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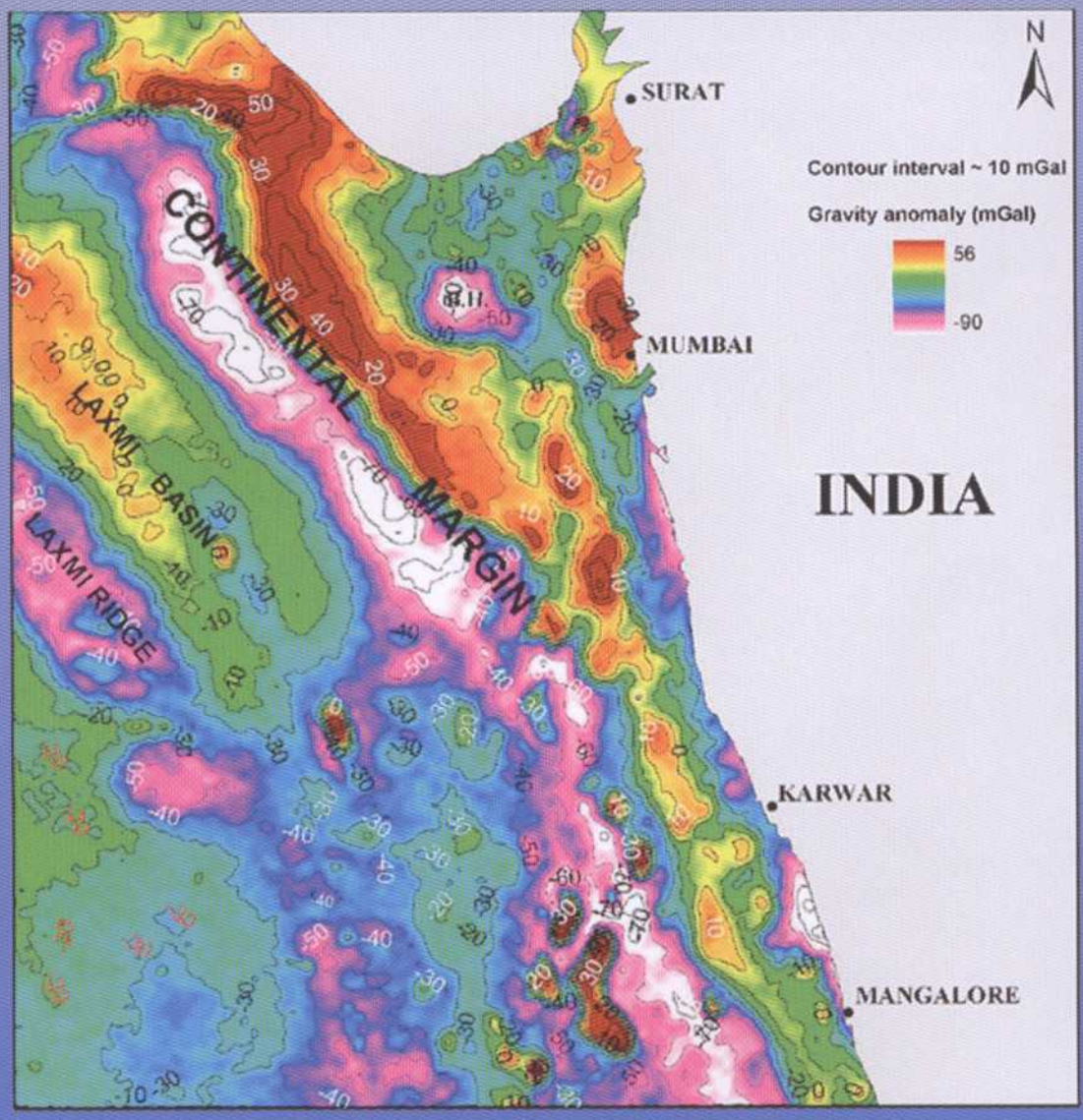

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Debris Coordination Committee. The situation is being continuously watched by ESA's Space Debris Office, which will periodically issue re-entry predictions.

Research Note

MAGDAS Capacity Building Activities for Space Weather Research at ICSWSE

[A. Yoshikawa, M.G. Cardinal, T. Hada and K. Yumoto, Kyushu University]

The International Center for Space Weather Science and Education (ICSWSE) of Kyushu University in Japan, formerly known as the Space Environment Research Center (SERC), has an extensive global-array near real-time MAGnetic Data Acquisition System (MAGDAS). With the support of the Japan Society for the Promotion of Science (JSPS) Core-to-Core Program, the ICSWSE, through the MAGDAS project, started conducting capacity building activities in order to develop basic space science awareness among scientists and students from developing countries in Asia and Africa. One of the objectives of the programme is to create world-class research hubs for research fields with international significance to Japan. The programme is also designed to form promising research hubs for fields of special importance to Asia and Africa. The Core-to-Core Program is comprised of two components: Advanced Research Networks (former "Core-to-Core Program" and "Asian CORE Program") and Asia-Africa Science Platforms. For further details, visit the website www.jsps.go.jp/english/e-c2c/adapted_b.html.

Under the Asia-Africa Science Platforms, ICSWSE proposed a project entitled "Formation of Preliminary Center for Capacity Building for Space Weather Research." The main goal of the project is to strengthen the research abilities of young scientists in Asian and African regions on space weather and related topics. Moreover, adhering to the objectives of the International Space Weather Initiative (ISWI), the project also aims to expose young Japanese scientists to international-oriented science activities such as instrumentation training and educational outreache in Asia and Africa. For information on ISWI, visit the website at www.iswi-secretariat.org.

The core institute in this project is ICSWSE of Kyushu University. In Japan, the coordinators of the project are Akimasa Yoshikawa and Kiyohumi Yumoto. Table 1 shows the list of collaborating countries and corresponding coordinators from Asian and African countries.

Partner Country	Core Institute	Coordinator
Indonesia	National Institute of Aeronautics and Space Indonesia/LAPAN	Clara Yono Yatini
Philippines	Manila Observatory	Quirino Sugon, Jr.
Malaysia	Ministry of Science, Technology and Innovation	Mustafa Din Subari
Nigeria	National Space Research and Development Agency	Akeem Babatunde Rabiu
Egypt	Helwan University	Ayman Mahrous

Table 1. List of collaborators of the JSPS Core-to-Core Programme - Asia-Africa Science Platforms

The following are the various approaches undertaken by ICSWSE to conduct capacity building for young scientists in Japan and Asia/Africa regions from 2012 until 2015.

(1) Conducting overseas MAGDAS Schools

In collaboration with ISWI members, the 2012 ISWI and MAGDAS School was held at Ciloto, Indonesia on 17–26 September with Nat Gopalswamy and Clara Yatini as school directors (see Figure 1). The host was the National Institute of Aeronautics and Space of Indonesia or LAPAN. The student participants were from Vietnam, Malaysia, Indonesia, Philippines, Egypt, Uganda, India, China and Pakistan. More information can be found in www.serc.kyushu-u.ac.jp/news/2012_ISWI_MAGDAS_School.pdf.

The school covered the following topics: fundamental and computational space physics, solar and terrestrial physics, space weather, space and ground-based data analysis and interpretation.

With a similar programme and a great deal of effort from Vafi Doumbia (the school director), another MAGDAS school was held at Cocody University in Ivory Coast of Africa on 20-25 September 2013. The participants were mainly from African nations.

(2) Implementing student exchanges and research internships

Under the mentorship of A. Yoshikawa, Estelle Dirand (a student of École Nationale Supérieure de Techniques Avancées Paris Tech) did a research internship during May-August 2013 at ICSWSE with the support of a Friendship scholarship of Kyushu University. Her study was on the computer simulation of the formation of ionospheric current system accompanied by the incidence of shear Alfven waves at the ionosphere.

In September 2013, Musafar Kilowasid, a PhD student of Bandung Institute of Technology in Indonesia, was accepted as an exchange student of ICSWSE with A. Yoshikawa as the thesis adviser. His research is on ULF waves associated with relativistic electrons.

Fig. 1: Participants of the 2012 ISWI and MAGDAS School on space science in Ciloto, Indonesia (Photo courtesy of Muneeza Ali)

(3) Installing MAGDAS in "missing areas"

MAGDAS is the largest global ground magnetometer array because it covers "missing areas" such as Sabah. On 21 March 2013, a MAGDAS magnetometer was installed in Sabah by the ICSWSE team in collaboration with the Universiti Malaysia Sabah.

A complementary talk was given on the research done by the MAGDAS project. More details can be found in newserver.stil.bas.bg/ISWI/PDFsL/V05_N038.pdf.

(4) Bringing Asians and Africans to study at Japanese universities

ICSWSE encourages MAGDAS hosts to pursue graduate studies on space weather science at Kyushu University. In September 2013, the PhD graduates were Magdi Elfadil Yousif and Mohamad Huzaimy Jusoh from Sudan, Africa and Malaysia, respectively (Figure 2).

Fig. 2: Under the mentorship of ICSWSE, Mohamad Huzaimy Jusoh (left) and Magdi Elfadil Yousif (right) obtained their PhD degrees at Kyushu University in September 2013

The Global 30 Project of the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) supported Yousif's study while Jusoh's support was from the Malaysian government.

(5) Conducting MAGDAS training for MAGDAS hosts

MAGDAS training courses are one of the many ways of building a network of scientists for space weather research. In November 2012, January and August 2013, training courses were conducted for MAGDAS hosts from Asian countries. The next batch of trainees are the MAGDAS hosts from Africa. The main objective of the programme is to equip the scientists or staff hosting the MAGDAS with the skills to handle the magnetometer and magnetic data (see Figure 3).

These training courses were given with the hope of paving the way towards the progress of space weather science in developing nations.

Fig.3. Teaching the MAGDAS training participants how to back up the system card of the magnetometer

Future ICSWSE activities include more student exchanges, more MAGDAS trainings and the 2014 MAGDAS School in Japan.

For updates, visit the website at: www.serc.kyushu-u.ac.jp/index_e.html or email: sercstaff@serc.kyushu-u.ac.jp.

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