

# Organization and Activities of the Doctoral Program in Earth Evolution Sciences (Geological Sciences) for the Academic Year 2007

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## Organization

During the year from April, 2007 to March, 2008, several promotions and appointments were made in the Doctoral Program in Earth Evolution Sciences (Geological Sciences) so that our research and teaching activities were enforced. All faculty and administrative staffs were (staffs with an asterisk \* are belonging to the Doctoral Program in Integrative Environmental Sciences, but they are listed in our organization here-with, because they study geological sciences and have lectures on geological sciences for undergraduate students):

### *Professor:*

Arakawa, Yoji, D. Sc., petrology, geochemistry and geochronology  
Hayashi, Ken-ichiro, D. Sc., migration of heavy metals, geochemistry of hydrothermal system  
Kimata, Mitsuyoshi, D. Sc., mineralogy and crystallography  
Ogasawara, Kenshiro, D. Sc., Cenozoic stratigraphy and molluscan paleontology  
Ogawa, Yujiro, D. Sc., structural geology and marine geology  
Sashida, Katsuo, D. Sc., Paleozoic and Mesozoic biostratigraphy

### *Associate Professors:*

Endo, Kazuyoshi, Ph.D., molecular paleontology  
Hisada, Ken-ichiro, D. Sc., Paleozoic and Mesozoic stratigraphy and sedimentology  
Tsunogae, Toshiaki, Ph.D. (Sc.), metamorphic petrology and crustal evolution  
Yagi, Yuji, D. Sc., seismology, structural geology  
\*Maruoka, Teruyuki, Ph.D., geochemistry

### *Assistant Professor:*

Adachi, Shuko, D. Sc., Paleozoic biostratigraphy  
Agematsu, Sachiko, Ph.D. (Sc.), Paleozoic and Mesozoic biostratigraphy  
\*Anma, Ryo, Ph.D., structural geology and tectonics  
Hirai, Hisako, D. Sc., earth planetary high-pressure science  
Komuro, Kosei, D. Sc., ore geology and geochemistry

Kurosawa, Masanori, Ph.D. (Sc.), mineralogy and geochemistry  
Kyono, Atushi, Ph.D. (Sc.), structural physics of minerals  
Motoyama, Isao, Ph.D. (Sc.), Cenozoic stratigraphy and micropaleontology  
Takizawa, Shigeru, D. Sc., structural geology

### Cooperative Graduate School System

#### *Professor:*

Takada, Akira, D. Sc., volcanology  
Yamazaki, Toshitsugu, D. Sc., paleomagnetism

#### *Associate Professor:*

Ishizuka, Osamu, D. Sc., arc magmatism

#### *Research and Teaching Assistants:*

Miyamoto, Makoto  
Otani, Satoshi, B.A.  
Ozaki, Shiro  
Shimizu, Masahiro  
Watase, Koichi, B.A.

#### *Administrative Staff:*

Sato, Chikako  
Yasuda, Yoko

## Doctor and Master's Theses

The following doctor and master's theses were completed during the academic year 2007 under the supervision of the members of the Doctoral Program in Earth Evolution Sciences.

### Doctor of Philosophy (Science or Geosciences)

Choowong, Montri (2008): Recognition and reconstruction of flow conditions from 2004 Indian Ocean tsunami deposits in Thailand.  
Echigo, Takuya (2008): Crystallographic and geochemical study of organic minerals.  
Hirauchi, Ken-ichi (2008): Subduction and exhumation processes of serpentinites inferred from multiple deformation and metamorphism.

- Hoshino, Mihoko (2008): Crystallographic mineralogy of allanite implicit in geochemical record of the host rocks.
- Kubota, Katsuhiko (2008): Description of Mongolian Dromaeosaurids (Dinosauria: Theropoda) and phylogeny of Dromaeosauridae.
- Machida, Shin-ichi (2008): Interactions in gas hydrates examined by changes in crystal structures and vibration modes and its implication for their stabilities under high pressure.
- Islam, Mohamad Aminul (2008): Integrated study of subsurface core and well log to characterize the Neogene reservoir sequences of Bengal Basin, Bangladesh.
- Nagato, Hideo (2008): Miocene floral changes of upper stream area of the Kujigawa River, Ibaraki Prefecture.
- Diop, Souleymanne (2008): Numerical and field analysis of notch growth-induced rockfall on coastal cliffs.
- Tekeuchi, Takeshi (2008): Expression and function of the acidic shell protein Aspein in the pearl oyster *Pinctada fucata*.

#### Master of Science or Geoscience

- Inoue, Seiko (2008): Age estimation of sediment cores from the Okhotsk Sea using relative paleointensity of the geomagnetic field.
- Inose, Hiroaki (2008): Biostratigraphy of the Lower Cretaceous Miyako Group, northeast Japan.
- Ito, Hotaka (2008): Miocene/Pliocene collision history in the South Fossa Magna.
- Ito, Toshihiko (2008): Fabric developed in the Horoman complex, Hokkaido, Japan.
- Masukawa, Kyoko (2008): Evolution of ore-forming fluid at the Takatori W-Sn vein type deposit from the quantitative analysis of heavy metals in fluid inclusions using synchrotron radiation X-ray fluorescence.
- Nishimura, Naoki (2008): Characteristics of source rupture process of the Tsunami earthquakes.
- Nitta, Eriko (2008): Crystal chemistry and growth mechanism of ZnS minerals: as evidence for high-temperature volcanic sublimates.
- Oshima, Kazunori (2008): The acid dissolution mechanism of galena (001) surfaces: comparison dissolution process of the cleavage surface with the growth surface.
- Ota, Teppei (2008): Inspection of a numerical model of sand-box-type experiment.
- Tadokoro, Hiroyuki (2008): Petrological study of ultrahigh-temperature granulites from the

Trivandrum Block, Southern India.

- Togami, Ai (2008): Tectonic evolution of Izu block in arc-arc collision based on sand sediments.
- Yaguchi, Masashi (2008): A lead isotopic study on radionuclides migration around the Tono uranium deposits, central Japan.

#### Master of Arts in Education

- Sakaguchi, Kanae (2008): Characteristics of the nocturnal surface fluxes in semi-arid area, Mongolia.

### Research Activities

Each researcher had the following research activities during the academic year 2007.

#### Research projects

- Arakawa, Y. and Park-K. H. (200–2007): Chronological and petrochemical studies of the Buncheon granitic gneiss and metasedimentary rocks, NE Yeongnam Massif, South Korea.
- Arakawa, Y., Matsui, T. and Kimata, M. (2005–): Sr isotopic and mineralogical studies of anorthite megacrysts in arc volcanic rocks.
- Arakawa, Y. and Shinmura, T. (2005–): Geological and geochemical studies of volcanic rocks in Aso volcano, Japan.
- Arakawa, Y. and Chen, B. (2003–2007): Nd-Sr-Pb isotopic and chemical studies of Mesozoic granitic rocks in NE China.
- Endo, K., Iijima, M., Sarashina, I., Takeuchi, T., Kunitomo, Y., Isowa, N. and Kuratani, S. (2003–2008): An exhaustive exploration of the genes involved in molluscan shell formation: a primer for a genome project.
- Endo, K., Nishi, M., Sarashina, I. and Hirayama, R. (2008–2010): Phylogenetic and biominerologic study of chelonian eggshell matrix proteins.
- Endo, K., Nishizawa, A. and Sarashina, I. (2006–2008): Embryogenesis and shell formation in the brachiopod *Lingula anatina*.
- Endo, K., Sarashina, I. and Chiba, S. (2006–2008): Phylogeny estimation using fossil peptides contained in extinct land snail shells from Ogasawara Islands.
- Endo, K. and Asami, T. (2008–2010): Evolution of left-right asymmetry in pulmonate snails.
- Endo, K. and Tanabe, K. (2008–2011): Mechanisms of growth line formation in molluscan shells.
- Hirai, H. (2007): Research of high-pressure properties of gas hydrates. Agency of Industrial Sci-

ence and Technology (AIST).

- Hirai, H. (2007) Development of hydrogen storage system utilizing by gas hydrate. Engineering Advancement Association of Japan.
- Hirai, H. (2006–2007) Ibaraki Prefectural Council for the Protection of Cultural Properties.
- Hisada, K., Charusiri, P., Lee, B.J., and Jin, X. (2005–2009): IGCP516 “Geological Anatomy of East and South Asia: Paleogeography and paleoenvironment in Eastern Tethys” (UNESCO).
- \*Maruoka, T. (2006–2008): Geochemical study for understanding the environmental perturbations at the mass-extinction events.
- Sashida, K. (2003–2008): Paleozoic and Mesozoic paleoenvironmental studies in Thailand and peninsular Malaysia.
- Tsunogae, T. and van Reenen, D.D. (2001–2008): UHT metamorphism of the Limpopo Belt, southern Africa.
- Tsunogae, T. and Santosh, M. (2003–2009): Crustal Evolution of the Southern Indian Granulite Terrane.
- Tsunogae, T., Osanai, Y., Toyoshima, T., Owada, M., and Hokada, T. (1998–2008): The role of fluid at UHT metamorphism of the Napier Complex, East Antarctica.
- Tsunogae, T. and Dubessy, J. (2004–2008): Characterization of fluids in granulites: evidence from quantitative Raman spectroscopic study.
- Yagi, Y. (2007): Source process of large earthquakes derived from waveform inversion, and data covariance components of seismic observation.

#### Research grants

- Arakawa, Y. (2005–2007): Elemental and Nd-Sr-Pb isotope geochemistry of Mesozoic igneous activities in North China Block. Japan Society for the Promotion of Science: Basic Research (C). (JPY 3,600,000)
- Endo, K. and Kuratani, S. (2003–2007): An exhaustive exploration of the genes involved in molluscan shell formation: a primer for a genome project. Japan Society for the Promotion of Science: Basic Research (S) (JPY 9,200,000 for 2007)
- Endo, K. and Hirayama, R. (2008–2010): Phylogenetic and biomineralogic study of chelonian eggshell matrix proteins. Japan Society for the Promotion of Science: Basic Research (B) (JPY 4,600,000 for 2008)
- Hirai, H. (2006–2009): Phase changes of methane hydrate under very high-pressure and high-temperature and inference of interiors of the giant icy planets. Japan Society for the Promotion of Science: Grant-in-Aid for Scientific Research (B) (18340126) JPY 17,910,000
- Hirai, H. (2007–2009): Synthesis of hydrogen hydrate and development of techniques for energy storage and transportation. Japan Society for the promotion of Science: Grant-in-Aid for Exploratory Research (19656251) JPY 3,100,000
- Hirai, H. (2007–2011): Development of ultra-high pressure material science utilizing strong pulsed-neutron source. Japan Society for the promotion of Science: Grant-in-Aid for Creative Scientific Research (19GS02050015)
- Komuro, K. (2006–2008): Geochemical properties of sedimentary rock: microanalysis of sedimentary rocks and laboratory rock-water experiment. Japan Atomic Energy Agency Cooperative Research (A) on Nuclear Fuel Cycle. JPY 3,000,000 for 2007.
- Kurosawa, M. (2005–2007): Studies on magmatic fluids in a collision zone of the Izu-Bonin arc by using high-energy ion beam. Japan Society for the Promotion of Science: Basic Research (C)
- \*Maruoka, T. (2006–2008): Geochemical study for understanding the environmental perturbations at the mass-extinction events. Japan Society for the Promotion of Science: Grant-in-Aid for Young Scientists (A), JPY 1,170,000 for 2007.
- Ogasawara, K. (2005–2007): Time and space distribution of Japanese Cenozoic molluscan type specimens based on the integrated biostratigraphy. Japan Society for the Promotion of Science, JPY 8,899,000
- Ogasawara, K. (2005–2007): Eventual stratigraphy of the Northwest Pacific: biotic, climatic, eustatic and sedimentologic events. Japan Society for the Promotion of Science, Grant-in-Aid for Scientific Research between Russia and Japan. JPY 5,000,000
- Tsunogae, T. (2005–2007): Fluids associated with UHT metamorphism along the Gondwana collision zone. Japan Society for the Promotion of Science: Basic Research (B), JPY 9,600,000.

#### Special International Congress

The 9<sup>th</sup> International Congress on Pacific Neogene Stratigraphy, October 1-3 in Tsukuba, by Ogasawara, K.

## **Activity Reports for Academic Exchange and Cooperation**

*University of Rajshahi, the Peoples Republic of Bangladesh*

- (1) Exchange of Researchers:  
Islam, Md Aminul (JSPS RONPAKU Program, 2005–2007, Yujiro Ogawa)
- (2) Exchange of Graduate Student: None
- (3) Collaboration Research: None

*Chulalongkorn University, the Kingdom of Thailand*

- (1) Exchange of Researchers:  
Choowong, Montri (JSPS RONPAKU Program, 2005–2007, Ken-ichiro Hisada)
- (2) Exchange of Graduate Students:  
Vivatpinyo, J. (Tokubetsu Kenkyusei; AIEJ Short-term Student Exchange Program, 12 months from December 2007, Ken-ichiro Hayashi)  
Horiuchi, Y. (2007–2008) Short-Term Student Exchange Promotion Program Scholarship offered by the University of Tsukuba; 6 months from October 2007)
- (3) Collaboration Research:  
Organizing joint works as co-leaders for IGCP 516 (2005–2009) (Punya Charusiri and Ken-ichiro Hisada)