

Form B-5

Date (日付)

22/09/2012 (Date/Month/Year: 日/月/年)

**Activity Report -Science Dialogue Program-**  
(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Carsten Güttler (ID No. P 11730 )

- Participating school (学校名): Kyoto Prefectural Yamashiro Highschool

- Date (実施日時): 15/09/2012 (Date/Month/Year: 日/月/年)

- Lecture title (講演題目): Playing with Sand: Analog Experiments in Planetary Science

(in Japanese) 砂で遊ぶ : 惑星科学における模擬実験

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

After some introduction about Germany and myself, I started the lecture with reminding the students of our solar system planets to continue with the asteroid belt between Mars and Jupiter. After that I showed some examples of asteroid pictures taken by spacecrafts to get an impression for the shape and the appearance of these small solar-system bodies. I explained some physical characteristics like their orbits (incl. the so-called Kirkwood Gaps), the material as deduced from meteorites, the importance of collisions for the asteroids' size distribution, craters, and boulders. Since there were two beautiful space missions to closely study small asteroids (NASA's NEAR Shoemaker and JAXA's Hayabusa), I focused on these two missions to relate the asteroid topic to the fascinating matter of space science.

After we recapitulated the key information about asteroids, I introduced the field that I am working on: laboratory experiments on asteroid processes. I introduced experiment facilities to perform cratering experiments in the US and in Japan and asked the students, which parameters determine the size of a crater (they did very well!). Using these parameters, I introduced a rather complicated, up-to-date scaling model to communicate an impression about actual science (without comprehending the details, I believe). As a second experiment, I introduced an effect to unmix sizes, e.g. large marbles from sand, which is called the Brazil-Nut effect. This effect is well known on Earth and was proposed to play a role on asteroids. I showed a movie of an experiment on that, which I had performed in the lab and explained my future plans to perform this experiments onboard microgravity platforms (drop tower, parabolic flight, suborbital rocket, international space station).

After the lecture, we had a good discussion. The students were shy in the beginning but the teachers and my assistant broke the ice and they asked many questions (some Japanese, mostly English) related to asteroid and general space-science matters: "How can this Brazil-Nut effect work without gravity?", "What are the conditions for life on extrasolar planets?", "How long

would it take for a space elevator to go from Earth to space?", and many more.

I was not sure about the resonance of my presentation since the students were very shy and quiet. However, I hope they enjoyed it since I realized in the Q&A time that they are really interested in that matter and understood some impressive details of my presentation.

- Language used (使用言語): English with some Japanese translation and explanation

- Lecture format (講演形式):

◆Lecture time (講演時間) 65 min (分), Q&A time (質疑応答時間) 25 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

powerpoint presentation (with questions to the students)

◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

accompanying PhD student to translate re-explain complicated parts

◆Name and title of accompanied person (同行者 職・氏名)

Takaya Okamoto, MSc

◆Other note worthy information (その他特筆すべき事項):

no

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。)

It was nice experience for me to have the chance to translate some parts of the lecture. The students seemed to be embarrassed to make their remarks at first, but during Q&A time they asked us a lot of questions, some of them was focused on the contents of the presentation. I hope that I was able to help the students understand our topic.