in the process of setting up an advanced research centre (BSL-III/IV laboratory) for COVID-19 analysis, which would help the entire Northeast region to test for COVID-19 and other dreadful virus detection and diagnosis.

Talking about setting up a research centre for COVID-19 analysis, Prof. T. G. Sitharam, Director, IIT Guwahati, said, "Our idea is to make this a state-of-the-art facility for the entire Northeast region. This centre in future would help to develop highly competent manpower for diagnosis of different infectious diseases in the early stage of infection and thus its prevention too".

As there are no approved drugs presently for this disease, the faculty members are in the process of developing small molecules inhibitors for the treatment of COVID-19 using modern biotechnological tools. The overall idea is to develop safe, efficacious and affordable drugs for this disease and other dreadful viral infections.

The Institute has been working tirelessly to educate the community at large on practicing social distancing and hygiene to prevent the spread of COVID-19. The institute hospital and Center for Nanotechnology have also initiated training of health center doctors and nurses and healthcare workers - for handling and necessary precautions to be followed during COVID-19 breakout on campus. The academic activity of the Institute remains suspended presently and based on the overall situation, the Institute is likely to announce the revised academic calendar. In the meantime, disinfection of hostels and guesthouses including academic and residential areas is being carried out.

The round-table on 'Women's emancipation' organized on 5 March 2020 at IIT Guwahati by the Press Information Bureau, Guwahati in collaboration with IIT Guwahati.



## International Women's Day

International Women's Day was celebrated at IIT Guwahati on 12 March.

Director, IIT Guwahati, Prof. T. G. Sitharam addressed the gathering and the invited speakers were Aasha Ramesh, Gender and Development Consultant on the topic 'Journey of women's movements in India' and Leena Doley, SP CID branch, Guwahati, Assam who has been counselling women and child victims of abuse in Assam.



A team of 62 students of IIT Jodhpur along with 4 officials reached IIT Guwahati to participate Student Exchange Programme under EBSB MHRD programme, an initiative of the MHRD. The team was showcased with various culture of Assam and got chance to exchange language and culture. During their stay from 6-10 March 2020, the team visited Kamakhya Temple, Pobitara National Park and attended holi celebrations at DouL Gobinda Temple in traditional style. The programme was officially inaugurated by Director i/c and Dean of Academic Affairs, Prof. Chitralkha Mahanta in presence of Dean of Students' Affairs Prof. V. V. Dasu, Associate Dean of Students' Affairs Prof. C. Mallikarjuna, Chairman Cultural Board Dr. Ashwini Kumar Sharma, Assistant Registrar, Students' Affairs Ms. Monalisa Kakati and faculty members from the visiting team IIT Jodhpur Dr. Prasenjeet Tribhuvan and Dr. Shrutidhara Sharma.



## Faculty Training on programme on "Robotics and Automation"

Department of Mechanical Engineering, IIT Guwahati in association with the Center for Educational Technology (CET) has successfully conducted TEQIP-III MHRD sponsored Two-weeks Faculty Training on Future Skill Technologies of IT-ITes "Robotics and Automation" from 3 -13 March 2020. About twenty-four faculty members from various government/semi-government engineering/technology institutes participated in this workshop.

The objective of this course was to develop certified trainers on Future skill technologies (Cyber Security, AI & Machine Learning, Robotic & Automation, Cloud Computing, 3D Printing, IoT, Virtual Reality, Blockchain, Data Science). The trained faculty shall further train their students in respective institutes to make the students in their institute more employable. In view of this, Dr. Shrikrishna N. Joshi, an associate professor of Department of Mechanical Engineering, IIT Guwahati designed and organized an extensive course which comprises lectures by industry/academia experts, hands-on sessions on hardware for robotics and industry automation, MATLAB, Robo-Analyser, Power-Mill.



## TechEvince 7.0

Glimpses of TechEvince 7.0, The Annual Technical Exhibition, presented by The Technical Board, IIT Guwahati, held on 14 March.







Antahsagari 2.0, the underwater remotely operated vehicle (ROV), designed to explore the underwater world and collect data for research and analysis. Different computer algorithms like Machine learning, Deep Learning, Opencv for Image Processing was used for its development. A custom ROS package for ROV was also developed. For navigation, work on Simultaneous Localisation and Mapping (SLAM) was undertaken. It includes temperature sensor, pressure sensor, leak sensor, sonar, camera on the ROV. Using sensors, the required data can be extracted.



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