UNITED NATIONS
Office for Outer Space Affairs

Basic Space Technology Initiative

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Capacity Building in Space Technology

- **Increasingly capable nano- and small satellites** can be developed with an infrastructure and at a cost that is now also **affordable to universities and smaller institutions and to countries with limited space expenditure**
- As a consequence there is a strong interest in a growing number of countries **to establish a certain level of indigenous capabilities for basic space technology development**
- Through the United Nations Programme on Space Applications the United Nations has been given the mandate to encourage and render assistance to countries wishing to establish research programmes as well as to ensure compliance with the relevant regulatory and legal framework

UNCOPUOS 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 Aerosespecial/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

Benefits of small satellite programmes

- High-technology in reach for countries with limited resources for space activities
- Establish technical capabilities in miniaturization, microelectronics and micro-manufacturing with spin-offs into other industry sectors
- Train and educate systems engineers, industrial engineers and project managers which will also benefit other than aerospace sectors
- Opportunities to establish commercial businesses
- Opportunities to develop/enhance a country's space capacity, to create a long-term plan for space technology development and to engage in international technology cooperation
- Benefits 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 (nano-) 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

BSTI Work Programme

I. Foundations

- 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. Regional 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

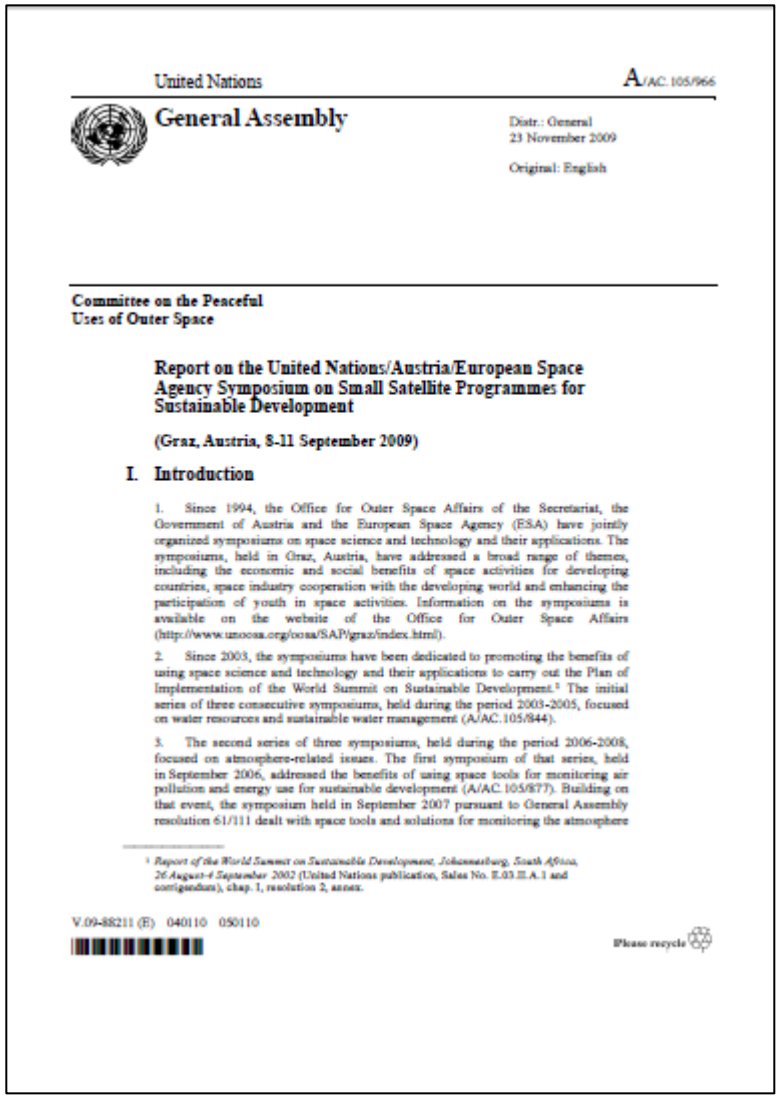
V. BSTI Projects

I. Foundations: UN/Austria/ESA Symposium

http://www.unoosa.org/oosa/en/SAP/act2010/graz/index.html

UN/Austria/ESA Symposium 2010

UN/Austria/ESA Symposium 2010



United Nations A/AC.105/966

General Assembly

Distr.: General
23 November 2009

Original: English

Committee on the Peaceful
Uses of Outer Space

Report on the United Nations/Austria/European Space Agency Symposium on Small Satellite Programmes for Sustainable Development

(Graz, Austria, 8-11 September 2009)

I. Introduction

1. Since 1994, the Office for Outer Space Affairs of the Secretariat, the Government of Austria and the European Space Agency (ESA) have jointly organized symposiums on space science and technology and their applications. The symposiums, held in Graz, Austria, have addressed a broad range of themes, including the economic and social benefits of space activities for developing countries, space industry cooperation with the developing world and enhancing the participation of youth in space activities. Information on the symposiums is available on the website of the Office for Outer Space Affairs (http://www.unoosa.org/oosa/SAP/graz/index.html).

2. Since 2003, the symposiums have been dedicated to promoting the benefits of using space science and technology and their applications to carry out the Plan of Implementation of the World Summit on Sustainable Development.[1] The initial series of three consecutive symposiums, held during the period 2003-2005, focused on water resources and sustainable water management (A/AC.105/844).

3. The second series of three symposiums, held during the period 2006-2008, focused on atmosphere-related issues. The first symposium of that series, held in September 2006, addressed the benefits of using space tools for monitoring air pollution and energy use for sustainable development (A/AC.105/877). Building on that event, the symposium held in September 2007 pursuant to General Assembly resolution 61/111 dealt with space tools and solutions for monitoring the atmosphere

[1] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. 1, resolution 2, annex.

V.09-88211 (E) 040110 050110

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- Symposium report will be issued in the six official UN languages (Arabic, Chinese, English, French, Russian, Spanish)
- Includes observations and recommendations made by participants
- Reflects future plans for BSTI
- Submitted to UN Member States through UNCOPUOS and the UN General Assembly

UN/Austria/ESA Symposium 2011

- **Date and location:** 13-16 September 2011, Graz, Austria
- **Theme:** "Implementing Small Satellite Programmes: Managerial, **Regulatory and Legal Issues"**
- **Draft Objectives**
  - Review the latest status of world-wide small satellite (<100 kg) activities, with a particular focus on international and regional cooperation
  - Examine issues relevant to the implementation of small satellite programmes, such as space technology development activities as part of a country's or organization's research and development strategy, financing, programmatic issues, and project management of small satellite programmes.
  - Elaborate on regulatory issues of small satellite programmes, such as frequency allocation and space debris mitigation measures
  - Elaborate on legal issues of small satellite programmes, such as registration of space objects and liability issues
  - Discuss the way forward for the United Nations Basic Space Technology Initiative (BSTI), such as regional conferences and BSTI education curriculum
- See http://www.unoosa.org/oosa/en/SAP/act2011/graz/index.html

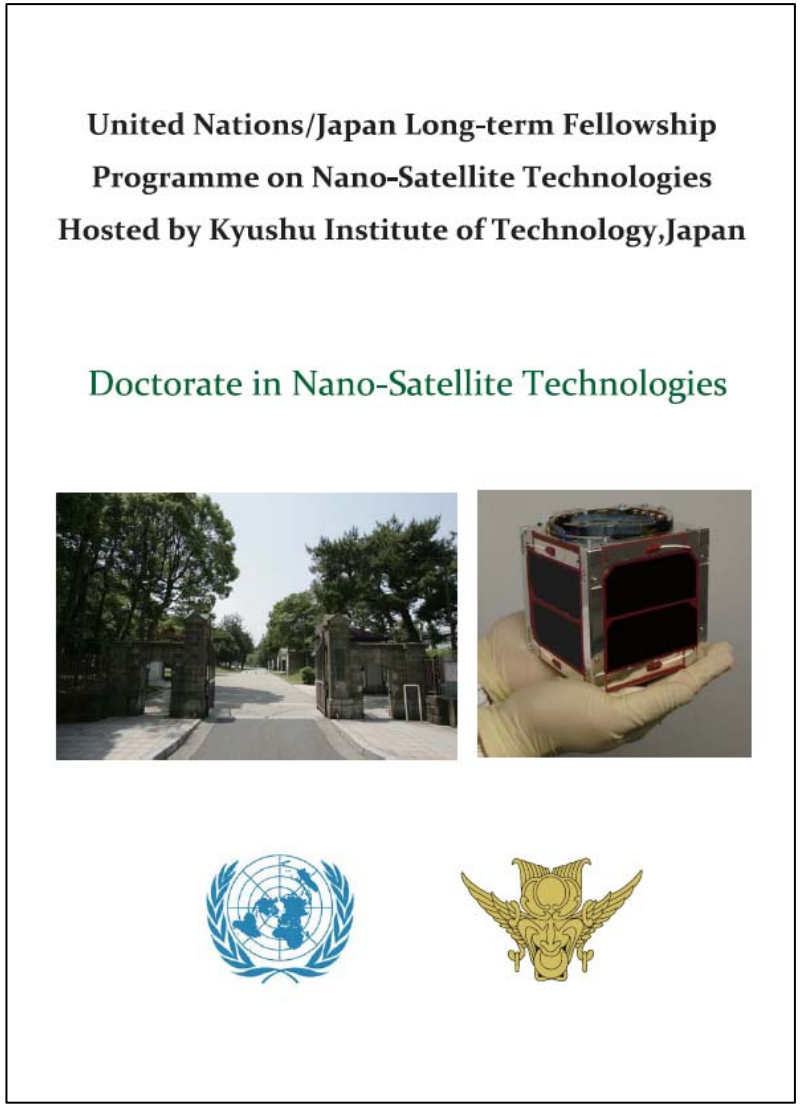
II. Regional Space Technology Conferences

- 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

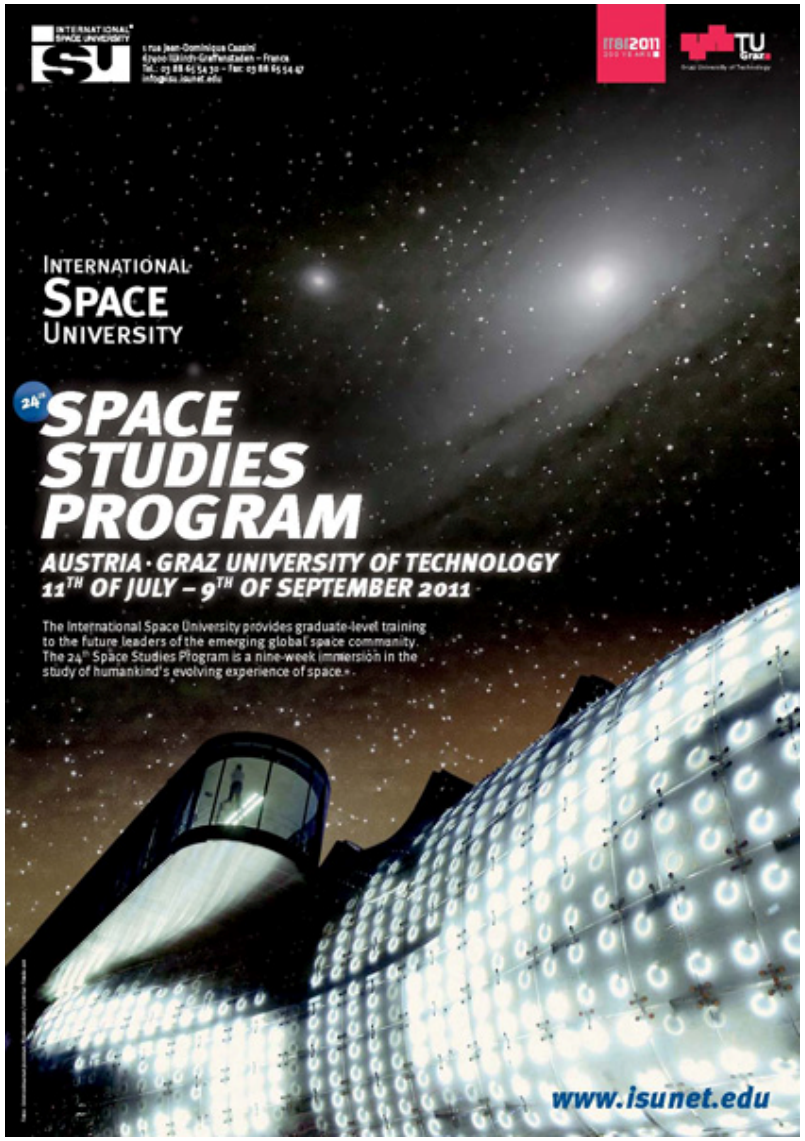


- United Nations/Japan Long-term Fellowship Programme, hosted by the Kyushu Institute of Technology at its Center for Nanosatellite Testing
- 3-year PhD programme ending with a doctorate degree in Nano-satellite Technologies (Doctor of Engineering) after successful thesis defense
- All cost (tuition, living cost, travel) covered by KIT and UN
- Application package available from http://www.unoosa.org/oosa/en/SAP/bsti/fellowship.html
- Application deadline: 30 April 2011, Start: October 2011

V. BSTI Projects

- BSTI is also used as a framework to implement regional or international projects related to capacity building in space technology
- Examples of projects presently being implemented:
  - Support to the HUMSAT Constellation Project (with University of Vigo, Spain) – see http://www.humsat.org/
  - Development of a Best Practices Handbook for Small Satellite Programmes (with International Space University) – see http://www.isunet.edu/index.php/ssp

ISU Space Studies Programme 2011



- International Space University – Space Studies Programme
- 11 July – 9 September 2011
- Minimum requirement is bachelors degree
- Scholarships available from European Space Agency and other organizations
- 3 Team Projects:
  - Fresh Water
  - Human-Robotic Cooperation
  - Small Satellite Capacity Building

Thank you for your attention!

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