

Reflections

Quarterly In-house Newsletter



The Young Scientists who participated the YUVIKA-2023 at NESAC along with the Director, NESAC, YUVIKA Mentor, and course coordinators

From the Director's desk



We had yet another fruitful quarter of activities at NESAC. As we are closing towards the deadline for completing the projects taken up under the Plan of Actions (PoA), our activities have been more focused on these projects. We have already completed nineteen projects and several projects are on the verge of completion. The high impact regional projects are also progressing well. We are preparing the project reports for the completed projects and the same will be submitted to the users for its implementation. We are ready to conduct workshops and even conduct project based training programs to train the users on the details about the project outputs and transfer the methodology and technology developed for wider application. There are a large number of projects in PoA that are being executed by the state remote sensing applications centre, where NESAC is providing the technical support and mentoring. These projects are also progressing well and we are hopeful to complete all projects within the deadline of 31st March, 2024.

Continued to page 7

Inside this issue

NESAC edition of YUVIKA-2023 **2**

8 Training programs organized by NESAC

Outreach & Capacity building initiatives at NESAC **6**

10 News and Events

Dr Jonali Goswami

Indian Space Research Organization (ISRO) beginning in 2019 in accordance with the Government's vision of "Jai Vigyan, Jai Anusandhan" and as part of the vision to increase the scope of the agency's ongoing capacity building and outreach initiatives. The third edition of the YUVIKA was conducted during 15th – 26th May, 2023 in seven centres of ISRO namely, Vikram



Director, NESAC delivered a very informative lecture on Space in India



The inaugural program of YUVIKA-2023 under way

Sarabhai Space Centre (VSSC), Thiruvananthapuram; U R Rao Satellite Centre

(URSC), Bengaluru; Space Applications Centre (SAC), Ahmedabad; National Remote Sensing Centre (NRSC), Hyderabad; North Eastern Space Applications Centre (NESAC), Indian Institute of Remote Sensing (IIRS), Dehradun and Satish Dhawan Space Centre (SDSC) Sriharikota after the very successful two editions of the YUVIKA in 2019 and 2022 where 265 students were trained.

Ten students of class IX-X standards from each State



YUVIKA-2023 Young Scientists visited the Space on Wheels facility



Prof Deviprasad Duari delivered a fascinating lecture on Indian Space missions

and Union Territory (UT) were selected for the programme based on the well defined criteria.



Rocket making activity

Students, who belong to rural schools, were given special weightage in the selection criteria. Thus, a total of 353 students were selected from the entire country in the year 2023.

The programme was meticulously designed for two weeks duration and based on geographical distribution of the states, the students were divided



Robotics activity

into seven batches for reporting to seven major centres of ISRO. NESAC hosted the program for the 49 selected students from the eight states of North Eastern Region of India.

Inauguration of YUVIKA programme

YUVIKA program at NESAC was inaugurated through a grand function with a Inaugural address



Experiencing the world of 3D

virtually by Shri S Somanath, Chairman ISRO in presence of all Centers Directors on 15th May, 2023.



Visit to the UAV Laboratory

The inauguration program at NESAC was continued Chaired by Dr. S.P. Aggarwal, Director, NESAC, Dr. K C Bhattacharyya, Former Director, NESAC, Course Mentor YuVIKA 2023 and all Head of Divisions of NESAC.

Lectures by Resource Persons

As per programme schedule several lecture modules were covered during this period. Young scientist got an opportunity to listen lectures from many ISRO's scientist. Some of the specific topics covered during the program are Space in India, history of Launch Vehicles, different kinds of rocket propulsion, history of Indian satellite technology, types of Satellites, parts of a satellite, applications of



Visit to the Guwahati Planetarium

satellites, space science, and satellites for weather / climate studies. In addition it covered different interesting topics covering Astronomy, Astrophysics, Cosmology, Chandrayaan, Mangalyaan, Gaganyaan, different Space Applications, etc. Further, live demonstrations on sounding rocket launching and live session from Antarctica were arranged to make the program a memorable one for the Young Scientists.



Visit to the Guwahati Science Centre

Activities

The program covered many interactive game based activities like design a mechanism to prevent the egg from cracking when dropped from a certain height. This activity introduced them to the challenges in landing a rover on different kind of surfaces and environments in space and also safe landing from high altitude in general. Students came up with different types of designs and some were extremely unique. Almost all students were successful in this event when the egg was dropped from 6 feet. Similarly different activities like CANSAT experiment, Model Rocketry, Telescope assembly, Unmanned Aerial Vehicle (UAV) assembling and flying etc. and a quiz program was organized for the 'Young Scientists'.

Practical Session and Project Activities

The students were involved in various practical sessions on exploring ISRO Bhuvan, Google Earth, Moon and other planets, Atmospheric Science, Image Processing and GIS. They were also involved

in 3D visualization and make their own 3D glasses.

Students were assigned with a team wise project for presentation on different topics ranged from birth and evolution of stars, plantation in other terrestrial planets, the red planet, food and space technology, designing of spacesuits etc.

Facility visits

The students were taken to different NESAC facilities such as Space on wheel, UAV lab, and IRNSS ground station. A balloon launch demonstration using an atmospheric sonde was also made. The Young Scientists were taken to Regional Science center at Guwahati. The students were taken to 3D film show, earth on sphere and Mining lab. The students were mesmerized with various models at the science center and showed keen interest in learning various phenomena and interacted with scientists therein. Thereafter they were taken to Guwahati Planetarium. The stars of the night sky were projected onto the dome of the planetarium. The students had a fascinating introduction to astronomy and observation of sun spot by telescope.

Cultural program

A cultural night program was organized in the NESAC auditorium. Students from all states participated in the event with a great deal of enthusiasm. There were few program performed by NESAC staff. The musical evening was loved by the all NESAC employees and the distinguished guests.



All Young Scientists participated in the cultural program very actively

Valedictory Program

The valedictory program was organized by ISRO HQ on 26th May 2023 via online mode, which was chaired by Chairman, ISRO/ Secretary, DOS, wherein he interacted with the students, answered their queries and addressed all the students. During valedictory program two students from NESAC gave very positive feedback and thanked ISRO and NESAC for the opportunity given to them as well as for the arrangements. The program was continued at NESAC Auditorium wherein the certificates were distributed by Director, NESAC and prizes for different events were distributed by other distinguished guests. The program ended with feedback from Young Scientist followed by an inspiring address by Director NESAC.



Sharing the feedback



Director, NESAC gave away certificate to all Young Scientists

The Outreach and Capacity Building Programme of NESAC started since its inception. It was initiated not only for the beneficiaries of North Eastern states but also for national level in various fields where space technology inputs has a role to play. Large numbers of outreach and capacity building programme have been organized by NESAC for maximum utilization of geospatial inputs for planning and developmental activities. NESAC has a separate facility located 300m away from the NESAC main campus. It is comprises of academic blocks with lecture hall cum GIS Lab, smart digital class room, conference hall with VC facility, 10 G Network connectivity for internet, hostel facility for 80 boarders along with the other recreation/ multipurpose hall, canteen facility, gymnasium, etc.

A numbers of regular courses have been organized by NESAC on Basics of Remote Sensing and GIS, UAV Remote Sensing and the use of geospatial technology on Agriculture, Forestry, Geosciences, water resources, urban and regional planning, Space and Atmospheric sciences and Satellite communication etc . User specified tailor made courses are also being conducted as and when demand arises from the User Departments. A two weeks course was successfully conducted by NESAC during 6-17 January, 2020 to strengthen the capacity of BIMSTEC countries in Earth Observation Applications and Research. This course was planned for 24 Research Personnel from BIMSTEC countries (4 candidates from each country) and the course was sponsored by the Ministry External Affairs (BIMSTEC & SAARC Division), Government of India. Capacity Building under AMRUT Sub-scheme on Formulation of GIS based Master Plan for three tiers were also conducted



The outreach & training facility at NESAC

since 2018 with the objective to train urban planners in using geo-spatial techniques for master plan preparation. Tier I for Decision Maker Level Officers, Tier II for middle level officers and TIER-III for Junior level officials from different parts of India.

In 2022-23, a total of 301 participants from Water Resource Department, Department of Agriculture, Assam Survey & Settlement Training Centre, National Disaster Management Authority, and BSF has participated in 9 such training programme. NESAC have also organized 1-2 weeks training Programme and 267 participants have participated from different organization in 11 training programme. Out of 11 training, 6 regular courses on different thematic areas and 5 customized courses for different user departments were organized during 2022-23. The course schedule for 2023–2024 has already been published (<https://nesac.gov.in/outreach/>) and it includes 12 training programmes, of which five have been successfully completed. In

Training Programs	2018-19		2019-20		2020-21		2021-22		2022-23	
	Prog	Partici.	Prog	Partici.	Prog	Partici.	Prog	Partici.	Prog	Partici.
1-2 days program	8	300	6	223	4	170	7	245	9	301
1-2 Weeks program	6	170	12	237	5	119	4	79	11	267
Exhibitions /DLP	11		10		4		4		8	
Research Internships	61		99		22		20		48	

Outreach & Capacity building initiatives at NESAC

In addition to the scheduled courses, NESAC has also organized the ISRO's "Young Scientist Programme (YUVIKA)" from May 15-27, 2023 with participation of 48 students from NER.

A number of students from different parts of the country have been carrying out their BTech/M Tech. / M. Sc. dissertation work at NESAC every year under the supervision of NESAC Scientists and Engineers.

NESAC has taken part in a number of exhibitions to highlight its varied activities and the advancements made by the nation in space science and technology. As part of the celebration, NESAC has also organised a number of outreach events, including remote sensing day, moon day, and Azadi



The Space on Wheels facility is extensively used for outreach activities

Continued from page 1

Like previous years, we hosted the third edition of the YUva VIGyani KARYakram (YUVIKA) or the Young Scientist Program of ISRO at NESAC during 15th – 26th May, 2023 along with six other major centres of ISRO. The YUVIKA program has drawn incredible interest among the youths of this country and ISRO had to increase the intake due to the very demand. The intake at NESAC increased to 49 from 30 last year, who were selected from the seven states of NER of India. We made the best possible arrangements to give a secure and memorable experience to the students. Although the students were not taken to Sriharikota, Andhra Pradesh this year, they could witness launching of RH200 sounding rocket live through video conferencing and interact with the Scientists/Engineers working at the NRSC ground station at Antarctica. The students also got an opportunity to interact with the Chairman, ISRO online got their queries answered.

We signed a Memorandum of Understanding (MoU) with the National Institute of Technology (NIT) Agartala on 11th July, 2023 at NESAC, Umiyam for collaboration towards joint research & development activities as well as academic programs. The MoU is specifically signed to take up advanced studies on

ka Amrut Mahotsav (AKAM) by the Government of India. Organising Space exhibitions where the 'Space on Wheel' Exhibition bus was stationed along with other visual displays for the school and college level students is one of such major programmes.

application of Artificial Intelligence (AI) and Machine Learning (ML) in different areas of space applications. I am extremely hopeful that the strength of the knowledge in geospatial technology domain available at NESAC and the depth of knowledge in the domain of AI and ML available in NIT Agartala, shall be integrated to develop products and services that will be useful to address the some of the challenges the region faces.

I am also happy to share that the first physical product under the Space Technology Incubation Centre (STIC) initiative of ISRO, which is an integrated, miniature and portable air pollution monitoring system (PROVID-1), was handed over to NESAC and ISRO on 27th April, 2023. The product was developed by the NIT-Agartala under the mentorship and guidance of NESAC Scientist. It was showcased at the exhibition organized as part of the National Technology Day celebration program during 11th to 14th May, 2023 at Pragati Maidan in New Delhi, which was inaugurated by the Hon'ble Prime Minister of India, Shri Narendra Modi Ji.. We are also mentoring in another three projects under the same initiative that are also expected to produce excellent result.

Training programs organized by NESAC

NESAC conducted one week course on Development of Geospatial Dashboard & Mobile Applications and Geo-Web Analytical Tools

One week short course on “Development of Geospatial Dashboard & Mobile Applications and Geo-Web Analytical Tools” was conducted during 17–21 July, 2023 at NESAC. The programme was conducted by Geo-informatics and IT Division (GID) of NESAC. The course was attended by 18 participants from government departments and academia coming from different parts of India.

The inaugural programme started with the opening remarks by Dr Dibyajyoti Chutia, Head, GID, followed by introduction from the participants. Shri PS Singh, Course Director gave a brief overview of the course. Dr. S.P. Aggarwal, Director, NESAC welcomed all the participants and gave detail insights of the course and how one must use geospatial technology in governance process. The course was designed to provide a thorough understanding of the basic GIS operations with Open Source, ability to publishing and manage the geospatial database, collection of data using Geotagging Mobile App and finally the use of geospatial dashboards to aid in decision making process.



The course concluded with valedictory program which was held on July 21, 2023. Shri PS Singh, Course Director welcomed the participants and appreciated all the participants for their dedication and active engagement during the course. He then gave detailed account of lectures conducted during 5 days course. Dr. S.P. Aggarwal, Director, NESAC addressed the participants, inspired and encouraged

all to use these powerful technologies for their developmental planning and governance. The program concluded with a vote of thanks offered by Shri Nilay Nishant, Course Officer.

One week course on UAV Remote Sensing for BSF officials

One week short course on “UAV Remote Sensing-



Technological Advances and Applications” was conducted for 172 Bn Border Security Force (BSF), Shillong during 19 – 23 June, 2023 at NESAC. The programme was jointly conducted by Geoinformatics and IT Division (GID) and SATCOM & UAV Division (SUD) of NESAC. During the inaugural programme, Dr. S.P. Aggarwal, Director, NESAC welcomed the participants and highlighted the importance of UAV in various applications such as for defense applications. A total of 10 Officers from BSF had participated the course

The course was focused on understanding the principles and components of UAV, assembly & integration of UAV, various remote sensors, flight planning for data acquisitions, different data processing techniques such as Orthomosaics, Digital Surface/Terrain Models, 3D Textured Models, etc. which are used for various planning and R&D purposes. The participants were also given demonstration on end-to-end work flow on UAV assembly, integration & operations, mission planning, data acquisition, data processing and data analysis.

The valedictory program of the course was held on June 23, 2023. Shri V Saikhon, course officer presented the course summary. Shri Pradip Kumar, IPS, IG, Border Security Force, Ftr HQ Meghalaya graced the occasion as the Chief Guest.

Training programs organized by NESAC

एनईसैकने ईओएस-04 डेटा उपयोग पर एक सप्ताह का प्रशिक्षण कार्यक्रम आयोजित किया।

एनईसैक ने 08-12 मई, 2023 के दौरान 'प्राकृतिक संसाधन प्रबंधन और अनुप्रयोगों में ईओएस-04 डेटा का उपयोग' पर एक सप्ताह का विशेष प्रशिक्षण कार्यक्रम आयोजित किया। इस प्रशिक्षण ने उनतीस प्रतिभागियों के एक विविध समूह को आकर्षित किया जिसमें संकाय सदस्य, राज्य उपयोगकर्ता, वैज्ञानिक, अनुसंधान अध्येता आदि शामिल थे। उद्घाटन कार्यक्रम में डॉ. एस.पी अग्रवाल, निदेशक, एनईसैक मुख्य अतिथि के रूप में उपस्थित थे।



पाठ्यक्रम की आवश्यकताओं के अनुरूप कुल दस सिद्धांत कक्षाएं और चार व्यावहारिक सत्रों की सावधानीपूर्वक योजना बनाई गई थी। विशेष विषयों पर व्यावहारिक सत्र देने के लिए अन्य इसरो केंद्रों के चार प्रतिष्ठित वैज्ञानिकों को आमंत्रित किया गया था। सैक, इसरो के वैज्ञानिक श्री राघव मेहरा ने 'एसएआर रिमोट सेंसिंग का परिचय' और 'ईओएस-04 डेटा के प्रसंस्करण' पर बहुमूल्य ज्ञान साझा किया। एनआरएससी, हैदराबाद की वैज्ञानिक श्रीमती एस हरि प्रिया और श्रीमती के निहारिका ने प्रतिभागियों को 'ईओएस-04 और इसके उत्पादों का अवलोकन' और 'एसएआर पोलारिमेट्री और इसके

अनुप्रयोगों' पर प्रबुद्ध किया। आईआईआरएस, देहरादून के वैज्ञानिक श्री आशीष जोशी ने 'एसएआर इंटरफेरोमेट्री और इसके अनुप्रयोगों' पर अपनी विशेषज्ञता से प्रतिभागियों को मंत्रमुग्ध कर दिया।

समापन कार्यक्रम 12 मई 2023 को आयोजित किया गया था, जहां एनआरएससी के निदेशक डॉ. प्रकाश चौहान मुख्य अतिथि के रूप में उपस्थित थे।

NESAC conducted one week training for MBDA Officials

NESAC, in collaboration with the Meghalaya Basin Development Authority (MBDA), successfully conducted a one-week training on "Geospatial tools & applications in regional planning" for officials from Meghalaya associated with the during May 1-4, 2023. The training covered the topics on the basic concepts and principles of GIS, including spatial data, attributes, layers, and coordinate systems, open source GIS software, other specialized GIS tools, A number of GIS applications such as urban planning, watershed management, IOT, mobile applications, VRM dashboard visualization systems etc. The officials were provided adequate hands-on excises relevant to training program. Dr S.P. Aggarwal, Director, NESAC, interacted with the officials and discussed the importance of geospatial technology for planning and monitoring of NRM projects. A total of 25 officials from various districts in Meghalaya participated in training, which was coordinated by Dr Jenita M. Nongkynrih, Head, URD, NESAC.



Lt. General Rana Pratap Kalita, PVSM, UYSM, AVSM, SM, VSM, GOC-in-C, Eastern Command, Indian Army, visited NESAC

Lt. General Rana Pratap Kalita, PVSM, UYSM, AVSM, SM, VSM, GOC-in-C, Eastern Command, Indian Army visited NESAC on 24th April, 2023. Dr SP Aggarwal, Director, NESAC welcomed Lt. Gen. Kalita on behalf of NESAC and made a presentation on the recent activities and achievements of the centre. Dr Aggarwal highlighted few major geospatial applications and operational services pertaining to natural resource management & monitoring, infrastructure planning, disaster management supports and satellite communication. Lt. Gen. Kalita appreciated the diversity and quality of work being carried out by NESAC for societal benefit in the region.



NIT, Agartala hands over first physical product under STIC initiative of ISRO

The first physical product under the Space Technology Incubation Centre (STIC) initiative of ISRO, an integrated, miniature and portable air pollution monitoring system, was handed over to Dr S P Aggarwal, Director, NESAC by Prof H K Sharma, Director, NIT, Agartala in presence of Shri Sudheer Kumar N, Director, CBPO, ISRO HQ. The product was developed by a team of students under the guidance of Dr Mitrabaran Sarkar, Assistant Prof, Dept. of ECE, NIT Agartala. The concept for the device and mentoring towards development of the same was provided by Dr Shyam S Kundu, Head, SASD, NESAC. The instrument provides real time measurement and monitoring of NO₂, SO₂, Ozone, Methane, CO₂, PM₁₀, PM_{2.5}, Temperature and

Humidity. The data is collected by the sensors every five seconds (user selectable) and are stored in a data logger along with the information on the coordinates of the data collection point. The collected data are transmitted to a central server via the GPRS connectivity and the same can be visualized using a mobile App, developed as part of the project.



The product handing over program was organised on 27th April, 2023 at NIT Agartala which was attended by a large number of faculties and students from NIT Agartala. Director, NESAC addressed the gathering and shared his vision of more collaborative work between NESAC and NIT Agartala to develop innovative products and services utilizing space science and technology.

Hon'ble German MP Mr Florian Müller visited NESAC



The German Christian Democratic Union (CDU) party's Member of Parliament, Mr Florian Müller, along two other delegates visited the NESAC on May 30, 2023 as part of his five days visit to the State of Meghalaya. He was welcomed by Dr. S. P. Aggarwal, Director, NESAC and a discussion was held along with the Scientists of NESAC at the Outreach conference room. Director, NESAC

felicitated the Hon'ble German MP and gave a presentation on various activities of NESAC. The MP lauded the efforts put by NESAC in helping the general public in various sectors particularly in combating natural calamities by providing space based inputs.

NESAC signs MoU with NIT, Agartala to promote collaborative research

NESAC signed a Memorandum of Understanding (MoU) with National Institute of Technology (NIT), Agartala on 24th July, 2023 at NESAC, Umiam, Meghalaya. The MoU was signed by Dr S P Aggarwal, Director, NESAC and Prof Sarat K Patra, Director, NIT Agartala. The Dean, Planning and Development, NIT Agartala and Group Head and Division Heads of NESAC were present during the MoU Signing program. The MoU will facilitate joint research & development activities and joint academic programs between the two institutions with particular emphasis on application of Artificial Intelligence and Machine Learning in different areas of space applications.



Visit of students to NESAC as part of NCW-Inter-State Exchange Programme

A facility visit was arranged at NESAC on the 11th July, 2023 on request from National Commission for Women as a part of the Inter State Exchange Programme involving young students above 18 years having leadership qualities from different regions of the country. The visit was organized by Meghalaya State Commission for Women along with the National Women Commission. There were students from Uttarakhand, Harayana, Uttar Pradesh,

Rajasthan and Himachal Pradesh. The students were given an exposure on Remote Sensing and GIS applications, Space Science Program, Indian Navigational System (NavIC) & UAV/Drone applications.



Webinar conducted at NESAC under AKAM

As a part of the Azadi ka Amrit Mahotsav (AKAM) celebration, NESAC organized an open webinar on 'NavIC – its Applications and Benefits to the Society' on 3rd July, 2023. The talk was delivered by Shri F B Singh, Deputy General Manager, IGSA & Deputy Project Director, IRIMS, IRNSS GSN, ISTRAC, ISRO.

The talk provided valuable insights and experiences in the domain of Indian regional navigation system. A comprehensive overview of NavIC (Navigation with Indian Constellation), including design and development of NavIC enabled GNSS chips were covered during the talk. He highlighted application of NavIC in different domains. The webinar was attended by professionals from diverse domain of disaster management, State Remote Sensing Application centres, user departments and students from universities in north eastern states.

Brainstorming Meeting held between NDRF and NESAC

A Brainstorming meeting was held on 28th June, 2023 at NESAC between officials from 1st BN, NDRF and NESAC officials under the chairmanship of Director, NESAC. The meeting was organized to look for the areas where both NESAC and NDRF can work together in reducing the disaster risk in NER. The meeting was attended by Shri HPS

Kandari, Commandant, 1st BN, NDRF, Guwahati along with team from NDRF and officials from NESAC. All aspects of use of space technology in different disasters being encountered in NER were deliberated during the brainstorming meeting. Both NDRF and NESAC shown keen interest in working together as a team in providing services during disaster incidences in NER.

NESAC organised workshop on ‘Usage of Official Language in Computers’

As per the Official Language Policy of the Government of India, Hindi Workshop is organized in each quarter of a year. To encourage the use of official language in the office, it is necessary to provide training related to use of Hindi in computers. Shri Rajesh Chaturvedi, Deputy Director (Official Language), State Bank of India, Guwahati was invited to conduct the workshop on the topic ‘Usage of Official Language in Computers’. Shri Chaturvedi, started his lecture session by describing various rules and regulations of the official language. Further, he informed all the participants about various methods of using Hindi language in computers with a PPT presentation.

NESAC organises Blood Donation Camp



NESAC organised a Voluntary Blood Donation Camp in collaboration with Regional Blood Centre, Pasteur Institute, Directorate of Health Services, Shillong on 16.06.2023 at the Multi-purpose Hall, NESAC Residential Complex, Umiam. 22 NESAC employees voluntarily donated blood on that day.

IMS-Shillong Chapter joins hands with NESAC for World Environment Day Celebration



The Indian Meteorological Society (IMS) – Shillong Chapter and the NESAC jointly organized a program to celebrate the World Environment Day on 5th June 2023. The program started with a welcome address by Dr. S.P. Aggarwal, Director, NESAC, who highlighted on the importance of environment protection and better plastic management. This was followed by an invited lecture by Prof. Hari Prasad Sarma, Former Pro-Vice Chancellor and the Head of the Department of Environmental Science, Gauhati University, on the topic “Plastic pollution and the control measures”. Prof. Sarma highlighted the initiatives of Govt. of India to control the pollution in addition to a informed lecture on the pollution control in India. The program ended with the inauguration of the “Weeklong Plantation Program” by Director, NESAC with plantation of a fruit tree samling at NESAC office campus.

Editorial Board

Dr Shyam S Kundu
Dr Pebam Rocky
Shri Anjan Debnath
Dr Gopal Sharma
Dr Aniket Chakravorty

Published by

North Eastern Space Applications Centre
Department of Space, Government of India
Umiam-793103, Shillong, Meghalaya
Ph: +91 364 2570141/2570140
Fax: +91 364 2570139
Web: www.nesac.gov.in