



UNITED NATIONS
Office for Outer Space Affairs

United Nations Basic Space Technology Initiative

Werner Balogh

United Nations Office for Outer Space Affairs

4th African Leadership Conference on
Space Science and Technology for Sustainable Development
„Building a Shared Vision for Space in Africa“
Mombasa, Kenya, 26-28 September 2011

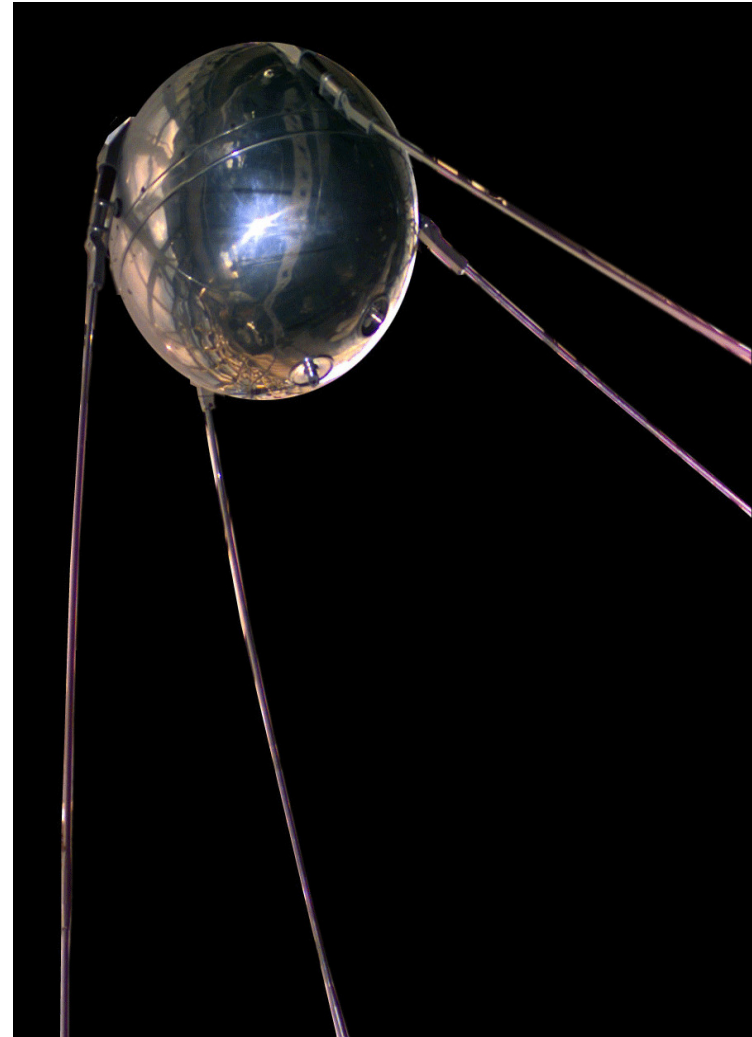
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The United Nations and Outer Space

- Beginning of the space age with the launch of Sputnik I on 4 October 1957
- Rising concerns over an arms race in space, the fair sharing of space benefits and the need for rules to regulate activities of states in outer space
- UN General Assembly establishes the **Committee on the Peaceful Uses of Outer Space (COPUOS)** in 1958
- Serviced by the United Nations Office for Outer Space Affairs (UNOOSA)



United Nations Office for Outer Space Affairs



UNCOPUOS



UNISPACE Conferences



WELCOME TO UNISPACE III



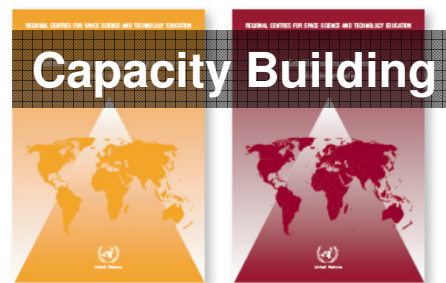
UN Interagency Meeting on Outer Space Activities



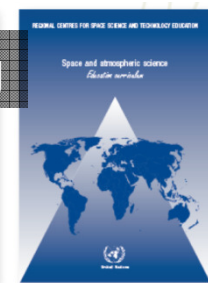
UN Programme on Space Applications



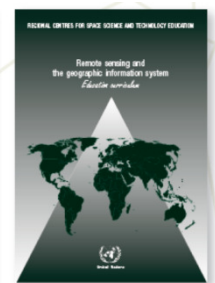
Satellite Registry



Capacity Building



Space and atmospheric science



Remote sensing and the geographic information system

UN Programme on Space Applications



- Established in response to recommendations of the first UNISPACE conference in 1968
- Became operational in 1971
- Implemented by UNOOSA
- United Nations Expert on Space Applications
- UNISPACE'82 in 1982, and UNISPACE III in 1999, further expanded the mandate of the Programme

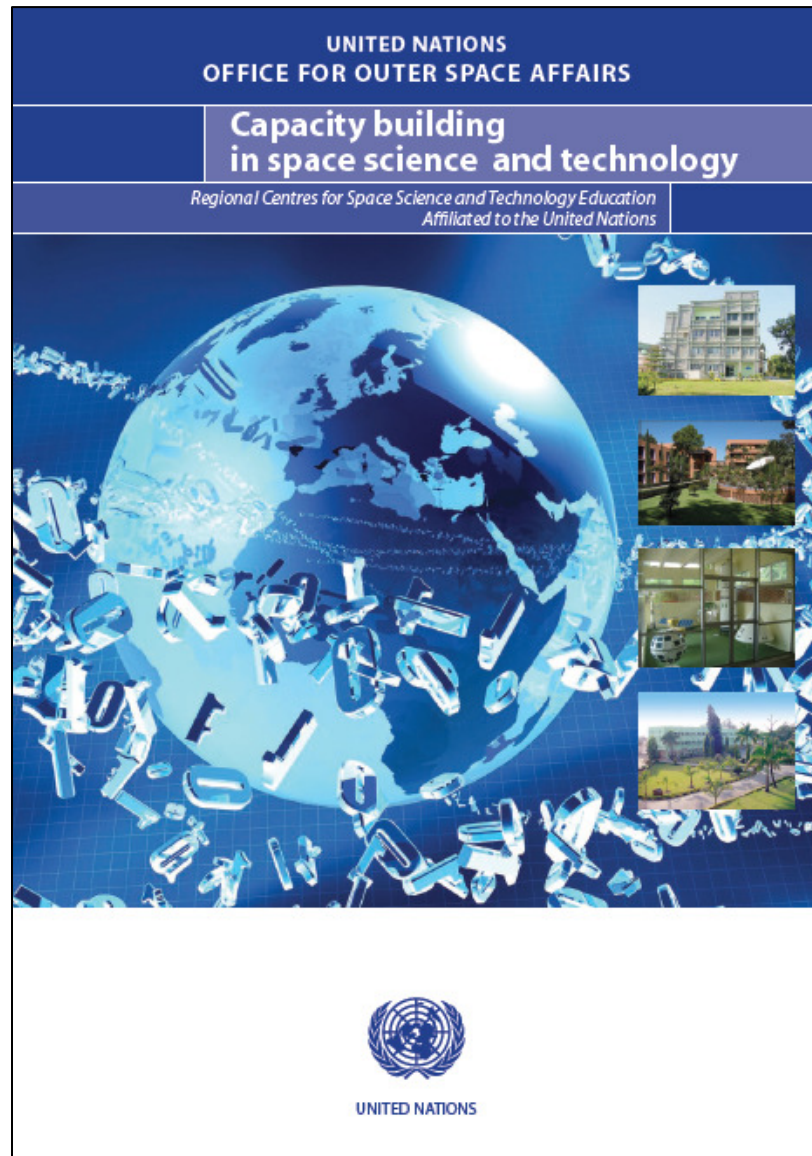
<http://www.unoosa.org/oosa/en/SAP/history.html>

Programme on Space Applications - Mandate

- **Promotion of greater cooperation ... in space science and technology;**
- **Development of a fellowship programme for in-depth training ... ;**
- **Organization of seminars on advanced space applications and new system developments for managers and leaders of space applications and technology development activities ... ;**
- **Stimulation of the growth of indigenous nuclei and an autonomous technological base ... ;**
- **Dissemination of information on new and advanced technologies and applications ... ; and**
- **Provision of technical advisory services**

United Nations General Assembly Resolution 37/90 (§ 7), <http://www.unoosa.org/oosa/en/SAP/mandate.html>

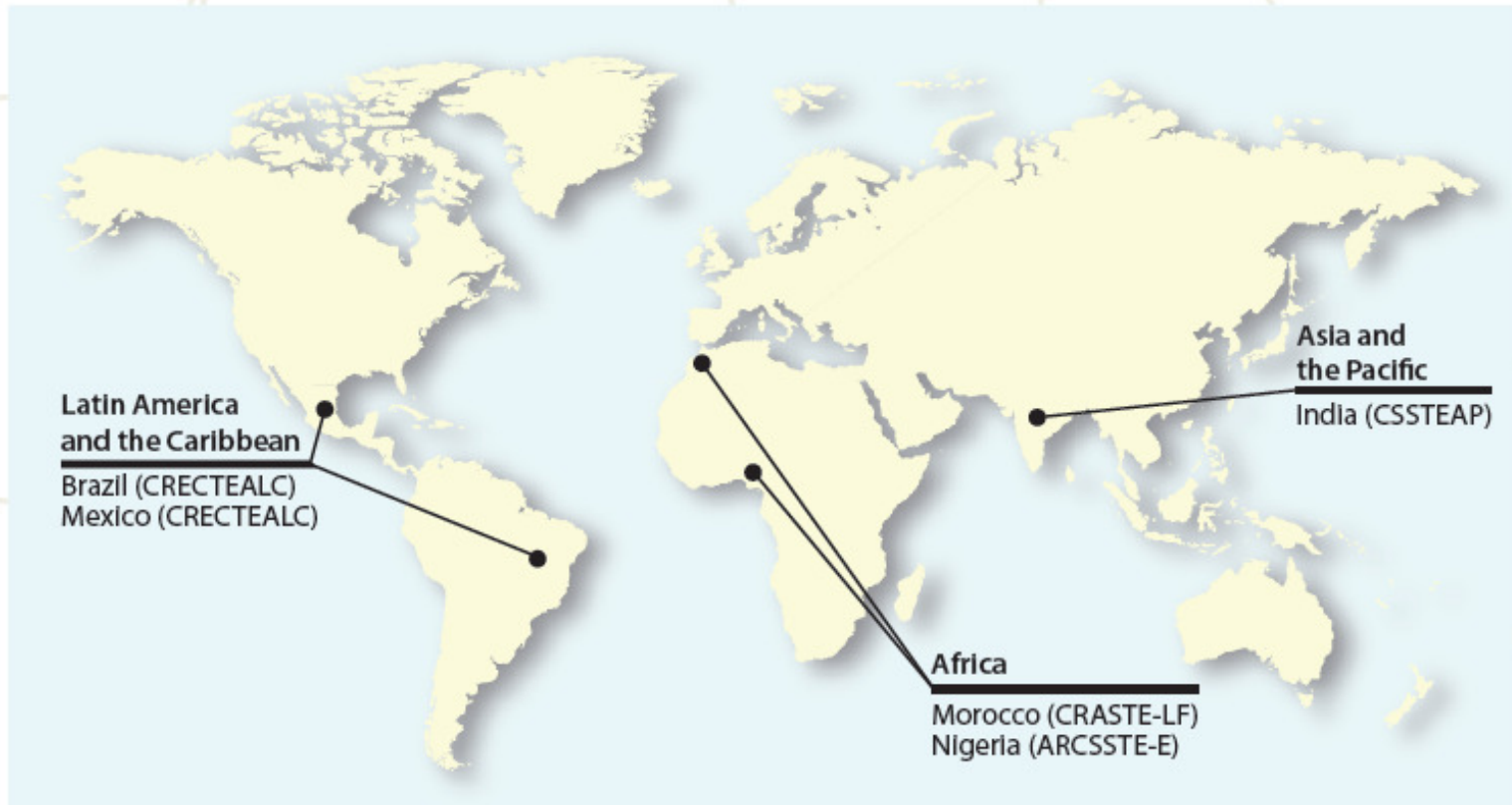
Programme Achievements



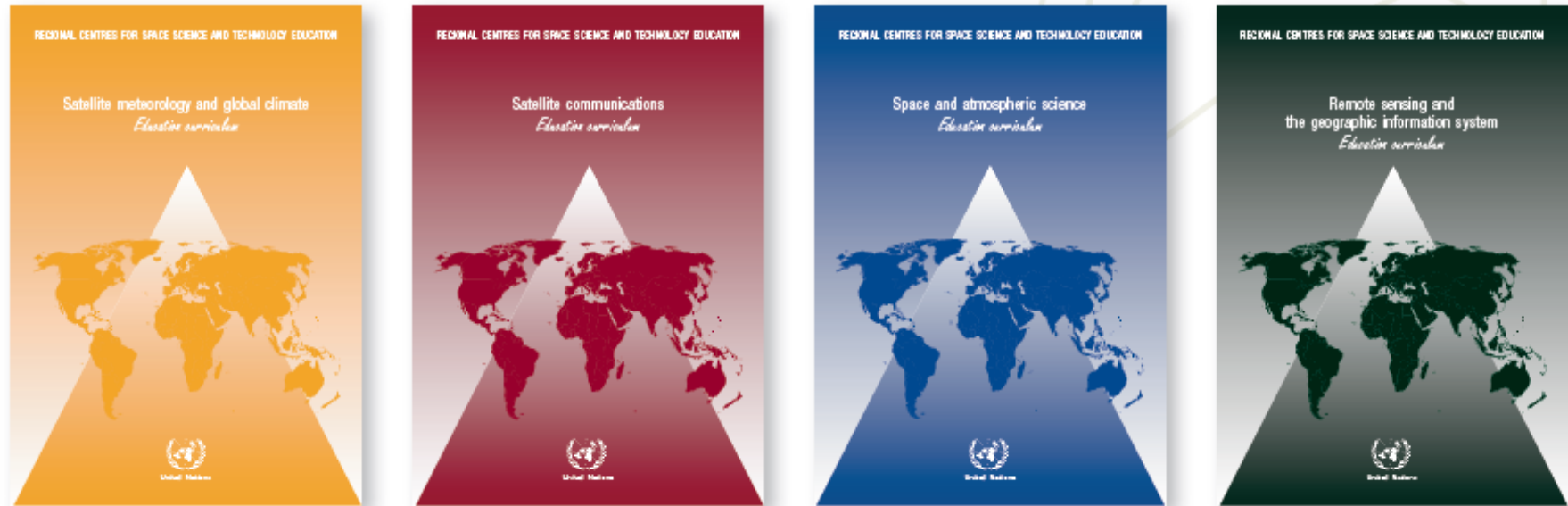
- >11,000 people participated in more than 200 activities (workshops, seminars, training courses...)
- ~300 specialists, selected from among ~1500 applicants, participated in various long-term fellowships programmes
- Establishment of four **Regional Centres for Space Science and Technology Education, affiliated to the United Nations**

<http://www.unoosa.org/oosa/en/SAP/accompl.html>

Regional Centres, affiliated to the United Nations



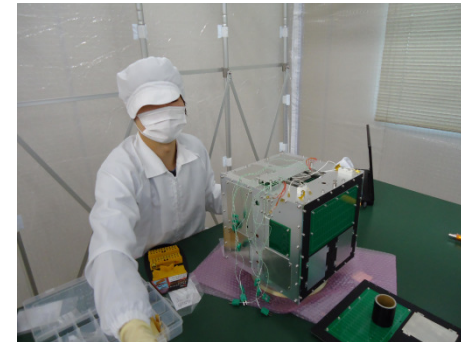
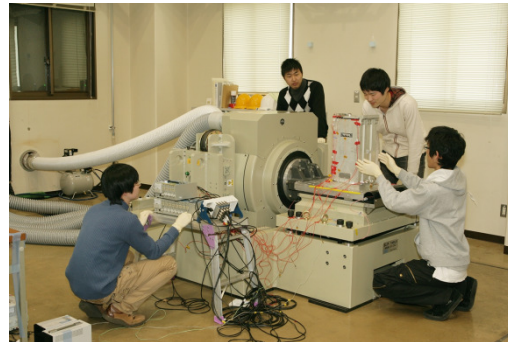
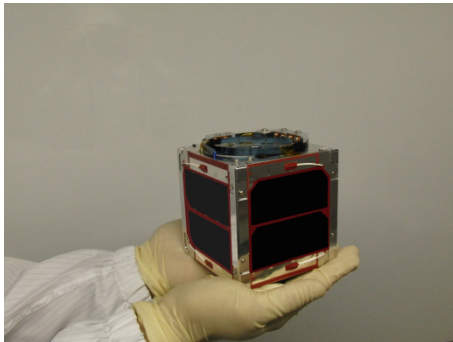
United Nations Education Curricula



- Education curricula and education modules have been and are being developed for
 - Remote Sensing and Geographical Information Systems
 - Satellite Communications
 - Satellite Meteorology and Global Climate
 - Space and Atmospheric Sciences as well as data management
 - In preparation: Space Law, GNSS

Small Satellite Programs

- Increasingly capable nano- and small satellites
- Can be developed with limited infrastructure and at low cost, with small teams
- Affordable to universities and smaller institutions and to countries with limited space expenditure
- Growing interest to establish adequate capabilities for basic space technology development in many countries that have previously only been space-using countries



Images © Kyushu Institute of Technology

Small Satellite Activities

- Small satellites have been addressed by the Committee on the Peaceful Uses of Outer Space since the mid-1990s
 - Microsatellites and Small Satellites: Current Projects and Future Perspectives for International Cooperation, 2 November 1995 (A/AC.105/611)
 - Symposium on Utilization of Micro- and Small Satellites for the Expansion of Low-cost Space Activities, Taking into Account the Special Needs of Developing Countries, 12-13 February 1996 (A/AC.105/638)
 - Report on the United Nations/Instituto Nacional de Técnica Aeroespacial/European Space Agency International Conference on Small Satellites: Missions and Technology, Madrid, 9-13 September 1996 (A/AC.105/645)
- UNISPACE III: UN/IAA Workshop on Small Satellites
 - UNISPACE III, "Report of the Technical Forum", 28 July 1999 (A/CONF.184/L.13)
 - UNISPACE III, Technical Forum, "Conclusions and proposals of the Workshop on Small Satellites at the Service of Developing Countries", 27 July 1999 (A/CONF.184/C.2/L.7)

Documents available from <http://documents.un.org>



**THIRD UNITED NATIONS CONFERENCE
ON THE EXPLORATION AND PEACEFUL USES OF OUTER SPACE**

Some benefits of small satellite programmes

- **Training and educating** systems engineers, industrial engineers and project management specialist which also benefit other than aerospace sectors
- **High-technology**, in reach for smaller countries and countries having limited resources for space activities
- Acquire technical capabilities in miniaturization, microelectronics and micro-manufacturing with **spin-offs** into robotics, entertainment & IT industry, other industry sectors
- Opportunities for establishing **commercial businesses** and for becoming a player in an open, global market place for small satellite technologies

Some benefits of small satellite programmes

- Create new opportunities for **international technology cooperation**
- A stepping stone in developing/enhancing a country's **space capacity** and to creating a long-term plan for space technology development
- Demonstrate technology and space capability and **encourage the people**
- **Raise attention** of government industry and people to the importance of space technology and its applications
- **Benefit from the actual applications**
- ...

Basic Space Technology Initiative (BSTI)

- Launched in 2009 in the framework of the United Nations Programme on Space Applications
- **Mission**
 - To enhance access to space application tools for sustainable development through building capacity in basic space technology
- **Objectives**
 - Respond to the growing **interest in many countries to establish indigenous capacities in basic space technology**
 - Address the **growing role of small satellites** for education, basic space science and for operational applications
 - Assist countries to assure **adherence to the relevant regulatory frameworks** and promote the **use of standards**
 - Promote **international cooperation and information exchange** in capacity building in basic space technology

A Results-Oriented Work Programme

I. Basic Activities

- UN Workshops/Symposiums on Basic Space Technology
- BSTI Website & Mailing List (<http://www.unoosa.org/oosa/en/SAP/bsti/index.html>)
- Regulatory aspects (registration, frequencies, space debris...)

II. International Space Technology Conferences

- Conferences in the regions that correspond to the United Nations Economic Commissions for Africa, Asia and the Pacific, Latin America and the Caribbean, and Western Asia

III. Space Technology Education Curriculum

- Basic Space Technology Education Directory based on a survey of Aerospace Engineering and Small Satellite Programmes
- Development of a Space Technology Education Curriculum

IV. Establishment of Long-term Fellowship Programmes

V. BSTI Projects

I. Basic Activities



<http://www.unoosa.org/oosa/en/SAP/act2011/graz/index.html>

II. International Space Technology Conferences

- Conferences are planned in the regions that correspond to the United Nations Economic Commissions:
 - Africa
 - Asia and the Pacific
 - Latin America and the Caribbean
 - Western Asia
- Objectives:
 - Address regional aspects of small satellite programmes and capacity building in basic space technology
 - Develop the Space Technology Education Curriculum in cooperation with educators and experts
 - Consider possible BSTI Pilot Projects
- These conferences will build on the outcomes of the UN/Austria/ESA series of Symposiums

III. Space Technology Education Curriculum



- A survey of world-wide academic programmes in aerospace engineering and small satellite development
- 250 academic institutions in more than 40 countries contacted and replies received from 43 academic institutions in 18 countries
- Published as UN publication ST/SPACE/53
- Available from <http://www.unoosa.org/oosa/en/SAP/bsti/bsti-education/index.html>
- BSTI will build on these contacts in the development of the Space Technology Education Curriculum

IV. Establishment of Fellowship Programmes

- BSTI seeks to help establish opportunities for long-term fellowship programmes for engineers from developing countries
- United Nations/Japan Long-term Fellowship Programme, hosted by the Kyushu Institute of Technology at its Center for Nanosatellite Testing
- 3-year PhD programme ending with a doctorate degree in Nano-satellite Technologies (Doctor of Engineering) after successful thesis defense
- All cost (tuition, living cost, travel) covered by KIT and UN
- Application deadline: April 2011, Start: October 2012
- <http://www.unoosa.org/oosa/en/SAP/bsti/index.html>
- http://cent.ele.kyutech.ac.jp/index_e.php

V. BSTI Projects

- BSTI can be used as a framework to implement regional or international projects related to capacity building in space technology
- Examples of projects being implemented:
 - Support to the HUMSAT Constellation Project (with University of Vigo, Spain)
 - Development of a Best Practices Handbook for Small Satellite Programmes (with International Space University)



Thank you for your attention!

Office for Outer Space Affairs
United Nations Office at Vienna
Vienna International Centre
P.O. Box 500, 1400 Vienna, Austria
Tel: +43-1-26060-4950
Fax: +43-1-26060-5830

Werner Balogh
Programme Officer – Basic Space Technology
werner.balogh@unoosa.org

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