Japan and ISWI (International Space Weather Initiative)

Role of ISWI

In order to raise the general level of space science and support space education in developing nations, one of the best methods is to introduce these nations to "ground-based observation". This introduction can be achieved by getting developed nations to contribute instrumentation to developing nations. Then, local engineers and scientists can be instructed in equipment maintenance, data acquisition and data analysis so that they become responsible for the long-term operation of such facilities. In this way, both the equipment provider and the equipment maintainer benefit because both can make use of the resulting scientific data.

To summarize these functions, a principle investigator (PI) funded by his/her country provides instrumentation and assists with data distribution from that instrumentation. In return, a host country provides the workforce, facilities, and operational support (typically at a university inside the host country). Host scientists become part of the science team. All data and data analysis activity is shared. In addition, international meetings are organized so that all parties can meet face-to-face to discuss progress and problems. At these meetings, student exchanges, ideas for publications, outreach activities, and so on, can be organized.

Japan's Contribution to ISWI

In Japan, the STPP (Solar Terrestrial Physics Program) subcommittee of the *Science Council in Japan* is participating in ISWI as a follow-on program of the International Heliophysical Year (IHY, 2006-2009). The Chief of the STPP subcommittee (Professor Kiyohumi Yumoto of *Kyushu University*) and other members of the subcommittee are moving forward with their instrument deployment plans – and are constructing database systems for public access. Table 1 is a list of Japanese scientists who have deployed (or soon will deploy) instrumentation overseas and will gradually make all acquired data available for public use (with some conditions attached). It should be noted that more members of the STPP subcommittee are preparing to join the instrument program or establish database systems, or both. In Figures 1 to 6, examples of instrument programs, education and outreach activities in Japan are shown.

To create awareness of ISWI in Japan, the STPP subcommittee is organizing an "ISWI-Japan Kick-Off Meeting" at *Kyushu Universit*y that will take place in March of 2010. Soon after that, the "ISWI-Japan International Symposium" will be held at Makuhari in May of 2010 with the help of the *Japan Geophysical Unio*n (JpGU). This symposium will be held every year in Japan during ISWI (2010 through 2012).

Table 1, Current Japanese Instruments (as of Feb 2009)

INSTRUMENT	Lead Scientist	Country	Objective
Magnetic Data Acquisition System (MAGDAS)	**K. Yumoto (Kyushu U)**	**Japan**	**Study of dynamics of geospace plasma changes during magnetic storms and auroral substorms, the electromagnetic response of iono-magnetosphere to various solar wind changes, and the penetration and propagation mechanisms of DP2-ULF range disturbances**
Global Muon Detector Network (GMDN)	**K. Munakata (Shinshu U)**	**Japan**	**To identify the precursory decrease of cosmic ray intensity that takes place more than one day prior to the Earth-arrival of shock driven by an interplanetary coronal mass ejection**
Flare Monitoring Telescopes (FMT) under the Continuous H-alpha Imaging Network (CHAIN)	**S. Ueno, K. Shibata, (Kyoto U)**	**Japan**	**Time variation and 3D velocity field of solar activity, flares, filament eruptions and shock waves (Moreton waves) by using multi-wavelength H-alpha images of the full-disk Sun.**
Optical Mesosphere Thermosphere Imagers (OMTIs)	**K. Shiokawa (Nagoya U)**	**Japan**	**Dynamics of the upper atmosphere through nocturnal airglow emissions**
South-East Asia Low - Latitude Ionosonde Network (SEALION)	**T. Nagatsuma (NICT)**	**Japan**	**Monitoring and study on ionospheric disturbances occurred in the equatorial region by ionospheric and geomagnetic field observations.**
Education and outreach activities of space weather	**S. Watari (NICT)**	**Japan**	**Education and outreach activities of space weather as a regional warning center under International Space Environment Service (ISES)**

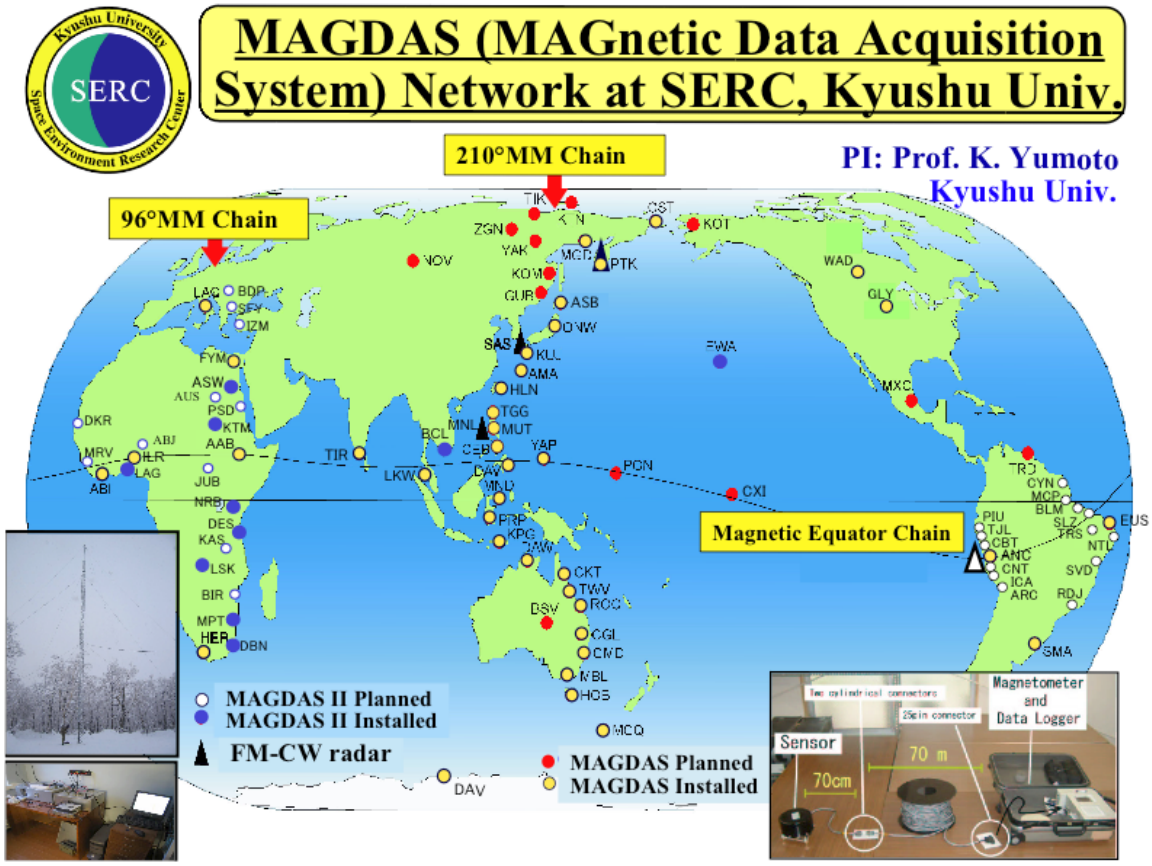

Fig.1. MAGDAS Project

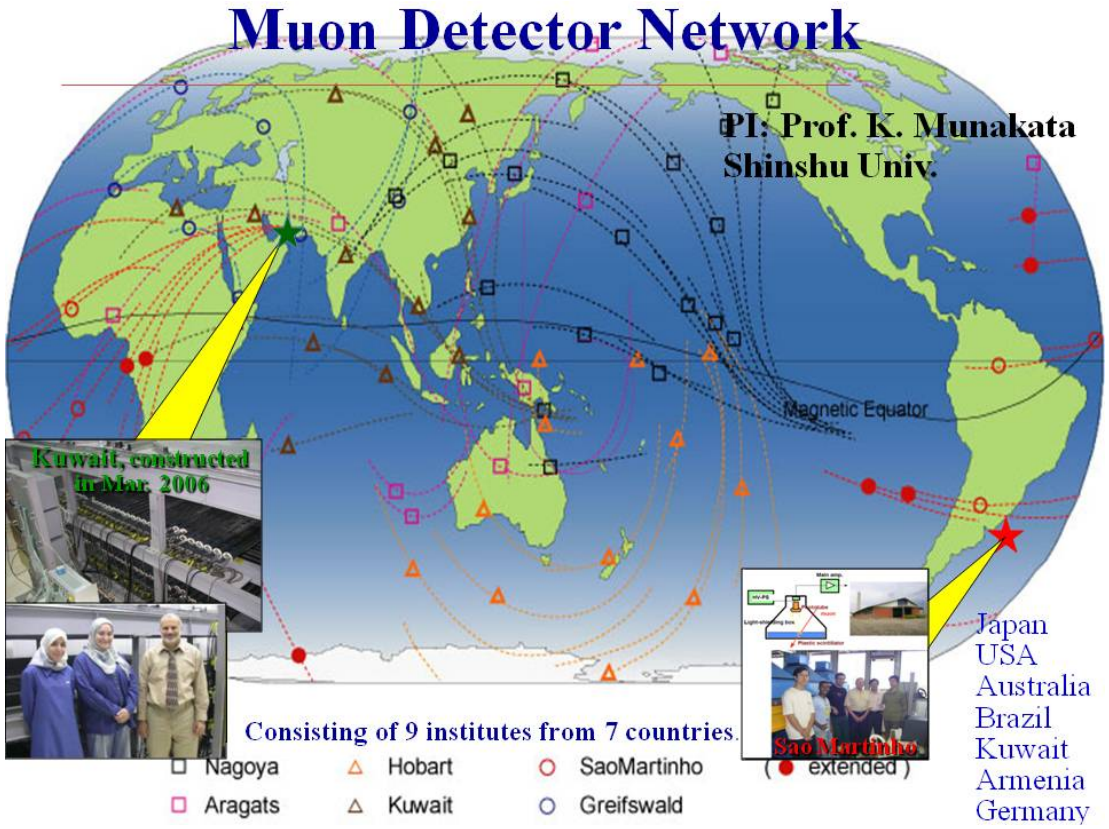

Fig. 2. GMDN Project

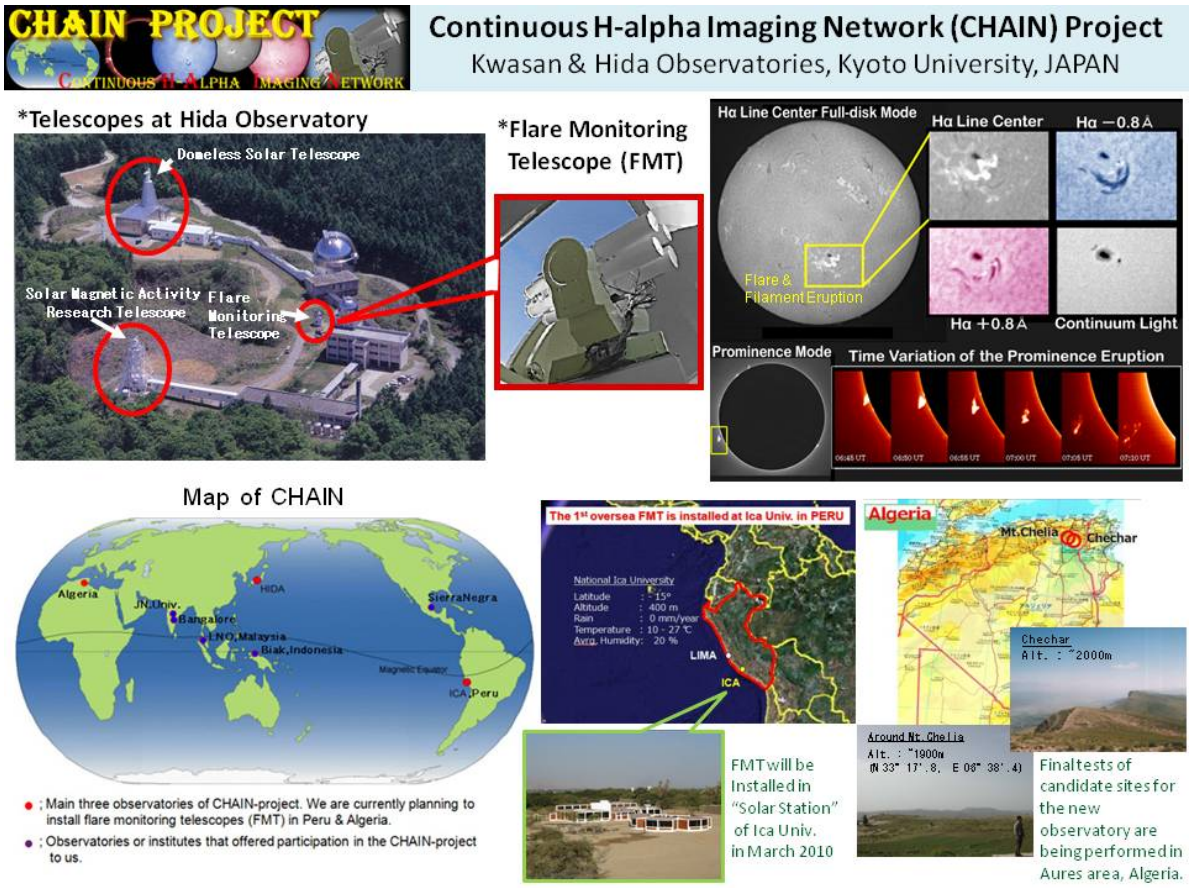

Fig. 3. CHAIN Project

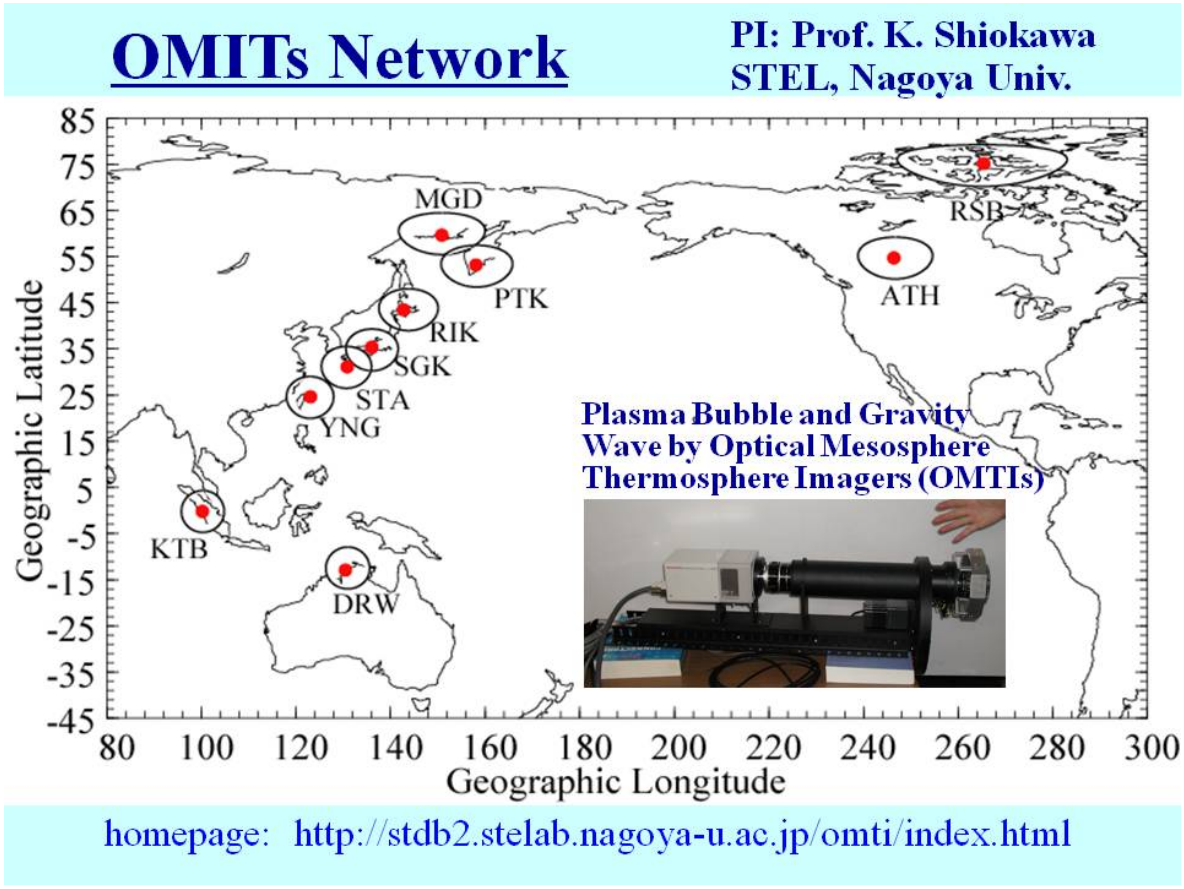

Fig. 4. OMTIs Project

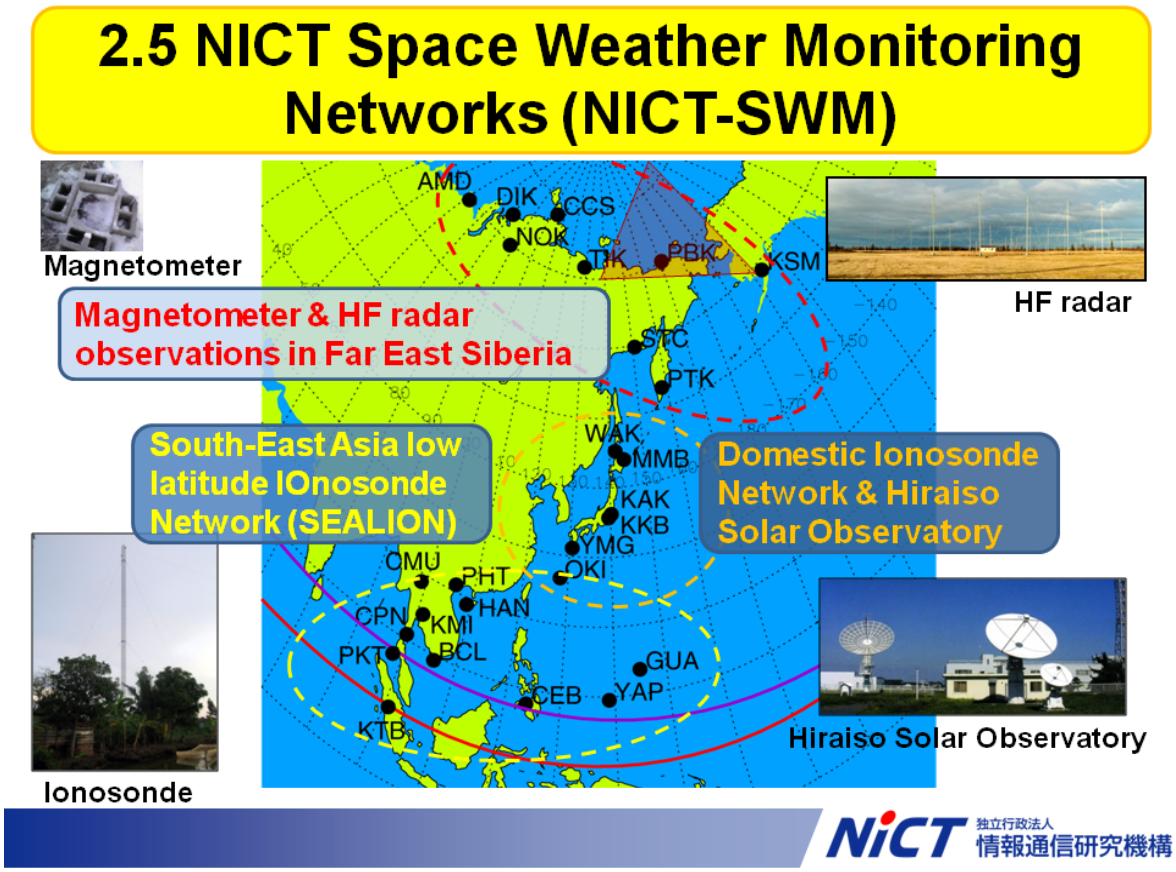

Fig. 5 SEALION Project

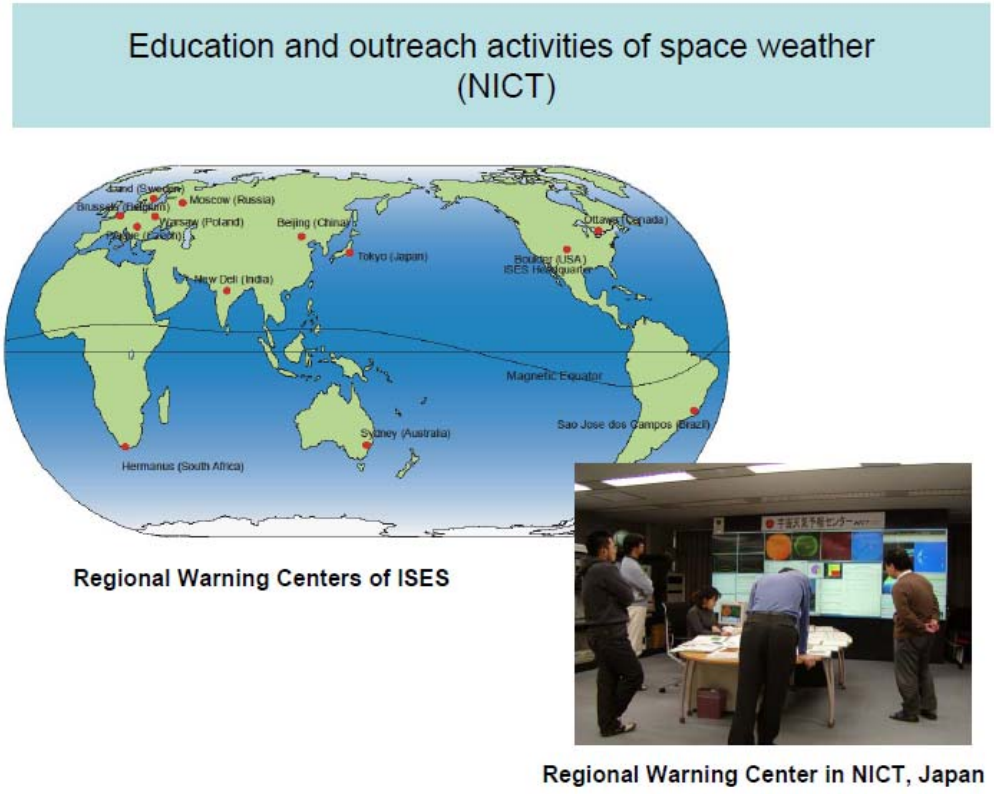

Fig. 6 Education and outreach activities of space weather