

# Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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GSC022-01

Room:301A

Time:May 23 08:30-08:45

## About the event holding for the astronomical volunteer promotion

Shunji Mouri<sup>1\*</sup>

<sup>1</sup>Faculty of Education & Human Studies

### Introduction

The volunteer's promotion of the university is important because it actively acts as a regional social contribution of the citizens in the region. In this report, it reports on the outline, the result of the questionnaire of the event of the astronomical volunteer promotion executed in the astronomical observatory of an Akita University, and the consideration.

### Event and astronomical volunteer in astronomical observatory

An astronomical event is held every month, and in the astronomical observatory of an Akita University, an astronomical event is recruited from the civilian and an astronomical volunteer with whom it cooperates is recruited. An astronomical volunteer can study the knowledge of astronomy and the celestial observation that attends the course, the course, and the heavenly body observation association held in the astronomical observatory. The starry sky guide recognition course is started in 2010 fiscal year, and it promotes it systematically of the astronomical volunteer. It is hoped to an ardent astronomical volunteer to execute the event of heavenly phenomena excluding the astronomical observatory. However, a lot of people and machine parts are needed to execute an astronomical event. It is thought that it is necessary that the astronomical observatory straighten the system that astronomical facilities and human resources can be offered to support the astronomical volunteer's activity.

### Outline of event and planned astronomical event

In the astronomical observatory, astronomical volunteer's communications course and astronomical volunteer promotion course were held as a course to promote astronomical volunteer's communications skills and project power for an astronomical volunteer and the civilian. It explained astronomical volunteer's role and the method of holding an astronomical event referring to the text in the beginning. Next, the workshop of the planning of an astronomical event acted by using an easy work-sheet.

The event was held three times, the number of intervenors was 16 description people, the project of the event of six totals was proposed, and two was executed in Akita City. One is a project that holds the observation association in the astronomical observatory of Akita University for an astronomical circle to which the participant belongs at nighttime. In another one, the star is a project of none and the concert to the hall as for the community hall around the station. The event was held once, there were eight person number of intervenors, and nine events were proposed in Yokote City. One was an introduction of the astronomical event that had already been decided to execute it. Moreover, is the astronomical reading association in which it was separately proposed joined with the heavenly body observation association, why don't you execute as a new event, and an active opinion exchange was done.

### Result of the questionnaire and consideration

The questionnaire survey was done in the event held in Akita City and Yokote City. In the question of "Was the activity happy?" and "Was it comprehensible?", the nearly everyone was happy, and it was answered plainly. In the question of "Have you participated in such an activity?", about 50 percent was answered as participation. In the question of "Do you want to participate again?", about 60 percent was answered as wanting participation if there was a chance. In the question of "Were you interested in nature and the science and the technology?", it was answered that the nearly everyone was interesting. In the question of "Has the interest in nature and the science and the technology risen?", about 90 percent was answered as interesting. It is thought that this event became a happy, comprehensible activity because a lot of participants have been interested in nature and the science and the technology because of result of the questionnaire up to now, and there was an experience of participating also in such an activity.

Keywords: contribution to society, volunteer promotion, communications skills, project power, astronomical event

GSC022-02

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## The creation of movie for full dome projection using the data of KAGUYA

Hiroataka Nakayama<sup>1\*</sup>, Eiichiro Kokubo<sup>1</sup>, Hiroshi Araki<sup>1</sup>

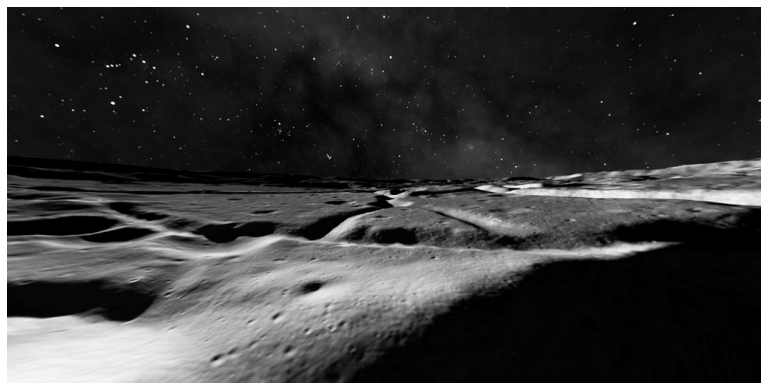
<sup>1</sup>NAOJ

Japanese lunar orbiter KAGUYA (SELENE) was launched by the Japan Aerospace Exploration Agency (JAXA) on September 14, 2007. KAGUYA carried 14 scientific instruments to investigate the lunar origin and evolution and to develop the technology for the future lunar exploration. The LALT (Laser ALTimeter) and the TC (Terrain Camera), 2 of the 14 instruments, continuously observed the lunar surface and by using these data, we have created the movie "KAGUYA's Moon" for dome theater.

The LALT is a ranging instrument that emits a laser beam to the lunar surface and measures the distance to it from the main orbiter by the timing delay of the reflected light. It obtained a global and precise topographic data set of the Moon, including the polar regions with a latitude higher than 75 degrees that have never been explored by previous satellites. And the TC has two telescopes with one-dimensional detectors looking at forward and backward directions, respectively. It captured three-dimensional (stereo) images of the Moon's globe with a world's first super high definition of 10m.

After these data were first processed by RISE (Research In Selenodesy) project and TC team respectively, we imported them to Maya which is a high-end 3-D computer graphics software to visualize the lunar surface. By using Maya instead of commonly-used visualization software, we succeeded in improvement of the quality as movie.

This movie is stereoscopic and the size of dome master is 3K. So it can be projected at many digital dome theaters and stereoscopic dome theaters across the nation. And now we are creating the high-definition version. It will be available on the web site of 4-Dimensional Digital Universe (4D2U) project soon.



Keywords: KAGUYA, SELENE, moon, visualization, LALT, TC

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GSC022-03

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## Aurora3D Project and Aurora Talk Show 2010

Ryuhō Kataoka<sup>1\*</sup>, Yoshizumi Miyoshi<sup>2</sup>, Hitoshi Fujiwara<sup>3</sup>

<sup>1</sup>Tokyo Tech, <sup>2</sup>Nagoya Univ, <sup>3</sup>Tohoku Univ

Aurora3D project has been conducting stereo imaging of aurora in Alaska, supported by Housou Bunka Foundation and Nikon. The 3D aurora images have been presented at the science live show UNIVERSE at Science Museum. The website [aurora3d.jp](http://aurora3d.jp) plays an important role to distribute the education materials and to inform the related outreach events via Twitter etc. The obtained images of aurora by Aurora 3D project are used for the Aurora Talk Show 2010, which was held at 13 different places over Japan in December 2010. The Aurora Talk Show 2010 was the first trial supported by the SGEPS. The young researchers of SGEPS and local science communication groups collaborated together to make the science talk show using the auroral images etc. The main topic depends on each speaker and place, broadly ranging from the Sun to planets. It is important to continue and extend such activities, collaborating with science communication groups. We would like to have your participation, support, and advice for Aurora Talk Show 2011 etc.

Keywords: aurora, science cafe, planetarium

GSC022-04

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## Environmental education by new sightseeing resources, "cloud sea at Mt. Tomamu" in Hokkaido, Japan

Kazuki Nakamura<sup>1</sup>, Yasuhiro Yamanaka<sup>1\*</sup>

<sup>1</sup>Faculty of Environmental Earth Science

Figure shows a sea of clouds overlooked from the terrace (1088m height) on Mt. Tomamu in Shimukappu, Hokkaido. It, Unkai terrace (Unkai mean sea of clouds in Japanese), was opened since 2005 (Mountain terrace named in 2005), when a staff maintaining gondola in sky slope awoke to value of the fantastic sea of clouds created by meteorological conditions in summer seasons with unique geographical position in Tomamu.

Here we report two practices using Unkai terrace. One is for tourists by an education program about clouds and another is for graduate students developing this program. Though these practices, we tried to solve problem of Unkai tours from just looking to more deep understanding.

(1) For general tourists trough the program about clouds We developed the program for parent and children studying clouds during two days with one night stay, with the special issue in newspaper "Eco-Chil" distributing all elementary students in Sapporo per month. We had story that participants investigate various characteristics of clouds instead of Sennin, a fictitious specialist, living in Tomamu. In program, participants studied them, though watching clouds, playing game and quiz about clouds and observing a sea of clouds on Unkai terrace, with enjoying. "Friendly to clouds" is the concept of our program; we expect that children hold their interesting to cloud, weather and natural environments after taking their home.

(2) For graduate students though developing a project in EPoCH course This is a practice in "course in Environmental Project Coordinator in Hokkaido"

staring May, 2010, in Graduate School of Environmental Science in Hokkaidou University. Cooprating with Hoshino Resort Tomamu Co.,Ltd provides students with learning how to proceed with social projects and to solve various difficulties in projects, though developing new educational program.

From these practices, we have realized to develop new tourism program not only just looking but also understanding and touching, using a sea of clouds as touristic resources by university-company collaboration, and to operate it by a tour sponsored by newspaper "Eco-Chil" in September, 2010. We will operate this program in summer 2011, as a practice in Practical Science for Environment in Graduate School of Environmental Science in Hokkaidou University.



Keywords: cloud sea, sightseeing, environmental education

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GSC022-05

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## Development of a permanent exhibit visualizing the mechanism of carbon dioxide underground storage

Shoji Nishimoto<sup>1\*</sup>, Yasuhiro Yamada<sup>2</sup>, Masao Suzuki<sup>1</sup>, Tsutomu Fukushima<sup>3</sup>, Ryokichi Masuda<sup>3</sup>, Tomoharu Kawai<sup>3</sup>, Hiroyuki Kobayashi<sup>3</sup>, Tomoko Yanagihara<sup>3</sup>

<sup>1</sup>Nagoya City Science Museum, <sup>2</sup>Kyoto University, <sup>3</sup>Nomura Co., Ltd.

Underground storage of carbon dioxide is an important method to reduce atmospheric emissions of greenhouse gases, which may contribute to the global climate change. Recent scientific investigations argue that residual gas trapping is an effective mechanism to securely store CO<sub>2</sub> in aquifers, especially in Japan. In order to make progress on this approach, understanding and support from the public are vital, but the geological storage of CO<sub>2</sub> has not well-known to the community.

The Nagoya City Science Museum developed a permanent exhibit to visualize the mechanism of residual gas trapping in aquifer. The modeled aquifer, originally designed by Takahashi et al., (2006), is made of layers of glass beads in an acrylic cistern. We used two sizes of glass beads, 1mm and 2mm in diameter, as differently permeable layers of porous sediments. The experiment can be automatically operated as follows: 1) fill the pore space of the glass beads with water, 2) inject air from the bottom of the cistern and observe the behavior of the injected gas, 3) stop the air injection then discharge the water to initialize the experiment. Lighting from the front side makes effective visualization due to retroreflection of the glass beads. We believe this exhibit will give a better understanding of carbon dioxide underground storage to the visitors.

Keywords: carbon dioxide underground storage, residual gas, permanent exhibit, science museum

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GSC022-06

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## Hakoniwa volcanology from playing with sand

Akira Takada<sup>1\*</sup>

<sup>1</sup>AIST, Geological Survey of Japan

Analog experiments are useful for outreach program. Hakoniwa is a small artificial Japanese style garden. Hakoniwa volcanology is an extension of Kitchen volcanology, and named after Japanese garden. Sand is easy to get at any place, for example, in developing countries as well as Japan. Students can carry out the experiments in the outside garden as well as in the indoor room. This paper introduces various analog experiments on volcanology using sand; explosive eruption, pyroclastic cone building, lava flow, constructing volcano, caldera formation, and lahar.

Keywords: Outreach, Analog experiment, kitchen volcanology, Hakoniwa volcanology, sand, eruption

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GSC022-07

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## Disaster preparedness and education activities based on locally produced and consumed concept

Yoshinari Hayashi<sup>1\*</sup>

<sup>1</sup>CIREN, Shizuoka Univ.

Disaster management is one of the leading application areas in earth sciences. Scientific research results have already been used in many aspects of public life. Therefore, outreach activity of disaster management is often done as part of natural science education. But it is difficult to meet the diverse needs of disaster management, if we have been staying in only natural science field. Participants may stay a few people who were quite limited in sex, age and occupation. We have redone the disaster in terms of capturing regional challenges. And we began efforts to prompt the participation of citizens share a sense of crisis. We have highlighted the importance of disaster management from regional problem. And we began efforts to prompt the participation of citizens share a sense of crisis. Many kinds of disaster management action were subjects that people can participate with a variety of expertise not limited in scientific research experiences. As a result, newcomers who have felt no interest in disasters are joining in our actions with their specialty.

Keywords: Tokai Earthquake, Disaster education, Continuity, Locally produced and consumed, Tsunami

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GSC022-08

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## Home delivery service of a set of teaching materials of geology as a supplement of outcrop and supporting school teacher

Hideyuki Nakano<sup>1</sup>, Yasushi Obi<sup>2\*</sup>, Takashi Ito<sup>3</sup>, Kiyokazu Kawajiri<sup>4</sup>, Naoko Iino<sup>5</sup>, Hiroyuki Yamashita<sup>6</sup>, Hideaki Teshirogi<sup>7</sup>, Kazuhiro Sakata<sup>8</sup>, Akihito Uebayashi<sup>9</sup>, Takeyuki Ueki<sup>10</sup>

<sup>1</sup>Kyoto Univ. Edu., <sup>2</sup>Sagamihara Seiryō High School, <sup>3</sup>Fac. Edu. Ibaraki Univ., <sup>4</sup>Sagamihara City Mus., <sup>5</sup>Fac. Edu. Kumamoto Univ., <sup>6</sup>Mikami-katae Elementary school, <sup>7</sup>Nakagawa-kita Elementary School, <sup>8</sup>Shizuoka Pref. High School of Sci. Tech., <sup>9</sup>Grad. School Sci., Hokkaido Univ., <sup>10</sup>Geological Survey of Japan (AIST)

The commission of public relations of Japan Society of Earth Science Education prepares a set of teaching materials of geology composed of peer specimen of sediments, teachers' manuals, and lesson plans and worksheets for student. Also It provides home delivery service of a set of teaching materials of geology, to supplement to lack of outcrop and support school teachers unfamiliar to earth science. This presentation shows the preparation methods of peer specimen of sediments, and teaching practice for elementary, junior high and high school students using a peer specimen of sediments.

Keywords: earth science education, peer specimen of sediments, elementary and secondary education, teaching practice, home delivery service, collaboration between society and school teachers



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GSC022-09

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## Education and outreach programs of the Japan Association for Quaternary Research

Takeyuki Ueki<sup>1\*</sup>, Kunihiko Endo<sup>2</sup>, Arata Momohara<sup>3</sup>, Sumiko KUBO<sup>4</sup>, Kiyohide Mizuno<sup>5</sup>, Kuniyasu Mokudai<sup>6</sup>

<sup>1</sup>Geological Survey of Japan, AIST, <sup>2</sup>Nihon Univ. & Assoc. Quatern. Res., <sup>3</sup>Fac. Horticulture, Chiba Univ., <sup>4</sup>School Edu., Waseda Univ., <sup>5</sup>Geological Survey of Japan, AIST, <sup>6</sup>Pro Natura Foundation

The Japan Association for Quaternary Research contributes to earth science education as school education and natural history education as life-long education, to facilitate liberal arts and literacy for students and citizens. Public symposia on new definition of Quaternary, future perspective of earth science education and promotion of natural history education for last several years. Network is a key concept of scientific society outreach, such as between-society cooperation, collaboration between society, school teachers and citizens.

Keywords: Japan Association for Quaternary Research, between-society cooperation, earth science education, natural history education, accountability, network

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GSC022-10

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## Some problems from the scientific researches toward an educational promotion

Masaki Takahashi<sup>1\*</sup>

<sup>1</sup>National Institute of Advanced Industria

It is commonly discussed the difficulties on promoting the scientific results for the students as well as the citizens. The use of special terms often brings about a barrier between the scientist and audience in a lecture. One of the most serious causes of this problem is derived from which, a speaker (scientist) is ignorant and/or careless to the audience that they are quite an amateur. We scientists have not still noticed that our common sense is not a matter of the common knowledge for the audience. The efforts that the speakers should not use special terms as possible and take easily-understood examples, are required in the outreach activities. Some techniques, such as a short ice-break story, in speech also help for reducing the barrier between the speaker and the audience. Thus other abilities are needed for promoting the scientific fruit to the students and citizens. This would also help that the various fields of the earth science will be merged and another scientific theme will be developed.

Keywords: outreach, earth science, geology, educational promotion

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GSC022-11

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## Earth Science Education using Exhibitions in Library

Toshio Sasada<sup>1\*</sup>

<sup>1</sup>STEP, Aichi University of Education

It has been pointed out that many students were not interested in science. Recently, it is concerned that teachers who dislike science increase the number of the students who dislike science. In order to change this tendency, two exhibitions of earth science were opened in Aichi University of Education Library. One is "Mt Fuji Exhibition" and the other is "Gem Stone Exhibition".

In this presentation, I will report the details of two exhibitions and argue the possibility of earth science exhibitions opened in library.

Keywords: Exhibition, Education, Earth Science, Library

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## Fieldwork-oriented seminars for children and their parents

Yusuke Katsurada<sup>1\*</sup>, Kazuhiro Tsukada<sup>1</sup>, Shoji Nishimoto<sup>2</sup>, Masamichi Matsuda<sup>2</sup>, Kuniyuki Furukawa<sup>3</sup>, Hidekazu Yoshida<sup>1</sup>

<sup>1</sup>Nagoya University, <sup>2</sup>Nagoya City Science Museum, <sup>3</sup>Aichi University

Geoscience, a discipline to clarify the earth that has a history of 4.6 billion years, is indispensable when considering sustainable development since it is directly connected to our environmental problems, natural disasters and resources. It has long been said that children are far from the nature and/or science but we believe it is caused not only by children themselves but we adults who are not familiar with the nature and have poor idea to tell the children. From our perspectives that we need to make opportunities for both children and their parents to experience, enjoy and learn in nature, the fieldwork seminar titled Chikyu-kyoshitsu (Earth School) was started by Nagoya University Museum collaborating with Nagoya City Science Museum, the social primary education professionals.

Chikyu-kyoshitsu was selected in the outreach models to be promoted by Japan Science and Technology Agency (JST) in late 2005 and in fiscal year of 2006. A number of fieldwork programmes that have contents based on geological outcrops in Gifu prefecture were established. Several programmes have been improved and implemented with self budget since FY 2007, after the end of funding by JST. Seminar programmes of Chikyu-kyoshitsu are now carried out four times (once in each semester and once in summer vacation period) in cooperation with Aichi University and other facilities occasionally.

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GSC022-13

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## The report of the International EarthScience Olympiad (IESO)

Yutaka Takigami<sup>1\*</sup>, Ken-ichiro Hisada<sup>2</sup>

<sup>1</sup>Kanto Gakuen University, <sup>2</sup>University of Tsukuba

The report of the International Earth Science Olympiad (IESO)

We will report the outlines of the 2010, 2011, 2012 and 2013 International Earth Science Olympiad (IESO).

### 1) IESO 2010 (Indonesia)

Application Oct.1 to Nov.30, 2009

1st Selection Dec.20, 2009

(682 students. 37 places)

2nd Selection March 24-26, 2010 at Tsukuba City.

(From 24 students, 4 special excellent and 4 excellent students were selected.)

Training 8 students ;April-Aug. (correspondence course)

4 students; Aug. (4 days)

4th International Earth Science Olympiad Sep.19-28, 2010

Results ; 1 gold medal and 3 silver medals

Formal visit to the Ministry of Education, Culture, Sports, Science and Technology.

### 2) IESO 2011 (Italy)

Application Sep.1 to Nov.15, 2010

1st Selection Dec.19, 2010

(869 students. 50 places)

2nd Selection March 24-26, 2010 at Tsukuba City.

(From 27 students, 4 special excellent and 4 excellent students were selected.)

Training 8 students ; April-Aug. (correspondence course)

8 students; June (2days), 4 students; Aug. (4 days)

5th International Earth Science Olympiad Sep.5-14, 2011

### 3) IESO 2012 (Japan)

Application Sep.1 to Nov.15, 2011

1st Selection Dec.18, 2011

2nd Selection March 25-27, 2012

(From 30 students, 4 special excellent and 4 excellent students will be selected.)

6th International Earth Science Olympiad Aug.26-Sep.2, 2012

### 4) IESO 2013 (India)

7th International Earth Science Olympiad Aug., 2013

Keywords: IESO2010, IESO2011, IESO2012, Internatuonal Earth Science Olympiad