Japan Association of Mineralogical Sciences

http://jams.la.coocan.jp

EARTH-LIFE SCIENCE INSTITUTE (ELSI) SELECTED AS WPI PROGRAM

A newly established research center, the Earth-Life Science Institute (ELSI), directed by Prof. Kei Hirose (mineral physics) of the Tokyo Institute of Technology, has been selected as one of three new WPI programs in 2012, making a total of 9 WPIs among all the research fields in Japan. The main goal of ELSI is to understand the origins of Earth and life, in collaboration with world-class researchers in fields such as mineralogy, geochemistry, geophysics, planetary science, space science, life science, and environmental science; the program will have strong financial support from the Japanese government for 10 years (+5 additional years after evaluations). The Geodynamics Research Center of Ehime University (directed by Prof. Tetsuo Irifune, mineral physics) is expected to contribute as an ELSI satellite institution, together with two overseas satellites, the Institute for Advanced Study, Princeton (directed by Prof. Piet Hut, astrophysics), and Harvard University (directed by Prof. J. Szostak, life science).

The World Premier International Research Center Initiative (WPI) was launched in 2007 by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in a drive to build within Japan "globally visible" research centers that boast a very high research standard and an outstanding research environment, sufficiently attractive to prompt frontline researchers from around the world to want to work in them. These centers are given a high degree of autonomy, allowing them to virtually revolutionize conventional modes of research operation and administration in Japan. The Japan Society for the Promotion of Science (JSPS) is commissioned by MEXT to conduct the program's grant-selection and project-assessment processes and to perform other administrative functions.

In the first round of the selection, held in 2007, five institutes were selected for the WPI programs: Tohoku University (Advanced Institute for Materials Research), the University of Tokyo (Kavli Institute for the Physics and Mathematics of the Universe), Kyoto University (Institute for Integrated Cell-Material Science), Osaka University (Immunology Frontier Research Center), and the National Institute for Materials Science (International Center for Materials Nanoarchitectonics), while Kyushu University (International Institute for Carbon-Neutral Energy Research) was selected in 2010. The other two programs selected in 2012 are those of the University of Tsukuba (International Institute for Integrative Sleep Medicine) and Nagoya University (Institute of Transformative Bio-molecules).

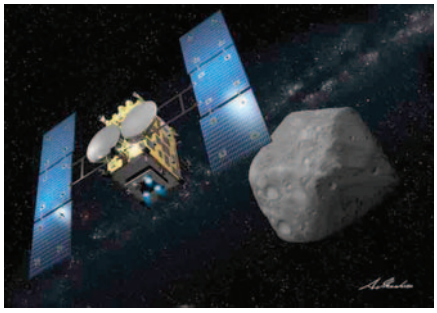
Tetsuo Irifune,
Geodynamics Research Center, Ehime University, Japan

HAYABUSA-2 – THE NEXT JAPANESE ASTEROID EXPLORATION MISSION (2014–2020)

Following Hayabusa's successful return of the first asteroid samples to Earth, the Japanese Aerospace Exploration Agency (JAXA) has a plan for another asteroid mission. Called Hayabusa-2 ("Hayabusa" means falcon in Japanese), the mission will return surface samples of a near-Earth carbonaceous-type asteroid, 1999 JU3. Because asteroids are the evolved remnants of planetesimals that were the building blocks of planets, detailed on-site observation by a spacecraft and analyses of returned samples will provide direct evidence of planet formation and the dynamical evolution of the Solar System. Moreover, carbonaceous-type asteroids are expected to preserve the most pristine materials in the Solar System, an interacted mixture of minerals, ice, and organic matter that would have later evolved into the Earth, the oceans, and life, respectively. Space missions are the only way to obtain such pristine minerals, organics, and volatiles with a geologic context and without terrestrial contamination.

In order to understand the dynamical and chemical evolution of the Solar System through its investigation and sampling of 1999 JU3, Hayabusa-2 has been given the following scientific objectives:

- Investigate the thermal evolution from planetesimal to near-Earth asteroid
- Investigate the destruction and accumulation of a rubble-pile body: planetesimal formation
- Study the diversification of organics through interactions with minerals and water on planetesimals
- Investigate material circulation in the early Solar System: chemical heterogeneity



Artist's rendition of Hayabusa-2 spacecraft at asteroid 1999 JU3. Credit: Akihiro Ikeshita

The basic design of the spacecraft is the same as for the original Hayabusa, but many improvements will be made and new technology will be adopted. The on-board scientific instruments necessary for the fulfillment of the scientific objectives are a laser altimeter (LIDAR), a multiband camera (ONC-T), a near-infrared spectrometer (NIRS3), a thermal infrared imager (TIR), and a wide-angle camera (ONC-W). A small impactor (SCI) will also be aboard for an asteroid-scale impact experiment, in which a crater several meters in diameter will be made. The concept and design of the Hayabusa-2 sampling device are also the same as for the original Hayabusa. In order to collect a sufficient amount of samples (at least one hundred milligrams) compliant with both monolithic bedrock and regolith targets, a 5 g Ta projectile will be shot at 300 m/s and ejecta will be stored in a sample container. The sampler has three projectiles, and the sample container has three separate compartments for sampling at three different locations, one of which could be the artificial impact crater where subsurface materials in the ejecta would be sampled.

Hayabusa-2 will be launched in late 2014, arrive on 1999 JU3 in mid-2018, and fully investigate and sample the asteroid during its 18-month stay. The spacecraft will depart the asteroid in late 2019 and return to Earth with samples in December 2020.

Shogo Tachibana, Hokkaido University, Japan

International Association of GeoChemistry

www.iagc-society.org

THE 10TH APPLIED ISOTOPE GEOCHEMISTRY CONFERENCE (AIG-10)

AIG10 10th Applied Isotope Geochemistry Conference

The Applied Isotope Geochemistry (AIG) Working Group of the International Association of GeoChemistry (IAGC) holds highly successful biennial conferences focused broadly on the emerging field of applied isotope geochemistry and biogeochemistry. The 10th Applied Isotope Geochemistry Conference will be held from September 22 to 27, 2013, in Budapest, Hungary. The venue is the marvelous historical building of the Hungarian Academy of Sciences.

THE FOLLOWING SESSIONS WILL BE HELD:

- Technological achievements and their applications
- Isotope techniques in environmental geochemistry
- Isotope hydrology as a tool for water-supply policy
- Paleoclimatology and paleoenvironmental changes
- Recent applications and developments in dendroisotopes (climate reconstruction, retrospective on pollution, physiology, new isotopes in tree rings)
- Biogeochemistry and ecological applications
- Isotopic tools applied to degradation of organic contaminants (including biodegradation and nonbiotic processes, such as ISCO treatments, passive barriers)
- Applied gas isotope geochemistry
- Isotope geochemistry of sedimentary to high-temperature geological processes
- Ore genesis and hydrocarbon exploration
- Isotopes as tools to interpret the effect of hydraulic fracturing; assessing shale gas production and environmental impact
- Application of isotopic tools to delineate the impacts of conventional (coal, oil, gas) and unconventional (shale gas) energy exploration on the environment
- Use of compound-specific isotopes in addressing organic contaminants in groundwater
- Isotopic tools applied to degradation of organic contaminants
- Nongeoscience applications (archeometry, forensic studies, food authenticity, medical studies, doping investigations, etc.)

Further information can be found at http://www.aig10.com.

Conference hall where AIG-10 will be held

Hungarian Academy of Sciences

We hope that many of you will be interested in the meeting and will come to enjoy the relaxed atmosphere, the scientific discussions, and the venue.

IAGC'S NEW VICE-PRESIDENT – IAN CARTWRIGHT

Ian Cartwright of Monash University in Melbourne, Australia, is the IAGC's new vice-president. Ian holds a BSc degree from UCW Aberystwyth and a PhD from the University of Wales. His research interests include the application of isotopes to environmental problems, groundwater chemistry, and groundwater–surface water interactions. Ian will be serving as vice-president until 2014, and we all look forward to working with him!

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ARTICLES

- The spatial variation of initial $^{87}Sr/^{86}Sr$ ratios in the Toki granite, Central Japan: Implications for the intrusion and cooling processes of a granitic pluton
  Takashi YUGUCHI, Tadahiko TSURUTA, Katsuhiro HAMA, and Tadao NISHIYAMA
- Petrology and chemistry of basal lherzolites above the metamorphic sole from Wadi Sarami central Oman ophiolite
  Mohamed ZAKI KHEDR, Shoji ARAI, and Marie PYTHON
- Oxidation states of Fe and precipitates within olivine from orthopyroxene-olivine-clinopyroxene andesite lava from Kasayama volcano, Hagi, Yamaguchi, Japan
  Terumi EJIMA, Masahide AKASAKA, Takashi NAGAO, and Hiroaki OHFUJI

LETTERS

- Iseite, $Mn_2Mo_3O_8$, a new mineral from Ise, Mie Prefecture, Japan
  Daisuke NISHIO-HAMANE, Norimitsu TOMITA, Tetsuo MINAKAWA, and Sachio INABA
- An early Paleozoic tectonothermal event in western Mongolia: Implications for regional extension of the Cambrian orogenic belt
  Masaaki OWADA, Yasuhito OSANAI, Nobuhiko NAKANO, Tatsuro ADACHI, Kazuhiro YONEMURA, Aya YOSHIMOTO, Madsudan SATISH-KUMAR, Jargalan SEREENEN, and Chimedtseie BOLDBAATAR