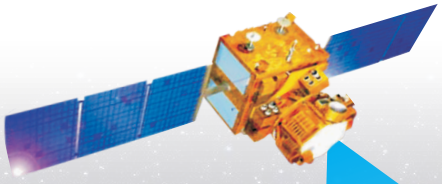
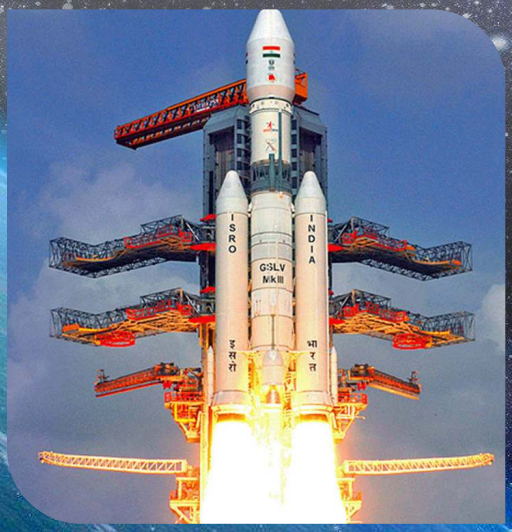
CSSTEAP Newsletter

JANUARY, **2022** I VOLUME **25** I ISSUE **1**





Centre for Space Science & Technology Education in Asia & the Pacific

(CSSTEAP)

(Affiliated to the United Nations)

on a mission of capacity building, the initiative of the United nations, for Asia and the Pacific Region in Space Science and Technologym through Excellence in Education, Training and Research.

CSSTEAP Governing Board

Chairman

Mr. S. Somanath
India

Members

Md. Azizur Rahman
Bangladesh

Dr. Hong Yong IL
DPR Korea

Dr. Thomas Djamaluddin
Indonesia

Mr. Arman Pishini
Iran

H.E. Mr. Zhalgasbayev Nurlan
Kazakhstan

Prof. Abdykalykov Akymbek Abdykalykovich
Kyrgyz Republic

H.E. Dato Hidayat Abdul Hamid
Malaysia

President of Mongolian Academy of Sciences
Mongolia

Dr. Kyi Thwin
Myanmar

Mr. Charan Kamal Singh Bhalla
Nauru

Mr. Ananda Prasad Sharma
Nepal

H.E (Mr.) Ramon S. Bagatsing, Jr.
Philippines

Dr. In Sang Moon
Republic of Korea

Mr. S. Panawennage
Sri Lanka

Dr. Pakorn Apaphant
Thailand

Dr. Kamol M. Muminov
Uzbekistan

Observers

Dr. Simonetta Di Pippo
UNOOSA

Prof Dr Freek van der Meer
ITC (The Netherlands)

Secretary

Dr. Prakash Chauhan
Director, CSSTEAP, India

Governing Board Members and Special Invitees during 26th Governing Board Meeting
Through Virtual Mode, December 22, 2021

contents

Director's Message

The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) has completed its 26 years and contributing significantly in capacity building in the Asia Pacific region in the frontier areas of Space Science and Technology and their Applications since its inception in 1995. The prime focus of the Centre has been on long-term and short-term programs for mid-career professionals by inviting them to its 9-month long Post Graduate (PG) courses and short courses spanning for about 2-4 weeks. The PG courses offered, covers the wide spectrum of Space Science and Technologies and Applications - Remote Sensing and Geographic Information Systems, Satellite Communications & Global Positioning Systems, Satellite Meteorology & Global Climate, Space & Atmospheric Science and Global Navigation Satellite System, approved by UNOOSA as potential subjects for societal benefit in the Asia-pacific region. Short courses cover typically different themes of Remote Sensing and GIS applications, DRR, Small Satellite Missions, Numerical Weather Prediction models and Navigation and Satellite Positioning System on regular basis etc. The Centre also organizes short courses & awareness programmes from time to time based on the request of user departments. CSSTEAP has been involved in supporting efforts by UNOOSA capacity building initiatives.

Again, Year 2021 was a challenging Year as Covid-19 pandemic continued to affect entire world. Since Covid-19 pandemic situation has not been conducive for in person courses, three PG Diploma courses namely: 25th RS and GIS, 12th Satellite Meteorology & Global Climate and 12th Space & Atmospheric Sciences courses are being conducted in hybrid mode and with the improvement of the situations, in-person mode of training will be adopted. Several online short courses on different themes were organized in 2021. The overwhelming response of participants shows the importance of CSSTEAP courses among participants of Asia-pacific region.

To increase the outreach through virtual mode, CSSTEAP and UNOOSA designed and developed the first MOOC on Geospatial Applications for Disaster Risk Management" so as to reach large number of participants enabling flexible online education. The Phase-I MOOC received huge response and based on the feed back received on the Phase-I of MOOC organized 2020 and request to continue the MOOC, CSSTEAP had launched Phase II of MOOC on June 01, 2021 which continued until November 30, 2021. About 7049 participants from 128 countries across the globe have attended the Phase II of MOOC.

CSSTEAP has partnered with UNOOSA, the European Space Agency (ESA), the Indian Space Research Organisation (ISRO), and the National Aeronautics and Space Administration (NASA) to provide a variety of training courses on the application of EO technologies for agriculture. A 2 days online short training programme on 'Remote Sensing Applications for Crop Mapping and Monitoring" was organized by CSSTEAP and ISRO on October 5 and 7, 2021 which received good response.

CSSTEAP also supported to UN activities in the Regional workshop on "Enhancing Preparedness for Climate Related Disasters Using Space-Based Technologies" for SAARC Countries on 17th February 2021. I am sure that in 2022, we would be able to organize our regular PG courses in person at Dehradun and Ahmedabad along with online short courses and MOOC.

I look forward to continued growth in stature of CSSTEAP in fulfilling all is objectives as well as keeping in pace with emerging opportunities in development and use of space technologies for national development and meeting the capacity building needs and requirement of the countries in the Asia and the Pacific region.

Dr. Prakash Chauhan
Director

About **CSSTEAP**

Peaceful utilization of the outer space has great potential for benefiting mankind. Considering the importance of space science, technology and its applications in promoting socioeconomic development, the United Nations, through its Office for Outer Space Affairs (UNOOSA), facilitated the establishment and operationalization of the Centres for Space Science and Technology Education in different parts of the globe. In its resolution 45/72 of 11 December, 1990, the United Nations General Assembly (UN-GA) endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space (COPUOS) to establish Regional Centres for Space Science and Technology in developing countries. Under the auspices of the United Nations, through its Office for Outer Space Affairs (UNOOSA), six Regional Centres for Space Science and Technology Education have been established in the regions that correspond to the United Nations Economic Commissions for Asia and the Pacific (India and China), Africa (Morocco, Nigeria) and Latin America and the Caribbean (with offices in Brazil and Mexico) and Jordan for the West Asia region. The Centres are affiliated to the United Nations through UNOOSA. Centre for Space Science & Technology Education in Asia and the Pacific (CSSTEAP) is the first Centre to be established on November 1, 1995 in India and has been imparting education/training in the areas of RS&GIS, Satellite Communications, Satellite Meteorology and Global Climate, Space and Atmospheric Science, Navigation and Satellite Positioning System and Small Satellite Missions using modern infrastructure, technology and training tools and practices for the Asia and the Pacific region.

The Centre's headquarter is located in Dehradun, India, and its programmes are executed by faculty of the Department of Space (DOS) at campuses in Dehradun, Ahmedabad and Bengaluru. The Centre is supported by Indian Institute of Remote Sensing (IIRS), Dehradun for RS & GIS course; by Space Applications Centre (SAC), Ahmedabad for Satellite Communication (SATCOM), Satellite Meteorology and Global Climate (SATMET) and Global Navigation Satellite System (GNSS) and Navigation and Satellite Positioning Systems (NAVSAT) short courses; by Physical Research Laboratory (PRL), Ahmedabad for Space & Atmospheric Science (SAS) course and UR Rao Satellite Centre (URSC), Bengaluru for short course on Small Satellite Missions. The Centre also has agreement with the Government of India by which it has been accorded specific privileges and international status to the centre, similar to the privileges enjoyed by UN specialized agencies. Under the agreement the Centre also has access to facilities, infrastructure and expertise of DOS/ISRO institutions, including IIRS, SAC, PRL, and URSC. The Centre has a Governing Board consisting of members from 17 countries from Asia-Pacific region and two observers, (UNOOSA & ITC, The Netherlands). The Centre has formal UN affiliation with UNOOSA for developing the CSSTEAP model and extending support in terms of expert advice, technical assistance, relevant documentation and future directions. The countries have agreed to the goals and objectives of the Centre by endorsing a cooperation agreement through which the Centre was established. The technical activities of the Centre are guided by an International Advisory Committee (AC) consisting of subject experts that critically reviews the curricula, technical facilities, expertise in terms of faculty, etc.

The course curricula are developed by the Centre and endorsed by the United Nations for the various educational programmes run by the Centre. The educational programmes of the Centre are oriented towards the dissemination of knowledge in relevant aspects of space science and technology. The Centre offers Post Graduate courses in five areas. The model of the PG courses is designed to emphasize university educators, researchers and application scientists on the

development and enhancement of knowledge and skills in the domains of space technology and the highlight of the course is an application project which greatly enhances the learning of the participants.


CSSTEAP Headquarters, Dehradun (India)

The successful completion of the 9-month PG-Phase of the programme leads to the award of a Post Graduate diploma by the Centre. The Centre has a collaboration with Andhra University, Vishakhapatnam, Andhra Pradesh, India for awarding Masters of Technology to eligible successful participants of the PG Diploma course. For those eligible students who successfully finish their PG course and whose academic qualifications satisfy Andhra University norms and are interested in continuing for a Master of Technology (M.Tech) degree, the Centre offers the opportunity to do so. This gives an opportunity to the scholar to apply their knowledge and training received to deal with a 'real life' problem, where inputs from space technology can be used.

In addition to providing facilities, infrastructure and skilled manpower, the Government of India, through the Department of Space provides most of the funding. Funding grants for international travel of participants, subject experts, tuition fees and scholarships of students and the management of the Centre are mainly provided by Department of Space on behalf of Host country. UNOOSA also provides funding for travel of the some participants. Other agencies which financially contribute to the Centre include UN Agencies like UN-SPIDER, Beijing, China; UN-ESCAP in Bangkok, Thailand, UNESCO and UNDP.

Educational Programmes

The Centre offers post-graduate (PG) level training in five areas of specialization namely:

a) Remote Sensing and Geographic Information Systems (RS & GIS),
b) Satellite Communication (SATCOM),
c) Satellite Meteorology and Global Climate (SATMET)
d) Space and Atmospheric Science (SAS), and
e) Global Navigation Satellite Systems (GNSS).

Besides the Post Graduate level courses, the Centre also conducts short courses, workshops, awareness programmes, Webinar and MOOC on specific themes in the above areas, highlighting how space-based information can be used for national development. These educational programmes have benefited many scientists/engineers who will be the future policy & decision makers in several countries.

CSSTEAP has conducted 61 PG Courses (24 in RS&GIS, 12 in SATCOM, 11 in each SATMET and SAS and 03 in GNSS) and 60 short courses and workshops and 10 online short courses in last 26 years. These programmes have benefitted 2898 participants (PG-1018, Short courses-1407 and online short courses-473) from 37 countries in the Asia-Pacific region including 48 participants from 23 countries, outside Asia Pacific region.

Till date, 188 PG students (85 in RS&GIS; 50 in SATCOM; 22 in SATMET; 27 in SAS and 04 in GNSS) from 17 different countries have been awarded M. Tech. degree.

Highlights

PG COURSES ONGOING

RS & GIS

25th PG Course on RS& GIS at IIRS, Dehradun during October 01, 2021 - June 30, 2022 (18 participants from 11 countries)

SATMET

12th Post Graduate Diploma in Satellite Meteorology and Global Climate at SAC, Ahmedabad during October 01, 2021-June 30, 2022 (6 participants from 5 countries)

SAS

12th Post Graduate Course on Space and Atmospheric Sciences at PRL, Ahmedabad during October 01, 2021-June 30, 2022 (12 participants from 6 countries)

JOINT ACTIVITY WITH UNOOSA

Massive Open Online Course (MOOC Course)

on "Geospatial Applications for Disaster Risk Management PHASE-II" during June 01, 2021 - November 30, 2021 (7049 participants from 128 countries)

CSSTEAP UNOOSA JOINT COURSE

On "Remote Sensing Applications for Crop Mapping and Monitoring" during 5th October and 7th October, 2021" (64 participants from 20 countries)

ONLINE SHORT COURSES COMPLETED

RS&GIS Application

on "Recent Advances in Space Applications for Forest Monitoring and Assessment" during April 12 - April 16, 2021 (56 participants from 08 countries)

Disaster Risk Reduction

on "Space Technology for Disaster Management" during April 19 - April 30, 2021 (45 participants from 11 countries)

Satellite Meteorology

on "Use of Space Technology for Weather and Climate Studies" during May 17 - May 31, 2021 (43 participants from 10 countries)

Disaster Risk Reduction

on "Coastal Zone Management in Response to Natural Hazards and Climate Variability" during July 26 - August 06, 2021 (43 participants from 07 countries)

Navigation and Satellite Positioning System

on "Introduction to Satellite Navigation" during September 13 - September 24, 2021 (45 participants from 13 countries)

Small Satellite Mission (SSM)

on "Small Satellite Mission" during December 13 - December 24, 2021 (22 participants from 8 countries)

Dr. Arijit Roy
Programme Coordinator, CSSTEAP

25th Post Graduate Course on Remote Sensing & Geographic Information System (RS & GIS)

Due to global pandemic and lockdown the long term PG Courses of CSSTEAP could not take place in 2020. The twenty-fifth PG course on Remote Sensing and Geographic Information System of CSSTEAP was decided to conduct in hybrid mode considering the evolving situation. The course was launched on October 1, 2021 in a combined virtual inaugural program with 12th PG SATMET and 12th SAS PG Course. The launch program was

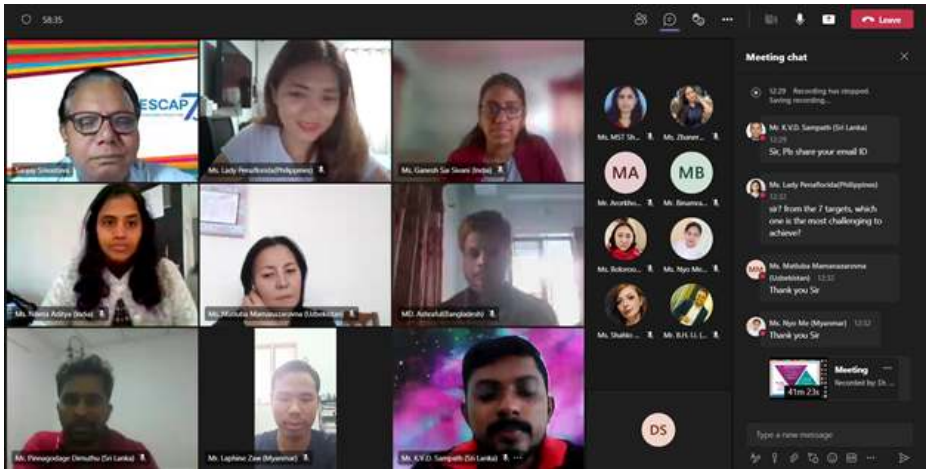
Combine Virtual Inaugural Program on October 01, 2021

attended by Director CSSTEAP/IIRS Dr. Prakash Chauhan, Director SAC, Ahmedabad Shri Nilesh M. Desai, Director, PRL, Dr. Anil Bharadwaj and Dean Academics, IIRS, Dr. S.K. Srivastav, PC, CSSTEAP, Dr. Arijit Roy, Course Directors, Course Coordinators, besides several other dignitaries and the course participants.

The 25th PG course on Remote Sensing and Geographic Information System of CSSTEAP is presently in progress and being conducted online by Indian Institute of Remote Sensing (IIRS), ISRO, Dehradun, one of the host institutions of CSSTEAP. There are total 18th participants from 11th countries of Asia-Pacific Region viz., three participants each from Sri Lanka, two each from Bangladesh, India, Mexico, Myanmar and Uzbekistan, one each from Kazakhstan, Mongolia, Nepal, Philippines and Tajikistan are attending the course. The participants attending the course are from varied backgrounds like Agriculture and Soils, Marine and Atmospheric Sciences, Geoscience and Geo-Hazards, Geoinformatics, Urban and Regional Studies, Water Resources, Satellite Image Analysis and Forestry and Ecology.

Presently the participants attending the 25th RS&GIS PG Course have completed the first Semester consisting of Module-1A and Module-1B. In Module-1A participants were imparted information on Remote Sensing and Geographic Information System and their application in natural resource management, where the emphasis is on the development and enhancement of knowledge and skills through classroom lecture, tutorials, field visits, seminars and hands on session. In addition, the participants had an opportunity to get benefitted from the experience and interaction during the guest lectures from Dr. Shirish Ravan, Head, UN-SPIDER Beijing Office, UNOOSA and Dr. Sanjay Srivastav, Chief DRR, UNESCAP, Thailand on Sustainable Development Goals and Sendai Framework especially in context of Asia Pacific and application of earth observation technology. The second semester consisting of Module-II is presently under progress, wherein the participants are required to opt for an elective suiting their professional background. In present batch 8 participants each had opted for Geoinformatics, 4 each for Agriculture & Soils, 3 each for Forestry & Ecology and Satellite image analysis & photogrammetry. After completion of Module-II, the participants will need to execute a three months duration pilot project, based on the knowledge gained during the Module-I and II respectively.

Guest lecture from Dr. Shirish Ravan, Head, UN-SPIDER Beijing Office, UNOOSA



Guest lecture from Dr. Sanjay Srivastav, Chief DRR, UNESCAP, Thailand

Dr. Sanjeev Kumar Singh
Course Coordinator, RS&GIS
sksingh@iirs.gov.in

Mr. C.M. Bhatt
Course Director RS&GIS
cmbhatt@iirs.gov.in

12th Post Graduate Diploma Course on Satellite Meteorology and Global Climate (SATMET-12)

The 12th Post Graduate Courses on Satellite Meteorology and Global Climate under the aegis of the UN affiliated CSSTEAP, is being conducted at Space Applications Centre (Bopal Campus), Ahmedabad in hybrid-mode during October 01, 2021 to June 30, 2022. This report contains the activities carried out during first three months i.e. October 01 to December 31, 2021. Due to Covid-19 pandemic this course has started in online mode from October 01, 2021. With improvement in pandemic situation the participants will be called in-campus in later half of the course.

Initially ten participants from seven countries in Asia-Pacific region have been selected for this course, however, during module 1, four participants have withdrawn from this course due to various personal reasons. Presently six participants (one each from Bangladesh, Maldives, Myanmar and Nepal and two from India) from 5 different countries are undergoing this course. They are mostly operational forecasters, meteorologist, and researchers in their own country. After they learn about satellite meteorology, they will impart training to their own officers in these subjects once they go back. The participants are from the countries like Bangladesh, India, Maldives, Myanmar and Nepal.

A joint virtual inaugural function of the three courses: (i) Satellite Meteorology and Global climate conducted by Space Applications

Centre (SAC), (ii) Remote Sensing and GIS conducted Indian Institute of Remote Sensing (IIRS) and (iii) Space and Atmospheric Science conducted by Physical Research Laboratory (PRL) was held in virtual mode on October 01, 2021. Shri Nilesh Desai, Director of SAC, Dr. Anil Bhardwaj, Director of PRL, Dr. Prakash Chauhan, Director of CSSTEAP, Dehradun and senior officers from SAC, IIRS and PRL graced the function.

This SATMET-12 course has 2 semesters spread in 3-modules. The 1st module covers the fundamentals of Satellite Meteorology and Global climate, and 2nd module deals with Advanced Concept of Satellite Meteorology, e.g., Geophysical Parameter Retrieval and Satellite Products and their application in NWP etc. In the first two modules, in the morning lectures from the subject experts followed by practical in the afternoon are conducted on daily. The 3rd module, called Pilot project module (duration: 3 months) the participants have to do project on a topic relevant to their own country under the guidance of an expert scientist from Space Applications Centre, Ahmedabad. In Module–I which has been successfully completed (October-December 2021) and Module-2 is presently going on, there are theory classes in the morning and practical's in the afternoon sessions. There were tutorials; weather discussions, climate seminars and the performance of the participants were assessed through written, interactive sessions and practical exercises, tests & examinations. On successful completion of the Phase I, the participants will be given the PG diploma, and they can complete their PHASE-II project work in their own county for one year, and the work can be submitted to Andhra University for the award of M. Tech.

Meeting of SATMET-12 participants with Director, SAC

SATMET-12 participants in lab session

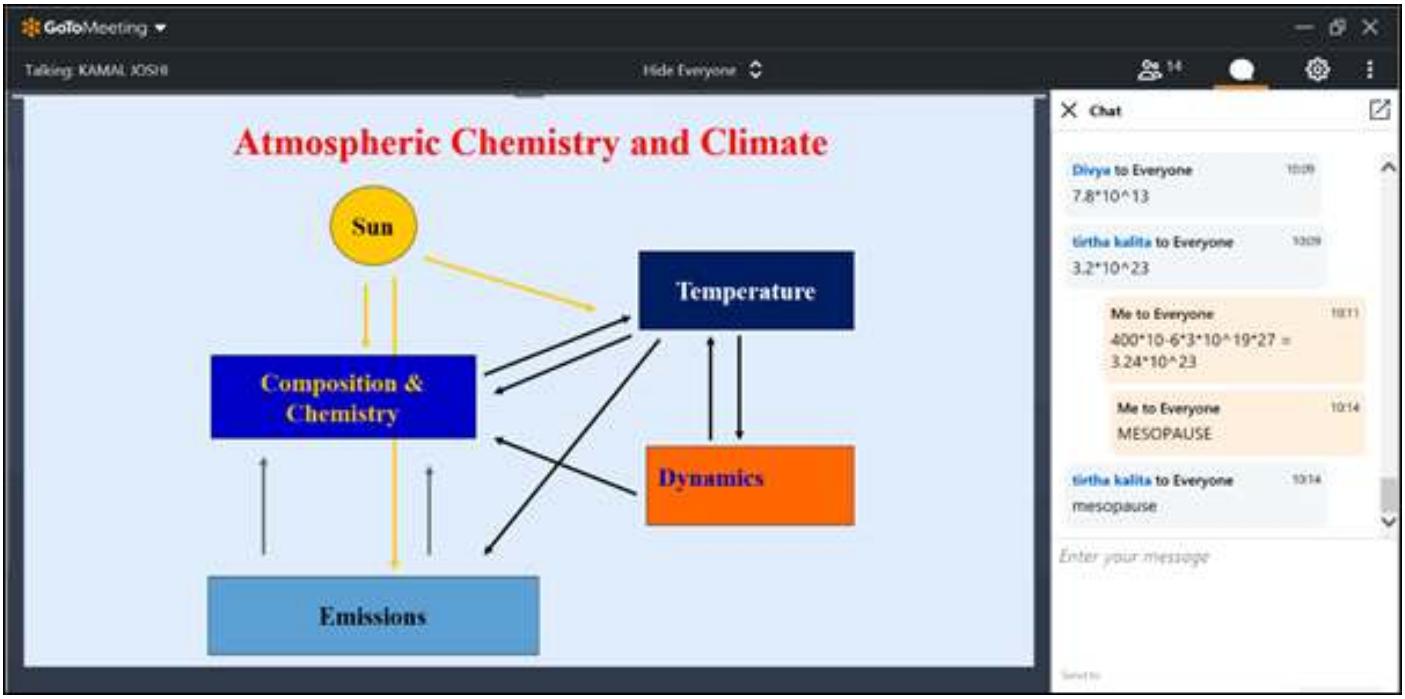
The glimpses of SATMET-12 participants meeting with Director, SAC and lab session are shown.

Dr. Sanjib Kumar Deb
Associate Course Director
sanjib_deb@sac.isro.gov.in

12th Post Graduate Course on Space and Atmospheric Sciences (SAS-12)

The 12th Post Graduate Course on Space and Atmospheric Science (SAS-12) started online from 01 October 2021. There were 12 participants: 7 from India, 1 from Nepal, 1 from Ethiopia, and 1 each from Bangladesh, Mongolia and Uzbekistan. A combined Virtual Inaugural function of CSSTEAP PG Courses on "25th Remote Sensing & GIS (RS&GIS-25)" hosted by IIRS Dehradun, "12th Satellite Meteorology and Global Climate(SATMET-12)" hosted by SAC Ahmedabad and "12th Space and Atmospheric Sciences (SAS-12)" hosted by PRL Ahmedabad was held at CSSTEAP Headquarters on 01 October 2021 through a virtual platform. Shri Nilesh Desai, Director SAC, Dr Anil Bhardwaj, Director, PRL, Dr Prakash Chauhan, Director CSSTEAP/IIRS, Dehradun and senior officers from SAC, PRL and IIRS graced the function.

The course started with introductory lectures common and useful to both SAS and SATMET participants. In this common module, very interesting talks were given by the faculty members from PRL, SAC and IIRS. The regular course began immediately after the common module was over. The course is spread over two semesters. Faculty members included eminent Scientists/Engineers



An online class in session

Screenshot of Combine Virtual Inaugural Program on October 01, 2021

from PRL and other Institutions in India. Subjects covered in the 1st semester were Earth's Atmosphere and Climate Change, Ionosphere and Radio Communication, Planetary Science and Exploration, Ground-Based Experiments for Near-earth Environment, and Space Instrumentation. Lectures for the first semester ended in December 2021. Final examinations for the first semester were conducted during the period 6-24 January 2022. Classes for the second semester will begin on 25 January 2022 and end on 25 March 2022. There will be 4 theory papers covering topics on Sun and Space Weather, Stellar and Galactic Astronomy, Electronic Devices and Detectors for Space Instrumentation, and Space Exploration. Apart from theory classes in the morning hours, there will be online practical sessions in the afternoon hours.

Dr. J. Banerji
Course Director
E-mail: jaybanerji1@gmail.com

Massive Open Online Course (MOOC): Geospatial Applications for Disaster Risk Management-Phase-II

During the challenging times of the COVID-19 outbreak, MOOCs are an effective way of reaching a large number of participants to share knowledge. The United Nations Office for Outer Space Affairs and the Centre for Space Science and Technology Education for Asia and the Pacific (Affiliated to the United Nations) launched the first phase of Massive Open Online Course (MOOC) on "Geospatial Applications for Disaster Risk Management" on 13th October,2020 the International Day for Disaster Risk Reduction. Based on the feedback and request for continuation of MOOC from particpnats a second phase of MOOC was launched, with enhanced additional lectures and hands on sessions on 01st June, 2021. The Phase-2 launch was attended by Dr. Prakash Chauhan, Director CSSTEAP/IIRS, Ms. Simonetta Di Pipo, Director UNOOSA, Shri Shantanu Bhatawdekar Director, Director, Earth Observation Applications & Disaster Management, ISRO, Dr. Shirish Ravan, Head, UN-SPIDER Beijing office, UNOOSA, Dr. Nancy Searby, Chair, WGcapD beside other senior officials and registered particpants.

The MOOC aimed to strengthen efforts of disaster management professionals to contribute to achieving the targets of the Sendai Framework for Disaster

Launching of MOOC Phase-II

Risk Reduction 2015-2030, the 2030 Agenda for Sustainable Development and the Paris Agreement stemming from the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). MOOC Phase-2 included 18 sessions, 4 use cases, 2 hands on delivered by 21 Speakers form 15 organizations across the globe.

The course content consisted of two tracks. Track-1 covered the basic topics of DRR suitable for non-experts (a person without professional or specialized knowledge of the subject). This track aimed at imparting basic knowledge on disaster risk reduction, remote sensing and geospatial technologies with few assignments and targets. The participants need not have specific knowledge or expertise in the area of disaster management, geospatial technologies or Earth observation to complete Track 1. The participants who completed Track 1 successfully could only continue with Track 2, which was more technical and aimed at developing skills of the participants in the use of Earth observation in assessing various disasters. Track-2 covered the advanced applications of earth observation and other space technologies in disaster managementwith case studies and hands on demonstartions. About 1684 partcipants got benefitted from MOOC Phase-2, Track-1 was attempted by about 1684 particpnats and Track-2 was competed by 644 partcipants from 128 countries. There was about 71% partcipantion from male and 29% from female partcipants.

Various organizations contributing to MOOC sessions

Mr. C.M. Bhatt
Course Director RS&GIS
cmbhatt@iirs.gov.in

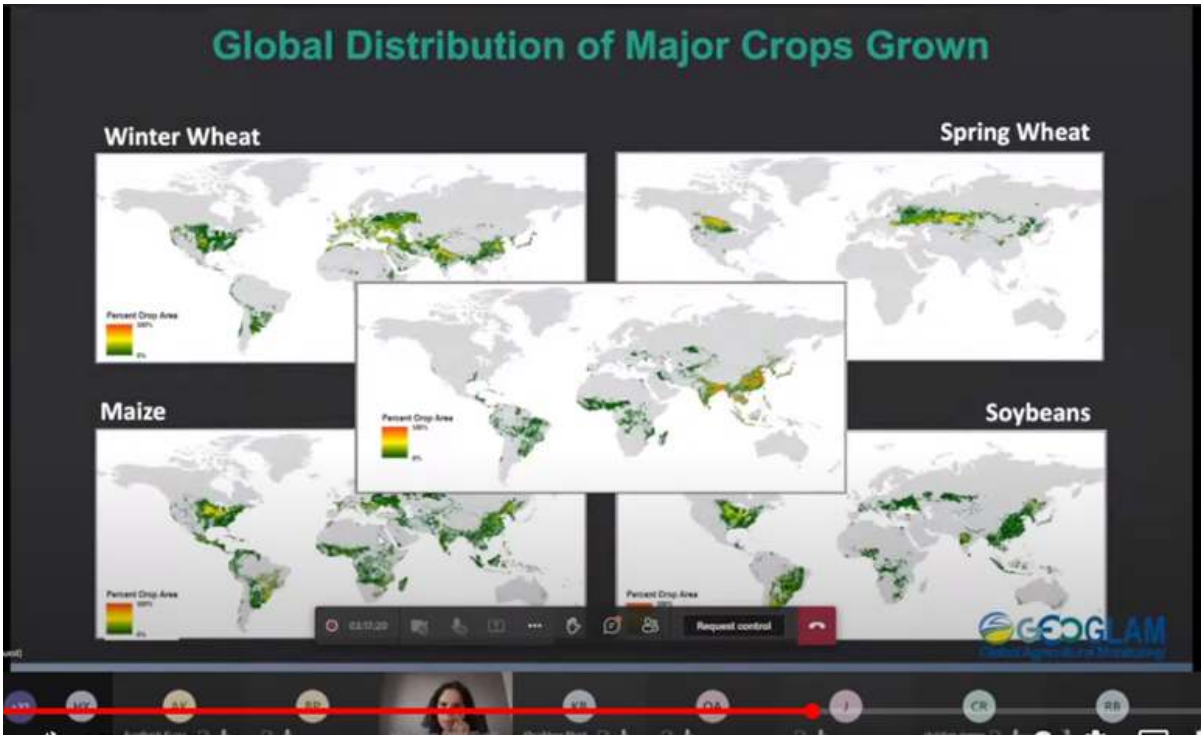
Online Course on "Remote Sensing Applications for Crop Mapping and Monitoring"

during 5th October and 7th October, 2021

As part of Centre for Space Science and Technology Education in Asia Pacific (CSSTEAP) and United Nations Office for Outer Space Affairs (UNOOSA) training activities, an online training on remote sensing application for crop mapping and monitoring was jointly organised by CSSTEAP and UNOOSA during 5th and 7th October 2021 in online mode. About 60 participants from 20 countries participated in this course. Dr. Manjunath, ISRO headquarters was the course director and Dr. Dipanwita, agriculture and soil department at Indian Institute of Remote Sensing was the course coordinator in the course. Renowned scientist working in the area of remote sensing application for crop mapping and monitoring from across the globe were resource person in this important training programme. The Wrap-up session was conducted by IIRS and ISRO, headquarters. The program was a grand success. The lectures and hands-on covered in the course are as follow:

- Overview of Remote Sensing and EO systems

Invited talk by Dr. Thuy Le Toan on Remote sensing applications for rice crop mapping and monitoring



Invited talk by Dr.Inbal Becker-Reshef, and Dr. Ritwik Sahajpal, University of Maryland on Global crop mapping concepts (for major crops such as rice, wheat, corn, soybean),
– techniques, tools and stakeholders.

- Remote Sensing Applications of Agriculture
- Global crop mapping concepts (for major crops such as rice, wheat, corn, soybean)– techniques, tools and stakeholders
- Remote sensing applications for rice crop mapping and monitoring (both optical and SAR)
- Hands-on: Image interpretation and Digital image processing
- Hands-on: Rice crop mapping and driving inputs for yield modelling (using optical and SAR data, on Google earth engine)

Online Short Course on "Recent Advances in Space Applications for Forest Monitoring and Assessment" during April 12 – April 16, 2021

SHORT COURSES

This online training course was organized by the Centre for Space Science and Technology Education in Asia and Pacific (CSSTEAP) and conducted by the Forestry and Ecology Department (FED) of the Indian Institute of Remote Sensing, ISRO, Dehradun during 12-16 April 2021. The training course was designed to provide the participants with a basic understanding of the recent advances in space applications for forest monitoring and assessment. The utility of Earth observation (EO) data, both passive and active, and its integration with in-situ measurements and modelling approaches for forest monitoring and assessment were the focus of this course. The participants could gain practical knowledge and ability to access, analyze, and apply EO data for forestry applications with a special emphasis on the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) region, which includes the countries: Bhutan, Bangladesh, India, Myanmar, Nepal, Thailand, and Sri Lanka. Dr. Hitendra Padalia and Dr. Subrata Nandy, faculty of FED, were the Course Director and the Course Coordinator of this special course respectively.

A total of 56 participants belonging to 8 countries (Bangladesh, Ethiopia, India, Iran, Mongolia, Myanmar, Nepal, and Sri Lanka) attended this course through a virtual platform. The course was comprised of lectures and demo sessions to facilitate comprehensive learning. The major topics covered in lectures were: Indian Earth observation missions and their benefits for the BIMSTEC region; Recent advances in space application for forest monitoring and assessment; National forest inventories in BIMSTEC region; Forest cover mapping and monitoring using remote sensing data; Application of LiDAR remote sensing for forest height and biomass assessment; Application of microwave remote sensing for forest disturbance and biomass studies: NISAR perspectives; Geoinformatics for biodiversity assessment and Forest fire monitoring and assessment. The demo sessions were carried out on Forest cover monitoring using cloud platform; SAR data processing for biomass studies and Forest burnt area and severity mapping. The lectures were delivered by the scientists of ISRO: Shri Shantanu Bhatawdekar, Dr. C.S. Jha, Dr. G. Rajashekar, Dr. Hitendra Padalia, Dr. Subrata Nandy, Dr. Ishwari Datt Rai, Dr. Taibanganba Watham, and by the guest faculty: Dr. Devendra Pandey and Shri Rajesh Kumar.

Dr. Subrata Nandy
Course Coordinator
nandy@iirs.gov.in

Dr. Hitendra Padalia
Course Director
hitendra@iirs.gov.in

Online Short Course on "Space Technology for Disaster Management" during April 19 – April 30, 2021

SHORT COURSES

Natural disasters are becoming more frequent and intense across the globe. According to the latest report by UN-ESCAP, Asia-Pacific region is the most disaster-prone region in the world, and the region faces major disaster problems in the form of environmental hazards, geological hazards and hydro-meteorological hazards, and causing massive damage to environment, infrastructure, economy and society. To address the challenge posed by disasters, the international community adopted the Sendai Framework for Disaster Risk Reduction (DRR) 2015-2030 at the Third UN World Conference on DRR in March 2015 in Sendai, Japan. The space based inputs can become an important tool in building resilience and addressing the priorities outlined by Sendai framework for DRR. Space technology can be useful particularly in the risk assessment, monitoring, response, mitigation and preparedness phases of disaster management, including early warning.

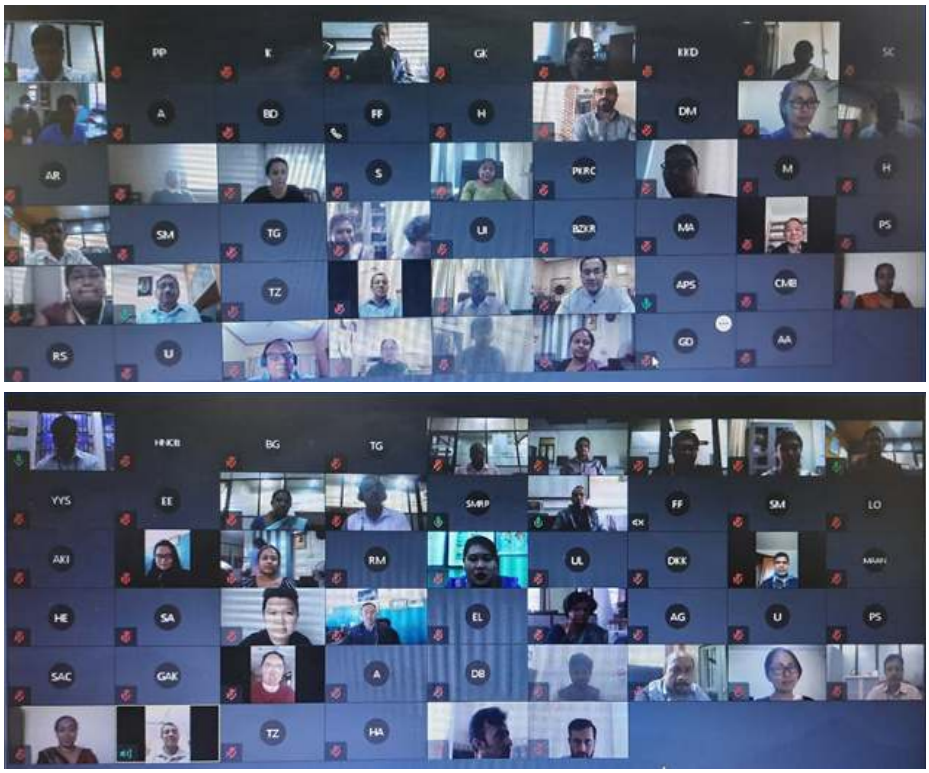
Center for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) was established in India in November 1995 with its headquarters in Dehradun and over the past 25 years, the center has emerged as a Centre of Excellence in capacity building in the field of space science and technology application. The 1st campus of the Centre was established at Dehradun, India and is hosted by Indian Institute of Remote Sensing (IIRS), a constituent unit of Indian Space Research Organisation (ISRO).

A two weeks online short course on 'Space technology for Disaster Management' for international participants, was organized by CSSTEAP and conducted by IIRS, Dehradun during April 19-30, 2021. In this online course, total 59 officer trainees from 12 countries joined the course on April 19, 2021. The officer trainees undergone for the training program were, one each from LAO PDR and Tajikistan; two each from Bangladesh, Myanmar, and Thailand; three each from Kyrgyzstan and Nepal; four each from India and Mongolia; eight from Kazakhstan; fourteen from Iran; and fifteen from Sri Lanka. Total 45 participants from 11 countries have successfully completed the course and awarded with the course completion certificate at the end of the course.

The overall objective of this two weeks online training programme was to generate awareness among users / researchers / professionals / decision-makers / academicians on Space technology and its applications for disaster management and in

the line of implementing Sendai Framework for DRR. The course was structured for fulfilling the requirement of the working level professionals in the field of disaster management. Keeping in mind the objective of the course, the course was designed for a comprehensive coverage of theoretical concepts and techniques of space technology including remote sensing, geographic information system, satellite communication; applications of space technology for various disasters; case studies on various disasters using space inputs; practical exercises related to satellite data download, data processing and database creation; overview of different geo-web portals for geospatial data availability for providing disaster related information; overview of disasters and global framework for disaster risk reduction; role of United Nations for promoting space technology in disaster risk management; success stories of applications of geospatial technology in disaster management support followed by interaction with faculty and panel discussion.

In this course, each session of theoretical lecture, overview lectures, practical and demonstration, and group interactions, was of one hour duration. Focus was also kept on using open source and easily accessible tools for the demonstration of practical



exercises and disaster related case studies. The entire course was conducted through a web link (GoToMeeting) and link was shared with all the participants in advance through respective emails and a common WhatsApp group. A common WhatsApp group was created to resolve the installation of web platform and day-to-day queries of the participants. The enthusiasm and support of the participants was highly inspiring during the course. They have shown their special interest during the course. At the end of the course, a soft copy of study material comprising of lecture power point presentation and practical exercises, and contact detail of all faculty members, were provided to all the participants. A team of subject experts from IIRS Dehradun, Space Application Center (SAC) Ahmedabad, ISRO Headquarters (ISRO-HQ) Bengaluru, UN-SPIDER, UN-ESCAP have shared their subject knowledge and valuable experience with the course participants during the course.

At the end of the course a formal feedback was collected from the course participants and overall the feedback was very good to excellent. Nearly all the participants found that the course met the objectives, relevant, well-structured, nicely organized and very useful to their current nature of job. The participants have mentioned that the course material provided will be very beneficial for help in future.

Hari Shankar
Course Coordinator
harishankar@iirs.gov.in

Dr. Arijit Roy
Course Director
arijitroy@iirs.gov.in

Online Short Course on "Use of Space Technology for Weather and Climate Studies" during May 17 – May 31, 2021

SHORT COURSES

Satellite Meteorology is a very promising field of remote sensing for analyzing and monitoring of weather and climate related information of the complex system earth. The invention of weather satellites has opened a new area in weather forecasting. Satellite observations enable to continuously monitor the weather as well as climate regimes on the whole globe. Therefore, it provides a powerful tool in weather forecasting, climate assessment etc. Worldwide the researchers, academicians, decision makers and professionals are using techniques developed under this field for use in most important areas like agriculture, climate and atmospheric science, marine science, hydrology etc. The recent development and availability of huge satellite data, worldwide connectivity through internet, and high performance computing environment opens up new vistas for managing the natural resources of system earth.

In the last 10-years or so Space Applications Centre (SAC), Indian Space Research Organization (ISRO) has created a store house of Indian satellite database from various ISROs meteorological/ earth observation missions and are operationally available from MOSDAC data centre (https://mosdac.gov.in). The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), affiliated to the United Nations is imparting training in various disciplines at different centres of ISRO. This is second online Short course on "Use of Space Technology for Weather and Climate Studies" under the aegis of the UN affiliated CSSTEAP conducted online at Space Applications Centre (Bopal Campus), Ahmedabad during May 17 to May 31, 2021.

The overall objective of the 2 weeks training course is to generate awareness among users/ researchers/ professionals /decision-makers /academicians on the basics of weather and climate and recent advances in predicting tropical weather phenomena with special emphasis on Indian Meteorological and Oceanographic satellites. The participants will be familiarized with following topics during lectures sessions: i) basic of weather and climate, ii) atmospheric motion: pressure, winds and circulations, iii) atmospheric instability, temperature, cloud formation and precipitation processes, iv) understanding of tropical weather systems cyclone, monsoon, ENSO etc., v) basics of weather forecasting and analysis, vi) space based observations for weather & climate, vii) atmospheric chemistry and climate

interactions, viii) Cryospheric process and climate change, ix) modeling of water cycle and climate change and climate projections. The participants will also be familiarized with applications and uses of satellite data for weather and climate during hands-on sessions.

Course Contents

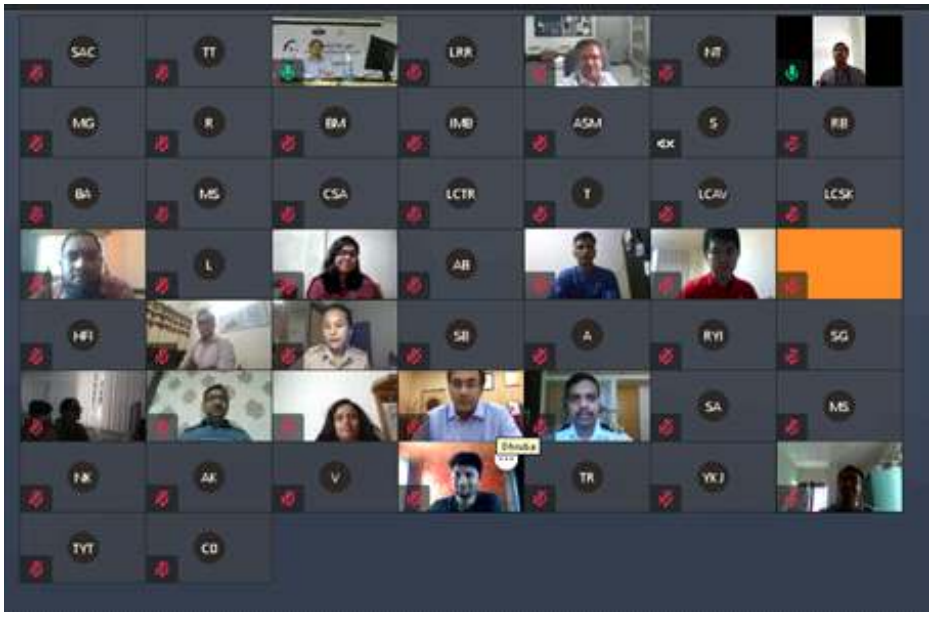
First Week

- Introduction to Weather and Climate.
- Basics of Satellite Meteorology.
- Space Based Observations for Weather and Climate.
- Tropical Weather Systems.
- Satellite data for Cyclone tracks and Intensity Prediction
- Basics of Weather forecasting and analysis.
- Now-casting using satellite data

Second Week

- Aerosol, radiation and chemistry-climate interaction
- Use of satellite data for Weather forecasting.
- Air-Sea Interactions.
- Global Warming and Sea-level Rise
- Urban Heat Island: Causes, effect and mitigation
- Concept of Climate Modeling.
- Modeling of Water Cycle and Climate Change
- Cryospheric process and Climate Change.
- Satellite based measurement of green-house gases

Apart from lectures, 7 online hands-on sessions were also conducted on the following topics



Some glimpses of inaugural session of the course

- Familiarization with INSAT-3D/ 3DR Rainfall products
- Now-casting of weather using INSAT-3D/3DR data
- Sea-level Rise using satellite altimeter observations
- Satellite based Synoptic Meteorology
- Satellite based cyclone analysis
- Use of satellite data for Atmospheric Chemistry related studies.
- Satellite data application for Urban Heat Island

One Online demo on MOSDAC data centre were also conducted.

All the sessions (both lectures and hands-on sessions) were very interactive with lots of questions from the participants and all faculties tried to clarify these online. In case of lengthy discussions, faculties e-mails were shared with them for further interactions. After the lecture sessions, presentation materials and lectures notes etc. were distributed among participants through e-mail. 2 theory lectures of 1hr 30 min each were conducted in the morning session of each day followed by 3 hrs online hands-on session. Total 20 lectures session were conducted in two-weeks' time.

Participants: Out of 48 selected participants, 43 participants from 10 countries in Asia-Pacific region were attended regularly and successfully completed the course. They are mostly operational forecasters, meteorologists, and researchers in their own country. The number of participants from country-wise is mentioned in the following table:

S. No.	Country	No. of candidates
1	Bangladesh	7
2	Ethiopia	1
3	Indonesia	1
4	India	18
5	Iran	1
6	Kazakhstan	3
7	Lao PDR	1
8	Mongolia	4
9	Nepal	3
10	Thailand	4
		43

Online Short Course on "Coastal Zone Management in Response to Natural Hazards and Climate Variability" during July 26 - August 06, 2021

SHORT COURSES

Two-week online short course on "Coastal Zone Management in response to Natural Hazards and Climate Variability" was organized by CSSTEAP and conducted by IIRS, Dehradun during July 26 - August 26, 2021. The overall objective of this two weeks course was to provide an understanding on sea level rise in response to natural hazards and climatic variability and the importance of coastal zone management to the users / researchers / professionals / decision-makers / academicians. There were no registration fees to attend the course. A total of 43 participants from 07 countries including India were attended this course. An inaugural function of this course was organized on first day (26 July, 2021) for which Dr. Shailesh Nayak, Director of National Institute of Advanced Studies, Bengaluru was joined with us as the chief guest.

The aim of this course was to provide knowledge about the coastal management concepts, inundation due to tropical cyclones and tsunami, climate change, sea level rise, coastal vulnerability due to inundation and sea level monitoring using remote sensing products. The participants also gained an understanding of the advantages of using remote sensing observations for coastal management and the areas of active research. All-together 14 lectures and 3 demonstrations were conducted during the course.

The lectures covered in the course are as follow:

1. Remote Sensing of coastal and Marine Ecosystems: Current and Future Indian Space Missions;
2. An introduction to ocean remote sensing;
3. Overview of Climate Change and Natural Hazards in context to coastal zone;
4. Coastal pollution and its impact;
5. Overview of remote sensing applications for coastal hazards;
6. Application of geospatial technology for coastal zone management;
7. Coastal disaster risk reduction techniques in developing countries;
8. Cyclone and its impact on coastal zone;
9. Tsunami modelling and coastal inundation;
10. Sea level rise in the climate change scenario;
11. Satellite Altimetry and Sea level Height measurement;
12. Primary production of marine ecosystems using ocean

colour satellite;

13. Assessment of coastal rip current using satellite data;
14. Impact of climate change on ocean CO_2 uptake.

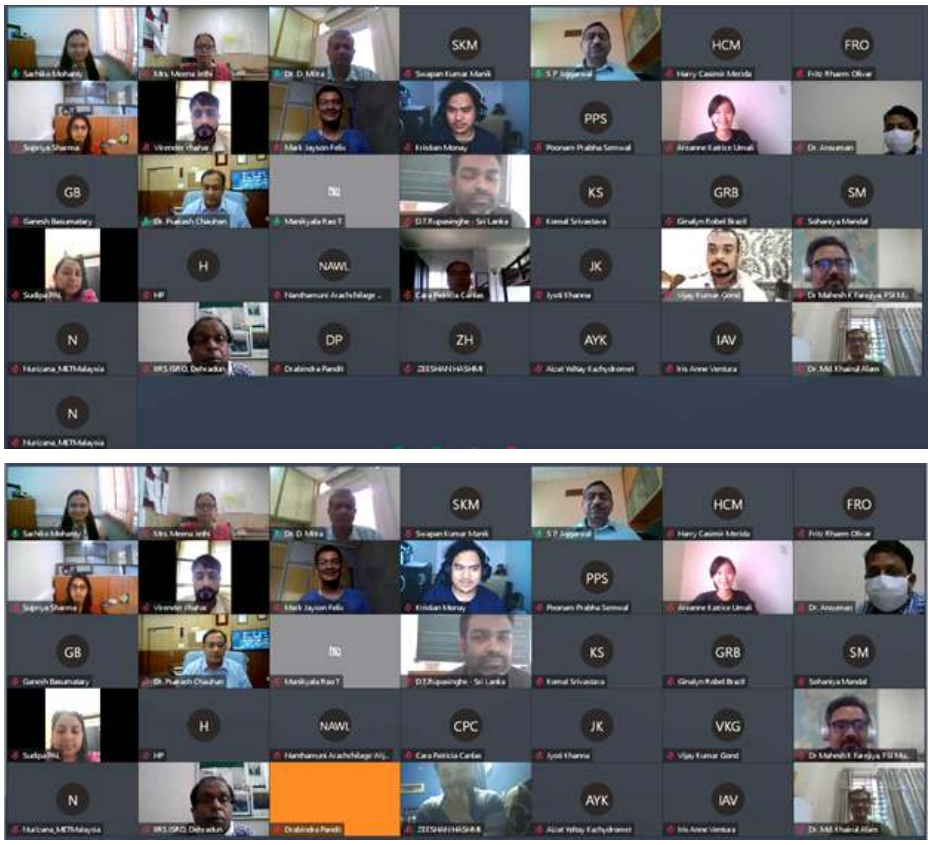
The demonstration was also given on the following topics:

1. Coastal erosion/Accretion estimation using multi-temporal satellite data;
2. Generation of DEM of intertidal zone using Google Earth Engine;
3. Online tool for water quality mapping zone using Google Earth Engine.

For the benefit of participants, the following eminent guest speakers from various organisations having experience in the field of coastal zone management, climate change and natural hazards were invited to deliver the lectures.

The programme was successfully completed on August 06, 2021. A completion certificate along with the lecture PDFs were distributed to the course participants through email.

S.No.	Name	Designation
1.	Dr. M. V. Ramana Murthy	Director, NCCR Chennai
2.	Dr. K. Ramu	Scientist E, NCCR Chennai
3.	Dr. Indrajit Pal	Assistant Professor, AIT, Thailand
4.	Ms. S. Sunitha Devi	Scientist F, IMD, New Delhi
5.	Mr. Patanjali Kumar	INCOIS, Hyderabad
6.	Prof. Sugata Hazra	Professor, Jadavpur University
7.	Dr. Rashmi Sharma	Scientist G, SAC Ahmedabad
8.	Dr. Mini Raman	Scientist G, SAC Ahmedabad
9.	Dr. Arun Kumar V. V. Surisetty	Scientist E, SAC Ahmedabad



Screenshot of valedictory function of the online short course on "Coastal Zone Management in response to Natural Hazards and Climate Variability".

Dr. Sachiko Mohanty
Course Coordinator
sachiko@iirs.gov.in

Dr. D. Mitra
Course Director
mitra@iirs.gov.in

Online Short Course on "Introduction to Satellite Navigation"

during September 13 -24, 2021

SHORT COURSES

In 2021, CSSTEAP organized an online short course on GNSS, titled "*Introduction to Satellite Navigation*". The course was conducted at the Space Applications Centre, Ahmedabad over a period of two weeks. The duration of the course was from 13 September 2021 to 24 September 2021.

The course was targeted for the beginner level and focussed on three principal areas of the subject, viz., Fundamentals, Technology and Applications. The primary objective was to cater the needs of those working in this field from varied backgrounds and therefore to build up the required capacity. However, considering the existing Covid-19 pandemic situation, the course was conducted in online mode from SAC.

In this online course, total 45 participants from 13 countries of Asia-Pacific Region actively participated in this course. Additionally, participants from two African countries, Viz., Rwanda and Nigeria also attended the course. The following list shows the detailed participation from different countries.

Sl. No.	Country	Nos. of Participants
01	India	11
02	Kazakhstan	04
03	Lao PDR	04
04	Malaysia	04
05	Mongolia	04
06	Myanmar	01
07	Nepal	04
08	Nigeria	02
09	Rwanda	01
10	Sri Lanka	07
11	Thailand	01
12	UAE	01
13	Vietnam	01

The course was inaugurated by Director, Space Applications Centre, in presence of other dignitaries including, Director, CSSTEAP, who joined the occasion online from CSSTEAP Headquarters, Dehradun. Director, SAC, in his inaugural speech emphasised the need an importance of conducting such online courses during the pandemic period. Deputy Director, SSAA, SAC, welcomed the participants and Director, CSSTEAP addressed the participants mentioning the heritage and usefulness of the CSSTEAP Courses. Director, SAC also delivered an introductory lecture on GNSS.

The overall goal of the 10 days training course was to introduce the concepts of the existing technology of GNSS among users, researchers, professionals, decision-makers and academicians. Towards this, the salient topics encompassed in the course curriculum include all the important aspects of the subject.

Snapshot of the Valedictory Session

The participants were introduced and familiarized with the relevant topics of the subject with which they were able to (i) know the background of the GNSS developments (ii) understand the working principles of the related systems, (iii) understand data types and data handling during hands-on sessions (iv) become acquainted with the applications and usage of GNSS and (v) got ready for advanced courses on GNSS. The faculty for this course were selected from the most experienced and acclaimed scientists and engineers from SAC and ISRO, as well.

The course completed successfully serving the end objective of providing a strong concept and working level knowledge to the participants. The valedictory session was held on 24th September, 2021. Director, SAC delivered the Valedictory address to the students. At the closure, the students were conferred with a participation certificate.

Mr. V.N. Parekh
Course Coordinator
vipul@sac.isro.gov.in

Dr. Rajat Acharya
Course Director
rajatacharya@iirs.gov.in

Online Short Course on "Small Satellite Mission" during December 13 -24, 2021

SHORT COURSES

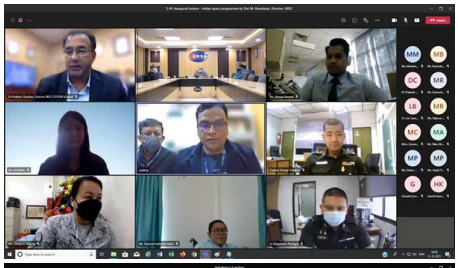
U.R. Rao Satellite Centre (URSC), Bengaluru and Indian Institute of Remote Sensing (IIRS), Dehradun, jointly conducted two-week online short term course on Small Satellite Mission for the participants from Asia Pacific Countries.

Centre for Space Science & Technology Education for Asia Pacific (CSSTEAP), IIRS Dehradun is hosting this course from 2012. This year the course was conducted online from U R Rao Satellite centre due to the COVID epidemic. This course commenced on 13th December 2021 and 22 participants from 8 countries of Asia Pacific attended the course.

The course was inaugurated by Shri. M. Sankaran, Director, U.R. Rao Satellite Centre. Dr. Prakash Chauhan, Director, IIRS & CSSTEAP briefed the CSSTEAP Programmes.

Dr. P Murugan, Course Director SSM-2021 briefed the participants about the course.

The course consists of lectures on satellite orbits, mission planning, system engineering, project management, satellite subsystems, Assembly Integration & Testing, facilities required for satellite fabrication and testing, launch vehicle interface and on-orbit operations. The course concluded on 24th December 2021 with address by Dr. Alok Srivastava, Deputy Director, MSA, U.R. Rao Satellite Centre. The lectures were supported by videos & demos. Course Director, Dr. P. Murugan and experienced engineers from URSC, IIRS and ISTRAC delivered the lectures. Participants submitted assignments online and online test conducted for evaluating the participants.



Dr. Alok Srivastava, Deputy Director, MSA, U.R. Rao Satellite Centre delivered the valedictory address and certificates were provided to participants through email.

Dr. Ashutosh Srivastava
Course Coordinator
asrivastavaiirs.gov.in

Dr. P. Murugan
Course Director
muru@ursc.gov.in

Meeting of CSSTEAP Governing Board

The 26th meeting of CSSTEAP Governing Board (GB) was held virtually on December 22, 2021. The meeting was chaired by Dr. K. Sivan, Chairman CSSTEAP GB and Secretary, Department of Space, Govt. of India and was participated by the GB members including observer from UNOOSA and invited participants.

The meeting was chaired by Dr. K. Sivan, Chairman, CSSTEAP-GB who welcomed all the GB members, observers and special invitees to the 26th GB meeting. He expressed his satisfaction on the commendable growth of the Centre in all spheres of activities related to capacity building in Asia Pacific region, under the able guidance of learned GB members. He expressed his extreme gratification that the Centre has completed 26 glorious years of commendable service of capacity building in Asia Pacific region. The Chairman also commended that Centre has maintained its momentum even during Covid-19 pandemic and three of its PG Courses are being conducted in hybrid mode, including various theme oriented short online training courses and MOOC in the different fields of space sciences.

Chairman, CSSTEAP GB further highlighted the achievements of ISRO in the last one year and the successfully launched Brazilian EO satellite "Amazonia-1" along with 18 co-passenger satellites on February 28, 2021 which was the first dedicated commercial mission of NewSpace India Limited (NSIL), a company under Department of Space. He also mentioned that India, along with other BRICS Space Agencies has signed an agreement for sharing remote sensing satellite data to address global climate change, major disasters and environmental protection. Chairman CSSTEAP GB also informed to the august gathering that in order to unlock India's potential in space sector, Government of India has announced space sector reforms, to enable greater participation of private Sector in space activities. A National Level nodal agency, namely, Indian National Space Promotion and Authorization Centre (IN-SPACe) has been created to promote, provide hand-holding, and supervise the space activities of the private sector, as per the regulatory provisions. Many start-ups / incubators have already started working closely with ISRO on innovative proposals.

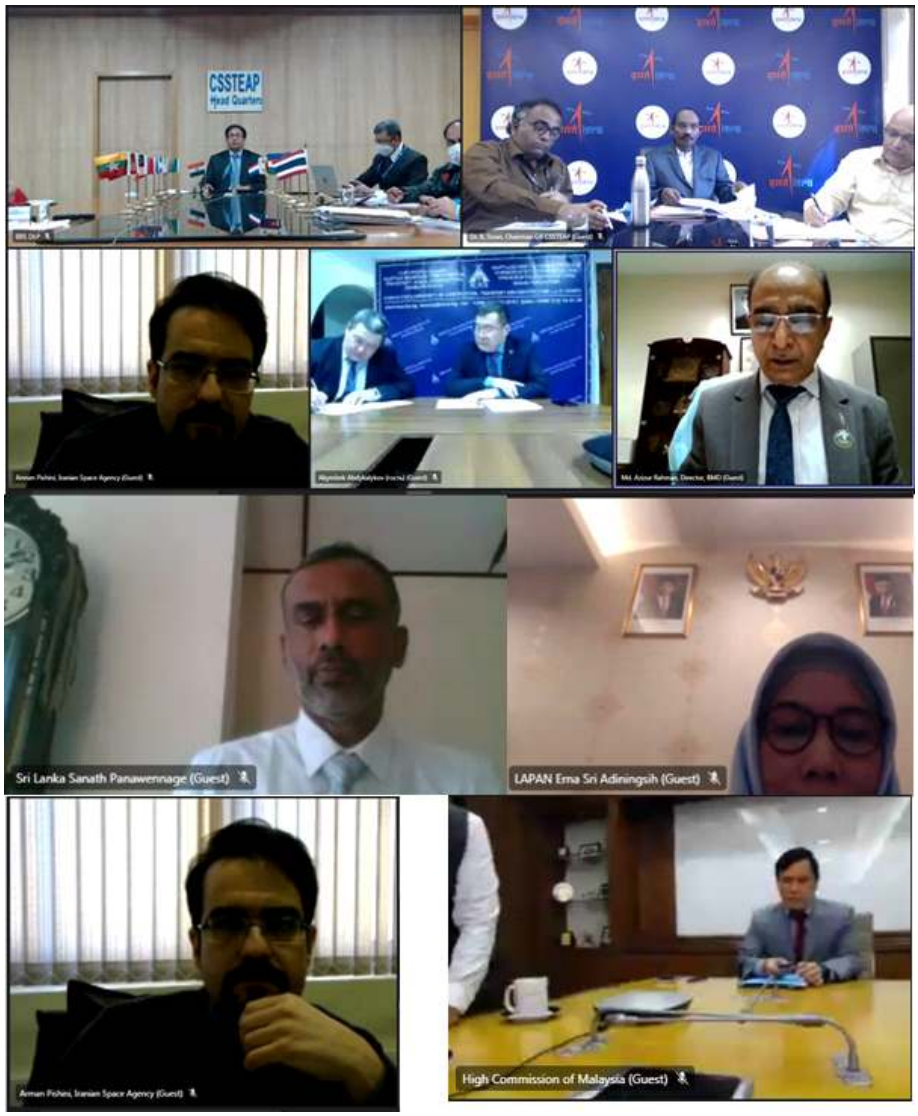
Many path-breaking changes in the EO domain through a new Space-based Remote Sensing Policy has been initiated which is more open, inclusive & forward-looking and encompasses all activities of space based remote sensing, viz. building & orbiting satellites, Ground stations, data acquisition & data dissemination. The access to EO data & products will be made easy and open for bringing new avenues for research, innovative solutions & employment generation. India's regional navigation constellation "NavIC" has unfolded new vistas for societal services and informed decision making. ISRO's Geoportal "Bhuvan" has rendered a yeomen service during the Covid-19 pandemic for State governments and citizens towards mapping the hotspots for identifying containment zones, enabling services for mobile vegetable market and navigation tools for distribution of free food for the needy etc.

This was followed by a brief report on Centre's programmes, activities, host country support, etc. in the past one year and planned academic activities for 2022 by Dr Prakash Chauhan, Director, CSSTEAP. He informed that Advisory Committee meeting was held virtually on November 25, 2021 to evaluate the syllabus of all the PG courses. He also highlighted the successful completion of online short courses and Phase-II of MOOC. He apprised the members about two-day joint Online Training Course on Remote Sensing Applications for Crop Mapping and Monitoring organised in association with UNOOSA, ESA, ISRO and NASA.

Dr. Shirish Ravan, Head, UN-SPIDER Beijing Office of UNOOSA and observer from the United Nations Office for Outer Space Affairs (UNOOSA) appreciated that the Centre has adapted to conducting its courses in the virtual and hybrid mode in response to the current global pandemic. The Massive Open Online Course on Geospatial Applications for Disaster Risk Management and other online short courses have benefitted a large number of participants. He expressed that keeping in line with international efforts and frameworks, the Centre continues to contribute to augmenting efforts to accelerate progress to achieve targets of the 2030 agenda for sustainable development, Sendai Framework for Disaster Risk Reduction and Paris Agreement on Climate Change.

Significant inputs were provided by the GB members and appreciated the efforts made by CSSTEAP in recent years. Mr. Sanath Panawennage, the GB member from Sri Lanka showed interest in organising a joint course with regional participants such as ACCIMT and others in AP region along with CSSTEAP. Dr Erna Sri Adiningsih, LAPAN also showed keen interest in contributing towards CSSTEAP programme.

The meeting was closed by Chairman, CSSTEAP-GB who thanked all the GB members for their active participation and involvement in improving the overall activities of CSSTEAP. Complementing CSSTEAP for serving tirelessly towards the capacity building in the Asia-Pacific region and given the rapid pace of space technology advancements indicated that CSSTEAP need to brace for the challenging tasks ahead.



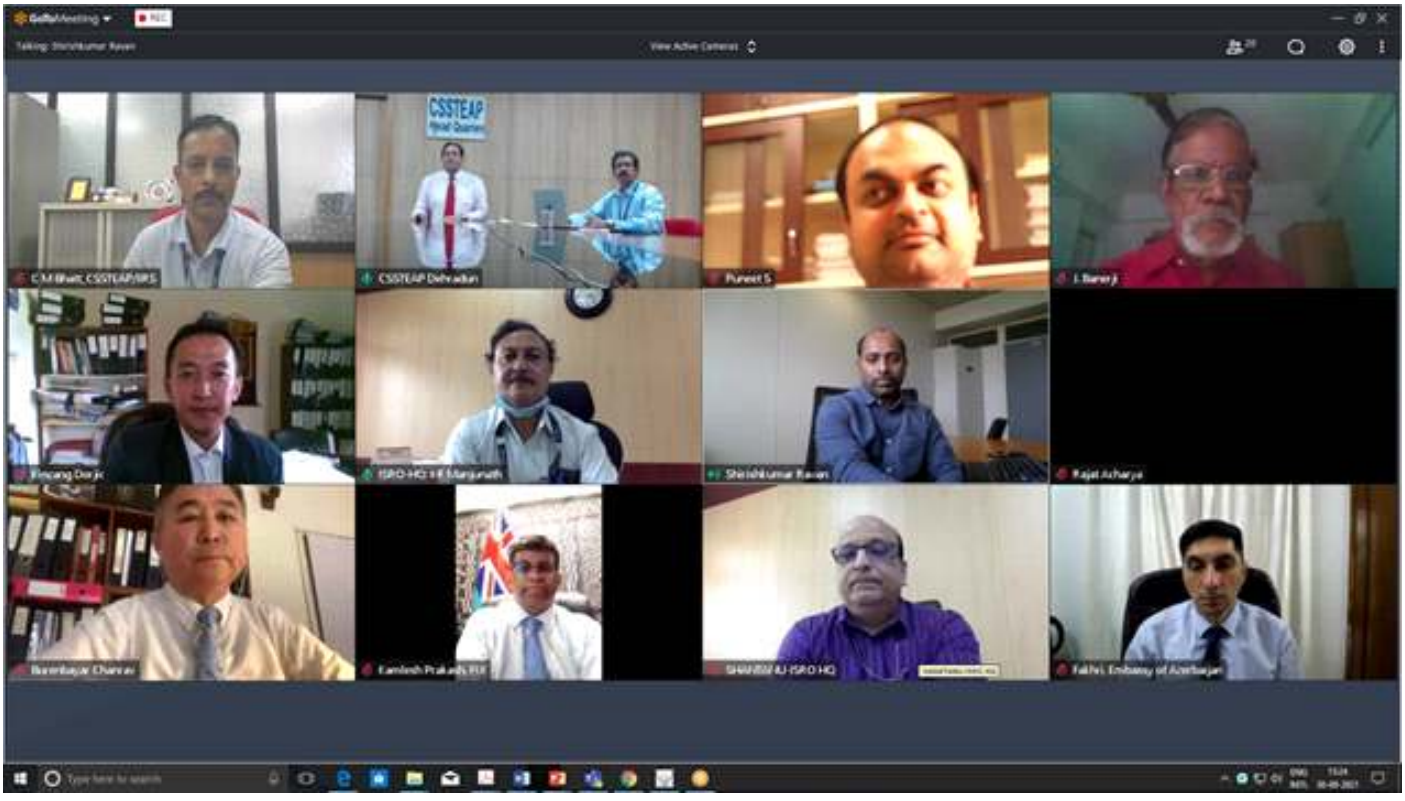
Governing Board Members and Special Invitees during 26th Governing Board Meeting

CSSTEAP Online Outreach Meet

As advised by the governing board of CSSTEAP during the 25th Meeting of the CSSTEAP Governing Board, Awareness Programme for ambassadors or embassy officials in India from Asia and the Pacific region, was organized virtually on September 30, 2021 to apprise about the UNOOSA initiative and CSSTEAP activities. The invited delegates from different embassies of Asia Pacific were from Azerbaijan, Bangladesh, Bhutan, Fiji, Mongolia, Nauru, Nepal, Singapore and Sri Lanka.

Dr. Prakash Chauhan, Director, CSSTEAP welcomed all the delegates from the GB Member & Non GB Member countries and other special invitees participating in the online outreach meeting. Dr. Shirish Ravan, Head, UN-SPIDER Beijing Office, UNOOSA appreciated the efforts of CSSTEAP in organizing the outreach meet to familiarize about the CSSTEAP activities. He expressed his faith that this meet will help in popularizing CSSTEAP capacity building program.

The non-GB members showed their interest in the academic programmes of CSSTEAP and its future activities and requested for additional information regarding educational activities and the research conducted by CSSTEAP. A few non-GB members have also asked the procedure to become member of CSSTEAP Governing Board.



Delegates attending Online Outreach Meet – September 30, 2021

CSSTEAP Advisory Committee Meeting

The 14th meeting of CSSTEAP Advisory Committee (AC) was held virtually on November 25, 2021 under the Chairmanship of Dr. Shirish Ravan, Head, UN-SPIDER Beijing Office, UNOOSA who represented Director UNOOSA. The AC members are subject specialists and experts those who attended were Dr. Pramod Kale (Pune University, India); Dr. Sanjay K Srivastava (UNESCAP, Bangkok); Prof. Annapurni Subramaniam (IIA, India); Prof. P.K. Garg (IIT, India); Prof. Vazeer Mahammood (Andhra University, India); Shri Nilesh Desai (SAC, Ahmedabad); Dr. Anil Bhardwaj (PRL, Ahmedabad); Shri R. Umamaheswaran (ISRO,India); Dr. Prakash Chauhan (IIRS, India); Shri Shantanu Bhatawdekar (ISRO, India) and Dr. Arijit Roy Programme Coordinator, CSSTEAP. Other members included, all Course Directors and Course Coordinators of various courses.

The committee took a review of the Centre's technical and academic activities since last meeting. During the meeting, issues like revision of course curricula, implementation of recommendations of Board of Studies (BOS), research activities in the form of M.Tech at the centre, designing of short courses were discussed. The AC reviewed the syllabi of all the Post Graduate (PG) and Short Courses, which were presented by the respective Course Directors. All the experts and AC members expressed satisfaction with the overall course structure and technical contents of the Post Graduate courses and expressed that the Centre should continue the existing PG courses.

Due to the current global pandemic, the Centre could not host regular capacity building programmes physically. Therefore, the three PG courses namely 26th RS&GIS, 12th SATMET and 12th SAS are being conducted in hybrid mode. The AC also appreciated Centre's response to the changing trend in technology and demands from the developing world by organising various online

14th AC Meeting – November 25, 2021

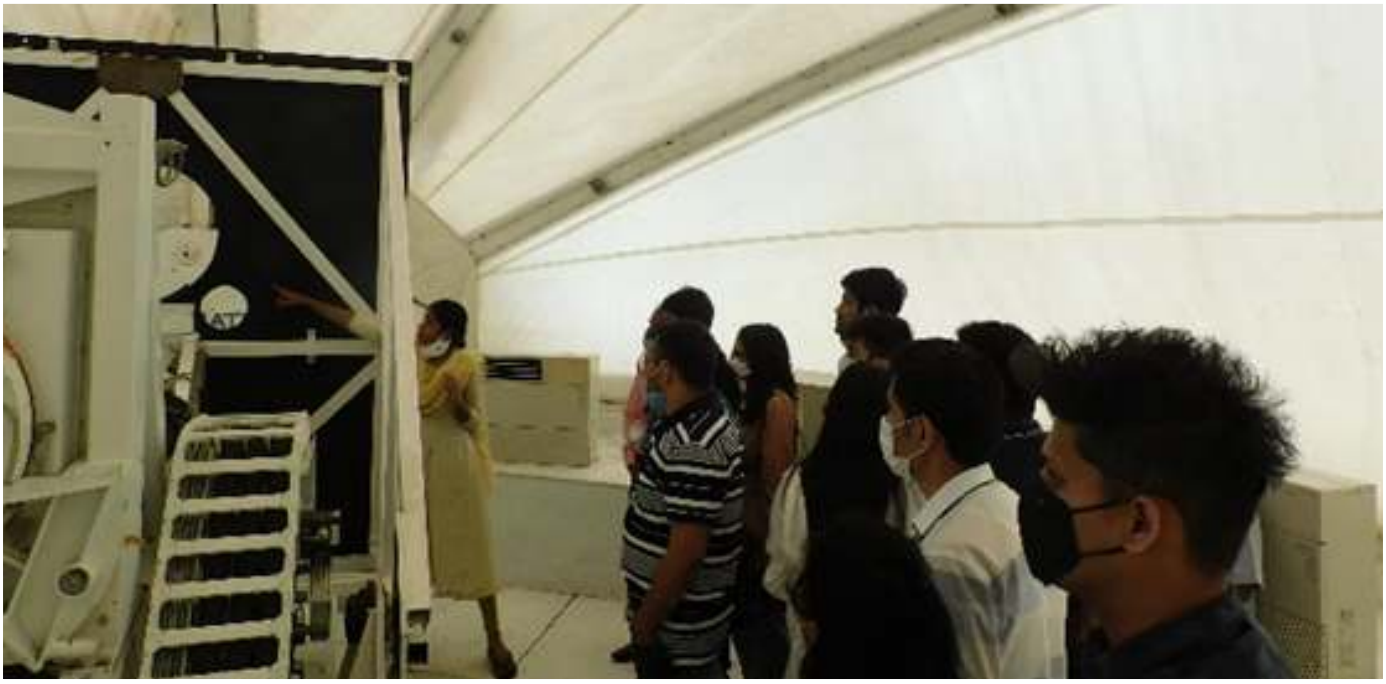
short courses on unique topics and especially MOOC which was conducted in two phases to cater to the needs of specific countries or target groups.

AC suggested organization of more MOOC and theme and country specific online short courses in different countries of the region with technical support of CSSTEAP and support from local institutions/organizations for hosting such initiative. The AC appreciated the efforts of the Centre for excellent progress made, and expressed satisfaction at the achievements and also for the support from the host country. The AC also noted the committed efforts of the Centre, in particular Director, CSSTEAP for his excellent vision and the host institutions namely SAC, PRL, IIRS and URSC who have made the Centre to gain high level of excellence. The AC also endorsed the courses, future programmes and technical activities of the Centre.

Glimpses of Students' Activities at CSSTEAP


CSSTEAP
Centre for Space Science and Technology Education
in Asia and the Pacific
(Affiliated to the United Nations)


iirs



Future Courses

PG COURSE	
26th Remote Sensing and Geographic Information System	August 01, 2022 - April 30, 2023
13th Satellite Communication	August 01, 2022 - April 30, 2023
4th Global Navigation Satellite System	August 01, 2022 - April 30, 2023
SHORT COURSES	
Application of Space Technology for Disaster Risk Management with special Emphasis on Floods and Landslides with emphasis on Asia-Pacific region	September 19-30, 2022
Weather Forecasting using numerical weather prediction models	September 2022
Techniques and Applications of Synthetic Aperture Radar (SAR) Remote Sensing	October 2022
Small satellite mission course	November 07-18, 2022
Space Weather	November 2022
Space based Innovative Solutions to Improve Water Resources Management in Asia-Pacific region	December 2022
Advances in Remote Sensing Data Analysis Techniques for Geological Applications with emphasis on Asia-Pacific Region	December 2022

EDITORIAL COMMITTEE

CSSTEAP Headquarter, IIRS Campus, 4, Kalidas Road, Dehradun 248001, INDIA.
Ph: 91-135 2740737, 2740787, Fax:+91-135-2740785
E-Mail: cssteap@iirs.gov.in, Website: www.cssteap.org

CSSTEAP Headquarters

IIRS Campus, 4, Kalidas Road, Dehradun-248 001, INDIA
Ph: 91-135- 2740737, 2740787, Fax: +91 - 135 - 2740785
E-mail: cssteap@iirs.gov.in, Website: www.cssteap,org

Printed at **Allied Printers**, Dehradun. 0135-2654505