



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

(Affiliated to the United Nations)

ESTD. 1995

**Presentation to the 47th Session of COPUOS
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**V.Sundararamaiah
Scientific Secretary, ISRO**



GENESIS OF CSSTE-AP

UNISPACE 82

- ❑ THAT THE UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS FOCUS ITS ATTENTION, INTER-ALIA, ON THE DEVELOPMENT OF INDIGENOUS CAPABILITY AT THE LOCAL LEVEL

UN GA
1990

- ❑ RESOLUTION - "... ESTABLISH REGIONAL CENTRES FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN EXISTING NATIONAL/REGIONAL EDUCATIONAL INSTITUTIONS IN THE DEVELOPING COUNTRIES"

UN EVALUATION
MISSION - 1994

- ❑ THE CENTRE FOR ASIA AND THE PACIFIC AND THE SUBSEQUENT STATEMENT ON THE SELECTION OF INDIA AS HOST COUNTRY FOR THE CENTRE

CENTRE - 1995

- ❑ CENTRE ESTABLISHED AT DEHRADUN



THE GOAL

INCREASING KNOWLEDGE AND UNDERSTANDING: SPACE SCIENCE AND TECHNOLOGY

- * EDUCATION AND RESEARCH
- * APPLICATIONS AND ANALYSIS
- * DATA MANAGEMENT

THE
CENTRE

ENHANCING NATIONAL & REGIONAL CAPACITY

- * SPACE FOR SOCIAL AND ECONOMIC DEVELOPMENT
- * REGIONAL COOPERATION IN SPACE SCIENCE AND TECHNOLOGY
- * SUPPORTING INTERNATIONAL ACTIONS AND PROGRAMMES



CSSTEAP: Organizational Structure

**Host Country
Linkage**

**Governing
Board**

CSSTEAP

**Advisory
Committee**

**Coordination
Committee**

Linkages

**IIRS
Dehradun
RS & GIS**

**SAC
Ahmedabad
SATCOM
&
SATMET**

**PRL
Ahmedabad
Space &
Atmosph
Science**

- UN-OOSA, Vienna,
- UN-ESCAP, Bangkok,
- UNESCO, Delhi
- ICIMOD, Kathmandu, Nepal
- COSTED, Chennai,
- NAM S&T Centre, Delhi
- GDTA-CNES, ISU, France
- ICS-UNIDO, TWAS, Italy
- ITC, The Netherlands



Governing Board

- ❏ Governing Board is the principal policy making organ.
- ❏ At present, 14 countries in the region are represented in the Governing Board & two observers.
- ❏ The Executive functions are exercised by the Director of the centre.
- ❏ An Advisory Committee provides technical guidance.



India
Indonesia
Kazakhstan
Korea (DPR)
Korea (Republic of)
Kyrgyzstan
Malaysia
Mongolia
Myanmar
Nauru
Nepal
Philippines
Sri Lanka
Uzbekistan
UNITED NATIONS
ITC

Advisory Committee

- ❑ TECHNICAL ARM OF GB
- ❑ INTERNATIONAL SUBJECT EXPERTS
- ❑ CHAIRED BY UN-OOSA
- ❑ MEETS ONCE A YEAR
- ❑ REVIEWS ALL TECHNICAL ASPECTS
 - ❑ CURRICULUM
 - ❑ TECH FACILITIES
 - ❑ PERFORMANCE
 - ❑ STUDENT AFFAIRS
- ❑ REPORTS TO GB



Locations



CSSTEAP Hqs, Dehra Dun



IIRS, Dehradun



SAC, Ahmedabad



PRL, Ahmedabad

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





IIRS Campus, Dehradun

HOST COUNTRY SUPPORT- INFRASTRUCTURE

- ❑ Host country has provided all necessary infrastructure for functioning of the Centre.
- ❑ Until now, the host country has provided to the Centre:
 - ♠ Annual grants totaling to about Rs 221 million (US \$ 5.25 million) for 1996 to 2004 (average ~ \$ 0.5 m/ year)— mainly to take care of the educational and administrative activities of the centre.
 - ♠ About Rs 336 million (US \$ 8.0 million) has been spent by the host country to establish new facilities, buildings, hostels, laboratories and facilities for supporting the CSSTEAP (in Dehradun and Ahmedabad).
 - ♠ In addition, host country also provides in-kind support – Facility, institutional support, experts (about 90% of the teaching staff comes from the host country) and so on.



HOST COUNTRY SUPPORT- FACILITIES

- ❑ All associated institutions, namely IIRS, SAC and PRL are well equipped with sufficient state of the art computers, Unix workstations, relevant state-of-the-art software and appropriate peripherals
- ❑ Multimedia based demonstrations and computer based exercises are also available to support and sustain the training
- ❑ Relevant laboratory equipment for data interpretation, Analysis, carrying out experiments and demonstration are freely accessible.
- ❑ Instruments for field work and *in situ* measurements are also available.
- ❑ Educational tours form an integral part of the training and during these tours, facilities available at various laboratories in India are shown and demonstrated.
- ❑ All above facilities are constantly upgraded and/or enhanced in a routine manner



Hostel Facilities

- ♣ An international Hostel with modern facilities are provided. It is also well equipped with kitchenette facilities.
- ♣ Mess serving Indian foods is also available in the campus at reasonable cost.
- ♣ Computers with internet and word processing software are also provided in the hostel.
- ♣ Indoor/Outdoor games facilities are provided by the host institution.
- ♣ Time to time cultural programmes and get together parties are also arranged in the institute. Festivals and National days of course participants are celebrated.



EDUCATIONAL PROGRAMMES



**9-month course
at IIRS in
RS/GIS**

**9-month course
at SAC in
SATCOM**

**9-month course
at SAC in
SATMET**

**9-month course
at PRL in
Space Science**

Award of PG diploma by CSSTEAP

1 year follow-up project in home country

Award of Masters (M.Tech) degree by Andhra University

In addition to PG/MTech Courses, CSSTEAP also conducts short term courses and workshops in specific areas of RS & GIS, SATCOM, SATMET and Space Science.

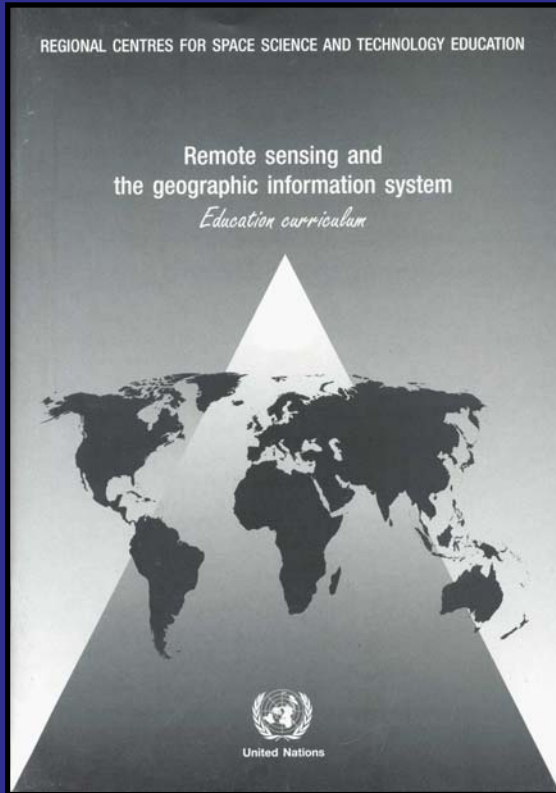


Course Structure in RS & GIS

First Module - principles of remote sensing, digital image processing, photogrammetry, geoinformatics, GPS and cost benefit analysis.

Second Module (Application module) - providing thematic treatment in agriculture/soils, forestry, geosciences, water resources, human settlements, oceanography, coastal applications, sustainable development, environmental analysis, earth processes and modelling.

Third module - Pilot project module for designing, scheduling and conducting an application of relevance.



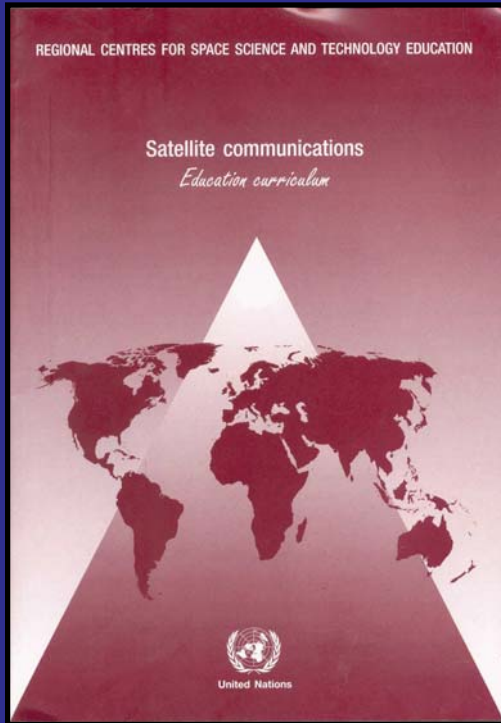
Facilities for RS & GIS

- ❑ Geo informatics lab facility, CSSTEAP lab facility, PRSD lab facility, for their module -1 and respective divisional lab facility during their thematic module. All labs are equipped with sufficient number of systems with regular upgradations.
- ❑ Software includes - ERDAS-IMAGINE for Digital Image Processing & ARC-INFO, ILWIS, ER MAPPER for Geographic Information System, MS OFFICE and other software.
- ❑ Peripherals include Printer/Plotters, Digitizer & Scanner.
- ❑ Ground truth data collection and laboratory data analysis facilities.





Course Structure in Satellite Communications



Eight Course Work Modules –

- ❑ Communication systems - an overview,
- ❑ Satellite communication systems,
- ❑ Earth station technology,
- ❑ Satellite communication for broadcasting, Specialised applications and future trends, Operational communication satellite systems,
- ❑ Development of Education & training applications,
- ❑ Network planning,
- ❑ management & operational issues of satellite communication systems,
- ❑ Development education & training applications pilot project.

Ninth Module is thematic Pilot Project



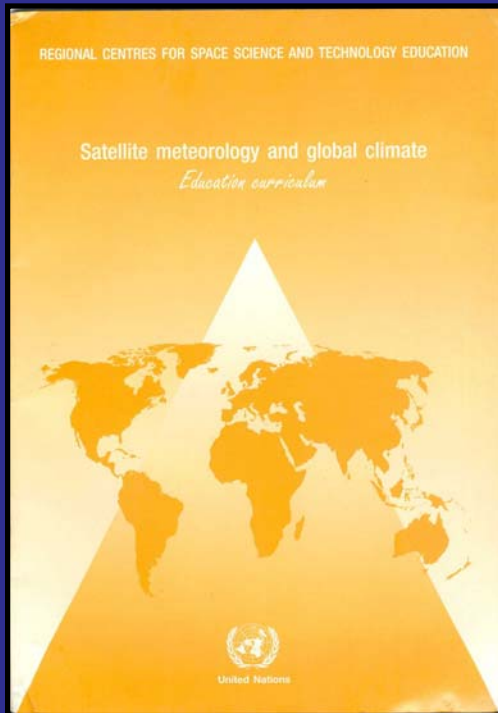
Facilities for Satellite Communications

- ❑ Comprehensive satellite communications equipment.
- ❑ Communication earth station, communication systems laboratory etc.
- ❑ Sufficient number of computer systems and workstations with several softwares.





Course Structure in Satellite Meteorology & Global Climate



- ✧ **First Module** - fundamentals of meteorology, climatology, satellites, global observing systems, tropical and mid latitude weather systems, image interpretation and geographic information systems.
- ✧ **Second Module** (Application module) - providing concepts of satellite meteorology, basics of radiative transfer, weather forecasting, meteorological parameter retrieval, green house warming and numerical weather prediction, advance concepts and environmental issues.
- ✧ **Third Module** - Pilot project module for designing, conducting and reporting on the field application of knowledge.



Facilities for Satellite Meteorology & Global Climate

- ❑ Comprehensive field and laboratory facility for meteorological data collection and analysis.
- ❑ Sufficient number of computer systems and workstations with several image analysis software.





Course Structure in Space and Atmospheric Science

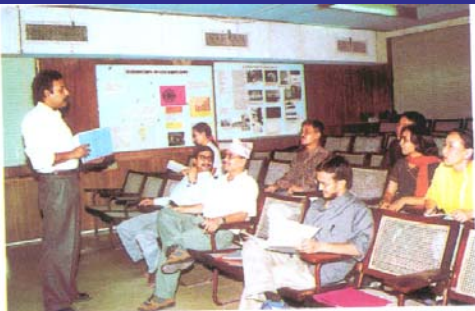
REGIONAL CENTRES FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION

Space and atmospheric science
Education curriculum



United Nations

- ❑ **First Module** - Physical properties of atmosphere, radiation budget, atmospheric dynamics, atmospheric chemistry, greenhouse warming, atmospheric changes.
- ❑ **Second Module** - Plasma physics, solar dynamics, ionosphere, magnetoionic theory, radio propagation, ionospheric tomography, humans in space, space biology, probe theory, high energy astronomy.
- ❑ **Third Module** - (measurements techniques) Ionosondes, radio sounding, radars, optical instrumentation, lidars, polarimetry, spectrophotometry.
- ❑ **Fourth Module** - Modelling of ocean-atmosphere-land interactions, numerical simulation studies.
- ❑ **Pilot Project** - integrated as one each per 2 modules



Facilities for Space and Atmospheric Science

- ❑ Pentium computers connected to IBM R SP 275 Supercomputer and RS 6000 system with all possible softwares.
- ❑ Comprehensive facility for field and laboratory studies on space and atmospheric sciences.



The Centre has so far conducted **17** Nine months **Post Graduate courses**

- **7** courses in RS & GIS
- **4** courses in SATCOM
- **3** courses in SATMET
- **3** courses in SPACE SCIENCE

- ♠ The Centre conducted 15 short courses/ Workshops in the last 8 years
- ♠ These programs have benefited **29 countries** in the region and **557 participants** (316 from long courses & 241 from short courses).



PUBLICATIONS

- ♠ **Newsletter:** So far, 25 issues have been released. Recent one, March, 2004 has been released. In general, the newsletters are portraying a lead article from an eminent person in the field, progress of students, centre's activities, announcements and opinion.
- ♠ Centre prints an **information brochure** and periodically updates it.
- ♠ **Announcement brochure** for each educational course is regularly brought out.
- ♠ A '**Memoirs**' marking the end of each course is being regularly brought out
- ♠ **Printed lecture volumes in the form of book & CD** covering Module-1, Module-II of PG course in RS & GIS and theme specific RS courses printed lecture volumes of RS & GIS, revised printed and CD's of PG courses in SATMET, STACOM and lecture volume & CD of Space Science have been brought out.
- ♠ **Maintenance & updating regularly the CSSTEAP website**



CSSTEAP

Affiliated to UN



June 7, 2004

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CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC (CSSTEAP)

(Affiliated to The United Nations)

On a mission of capacity building in Space Science and Technology in Asia-Pacific region under the United Nations initiative.

The Centre is an Education and Research Institution that is capable of high attainments in the development and transmission of knowledge in the fields of Space Science and Technology. The initial emphasis of the Centre has been on in-depth education, research and applications programmes, linking to the global programmes/databases, execution of pilot projects, continuing education, awareness and appraisal programmes.

The Centre offers Post Graduate Level Courses in the fields of:

- Remote Sensing and Geographic Information System,
- Satellite Communications,
- Satellite Meteorology and Global Climate,
- Space and Atmospheric Sciences.

A set of standard curricula developed by the United Nations is adapted for the educational programmes. The Centre is affiliated to the United Nations and its education programmes are recognised by Andhra University, India.

The Centre is hosted by the Government of India, Department of Space. Government of India has made available appropriate facility and expertise to the Centre through the Indian Institute of Remote Sensing (IIRS), Dehradun, Space Applications Centre (SAC), Ahmedabad & Physical Research Laboratory (PRL), Ahmedabad.

LATEST NEWS

Announcement

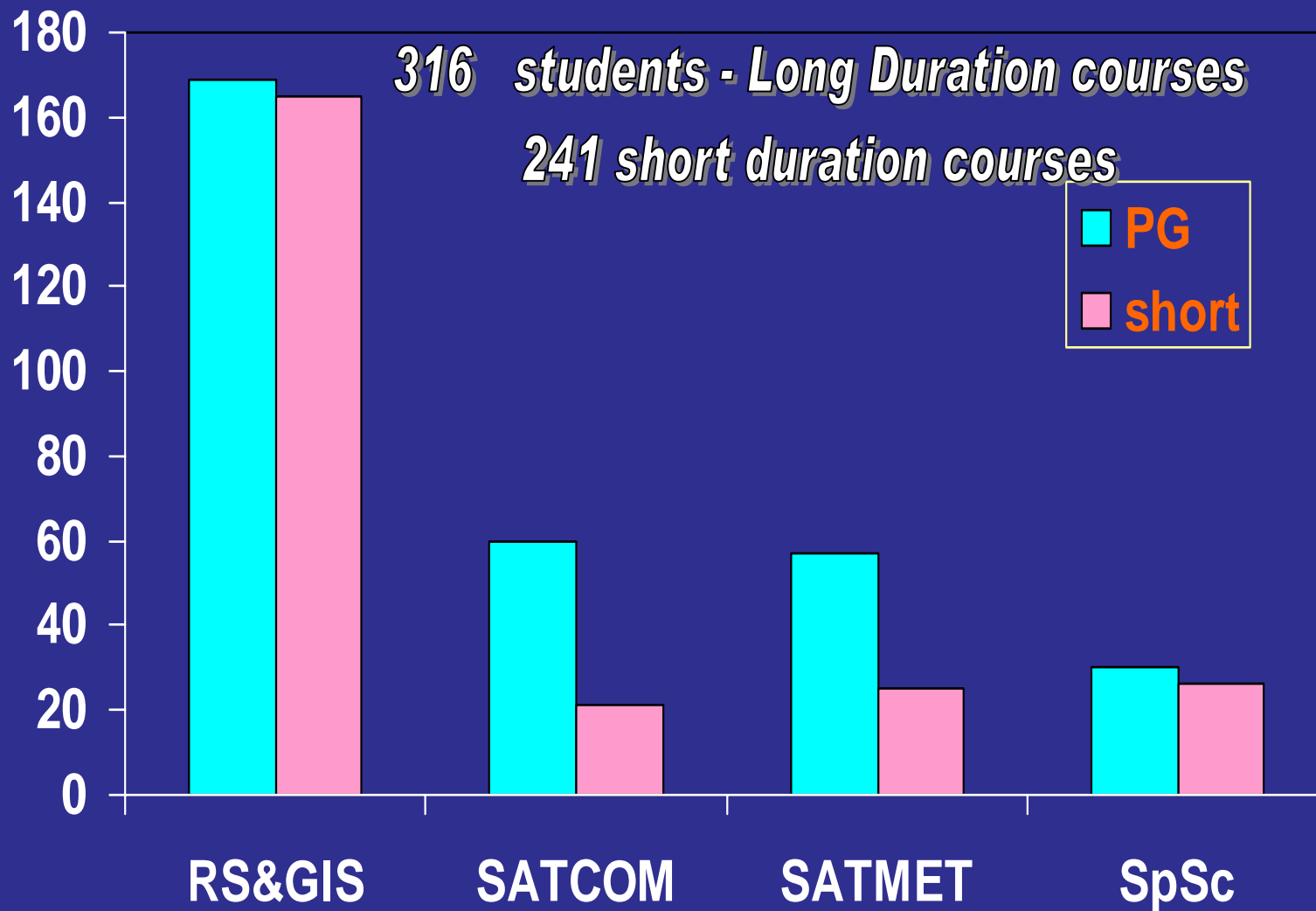
SATMET- IV
Aug 2, 2004 to
April 30, 2005



Last Updated: June 01, 2004

[Click here for the
Map of Asia Pacific Region](#)

Total Number of AP Students (all courses, Apr 04)



**RS &GIS****SATCOM****SATMET****SPACE SC****1996****25 Students**
14 Countries**1997-98****23 Students**
14 Countries**13 Students**
9 Countries**1998-99****21 Students**
11 Countries**17 Students**
10 Countries**10 Students**
7 Countries**1999-00****17 Students**
11 Countries**18 Students**
8 Countries**2000-01****19 Students**
13 Countries**21 Students**
13 Countries**9 Students**
5 Countries**2001-02****20 Students**
13 Countries**14 Students**
8 Countries**2002-03****23 Students**
13 Countries**19 Students**
13 Countries**11 Students**
3 Countries**2003-04****21 Students**
16 Countries**15 Students**
7 Countries

1. Azerbaijan
2. Bangladesh
3. Bhutan
4. Cambodia
5. China
6. Fiji
7. India
8. Indonesia
9. Iran
10. Japan
11. Korea (DPR)
12. Korea
(Republic of)
13. Kazakhstan
14. Kyrgyzstan
15. Lao PDR
16. Malaysia
17. Maldives
18. Mongolia
19. Myanmar
20. Nepal
21. Pakistan
22. Papua N.G
23. Philippines
24. Sri Lanka
25. Thailand
26. Taiwan
27. Uzbekistan
28. Vietnam

Award of M.Tech degree

- ◆ ~316 STUDENTS IN 4 COURSES COMPLETED PG DIPLOMA
- ◆ 80 APPLIED FOR MTECH AFTER COMPLETING 1-YEAR PROJECT THESIS
 - ◆ REMOTE SENSING & GIS - 48
 - ◆ SATELLITE COMMUNICATIONS - 16
 - ◆ SATELLITE METEOROLOGY - 16
 - ◆ SPACE SCIENCES – NIL
- ◆ MTECH DEGREES AWARDED TO ALL CANDIDATES THAT APPLIED AND WERE QUALIFIED; HOWEVER, ONLY 25% OF STUDENTS ARE ABLE TO QUALIFY AFTER PROJECT



FORTHCOMING COURSES

Programmes for 2004

- 4TH SATMET course (Aug,2004-Apr 2005)
- 4TH Space Science course (Aug,2004-Apr 2005)
- 4 weeks Geoinformatics for Disaster Management (Aug16-Sept.10, 2004)
- 9th RS & GIS PG course (Oct,2004 - Jun 2005)

Programmes for 2005

- 10th RS & GIS PG course (Oct,2005-June, 2006)
- 4 weeks RS & GIS Sustainable Agriculture (Aug-Sept 2005)
- 5th SATCOM PG course (Aug, 2005 - Apr.2006)



COURSE ORGANISATIONAL EXPERIENCE

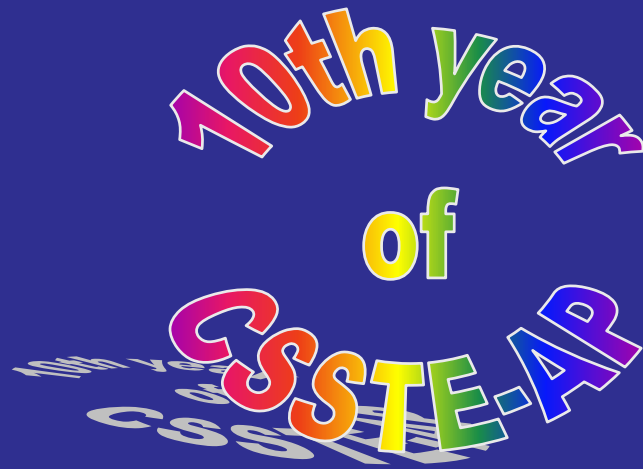
- **APPLICANTS HAVE DIFFERENT TYPES OF DEGREES FROM DIFFERENT COUNTRIES – EACH HAVING A UNIQUE SYLLABUS AND COURSE-DESIGN**
- **KNOWLEDGE OF ENGLISH AND COMMUNICATION SKILLS VARY VASTLY ACROSS DIFFERENT COUNTRIES AND HENCE CAPACITY TO UNDERSTAND/ABSORB SUBJECT VARIED VASTLY**
- **LESS ATTENTION AND PRIORITY FOR 1-YEAR PROJECTS IN HOME COUNTRY– DUE TO LACK OF FACILITIES OR SUPPORT FROM SPONSORS**
- **RELATIVE PRIORITY FOR DIFFERENT SUBJECTS IS NOT SAME, E.G., VERY FEW PERSONS/ORGANIZATIONS APPEAR TO BE OPTING FOR SPACE SCIENCES COURSE , WHERE AS RS/ GIS ATTRACTS MORE**



PLANS FOR THE FUTURE

- **CONSOLIDATE**
 - EXPAND OUTREACH IN ASIA PACIFIC
 - ASSIST IN CAPACITY BUILDING IN MEMBER STATES
 - ESTABLISH HUMAN NETWORK OF SPACE-EXPERTS
- **EXPAND**
 - INITIATE RESEARCH SUPPORT FOR PHD
- **FURTHER IMPROVE QUALITY OF EDUCATION**
 - SELF-LEARNING METHODS
 - INTERNET MODULES
- **UNDERTAKE REGION-SPECIFIC PROJECTS**
- **EMERGE AS AN INSTITUTION OF EXCELLANCE**
- **CONTRIBUTE TO INTERNATIONAL ENDEAVOURS**
 - ESCAP'S RESAP
 - UNISPACE-III EDUCATION ENDEAVOURS





TO SUM UP

- With the consistent support of the host country, and encouragement from OOSA the Centre is helping capacity building in the region
- More countries in the region can benefit by joining the Centre
- Strengthening the financial support will help organising more courses for the region

THANK YOU

