

IIT Guwahati 6th Top Institute in India, Holds 350th Rank Worldwide

IIT Guwahati has been ranked 350th in the Overall World Category and 6th in Overall India Category in the Academic Sector of Nature Index Annual Ranking 2020. While in Subject-wise Rank in India, IITG has been ranked 5th in Chemistry, 7th in Physical Sciences and 9th in Life Sciences.

It is a matter of pride for IIT Guwahati as the Nature Index Rankings are based exclusively on an institution's share of articles published in various prestigious scientific journals selected by an independent panel of experts, which are tracked by the Nature Index database.



IIT Guwahati ranks #7 in 'Engineering' and 'Overall' Categories of India Rankings of NIRF 2020

Indian Institute of Technology Guwahati has been ranked #7 with a score of 74.90 among all the Engineering institutes as per the India Rankings 2020 conducted by the National Institutional Ranking Framework (NIRF), Ministry of Human Resource Development, Government of India. The Institute has retained its position under this category, however, it has improved its score from 70.87 in 2019 to 74.90 this year (2020).

The Institute has also achieved the best ever rank of #7 with 68.81 score in the 'Overall' category this year (2020). Last year, the Institute was ranked #9 with a score of 65.47.

Dr. Ramesh Pokhriyal, Minister of Human Resource Development, Government of India, announced the 'National Institutional Ranking Framework' (NIRF) 2020 results today, 11th June 2020.

Speaking about the rankings, Prof. T. G. Sitharam, Director, IIT Guwahati, said, "I am delighted that the overall ranking for IIT Guwahati has phenomenally improved. This is a recognition of the commitment, hard work and dedication of our faculty, students, staff and all stakeholders associated with the Institute. I acknowledge everyone's effort in making our Institute improve steadily in the overall ranking and congratulate for this success. We will strive very hard to do even better next year."

Score in specific parameters of 'Engineering' category of NIRF Ranking 2020 are:

- Teaching, Learning and Resources (TLR) 83.04
- Graduation Outcomes (GO) 83.03
- Outreach and Inclusivity (OI) 59.13
- Research Professional Practice and (RPC) 70.73
- Perception 62.45

IIT Guwahati improved its scores in most of the parameters of 'Engineering' and 'Overall' categories.

Engineering:

	Overall Score	TLR (100)	RPC (100)	GO (100)	OI (100)	PERCEPTION (100)
2019	70.87	82.55	63.60	78.45	58.86	54.49
2020	74.90	83.04	70.73	83.03	59.13	62.45

Overall:

	Overall Score	TLR (100)	RPC (100)	GO (100)	OI (100)	PERCEPTION (100)
2019	65.47	76.79	56.58	73.87	60.63	46.34
2020	68.81	74.06	63.55	81.85	62.35	49.09

The main reason for the improvement in the rankings in both the categories is the strong growth seen across three parameters viz. RPC, GO and Perception.

Ranking results announced by various ranking agencies viz. QS World University Rankings, Nature Index rankings and NIRF 2020 over the last week, has shown that IIT Guwahati has consistently improved in all these ranking results due to the very strong research publication and citations as a common factor.



IIT Guwahati improves its position by 21 places in the QS World University Rankings 2021, ranks 470 Globally

Indian Institute of Technology Guwahati, one of the premier educational and research institutes across the nation, has been ranked 470 globally in the QS World University rankings 2021 announced today, 10th June 2020. This marks an improvement of 21 places by the Institute, which was ranked 491 in the 2020 edition of the QS World University rankings. The main reason for this increase is the strong improvement in the 'Citations per Faculty' category where IIT Guwahati has improved from 71.2 in the year 2020 (Global Rank 89) to 77.9 in 2021 (Global Rank 55). This has also helped improve the QS India rank to #8 this year from the rank #10 in the previous year.

Speaking on this occasion, Prof. T. G. Sitharam, Director, IIT Guwahati, said, "In order to further move up in the ranking table, IIT Guwahati needs to attract more International students and International faculty members, improve the faculty-student ratio and work on improving the academic and employer reputation (perception). IIT Guwahati has started making efforts in this direction and over the next few years we are likely to improve on these parameters as well".

Prof. Sitharam further added, "IIT Guwahati is striving very hard to deliver quality online courses to industry and academia and sees a great future in online education which will play an important role and further the learning experience in this time of pandemic".

The QS World University rankings 2021 announced today were based on six metrics; Academic Reputation, Employers Reputation, Faculty Student ratio, Citation per Faculty, International Faculty and International Students.

IIT Guwahati students' startup Flyzy develops a mobile application for safe and contactless air travel

Students of Indian Institute of Technology Guwahati have developed a mobile application, called 'Flyzy', to provide a seamless air travelling experience to passengers during the pandemic. The application has been developed by Mr. Deepak Meena, 3rd-year B.Tech student, Department of Chemistry, IIT Guwahati, Mr. Hansraj Patel, 3rd year B.Tech student, Department of Computer Science and Engineering, IIT Guwahati,

and Mr. Arjit Singh, 4th year B.Tech. student, Department of Electrical Engineering, JMIT.

The mission is to build Flyzy into India's Finest Aviation IT Technology Company for providing a stress-free and safe journey to flyers. The aim of the application is to provide contactless boarding keeping in mind the easier baggage drop, manageable parking, a better shopping experience and providing necessary updates during the whole journey.

The focus of the start-up is the software that they have developed and will be installed at the airports. The application is their way of taking the software to the public. The idea behind a mobile-based software is majority of the people have a smartphone. Moreover, it's a hybrid software which will support face-biometric recognition in the future, without even changing the complete software system of the airport.

The idea is not only relevant during the present pandemic situation but also during the non-crisis time. The main idea behind the application is to provide a seamless journey to passengers as they move through the airport, especially to the first-time flyers. The application will guide them thoroughly and provide them with an easy understanding and implementation of several airport functions.

Passengers can shop from the airport using the application and can also pay from the application. They can either opt for the takeaway or gate delivery option. The application also supports multi-currency payments. For food ordering purpose, the app dynamically suggests the passenger the best option he could choose, based on the flight status. For instance, if the flight departs in 1 hour, the app will suggest the passenger the food items that could be prepared within the available time.

The application also has a Smart UI Assistant which helps the elderly to use the app easily. Other features of the application include: real-time flight notifications, universal Web Check-in portal, check-in baggage status and map of the airport.

Talking about their work, Flyzy team said, "Flyzy app will make the air-travel completely:

- Personalised by bringing everything on the phone
- Secure as the app is hosted on the cloud and proper IATA and DGCA guidelines were followed
- · Contactless"



The Founders believe that the application will help the aviation industry save money as the process will become automated, faster and easier. The company provides an end-to-end service at a low infrastructure cost. The team is already in the process of speaking to the authorities for implementing the application at some airports.

The students have established it as a start-up and it has been recognised by Startup India. The team was a finalist at Start-up India Covid-19 Challenge 2020. Flyzy has been developed as per International Air Transport Association (IATA) guidelines. Mr. Sankalp Borthakur, an alumnus of IIT Guwahati, is the Advisor of the start-up.



IIT Guwahati develops high quality and affordable Sterile "SPILD" VTM kits, RT-PCR kits and RNA isolation kits

The "SPILD" VTM kits have already been handed over to National Health Mission, Assam and Guwahati Medical College and Hospital (GMCH). The 'Made in Assam/India' kits will spur affordable and high quality health-care products development in Assam and provide access to world-class kits and product development as well as career opportunities to healthcare professionals and student and an important step in PM's 'Atmanirbhar Bharat Abhiyan'

The Minister of Finance, Health and Family Welfare, Assam Shri Himanta Biswa Sarma, today launched the Viral Transport Media (VTM) Kits in presence of Shri Samir Kumar Sinha, Principal Secretary (IAS), Prof. Siddhartha Sankar Ghosh and Prof. Parameswar Krishnan Iyer, professors from the Indian Institute of Technology Guwahati (IITG), Dr. Achyut Chandra Baishya (Principal cum Chief Superintendent) GMCH, Dr. Ajanta Sharma (MD) GMCH, Dr. Lahari Saikia (HoD), GMCH, Dr. Pankaj Choudhary, Technical Manager, RR Animal Health Care Ltd. and other officials.

These affordable and sterile Viral Transport Media (VTM) kits, RT-PCR kits and RNA isolation kits have been developed at IIT Guwahati jointly with RR

Animal Healthcare Ltd. with inputs from GMCH. Due to the huge demand for these kits and the high price associated in their timely procurement, the National Health Mission (NHM), Assam had approached IIT Guwahati for their development and procurement. The requested kits were already under development stage and on knowing the immediate requirement of these kits in high quantity, the research teams led by Prof. Parameswar Krishnan Iyer, Prof. Siddhartha Sankar Ghosh from IIT Guwahati and Dr. Labanyamoy Kole of RR Animal developed these kits as per the standards laid down by the GMCH and have already delivered them ~950 VTM kits, which have now been tested and validated.

Speaking about this at the launch of these kits, the



Hon'ble Minister Shri Himanta Biswa Sarma, said, "Assam has been successfully leading the fight against COVID-19 pandemic and our initiatives have gone a long way in containing this disease in the entire NE region. We want to identify and contain this disease at an early stage and it is vital that we have all the crucial kits and materials so that our frontline healthcare workers and doctors who are doing a commendable job do not face any hurdles. We are very happy with this product development and launch of the VTM and other COVID-19 related kits in IIT Guwahati, Assam and I congratulate The Director, IIT Guwahati and the faculty members for this development as well as acknowledge other help being provided to us."

The viral transport media or VTM kits are the first stop source used to collect the nasal and oral swab specimens from the individual source to the laboratory safely for culture and testing. During this period the virus, if present, in the sample specimens should remain intact until the testing procedure is completed. The "SPILD" VTM kits developed at IIT Guwahati, consists of a comprehensive solution specially formulated for the collection and transport of SARS-CoV-2. These kits comprise of a CDC recommended and validated transport medium and one each Nasopharyngeal and Oropharyngeal specimen collection swabs. The complete package is suitable for the collection, transport, maintenance, and long-term freezer storage of viral specimens. The unique formulation of the transport medium helps in preserving the viability of viruses for up to 72 hours (at refrigerated temperatures). The swabs have been designed ergonomically with a pre-molded breakpoint on their shaft for enabling secure sampling. These sterile "SPILD" VTM kits comply with the CDC recommended configurations for viral specimen collection for COVID-19 and are packed in user friendly individual packs.

Speaking about this timely and remarkable development, Prof. T. G. Sitharam, Director, IIT Guwahati, said, "IIT Guwahati is thankful to Shri Himanta Biswa Sarma for launching these VTM kits, specially developed by IITG on request from the state government. He further added that IITG has been in the forefront in this fight against COVID-19 and has been supporting the Assam state government in this time of pandemic. On receiving the request from Director, NHM to provide these VTM kits, the institute immediately acted upon this request and began production of these sterile and affordable VTM kits and the first

batch have already been delivered to GMCH. IITG is leaving no stone unturned in making the country self-reliance (Atmanirbhar Bharat Abhiyan) as mentioned by the Hon'ble Prime Minister and is fostering relations with the industry in healthcare products manufacturing in Assam".

In addition to the sterile "SPILD" VTM kits the Institute has also developed "SPILD" RNA isolation kits and "SPILD" RT-PCR kits jointly with RR Animal Healthcare Ltd. which are imperative to safely isolate the RNA from COVID-19 virus. The purified RNA are then converted to DNA by an enzyme Reverse Transcriptase, which are utilized to confirm the presence or absence of COVID-19. The large scale production of all these kits has commenced to meet the requirement of the Assam State as well as will be made available across the country.

The entire logistics to meet the deadline set by the state government has been strictly adhered to which has led to the timely development and production of these sterile kits. An important initiative of the entire programme has been the involvement of industry right from the conception stage and assuring that the production of these kits will bring high quality and affordable healthcare product development in Assam.

Talking about the development of these kits, Prof. Parameswar Krishnan Iyer, Professor at the Department of Chemistry and Center for Nanotechnology, said, "This collaboration of academia with industry and the timely development of these high quality sterile kits as requested by the state government will immensely help in conducting large scale testing and identification of COVID-19 cases and prevent the spread of this pandemic".

Prof. Siddhartha Sankar Ghosh, Professor, Department of Biosciences and Bioengnieering and Center for Nanotechnology, added, "The entire kit development, the quality of which is comparable to the best in the world, to scaling up was very exciting since the demand from GMCH and NHM, Assam was immediate and with industry joining IITG, we could deliver the necessary 'SPILD' VTM kits successfully."

Speaking about this unique initiative, Dr. Debashis Dutta, Director, RR Animal Healthcare Ltd., stated, "We are very delighted to jointly work with IIT Guwahati and the Assam State government for the development of these COVID-19 diagnostic kits which



has given us an opportunity to serve the society, especially in north-east region of India at this time of pandemic. We look forward to provide an affordable and high quality one health solution to the Region and the entire Nation".

Dr. Labanyamoy Kole, Head, Research and Development, RR Animal Healthcare Ltd, also added, "This process of COVID-19 related kit development with IIT Guwahati has been a very good prospect to serve people in a timely manner and deliver important healthcare products".

RR Animal Health Care Limited (MSME) is a Research Oriented Indian MNC, now based at Research Park, IIT Guwahati with major focus in Animal and Human Health care specialities, with a belief that the ongoing concept of 75% of the emerging diseases in humans may have been originated from animals and it is time for the Veterinary Health scientists to work coherently for improving human health and to contribute as an integrated effort towards "Human-Animals Plants" in 'One Planet-One Health and we are One'.

The large scale production of all these COVID-19 diagnostic kits has commenced and would be delivered to the Assam state officials as well as other testing centres across the country as and when the demand arises. This is also likely to create lots of employment opportunities in research and development, sales and marketing and spur development of other related healthcare products.



Laxmi Raman Adil, PhD student, Dept of Chemistry, Dr. Pankaj Choudhury, RR Animal Health Care, Prof. Parameswar Iyer, Prof. Siddhartha Ghosh, Dr. Anil Bidkar, RR Animal Health care

IIT Guwahati becomes the first IIT to introduce MS (Research) programme in E-mobility

Indian Institute of Technology Guwahati has introduced a new programme, MS (Research) in E-mobility. Due to the multidisciplinary nature of the curriculum, the programme is being jointly offered by the Departments of Electronics and Electrical Engineering and Mechanical Engineering from the coming academic year (2020-2021). The admission procedure will start from 15th June 2020.

The government has launched schemes and incentives to promote electric mobility in the country. The adoption of EVs has opened new opportunities. Thus, it is imperative to be prepared to extract maximum out of this unique opportunity. A significant step towards the preparedness is training the next generation in EV technology. To address this, the Institute has launched this unique programme in e-mobility. The aim of the Institute is to develop a world-class 2-years MS (Research) programme that is relevant to the needs of the country.

Speaking about the unique programme, Prof. T. G. Sitharam, Director, IIT Guwahati, said, "IIT Guwahati is looking forward to fostering interactions with the industry in frontier technologies, including introducing courses on EV and e-mobility technologies, such that highly trained manpower is readily available to work in these interdisciplinary areas and the country keeps pace with the global trend of competitiveness".

The Institute is offering a total of 20 seats for the programme. 10 seats are for the students who have completed their B.Tech. in Electrical Engineering, Electrical and Electronics Engineering, Mechanical Engineering and Production Engineering. The other 10 seats are for the industry-sponsored candidates. The selection of industry-sponsored candidates will be through a written test and/or interview.

The Institute has developed the curriculum in consultation with the leaders of the automobile industry. The hallmark of the programme is that it not only focuses on the theoretical aspects of the EV technology, but one-third of the curriculum is dedicated to laboratory work which has hardware as well as modelling-based experiments. The syllabus will cover topics such as E-mobility, Electric and Hybrid Vehicles; Modelling, Dynamics and Control of EVs; and, Energy Storage and Conversion.



Talking about the programme, Prof. Praveen Kumar, Coordinator of the programme, said, "This programme is truly a collaboration between the industry and academia and covers topics such as smart mobility, EV drivetrain design and control, EV testing standards and protocols, charging infrastructure and V2G, among other topics."

Talking about the opportunities that the programme will bring, Prof. Santosha K. Dwivedy, Head of the Department of Mechanical Engineering, IIT Guwahati, added, "This programme will give an opportunity to the students and professional engineers to develop the skills related to design, development, manufacturing and maintenance of Electric Vehicles and their components using the state-of-the-art techniques."

The Institute believes, through this blend of theory and laboratory experiments, the students will have well-rounded exposure to the EV technology and upon graduation can contribute to the industry. Besides the theory and the laboratory courses, the programme has dedicated three semesters to project work. During these three semesters, the students will execute projects related to EV technology such as drivetrain design, control systems, battery management systems, V2G, autonomous vehicles, among others.

Talking about the need for this programme, Prof. Rohit Sinha, Head of the Department of Electronics and Electrical Engineering, IIT Guwahati, said, "Within one decade, the nation is projected to adopt the EV culture in a big way. Thus, it is high time for young engineers to join this exciting technological revolution and reap fulfilling career opportunities. I'm confident that this new MS programme will help them realise their dreams."

The Institute will also regularly conduct sessions and seminars delivered by industry experts. The aim behind these sessions is to make the students aware of the state-of-the-art in the EV technology and foster industrial problem-solving skill in them. The students will be provided with top-level computational and experimental facilities to execute the project work.

IIT Guwahati researchers develop point-of-care device for early and easy detection of diabetic retinopathy

Indian Institute of Technology Guwahati in collaboration with Shri Sankaradeva Nethralaya Guwahati,

have developed a point-of-care testing device that can detect diabetic retinopathy at an early stage, without need for invasive testing.

The research team is led by Dr. Dipankar Bandyopadhyay, Professor, Department of Chemical Engineering and Head of Center for Nanotechnology, IIT Guwahati. Descriptions and results of their testing device have been recently published in the ACS journal, ACS Sustainable Chemistry & Engineering. The paper has been authored by Prof. Bandyopadhyay and his students, Mr. Surjendu Maity, Mr. Subhradip Ghosh, Ms. Tamanna Bhuyan, at IIT Guwahati. The other author and collaborator Dr. Dipankar Das, a Senior Consultant and practicing Ophthalmologist, is the Head of the Department of Ocular Pathology and Uvea in Shri Sankaradeva Nethralaya, Guwahati.

The team has also filed an Indian patent for this idea and device. The research is funded by the Ministry of Human Resource and Development, Indian Council of Medical Research and Ministry of Electronics and Information Technology, Government of India.

Diabetic retinopathy is a serious non-communicable disease in India, with a conservative estimate that 11-20 million Indians will suffer from this malady by 2025. It is caused by abnormal growth in the retinal blood vessels in people with diabetes, and it is usually worsened when the patient is on insulin for diabetic treatment.

"Currently, the first step in the test for diabetic retinopathy is an invasive eye exam, in which the eyes are dilated and the ophthalmologist inspects the eye," explains Dr. Bandyopadhyay. As people who have had eye examination know, this is inconvenient, with blurry vision for a long time after examination. Advanced detection methods such as optical coherence tomography, fluorescein angiography, detection of exudates in retina, and image analysis are complicated and require skilled operators and can show the malady only after it has progressed enough to be detected.

The IIT Guwahati team wondered if there was a simple test such as a blood or urine test, that can detect retinopathy even before symptoms are seen in the eye. This induced the researchers to look for appropriate biomarkers of retinopathy – chemicals that are found in body fluids, that can indicate impending or ongoing retinopathy.



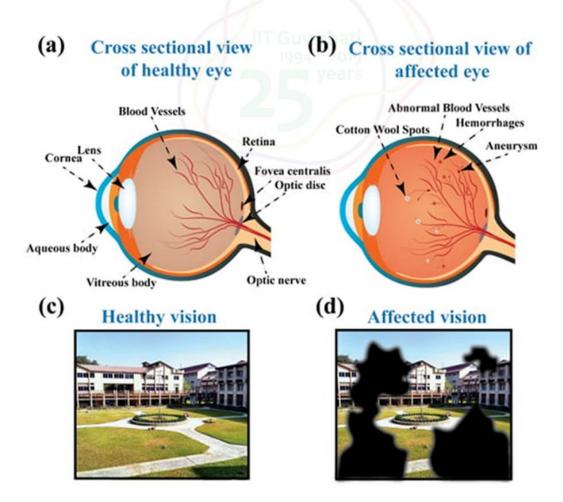
The researchers found that β -2-microglobulin (B2M), a protein found in tears and urine, is a reliable indicator for retinopathy. Armed with this knowledge, they set out to develop a device that can detect this protein in these body fluids.

The team developed a device in which the sensing element was an antibody to B2M that was immobilised on gold particles a hundred thousand times smaller than the width of the human hair. When the nanogold-laden antibody came in contact with B2M, there was a colour change.

"We designed a microfluidic system, in which, the body fluid – tear or urine – was drawn into very thin tubes or capillaries, where they came in contact with the gold-antibody nanoparticles, and the change in colour was assessed to detect B2M", explains the lead researcher. Their prototype microfluidic analyser

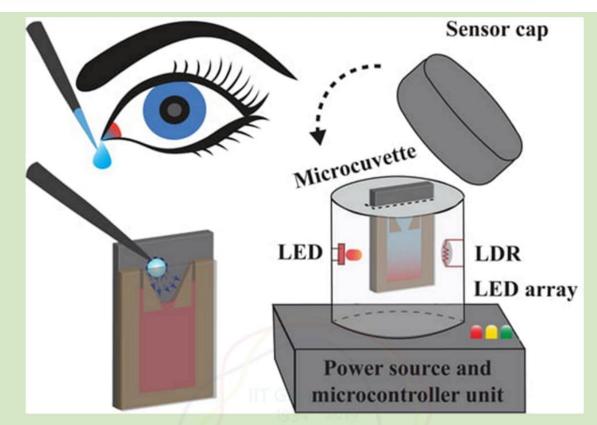
produced good results with reliable and sensitive detection of B2M, offering promise for design of hand-held, easy to operate detectors for diabetic retinopathy, much like the popular glucometers for diabetes itself.

Microfluidic devices, also known as microchips and lab-on-a-chip, have been eliciting considerable interest in recent years in the design of such detection devices. The device typically comprises a small plate containing microchannels for guidance of fluids, in this case, a microdrop of urine or tear. Numerous microfluidic devices have already been developed for the biomarker detection in cancer and other diseases, but there are hitherto, none for detection of diabetic retinopathy. The IIT Guwahati team's work is among the first in this area and has tremendous practical implications, especially in India, the diabetic capital of the world.



Cross sectional view of healthy and affected eye





Working of the point-of-care device for early & easy detection of diabetic retinopathy



Point-of-care device for early &easy detection of diabetic retinopathy developed by IIT Guwahati researchers



On the occasion of the World Environment Day, IIT Guwahati organized a plantation drive at the two beautiful areas of the campus. Around 110 numbers of different varieties of saplings were planted by the IITG community.







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योग करें स्वस्थ रहे...



International Yoga Day 2020 was celebrated at IIT Guwahati through a virtual session for the community. The Director, Deans, Faculty, staff and

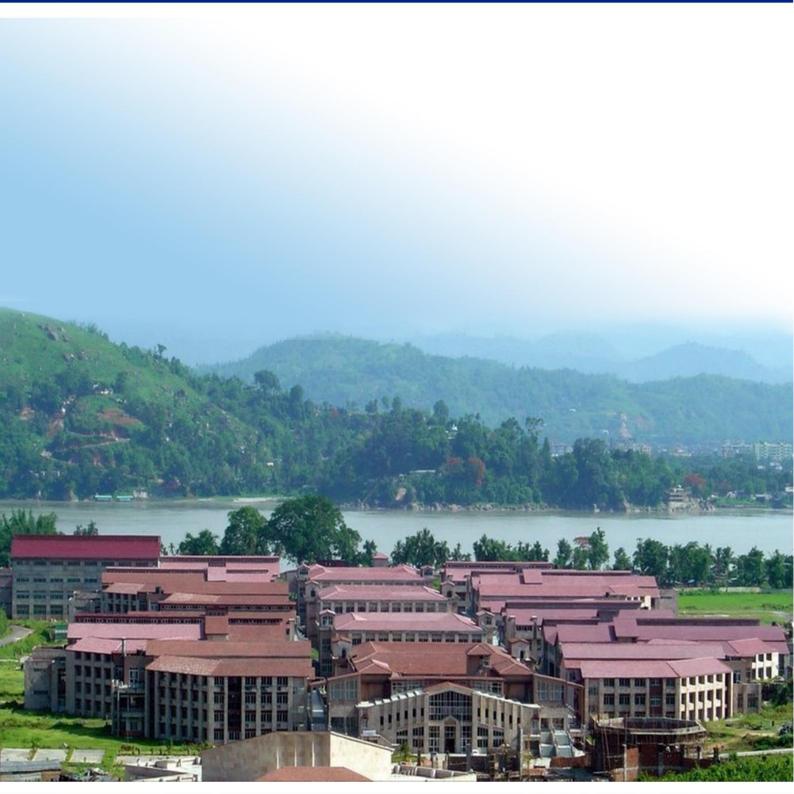
students actively participated during the event. The program was started by the welcome address of Prof. V. V. Dasu, Dean student affairs followed by a speech of the Director, Prof. T. G. Sitharam. The Keynote address was delivered by Sushree Meera Kulkarni ji on "Yogic Principles for combating psychological challenges in the context of the current crisis". This was followed by a panel discussion on "Yoga Therapy for Health and Holistic Wellbeing". Smt. Meera Kulkarni, Smt. Kalpana Mehta, Smt. R. Thangalakshmi were the panelists and Dr T.V. Bharat was the moderator. Lastly, Yoga practice session was conducted by Smt. Asmita Shukla. Dr. S. Kartha, chairman Sports Board delivered the vote of thanks.

The whole program was broadcast live in the IIT Guwahati Facebook page. The IITG community participated through Microsoft Teams



CONGRATULATIONS to Prof. Bosanta R. Boruah, Department of Physics, IIT.Guwahati, for receiving the grant of US Patent on "Free space optical communication system, apparatus and a method thereof".









Indian Institute of Technology Guwahati Guwahati - 781039 Assam, India

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