

## エクスチェンジプログラム報告書

### 1. 招へい者（派遣者）の氏名と滞在期間、滞在先

招へい者氏名： Sarah T. Stewart (ハーバード大学准教授)

Richard G. Kraus (ハーバード大学大学院生)

滞在期間：2010 年1 月11 日~1 月17日

滞在・訪問先：

惑星科学研究センター (CPS)

名古屋大学大学院環境学研究科

宇宙航空研究開発機構宇宙科学研究本部

東京大学大学院新領域創成科学研究科

### 2. 受け入れ担当者の氏名と所属

荒川政彦 (名古屋大学大学院環境学研究科)

中村昭子 (CPS / 神戸大学大学院理学研究科)

### 3. 招へいの目的

申請者らは衝突研究会を組織して、国内の複数の惑星衝突研究グループで連携した教育・研究活動を行っている。このネットワークを海外にまで広げるための取り組みの一環として、数年をかけて、Stewart 研究室との相互交流を軌道に乗せる。

### 4. 成果報告

Stewart 氏には講義を、Kraus 氏にはセミナーを、それぞれ CPS と名古屋大学にて行ってもらい、Stewart 研究室における研究内容について理解を深めることができた。また、ポスドクの鈴木絢子氏が両氏に、国内の衝突実験施設・設備を紹介してまわることで、共同研究立案・推進のための素地を整えた。

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## Final Report on Scientific Exchange

CPS host: Professor A. Nakamura, CPS, Kobe University

Harvard University, USA: Professor Sarah T. Stewart and Graduate Student Richard G. Kraus

The scientific visit of Prof. Sarah T. Stewart and Mr. Richard G. Kraus to Kobe, Nagoya, and Tokyo lasted from January 11 to January 17, 2010. During this time, Professor Stewart and Mr. Kraus met with Professor Akiko Nakamura from Kobe University, Professor Masahiko Arakawa from Nagoya University, and Professor Seiji Sugita from the University of Tokyo.

January 11-13 was spent at Kobe University with Professor Akiko Nakamura and group. During these two and a half days Professor Stewart gave three workshop style lectures on the mechanics of crater formation, shock wave studies in ice, and crater formation in ice. These lectures were well attended by members of Professor Nakamura's group as well as members from other universities through video conferencing. Professor Nakamura gave a laboratory tour and exciting demonstration of their laboratory techniques. Professors Stewart and Nakamura were then able to discuss avenues for possible future collaboration with the remaining time spent in Kobe. Our visit was also enriched by the presence of another international visitor, Dr. David Baratoux from the University of Toulouse, France.

On January 13, Professor Stewart, Dr. Ayako Suzuki, and Mr. Kraus travelled to Nagoya to visit Professor Masahiko Arakawa and his laboratory. On January 14, Mr. Kraus gave a two-hour seminar on the research he performed in his first year at Harvard University. He discussed how energy is partitioned to the different components of an ice-rock mixture during an impact event. The seminar was attended by members of Professor Arakawa's group and by way of video conferencing, members of Professor Nakamura's group. Two Master's level students from Professor Arakawa's group then gave very interesting presentations on their current research, one looking at disruption of porous bodies and another performing experiments to determine crater morphology in layered targets, topics of great interest to Professor Stewart and Mr. Kraus. The rest of the time in Nagoya was spent discussing the finer points of everyone's research areas, as short seminars are not enough time to cover the technical points.

On January 15, Professor Stewart, Dr. Suzuki, and Mr. Kraus traveled to the ISAS gun range at JAXA. Professor Stewart and Mr. Kraus were given a thorough tour of the facility by the head technician of the facility, Dr. Hasegawa. Professor Stewart and Mr. Kraus were impressed by the different hypervelocity guns available at the facility and the technical aspects of the facility (the large two-stage gun at the ISAS facility was built by the same company as the gun at Harvard University).

On January 16, Professor Stewart, Dr. Suzuki, and Mr. Kraus traveled to the University of Tokyo and the National Institute for Materials Science. At the University of Tokyo we met with Professor Seiji Sugita and his group. Professor Sugita introduced the members of his group and each student in the group gave a brief introduction to their research projects. This process was very enlightening as a number of students were working on projects very similar to those at Harvard University. There are clear avenues for collaboration between Professor Stewart and Sugita as Professor Sugita is an expert in shock-induced chemistry, a field that Professor Stewart and Mr. Kraus would like to enter.

Overall the visit was tremendously successful and beneficial to Professor Stewart and Mr. Kraus. Professor Stewart and Mr. Kraus would like to thank Professors Nakamura, Arakawa, and Sugita for making this visit possible. Professor Stewart and Mr. Kraus would especially like to thank Dr. Ayako Suzuki for traveling with us until January 17<sup>th</sup> and providing additional insights into each research group's activities.