Committee on the Peaceful Uses of Outer Space
Fifty-second session
3 - 12 June 2009

Status report on the operation of the Regional Centres for Space Science and Technology Education, affiliated to the United Nations

Note by the Secretariat

The General Assembly, in its resolution 63/90, agreed that the regional centres should continue to report to the Committee on their activities on an annual basis. The Annex to this note contains the presentations made by the directors of the regional centres at the fifty-second session of the Committee.

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African Regional Centre for Space Science and Technology Education - in English Language (ARCSSTE-E)
Presentation Outline

Background

Mission/mandate of Centre

Governing board meeting and Recommendations

Highlights of space education outreach programmes for 2008/2009

Challenges of the PGD programme implementation in Nigeria

BACKGROUND


Dr. J.O. Akinyede
Executive Director, ARCSSTE-E
Inauguration of ARCSSTE-E, Ile–Ife, Nigeria

Inauguration of Centre at Sheraton Hotel, Abuja, Nigeria, 24th November, 1998.

Attended by eight of the 22 member countries, viz:

Kenya, Ghana, Namibia, South Africa, Sierra Leone, Liberia and Egypt and Nigeria the host country – 8 countries

Same day and venue of first meeting of the eight member states: Memorandum of Understanding (MoU) was signed, with Dr A. Abiodun signing for the UN-OOSA
MISSION/MANDATE OF THE PGD PROGRAMME

• To build indigenous capacities in Space Science and Technology (SST) applications

• Serve as an educational, Research and Training institution in SST

• To Boost the growth and capacities of the participating African countries.

• Enhance Anglophone countries’ knowledge, understanding and skills in SST applications

• Drive the applications of SST for national and regional development through teaching, research and development in four prime areas of SST, viz:

  Remote Sensing/GIS,
  Satellite Communication,
  Satellite Meteorology/Global Climate and
  Basic Space and Atmospheric Sciences.

Now with expanded mandates in GNSS and Space Law

9 MONTHS POSTGRADUATE DIPLOMA PROGRAMME IMPLEMENTATION

• In line with the curriculum approved by the UN-PSA; modular courses, with assessment at the end of each module

• Field trip/educational tours as part of training

• Hands-on/ practical

• Functional Library

• Resource persons from within and outside Nigeria

• Scholarships/fellowship + stipends (funded by Nigeria) + Return tickets (provided by OOSA)

• Commencement: April 2000 to date

• Initially September to July

• Since 2005, re-scheduled to run from January to October every year

• Award of PGD Certificates (jointly signed by UN-PSA and Centre)
**TOTAL NUMBER OF PARTICIPANTS PER COUNTRY SINCE 2000**

- Cameroon 18
- Sudan 8
- Malawi 5
- Uganda 5
- Kenya 3
- Liberia 2
- Ethiopia 3
- Gambia 2
- Tanzania 4
- Zimbabwe 2
- Zambia 2
- South Africa 1
- Congo (DRC) 1
- Nigeria 119
- Ghana 1
- Sierra Leone 1

**TOTAL (16 countries) = 177 participants**

**2009 PARTICIPANTS**

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>NOS. OF PARTICIPANTS</th>
</tr>
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<td>Ghana</td>
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<td>Malawi</td>
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<td>Zambia</td>
<td>1</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>1</td>
</tr>
<tr>
<td>Cameroon</td>
<td>3</td>
</tr>
<tr>
<td>Nigeria</td>
<td>26</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>39</strong></td>
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</tbody>
</table>
Statistics of PGD participants by course options and gender

Yearly Distribution of Participants since 2000

<table>
<thead>
<tr>
<th>SESSION</th>
<th>RS/GIS</th>
<th>SATCOM</th>
<th>BSAS</th>
<th>SATMET</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>2000/2001</td>
<td>6</td>
<td>-</td>
<td>-</td>
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<td>6</td>
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<tr>
<td>2001/2002</td>
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<td>4</td>
<td>9</td>
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<td>2002/2003</td>
<td>-</td>
<td>5</td>
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<td>6</td>
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<td>2003/2004</td>
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<td>-</td>
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<td>-</td>
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<tr>
<td>2004/2005</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>2006</td>
<td>20</td>
<td>14</td>
<td>4</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>2007</td>
<td>18</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>26</td>
</tr>
<tr>
<td>2008</td>
<td>23</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>35</td>
</tr>
<tr>
<td>2009</td>
<td>22</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>TOTAL</td>
<td>106</td>
<td>51</td>
<td>12</td>
<td>8</td>
<td>177</td>
</tr>
</tbody>
</table>

Distribution of member states by participation in the PGD programme.
**Typical dress codes for opening and graduating ceremonies**

PGD GRADUATING CEREMONY FOR 2009

PGD OPENING CEREMONY FOR 2009 WITH 39 PARTICIPANTS FROM 9 COUNTRIES

NEW PGD HOSTEL

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**WORKSHOPS, CONFERENCES, SEMINARS AND PUBLICATIONS**

Organisation of short courses and workshops for stakeholders as needs and requests arise:

- **WORKSHOP ON** Nigerian MESOSCALE project for Nigerian universities in conjunction with IPPS, Uppsala university, Sweden.
- **GEOFORMING** workshop for Nigerian Stakeholders in conjunction with NASRDA and Space Application and Environmental Laboratory, Institute of Ecology, OAU, Ile-Ife.
- **Capacity Building on the Use of Landsat Dataset for Sustainable Resource and Environmental Management in Africa.**
- **Global Learning and Observation to Benefit the Environment (GLOBE) Trainers Workshop** for Science Teachers in High Schools and universities in collaboration with North Lake College, Texas, USA and Osun State Government in Nigeria.
- **Workshop on Capacity and Institutional Building: Application of Satellite Data for Resources and Disaster Management and Global Climate Change**
- **PUBLICATION & CIRCULATION OF BI-ANNUAL MAGAZINE CALLED “ORBIT”**
GOVERNING BOARD MEETING AND RECOMMENDATIONS

- Governing board meeting was held on 11th March, 2009

- Attended by Twelve (12) member countries represented either by their high commissioners/ambassadors or first secretaries, viz:
  Sierra Leone, Botswana, Tanzania, Kenya,
  Uganda, Ghana and Zambia, Zimbabwe,
  Sudan, Gambia and Namibia and Nigeria.

- Mr. Sergei Chernikov, programme Officer,
  United Nations Office for Outer Office
  Affairs (UN-OOSA) , as well as Dr S. O.
  Mohammed the Acting Director General
  of NASRDA and the representative of the
  Vice Chancellor, OAU, Ile-Ife, Nigeria

2009 GOVERNING BOARD MEETING,

RECOMMENDATIONS OF THE GOVERNING BOARD AT THE 2009 MEETING:

- Establishment of linkages/contact between the Centre and the relevant
  ministries in member states ; the respective High Commissions/Embassies
  offered to facilitate this process.

- Ministers and Directors of relevant ministries in member states to attend the
  Governing Board meetings which has been scheduled to hold in March every
  year.

- Director and principal officers of the Centre to pay advocacy visits to
  governments of member states

- Peer review mechanisms to be established within Regional Centres to
  facilitate exchange of ideas/collaboration and learning process.
Recoms. ctd

- Ministerial meetings of member states to be organised by host country (Nigeria) as need arises.
- Linkages/collaborations with relevant tertiary institutions to mobilise course participants and resource persons.
- Host country (Nigeria) to increase efforts in fund mobilisation from corporate bodies and international organisations.
- Reports on course participants, including areas of application/benefits of their studies, to be forwarded to home countries through the High Commissions in Nigeria.

HIGHLIGHTS OF SPACE EDUCATION OUTREACH ACTIVITIES
(2008/2009)

COVERAGE OF OUTREACH ACTIVITIES
ACTIVITIES INVOLVED IN THE OUTREACH PROGRAMME OF SPACE SCIENCE AND TECHNOLOGY EDUCATION IN NIGERIA

1. Annual Schools’ Space Education Outreach programmes
   - Nursery/Primary schools poetry, rhymes, songs, etc.
   - Secondary schools’ Quiz, debate, art and essay competitions
   - Science project exhibitions by schools
   - Educational tour/excursion

2. Teachers’ Seminars/ Curriculum Development

3. Zeronaut programme supported annually by the USA.

4. Activities marking the World Space Week

Space Education Workshop
Ilorin, (Jan, 2008)

Cross section of attending students & high table

Students asking questions about the presentation delivered.

Another view of participating students
2008 WORLD SPACE WEEK

Dr. Favier (an Astronaut) with winners of a debate competition

Primary school pupils in a performance during the WSW 2008

Representative of VC, OAU with other guests at a lecture held in the university hall

Guests at the gala night

Group photograph with students at WSW 2008

African Regional Centre for Space Science and Technology Education-English

Training Workshop for Space Science Education
Contact Teachers, 11th December, 2008

Cross section of participants

Interactive session

Group photograph
Space Education Workshop, Owode, Ogun State
(December, 2008)

Event banner

Dignitaries on high table

Cross section of attendees

Group photograph

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SPACE EDUCATION WORKSHOP, KANO, MAY, 2009.

Cross section of students

Resource person making a presentation

Courtesy call to the VC, BUK, Kano

Courtesy calls to the Commissioners for Sc & Tech and Education, Kano State to solicit for partnership in the space education programme

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African Regional Centre for Space Science and Technology Education-English
Obafemi Awolowo University Campus, Ile-Ife, Nigeria
www.arcsstee.org
ANNUAL SPACE EDUCATION WORKSHOP, MAY, 2009

Exhibition by schools

Cross section of attendees

Group photograph

ARCSSTE-E’S ZERONAUTS PROGRAMME AS PART OF THE WORLD SPACE WEEK ACTIVITIES

- Zeronaut programme is established to inspire the young ones. It takes place annually at Kenedy Space Centre, Florida, USA in collaboration with Space Week International Association (SIA).

Stella Felix
ARCSSTE-E’s 1st Zeronaut 2006

Adeolu Akanu
ARCSSTE-E’s 2nd Zeronaut 2007

Omelola Ibrahim
ARCSSTE-E’s 3rd Zeronaut 2008
CHALLENGES OF THE POSTGRADUATE PROGRAMME IMPLIMENTATION

- Poor funding, especially without any funding support from other African countries since inception
- Inadequate Hostel accommodation
- Inadequate research materials/equipment etc
- Inadequate project vehicles
- Limited number of Lecture rooms
- Sustainability of scholarship/fellowship

Thank You
Annex II

African Regional Centre for Space Science and Technology - in French Language (CRASTE-LF)
Regional African Centre of Space Sciences and Technologies

In French Language (CRASTE – LF)

Affiliated to the United Nations

Prof. Abderrahmane TOUZANI
Doyen

Sis Ecole Mohammadia d’Ingénieurs (E.M.I) - Avenue Ibn Sina, B.P 765, Agdal-Rabat Maroc
Tel: 212 537 88 18 24 – Fax: 212 537 88 18 26 – Email: touzani@emi.ac.ma / craste@emi.ac.ma
Web site: www.cрастelf.org.ma

52nd Session of the United Nations Committee on the Peaceful Uses of Outer Space

Activities of African Regional Centre of Space Sciences and Technologies Education in French Language (CRASTE_LF)

Vienne, 03-12 June 2009
Space Sciences and Technologies

The Space Techniques Applications constitute a major development tool, in particular for the Earth Observation and Communications.

Meteorological Satellite, Satellite of Observation, Positioning

The use of the data of the Earth Observation Satellite knows a strong growth in fields of intervention increasingly wider.

Communication Systems by Satellite tools essential to the economic and social development

Regional Centres for Space Sciences and Technologies Education Affiliated to UN

Solutions for the implementation of training schemes, to share of Training, Experiments and Competences

United Nation General Assembly Resolutions:


- 4 Centres in Activities affiliated to UN in differences regions of the World:
  - India (Asia & Pacific),
  - Morocco (Africa – French Language),
  - Nigeria (Africa – English Language),
  - Brazil – Mexico (Latino America & Caribbean)
The contribution of training on Space Sciences and Technologies for sustainable development

The CRASTE-LF has been established, on the initiative of the OOSA program on applied of the UN/G.A. Resolution, in Rabat on October 23, 1998.


Building of CRASTE-LF

CRASTE-LF STRUCTURE

Governing Board

Financial Resources
Members States, Regional and International Institutions, Projects

Human Resources
Experts and Institutions Network, Teachers, Supervisor for projects, ...

Post-Graduate Training

Short Courses Training, Scientific animation

Consulting to Member State and Regional Institutions

Collect and Dissemination Space Information

Fundamental Space Sciences And Technologies

Comptences

Fields
The Objectives of the Centre

To **increase knowledge** in Space Sciences and Technologies by organizing courses, seminars, workshops, conferences at the Regional level,

To improve the technical **competence** of the experts, teachers, decision-makers and to hold them informed about technical progress.

To **assist** the countries of the region on the development of endogens capacities in space tools.

To **Strengthen** the Local and Regional Capacities.

To promote **Cooperation** between the Developed Countries and States Members as well as among these States.

To develop **expertise** in Space Sciences and Technology.

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The Main Courses Programs

- Remote Sensing And Geographic Information Systems,
- Satellite Communications,
- Satellite Meteorology and Global Climate,
- Space and Atmospheric Sciences

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Target Public
Academics (Professors,...)  
Researchers, Engineers, Administrators and Managers

Recovering Sectors
Universities, Research Institutes, Professional and Private Institutes and Administrations
Educational Curriculum

Published by UN-OOSA to Regional Centre Of Space Education

Realized Training Courses

*Six training courses in Remote Sensing and GIS, the First started in April, 2000, the Second in November, 2001 the third in November, 2003, the fourth in November 2005, fifth in November, 2006 and November 2008.

*Two training courses in Satellite Meteorology and Global Climate in January, 2002 and November 2004

*Three training courses in Satellite Communications, the First in December, 2000 and the Second in November, 2002
Postgraduate Courses In Remote Sensing and Geographic Information System

113 trainees from:
18 Countries member and no member
24 different institutes.

From Countries: Morocco, Algeria, Tunisia, Mauritania, Senegal,
Burkina Faso, Niger, Tchad, Cote d'Ivoir, Togo, Benin, Gabon,
Cameroon, Cap Verde, R.D. Congo, Madagascar, Syrie,
Central Africa

• Trainees Profile
  • Engineer in Geodesic Sciences
  • Diploma of Studies of Cartography
  • Engineer of Geographic Works,
  • Engineer Agro - Meteorologist
  • Engineer Cartographer
  • Maîtrise in Applied mathematics
  • Master in Geography
  • Doctorate in Geography
  • Doctorate in Physics

02-06 June 2009
52nd Session of COPUOS

Postgraduate Courses In Remote Sensing and Geographic Information System

Activity Hours

Lectures and Practical Exercises: 700 h
Conferences: 70 h
Supervising: 240 h
Scientific Visits: 36 h
Total: 1,046 h

More than 32 Experts from various university and professional institutions or international
The research projects cover several topics in preparation of the Memoir of the Master in Space Sciences and Technologies, relate to the applications of Remote Sensing and Geographical Information Systems on: Cartography, Topography, Urban, Agriculture, Geology, Natural resources, Water, Ecology, forest, desert progress, coastal Managing, Migration of Population, etc...

International Workshop on Remote Sensing and GIS « Space Information and Sustainable Development »

120 communications
More than 150 participants from 30 countries

Partnership : CRASTE – LF, Mohamed V University, ISESCO, – UN-OOSA and ESA

Sponsored by
French Speaking Academic Agency (AUF) – Mohamadia Engineering School (EMI).

(Rabat, 14 – 16 November 2005)
International Workshop

Space Tools with the Service of the Disaster Management and the Emergencies in Africa. Technical, Organizational and Legal Aspects.

Rabat (Morocco) November 10, 11 & 12 2008
Organize jointly with:
UN-OOSA, ISESCO, CRS, EMI, BID
And With support: CNES, ESA, EUROPA OPA, INFOTERRA, EUMETSAT,
42 communications
More than 100 participants from 22 countries

Postgraduate Courses on Satellite Communications

37 trainees from:
9 countries
and
14 different institutes

From Countries: Morocco, Algeria, Tunisia, Mauritania, Senegal, Niger, Tchad, Cote d'Ivoir, Togo, Cameroon, Cap Verde, R.D. Congo, Central Africa

Trainees Profil

- Engineer on Communications,
- Engineer on Mechanical engineering,
- DEA on Signal Processing,
- Engineer on Electromechanically,
- DEA on Electronics and
- DEA on Communications
- Bachelor on theoretical Physics
- Engineer Multimedia Designer
- Doctorate on Communications
- Doctorate on Physics (electro-optics)
Postgraduate Courses on Satellite Communications

Various Hours
Teachers Staff

Up 27 Experts from various university and professional institutions or international Organizations.

Lectures and Practically Exercises: 600 h
Conferences: 210 h
Supervising: 210 h
Scientific visits: 40 h
Total: 1060 h

International Conference

Space Technologies and Telemedicine
June 26 and 27, 2003

This Conference was organized in collaboration with Faculty of Medicine and Pharmacy of Mohamed V University of Rabat

With active support of:
UN/OOSA,
ESA
ASC – CSA (Canada),
CNES - MEDES (France),
OMS,
ISESCO,
EUTELSAT, CNRST (Morocco).
Postgraduate Courses on Satellite Meteorology and Global Climate

18 Trainees from:
8 member Countries and 10 Differences Institutes

From Countries: Morocco, Algeria, Tunisia, Mauritania, Senegal, Niger, Cameroon, Cap Verde, R.D. Congo, Central Africa, Togo

Trainees Profiles
- Meteorological Engineer,
- Mechanical Engineer,
- Forest Engineer,
- DEA on Signal Processing
- Computers Engineer,
- D.E.A. on Environment,
- DEA en Communication
- Doctorate d'état on Es Sciences Physiques

02.06 June 2009
52nd Session of COPUGOS

Postgraduate Courses on Satellite Meteorology and Global Climate

Teachers Staff

Various Hours

More than 26 Experts from various institutes (universities, professionals or internationals Organizations.

Lectures and Practically Exercises: 600h
Conferences: 50h
Supervising: 300h
Scientific Visits: 36h
Total: 986 h
This workshop was organized with the collaboration of the:

- National Meteorology of Morocco,
- National Oceanographic Administration (NOAA - USA)

This workshop gathered about 60 participants from 15 countries

Workshop International
Les Changements Climatiques et Adaptation en Afrique

organized and with the collaboration of the
ASAL,
CRASTE_LF,
UNOOSA
Supporting by
IDRCI_CERDI (Canada)
UNESCO
Introduction the Additional Courses

1) Capacity Building in Space Law

The Centre has including, in first one, one module on initiation in space Law (16 hours) for the all space education:

Remote Sensing and GIS,

Satellite Communication,

Satellite Meteorology and Global Climate.

UNOOSA was organizing the experts meeting in December 2007, to develop the curricula education on Space Law.
Introduction the topics in Space Sciences and Technologies

2) Development the Courses in Disasters Management.

As part of outreach activities UN-Spider Program, The Centre proposed a Education Curriculum of the program course for Capacity Building to Reduce Disasters Management.

It is the subject of the Workshop which is organizing by UN-SPIDER team in parallel with 52nd meeting of COPUOS

3) International Training Courses in GNSS on Satellite Navigation and Location Based Services

The Centre will organize the GNSS courses for 4 weeks from September 28 to October 24, 2009, Supporting by UNOOSA, ICG and others National and International Institution.

**Duration**: 4 Weeks

**Location**: The Course will be conducted by CRASTE_LF

**Objective**: Capacity Building in GNSS Applications, and to make the participants aware of the potential of Satellite Navigation Technology and its applications.

**Target Public**: Trainees from Institutions work and use Space Tools from Africa Region and speaking in French, they have high level education.
International Training Courses in GNSS on Satellite Navigation and Location Based Services

**PROGRAM**

**MODULE I**
- Elements of Geodesy,
- Satellite Positioning,
- The Global Positioning System
- GNSS Receiver Architecture
- New GNSS Generation

**MODULE II**
- GNSS Augmentation System,
- GNSS Applications,
- GNSS Markets,
- GNSS Regulation


Until Now, Up **158 Trainees** followed Postgraduate courses in the **CRASTE-LF from 18 countries**

and, There are **42 Master Diploma** of Space Sciences and Technologies have been delivered by the Centre in various fields applications of Space Sciences & Technologies.
Scientifics Animations

Until Now, There are up 850 experts are attending different Conferences and Workshops organized by the Centre in each fields in Space Technologies from 48 countries in Africa, Europe, Middle East and North America.

REFLEXION

The ten years of the life of the Center enabled him to achieve significant objectives, like to:

- Contribute to capacity Building by training in space sciences and technologies,
- Constitute a data base of regional expertise in this field by an investigation near ex trainees or those which took part in a Workshop or Conference organized by the Center,
- Contribute to become aware of the utility of the space techniques for the development.
the difficulties which the Center has to carry out some objectives:
- it is in financial order, the Member States do not contribute regularly,
- the majority of the trainees who followed the first phase of training successfully, they did not carry out their research project, due: they are generally in activity in their institutions, not have enough time for research, they doesn’t find a adequate structure for research, lack of supervisor, there are not sufficient technical tools, even if they carry out their projects do not have financial means to move and defend their memoire in Centre.

Thank you for your attention

• Web Site: www.crastelf.org.ma
Annex III

Regional Centre for Space Science and Technology Education for Latin America and the Caribbean (CRECTEALC)
Regional Regional Centre for Space Science and Technology Education for Latin America and the Caribbean (CRECTEALC)

Activities in 2008 y and work planned for 2009 – report to COPUOS

Sergio Camacho-Lara
Fifty-second session of the Committee on the Peaceful Uses of Outer Space
5 June 2009, Vienna, Austria

Background of the Regional Centres, affiliated to the United Nations

- Resolution 45/72 of the General Assembly of the UN, 1990: “UN should lead ... establishment of Regional Centres ...”

- Regional Centres established in:
  - Asia and the Pacific (India, 1995);
  - Latin America and the Caribbean (Brazil & Mexico 1997) - CRECTEALC;
  - French-speaking Africa (Morocco, 1998)
  - English-speaking Africa (Nigeria, 1998)

- CRECTEALC was affiliated to the United Nations in 2003
Regional Centre for Latin America and the Caribbean (CRECTEALC)

- Campuses in Brazil and Mexico
  - Santa Maria, Brasil
  - Tonantzintla, Mexico

Mission of CRECTEALC

- Aim of the Centre: to provide high-level education and training that develop skills and scientific knowledge
- The Centre offers postgraduate programmes, workshops, short-term courses in the core disciplines:
  - Remote Sensing and Geographic Information System
  - Satellite Communications
  - Satellite Meteorology and Global Climate, and
  - Space and Atmospheric Sciences
Regional Centre for Latin America and the Caribbean (CRECTEALC)

Long-term post-graduate education programmes

- RS&GIS, SATCOMM, SATMET, SPACE&ATMOS
- 9 and 12-month courses, including projects

Activities of CRECTEALC

- **Education Programmes** relate to: the environment, protection of biological diversity, climate change studies, health and education, weather forecasting, disaster management and the development of space science.
- **Target beneficiaries**: professors, researchers, practitioners from public and private institutions and others professionals.
- The campus in Brazil is supported by the National Institute for Space Research (INPE).
- Campus in Mexico is supported by the National Institute of Astrophysics, Optics and Electronics (INAOE).
- **The languages of education** of the Centre are Portuguese, Spanish and English.
Activities of CRECTEALC

- Since its establishment, CRECTEALC has conducted:
  - 10 nine- and twelve-month post-graduate courses on RS&GIS
  - 4 nine- and twelve-month courses in satellite communications
  - 2 nine- and twelve-month courses on satellite meteorology
    and global climate
    - Courses organized in partnership with INPE, INAOE, the National Council
      for Scientific and Technological Development (CNPq) of Brazil, the
      United Nations University and UN-OOSA
- 253 professionals from 12 countries have graduated
  from these courses
- More than 80% of them are still working in the areas of
  specialization in their countries.

Activities of CRECTEALC

- CRECTEALC has carried out 14 workshops, short courses,
  seminars – Natural Disasters Series
  - Geotecnologías Aplicadas a la Gestión y Prevención de
    Desastres Naturales: el Volcán de Tungurahua - Ecuador” –
    CLIRSEN (2007)
  - “La Geoinformación en la Gestión de Cuencas Hidrográficas
    Movimientos Gravitacionales de Ladera en Regiones Andinas” –
    CLIRSEN (2008)
  - "I Escuela de Primavera sobre Soluciones Espaciales para la
    Gestión de Desastres Naturales y Respuesta y a Emergencias –
    Inundaciones UN-SPIDER/GEO/CEOS WGEdu (2008)
  - Uso de la Información de SRTM y software con Licencia Pública
    General para la Determinación de Avenidas de inundación en
    Zonas Costeras
GNSS Activities of CRECTEALC

• First GNSS Course, in cooperation with ESA, INPE and UNISINOS
• Portal on the use of GNSS in agriculture
• CRECTEALC is the Coordinator of the LATINO Consortium,
  – Support the future Galileo user communities
  – Develop a Galileo portal (information related to Galileo)
  – Prepare educational material
  – Organize courses and seminars

GNSS Activities of CRECTEALC

• Galileo Portal, operational in 2006

Courses and seminars
• Outreach seminars on Galileo, September 2006 and 2007, held during GIS Brazil, Sao Paulo
• Summer School on Galileo, December 2007, Brazil
• Fall School on Galileo, October 2008, Mexico

Educational material
• Manual on Galileo, December 2007; to become a general manual on GNSS (English and Portuguese)
GNSS Activities of CRECTEALC

Future workshops:

- Meeting on Galileo Networking for Industry, Brazil, 2009

- Workshop/course on GNSS capabilities and use in research and applications, (OOSA) Mexico, 2009

Preparation of GNSS curricula (in cooperation with other Regional Centres; effort led by OOSA)

- Participation in “International Training Course on Satellite Navigation and Location Based Services”, CSSTEAP, Ahmedabad, India, 2008


- Participation in “International Training Course on Satellite Navigation and Location Based Services”, CRASTE, Rabat, Morocco (2009)
GNSS Activities of CRECTEALC

Proposal to ICG:

- CRECTEALC as Information Centre for the ICG for Latin America and the Caribbean

- CRECTEALC Offers:
  - Regional reach
  - Education programmes in all space disciplines
  - Support the development of educational material in Portuguese and Spanish
  - Support for the development of a policy to create critical mass in the region

GNSS Activities of CRECTEALC

- Participation of CRECTEALC in ICG-3, Pasadena, USA:
  - CRECTEALC accepted as Information Centre for the ICG in Latin America and the Caribbean
  - Joins ICG WG C (Capacity building)
  - Developing a dedicated Web site
Outreach and policy-making activities of CRECTEALC

• Il Seminario de Difusión e Información: Actividades del Centro Regional de Enseñanza de Ciencia y Tecnología del Espacio para América Latina y el Caribe (2008, Mexico)

• Space Policy in Latin-America and the Caribbean: Looking to the Future (Nov. 2009, Mexico) – jointly with Secure World Foundation

GNSS Activities of CRECTEALC

• In 2009, CRECTEALC will:
  – Conduct Two long-term courses on remote sensing and GIS
  – Conduct Two long-term courses on satellite Communications

• Develop as Information Centre for the ICG in Latin America and the Caribbean
  – Joined ICG’s WG C (Capacity building)
  – Developing a dedicated Web site
  – Preparing a GNSS curriculum (with OOSA)
GNSS Activities of CRECTEALC

- Current education model:
  Courses → projects with R &D elements

- Complementary model:
  - R&D projects → Educ, and capacity building
    - Infrasound and gravitacional waves in the mesopause
    - Nanosatellite constellation (Humanitarian and climate change applications)
    - Database of existing human resources and diverse capacities in space science and technology

THANK YOU
Annex IV

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

Presentation at the COPUOS  June, 2009

DR. GEORGE JOSEPH
DIRECTOR, CSSTEAP
IIRS Campus, 4 Kalidas Road
Dehradun- 248001, INDIA
Web : www.cssteap.org

CENTRE FOR SPACE SCIENCE & TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC (CSSTEAP)
(Affiliated to the United Nations)

Nov 1, 1995 – 10 Countries sign agreement to establish CSSTEAP
May 7, 1996 – Cooperation Agreement with UN
Mar 10, 1998 – Host Country Agreement (Sec. DOS, GOI)

DPR Korea (1996)
India
Indonesia
Kazakhstan
Kyrgyzstan
Malaysia (1996)
Mongolia
Myanmar (1999)
Nauru
Nepal
Philippines (1998)
Republic of Korea
Sri Lanka
Thailand (2005)
Uzbekistan
CSSTEAP: Headquarters & Campuses

- HEADQUARTERS:
  - INDIAN INSTITUTE OF REMOTE SENSING, DEHRADUN
  - (ALSO CONDUCTS RS&GIS COURSE)

OTHER CAMPUSES

SPACE APPLICATIONS CENTRE
AHMEDABAD
(FOR SATMET & SATCOM)

PHYSICAL RESEARCH LABORATORY
AHMEDABAD
(FOR SPACE SCIENCE)

CSSTEAP: Organizational Structure

- Governing Board
- Advisory Committee
- Board of Studies

Host Country

Coordination Committee
CSSTEAP

COURSE DIRECTOR
IIRS-NRSC
Dehradun
RS & GIS

COURSE DIRECTORS
SAC
Ahmedabad
SATCOM & SATMET

COURSE DIRECTOR
PRL
Ahmedabad
Space & Atmosph Science
GOVERNING BOARD

GB FORMULATES POLICIES OF CSSTEAP
ONE EACH FROM MEMBER COUNTRIES
UN-OOSA & ITC OBSERVERS
DIRECTOR – SECRETARY

HELD EVERY YEAR SINCE 1995 (Except 1998)


ADVISORY COMMITTEE

• AC is technical arm of GB, an independent body of experts, for
  - Guiding the technical programme of CSSTEAP
  - Evaluating the courses & Advise CSSTEAP in setting technical facilities
  - Chaired by UNOOSA

• 10th AC-2008: November 24, 2008, Ahmedabad
LINKAGES

INDIA

- **DOS/ISRO Host Institutions**
  - Academic Institutions: IITs, Nirma University, etc for Guest Faculty
  - Andhra University: Recognition of PGD curricula to meet course-work requirement of M.Tech
  - GOI Organizations: for international student travel support

INTERNATIONAL

- **UN Agencies**: including UNOOSA, UNESCO, UNDP, WMO
  - fellowships / travel support
- **ITC, Netherlands**: Academic & faculty support;
  - Recognized RS&GIS PG Diploma for partial credits of M.Tech Programme
- **International Centers** (ICIMOD, TWAS, GDTA*): – Student sponsorship / exchange
- **Universities / Institutes**: Guest Faculty (US, UK, EUROPE, JAPAN...)

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

By Merit since 2004 at IIRS

1 year follow-up project in home country

CSSTEAP 1 Yr Fellowship in India

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

In addition to PG courses, CSSTEAP also conducts short term courses & workshops in specific areas of RS & GIS, SATCOM, SATMET & Space Science.
INTRODUCED COMMON MODULE

A. SPACE SCIENCE & METEOROLOGY
   THE UNIVERSE; IONOSPHERE; SOLAR ACTIVITY; EARTH’S ATMOSPHERE;
   METEOROLOGICAL SATELLITE APPLICATIONS; GLOBAL CLIMATE & CLIMATE CHANGE

B. SATELLITE COMMUNICATIONS
   EVOLUTION OF COMMUNICATION SATELLITES; ELEMENTS OF SATELLITE
   COMMUNICATIONS SYSTEMS; SATELLITE COMMUNICATIONS LINK & ATTENTION EFFECTS;
   INTERNATIONAL REGULATIONS; APPLICATIONS AND TRENDS IN SATELLITE
   COMMUNICATIONS

C. REMOTE SENSING & GIS
   BASIC PRINCIPLES OF REMOTE SENSING; DATA RECEPTION & DATA PRODUCTS;
   GEOGRAPHIC INFORMATION SYSTEM; APPLICATIONS OF REMOTE SENSING

D. SPACE LAW
   FORMULATION OF UN SPACE TREATIES FORUM; UN PRINCIPLES ON OUTER
   SPACE ACTIVITIES; UNCOPUOS – STRUCTURE; MAJOR ISSUES RELATING TO
   OUTER SPACE ACTIVITIES
The Centre has so far conducted **THIRTY** PG courses

- **12** courses in RS & GIS
- **6** courses in SATCOM
- **6** courses in SATMET
- **6** courses in SPACE SCIENCE

The Centre conducted **21** short courses/Workshops in the last **13 yr**

These programmes have benefited **862** participants from **47 countries**. (**520** from PG courses & **342** from short courses)

*This includes **27** participants from **17 countries** from outside AP region in different courses*

<table>
<thead>
<tr>
<th>Year</th>
<th>RS &amp; GIS</th>
<th>SATCOM</th>
<th>SATMET</th>
<th>SPACE SC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>25 (14)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1997-98</td>
<td>23 (14)</td>
<td>13 (09)</td>
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<td>2000-01</td>
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<td>21 (13)</td>
<td>09 (05)</td>
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<td>2001-02</td>
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<td>14 (08)</td>
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<td>2002-03</td>
<td>23 (13)</td>
<td></td>
<td>19 (13)</td>
<td>11 (03)</td>
</tr>
<tr>
<td>2003-04</td>
<td>21 (16)</td>
<td>15 (07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>20 (11)</td>
<td></td>
<td>15 (10)</td>
<td>09 (05)</td>
</tr>
<tr>
<td>2005-06</td>
<td>19 (13)</td>
<td>12 (06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006-07</td>
<td>22 (14)</td>
<td></td>
<td>18 (11)</td>
<td>13 (07)</td>
</tr>
<tr>
<td>2007-08</td>
<td>18 (11)</td>
<td>20 (10)</td>
<td></td>
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</tr>
<tr>
<td>2008-09</td>
<td>15 (10)</td>
<td></td>
<td>16 (13)</td>
<td>07 (03)</td>
</tr>
</tbody>
</table>

**Total** 263 (23) 92 (16) 106 (20) 59 (13)

*() gives no. of countries benefited (Total 27 countries)
OVERALL COUNTRYWISE OUTPUT OF M.TECH AWARDED

<table>
<thead>
<tr>
<th>Country</th>
<th>RS/GIS</th>
<th>SATCOM</th>
<th>SATMET</th>
<th>SPACE SC.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
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<tr>
<td>Bangladesh</td>
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<td>Bhutan</td>
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<td></td>
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<td>1</td>
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<tr>
<td>India</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>38</td>
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<tr>
<td>Indonesia</td>
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<td>1</td>
<td></td>
<td></td>
<td>3</td>
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<td>Iran</td>
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<td>Myanmar</td>
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<td>6</td>
</tr>
<tr>
<td>Nepal</td>
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<td>1</td>
<td>14</td>
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<tr>
<td>Republic of Korea</td>
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<td>Sri Lanka</td>
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<td>6</td>
</tr>
<tr>
<td>Thailand</td>
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<td></td>
<td>1</td>
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<tr>
<td>Uzbekistan</td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Vietnam</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>20</td>
<td>13</td>
<td>10</td>
<td>94</td>
</tr>
</tbody>
</table>

M.TECH IN PROGRESS (58)

M.TECH AWARDED (94)

Short Courses /workshops

RS&GIS


SATCOM:

Digital signal processing (DSP). Applications of satcom for societal development. Satellite navigation & location based services

SATMET

Emerging trends in satellite meteorology. Applications of MW RS

SPACE SCIENCE

satellite x-ray data processing

SHORT COURSES (342)
OUTREACH

ASIA
1. Afghanistan
2. Azerbaijan
3. Bangladesh
4. Bhutan
5. Cambodia
6. China
7. Georgia
8. INDIA
9. INDONESIA
10. Islamic Republic of Iran
11. Japan
12. KAZAKHSTAN
13. KOREA DPR
14. KYRGYZSTAN
15. Lao PDR
16. Maldives
17. MALAYSIA
18. MONGOLIA
19. MYANMAR
20. NEPAL
21. Pakistan
22. PHILIPPINES
23. REP. OF KOREA
24. SRI LANKA
25. Tajikistan
26. THAILAND
27. UZBEKISTAN
28. Vietnam
29. Fiji
30. NAURU
31. Papua New Guinea

More than 95% Countries of Asia Region got benefited

Member countries are shown in capital & underlined

ACTIVITIES FOR 2009

6th PG COURSE IN SATMET CONCLUDED ON APRIL 30, 2009
(16 Students from 13 Countries)
6th PG COURSE IN SP: SCIENCE CONCLUDED ON APRIL 30, 2009
(7 Students from 3 Countries)
13th PG COURSE IN RS & GIS TO BE CONCLUDED ON 30th June 2009
(15 Students from 10 Countries)

14th POSTGRADUATE COURSE IN RS & GIS
JULY 01, 2009 TO MARCH 31, 2010
VENUE: INDIAN INSTITUTE OF REMOTE SENSING, (NRSC) DEHRADUN
STATUS:
21 Students from 13 countries have been selected & admission process is going on

7th POSTGRADUATE COURSE IN SATELLITE COMMUNICATION
AUGUST 01, 2009 TO APRIL 30, 2010
VENUE: SPACE APPLICATIONS CENTRE, AHMEDABAD
STATUS:
15 Students from 9 countries have been selected & admission process is going on
PUBLICATIONS

NEWSLETTER
As a medium to keep in touch between alumni, professionals from A-P countries and the centre. Apart from progress of center’s activities and future announcements, the newsletter in general portrays

a lead article from an eminent person in the field,
news from member countries,
achievements from alumni (alumni speaks),
forthcoming symposiums/workshops

Memoirs
Marking the end of each course is being regularly brought out.
The lecture material of all the CSSTEAP courses had been brought out in lecture volume as well as in CD-ROM and is also been provided to all respective participants.
Digitizing of the publications and storing them on CD-ROM is done from time to time.

Alumni our extended family!!

Established an **alumni forum**

Every alumni can register in our website ([www.cssteap.org](http://www.cssteap.org)) & eligible for certain privileges.

Discussion forum on web .

Publishing short scientific articles from alumni in the website to get feedback before submitting to Journal.
DEDICATED EARTH STATION FOR SATCOM STUDENTS AT SAC CAMPUS AHMEDABAD
PICTURE SHOWS 9 METER ANTENNA OF THE EARTH STATION.
SATMET STUDENTS HAVE ACCESS TO MET DATA FROM METEOROLOGICAL SATELLITES

Picture shows Antenna of the Earth Station at SAC campus (BOPAL) for receiving data from meteorological satellites.

EACH STUDENT IS PROVIDED WITH A COMPUTER HAVING NECESSARY APPLICATIONS SOFTWARE & INTERNET FACILITY.
EACH CENTRE HAS EXCELLENT LIBRARY FACILITY HAVING BOOKS AND INTERNATIONAL JOURNALS INCLUDING E-JOURNALS OF RELEVANCE TO THE SUBJECTS

FACILITIES FOR IMPROVING ENGLISH LANGUAGE SKILLS ARE MADE AVAILABLE UPON THEIR ARRIVAL ON CAMPUS

STATE OF THE ART LABORATORY & FIELD INSTRUMENTS ARE PROVIDED
INDOOR/OUTDOOR GAMES FACILITIES ARE PROVIDED BY THE HOST INSTITUTIONS

WELL EQUIPPED GYMNASIUM AVAILABLE FOR COURSE PARTICIPANTS
INTERNATIONAL HOSTEL WITH MODERN FACILITIES, INCLUDING WELL EQUIPPED KITCHENETTE

OPPORTUNITY TO VISIT DIFFERENT INSTITUTIONS IN INDIA CONCERNED WITH SPACE TECHNOLOGY. TIME TO TIME CULTURAL PROGRAMMES AND GET TOGETHER ARRANGED
Concluding remarks

FOR THE PAST 13 YEARS CSSTEAP HAS TRAINED

~66 SCHOLARS/ YEAR
~80% FROM OUTSIDE INDIA

TRAINING IMPARTED ~ 400 MAN YEARS

CSSTEAP has emerged as a centre of excellence in imparting education & training in the areas of space applications.

THANK YOU