



Office for Outer Space Affairs
United Nations Office at Vienna



International Committee on
Global Navigation Satellite Systems

International Committee on Global Navigation Satellite Systems (ICG): GNSS Education Curriculum

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Office for Outer Space Affairs
United Nations Office at Vienna

Fifth Meeting of the ICG

18 – 22 October 2010

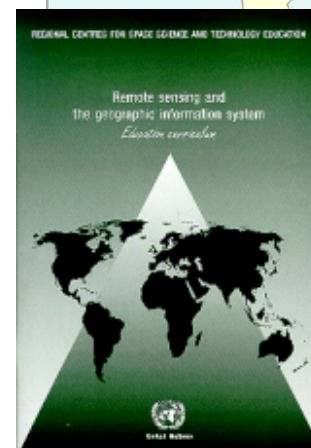
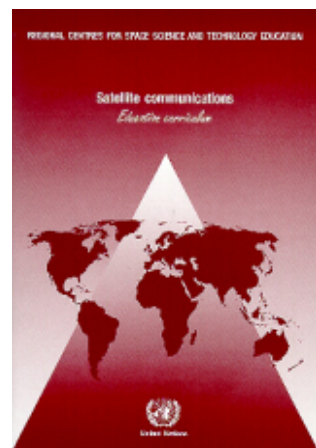
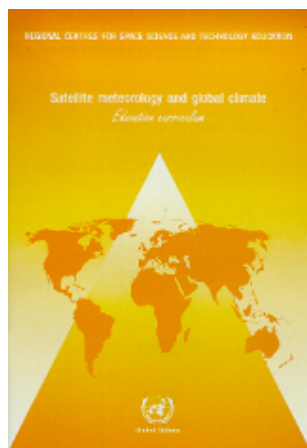
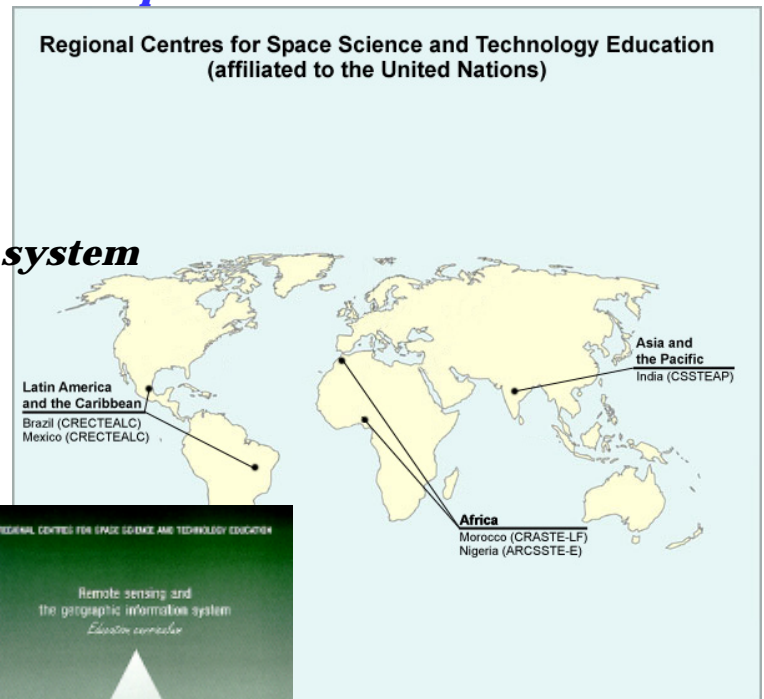
Turin, Italy

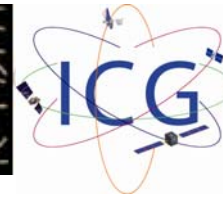
Meeting of the Working Group C, 19 October 2010



UN-affiliated Regional Centres for Space Science and Technology Education

- ◆ **Education Curricula:** *Postgraduate courses provided by the Centres are based on education curricula developed through UN expert meetings, with the support of prominent educators, in 1989, 1995, and 2001 for each topic of core disciplines*
 - ◆ ***Satellite meteorology and global climate***
 - ◆ ***Satellite communications***
 - ◆ ***Space and atmospheric science***
 - ◆ ***Remote sensing and the geographic information system***
- ◆ ***Space law***
- ◆ ***Global Navigation Satellite Systems (GNSS)***





UN-affiliated Regional Centres for Space Science and Technology Education

Proposal: Centre for Space Science and Technology Education in the Asia and Pacific Region, India – COURSE CURRICULUM (10 weeks)

- ◆ **Prerequisite:** Graduate in Electronics and Communications Engineering

- ◆ **Theory (150 hours):**

- ◆ **Introduction (5 hours)**
- ◆ **Basic techniques of communications and navigation (60 hours)**
- ◆ **Technologies: GNSS global and regional systems (20 hours)**
- ◆ **Technologies: Augmented systems (20 hours)**
- ◆ **Receivers (30 hours)**
- ◆ **Applications (15 hours)**

- ◆ **Practical (150 hours):**

- ◆ **Basics of MATLAB**
- ◆ **GNSS receivers**
- ◆ **GNSS data and coordinate conversion**
- ◆ **Experiment with DGPS**
- ◆ **Experiment with RTK receivers**
- ◆ **Demonstration of accuracy improvement using SBAS**
- ◆ **Design aspects of software for integrating location based services with position**
- ◆ ...

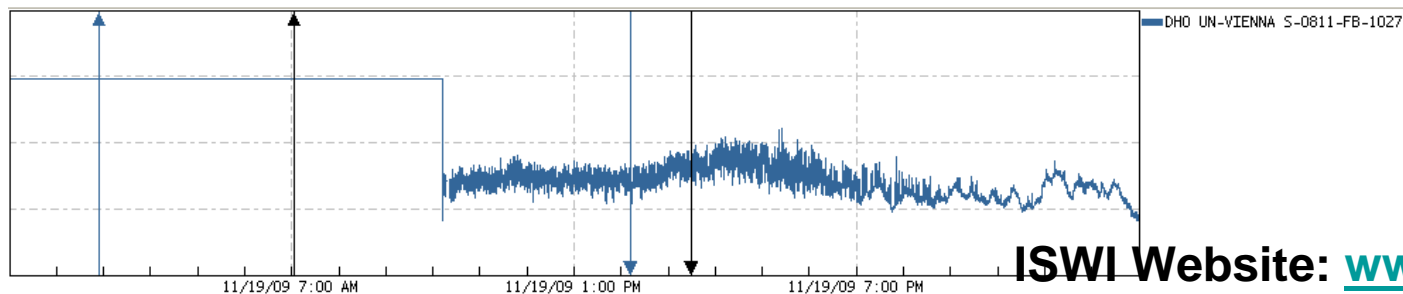


International Space Weather Initiative

Implemented in 2010 – 2012 under a three–year work plan in the Scientific and Technical Subcommittee of UN COPUOS

- ◆ **14 instrument arrays, five types of instruments, ~ 1000 instruments in operation – deployed during the IHY 2007 campaign (2005 – 2009)**
- ◆ **Lead scientist or principle investigator funded by his/her country provides instrumentation and data distribution**
- ◆ **Instrument host country provides the workforce, facilities, and operational support typically at a local university**
- ◆ **Host scientists become part of science team**
- ◆ **All data and data analysis activity is shared**
- ◆ **All scientists participate in publications and scientific meetings where possible**

(Super) Sudden Ionospheric Disturbance Monitor (SID) operated by UNOOSA



Stanford Solar Centre

SID Data Access

www.stanford.edu

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ISWI Website: www.iswi-secretariat.org



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Global Navigation Satellite Systems**

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