



# Japan Association of Mineralogical Sciences

<http://jams.la.coocan.jp>

## JAPAN ASSOCIATION OF MINERALOGICAL SCIENCES AWARDEES

The Japan Association of Mineralogical Sciences (JAMS) is proud to announce the recipients of its 2016 society awards. The 2016 **Japan Association of Mineralogical Sciences Award for Young Scientists** is being awarded to three scientists under 37 years of age, all of whom have made exceptional contributions to mineralogy or related sciences. The **Japan Association of Mineralogical Sciences Award for Applied Mineralogy** is being awarded to one scientist who has made remarkable contributions in the field of applied mineralogy. The **Japan Association of Mineralogical Sciences Research Paper Award** is being awarded to the authors of excellent papers that were published in the *Journal of Mineralogical and Petrological Sciences (JMPS)* and the *Ganseki-Kobutsu-Kagaku (GKK)* in the previous three years. Congratulations to the awardees!

### JAMS Award for Young Scientists: Tatsuya Sakamaki



Tatsuya Sakamaki

**Tatsuya Sakamaki** is an assistant professor at the Graduate School of Science and Faculty of Science, Tohoku University (Japan). He received his PhD from Tohoku University (supervised by Professor Eiji Ohtani) on pressure-induced changes in the property/structure of magma and its correlation to its macroscopic property and microscopic structure. The goal was to better understand magma behavior from the magma ocean in the early Earth to present-day volcanism. Dr.

Sakamaki demonstrated, using density measurements at high pressures and temperatures (notably through X-ray absorption), that hydrous magma at the base of the upper mantle was gravitationally stable. His results indicated a rapid reduction of the partial molar volume of H<sub>2</sub>O in the magma with pressure, causing sufficient densification for the hydrous magma to become stagnant. On this basis, he proposed a "ponded magma model" at the lithosphere–asthenosphere boundary due to a decrease in magma segregation rate. This model can help explain the geophysically observed anomaly at or near that boundary. In addition to Earth's magma, he also investigated lunar basaltic magma, and found a density crossover between this magma and the lunar mantle at a certain depth. Based on this result, he suggested that subducted magma could create chemical heterogeneities and be the cause of the low-velocity anomaly observed in the lunar mantle using seismic tomography.

### JAMS Award for Young Scientists: Koichi Momma



Koichi Momma

**Koichi Momma** is a researcher at the National Museum of Nature and Science in Tokyo (Japan). He has been studying such topics as the growth mechanism of quartz twins, accurate electron density analysis using the maximum entropy method (MEM), the development of crystallographic visualization software, X-ray crystal structure refinement, and the description of new minerals. In the study of quartz, he successfully modeled the structures of the Japanese twin law

{11 $\bar{2}$ 2} twin boundaries by using molecular dynamics simulations. He also investigated the growth history of natural Japanese twin quartzes using optical microscopy, scanning electron microscopy, and cathodoluminescence. The results of these observations were then interpreted from the perspective of atomistic models of twin boundary structures. Dr. Momma revealed the interesting roles played by the {11 $\bar{2}$ 2} twin boundaries: (1) they are the only coherent and energetically stable composition plane that requires no dangling bonds; (2) they are the

preferential site for crystal growth; (3) they are the source of dense Brazil law twin lamellae. A Japanese law twin grows about 1.5–2 times faster than a single crystal when, and only when, the composition plane is {11 $\bar{2}$ 2}, and this preferential growth is due to the structural nature of the {11 $\bar{2}$ 2} twin boundaries, which allow for a variety of configurations of the SiO<sub>4</sub> tetrahedral linkages.

To conduct accurate electron density analyses using MEM, Dr. Momma developed the MEM-analysis software *Dysnomia*, which can converge to the true MEM solutions instead of approximate solutions, and can be used for the MEM-based pattern fitting of powder X-ray diffraction data in combination with the Rietveld analysis code RIETAN-FP. An appropriate weighting for the observed structure factors has been noted as necessary to obtain reasonable electron density distributions using MEM. Dr. Momma revealed the physical meaning of the weighting and also pointed out that different weighting factors should be used for X-ray and neutron diffraction data.

Dr. Momma has also contributed to descriptive studies of new minerals, and the development of the widely used crystallographic visualization software VESTA.

### JAMS Award for Applied Mineralogy: Kunio Ishikawa

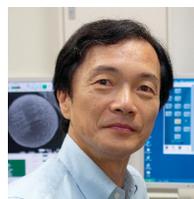


Kunio Ishikawa

**Kunio Ishikawa** is a professor at the Department of Biomaterials, Faculty of Dentistry, Kyushu University (Fukuoka, Japan). His key interest is the reconstruction or regeneration of hard tissues (teeth and bones) using calcium phosphates or calcium carbonate. His key technique is the dissolution–precipitation reaction known as the setting reaction of gypsum. For example, it takes 30–60 minutes for apatite cement (tetracalcium phosphate and dicalcium phosphate anhydrous)

to set and form hydroxylapatite, a reaction that is based on the dissolution–precipitation reaction. Prof. Ishikawa analyzed the reaction using a chemical potential method and found that the supply of the phosphate to the reaction media was the rate-determining step. He developed a fast-setting apatite cement, which sets within only 5 minutes, by adding sodium phosphate to the liquid phase of the cement. This fast-setting cement is now the world standard for apatite cement. Recently, he has been developing a carbonate apatite (CO<sub>3</sub>Ap) as a bone replacement. In the 1970s, sintered hydroxylapatite (s-HAp) was found to show excellent tissue response and good osteoconductivity. However, bone apatite is not HAp but CO<sub>3</sub>Ap. Prof. Ishikawa fabricated CO<sub>3</sub>Ap based on the dissolution–precipitation reaction using calcium carbonate as a precursor in a sodium phosphate solution. The CO<sub>3</sub>Ap gets resorbed by the osteoclast and new bone is formed by the osteoblasts. As a result, CO<sub>3</sub>Ap is replaced by bone similar to the graft bone. In addition, CO<sub>3</sub>Ap was found to up-regulate the proliferation of osteoblasts. Thus, CO<sub>3</sub>Ap demonstrated a much higher osteoconductivity, even when compared to HAp. Granules of CO<sub>3</sub>Ap are now under clinical trial.

### Japan Association of Mineralogical Sciences Research Paper Award



Hiroshi ISOBE

**Hiroshi Isobe, Takaaki Gondo** (2013) Dendritic magnetite crystals in rapid quenched fine spherules produced by falling experiments through the high temperature furnace with controlled gas flow. *Journal of Mineralogical and Petrological Sciences* 108-4: 227-237



# Association Internationale pour l'Étude des Argiles

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## INTERNATIONAL CLAY CONFERENCE 2017



The year 2017 is knocking at the door, and it is time for all participants to organize their travel to Granada (Spain) for the 16<sup>th</sup> International Clay Conference, the quadrennial AIPEA meeting. The conference will be organized by the Sociedad Española de Arcillas (Spanish Clay Society), under the chairmanship of Dr Alberto Lopez Galindo (University of Granada). The five-day meeting will take place 17–21 July 2017 at the Science Park in Granada. With the theme “Clays: from the Oceans to Space”, the conference will embrace the universe of micro- and nanominerals, confirming, once again, the central role that AIPEA plays in promoting multidisciplinary activities in theoretical and applied clay science. The meeting will be an excellent occasion for sharing ideas and knowledge with scientists working in the diverse scientific fields of microminerals. It will also be a great opportunity to meet old and new friends, and to visit the wonderful city of Granada. More information can be found at the website [www.16icc.org](http://www.16icc.org).

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## JOURNAL OF MINERALOGICAL AND PETROLOGICAL SCIENCES

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### Original Articles

**Mineralogical characterization of radioactive particles from Fukushima soil using  $\mu$ -XRD with synchrotron radiation** – Satoko MOTAI, Hiroki MUKAI, Tetsu WATANUKI, Kenji OHWADA, Tatsuo FUKUDA, Akihiko MACHIDA, Chisaki KURAMATA, Ryosuke KIKUCHI, Tsuyoshi YAITA and Toshihiro KOGURE

**Color-inducing elements and mechanisms in nephrites from Golmud, Qinghai, NW China: Insights from spectroscopic and compositional analyses** – Haiyan YU, Rucheng WANG, Jichun GUO, Jiagui LI and Xiaowen YANG

**U–Pb ages and Hf isotopic composition of zircon and bulk rock geochemistry of the Dai Loc granitoid complex in Kontum massif: Implications for early Paleozoic crustal evolution in Central Vietnam** – Pham Trung HIEU, Nguyen Thi DUNG, NGUYEN Thi Bich Thuy, Nguyen Trung MINH and Pham MINH

**Geothermobarometry of amphiboles in intermediate to basic rocks from the Almogholagh pluton in western Iran** – Manuchehr AMIRI, Ahmad AHMADI KHALAJI, Zahra TAHMASBI, Reza ZAREI SAHAMIEH and Hassan ZAMANIAN

**Internal texture and U–Th–total Pb isochron ages of monazite in metamorphic rocks from the Southwestern Highland Complex, Sri Lanka** – D. Nuwan Sanjaya WANNIARACHCHI and Masahide AKASAKA

**Structural refinement of köttigite–parasymplectite solid solution: Unique cation site occupancy and chemical bonding with water molecules** – Akira YOSHIIASA, Yumiko MIYANO, Hiroshi ISOBE, Kazumasa SUGIYAMA, Hiroshi ARIMA, Akihiko NAKATSUKA, Koichi MOMMA and Ritsuro MIYAWAKI

## CALL FOR AWARD NOMINATIONS

Nominations are now sought for 3 awards: the AIPEA Medal, an AIPEA Fellowship, and the AIPEA Bradley Award

**AIPEA Medal** – This medal was established to award clay scientists for outstanding contributions to advancing our knowledge of clays and clay minerals. A maximum of two medals will be awarded at the 16<sup>th</sup> International Clay Conference (17–21 July 2017 in Madrid, Spain). All candidates must be active clay scientists, meaning that they have published a minimum of three publications in refereed and internationally recognized journals in the last two years. Candidates can be proposed by affiliated societies or by AIPEA members and should include supporting letters from at least three individual AIPEA members.

**AIPEA Fellowship** – The AIPEA Fellowship program was established to recognize and reward clay scientists for a lifetime of activity in promoting clay science and in supporting the clay science community through AIPEA or other bodies. Fellows must be current members of AIPEA. Nominations can be submitted by a member of the AIPEA Council, by a national society liaison officer, or by a national or regional society of clay scientists. The proposal should contain publications and appropriate supporting documentation (e.g. supporting letters, curricula vitae, etc.), and should be submitted to the president of AIPEA by 31 December 2016. Selection will be made by the AIPEA Council. The successful nominee will be invited to take part in the 16<sup>th</sup> International Clay Conference, and AIPEA will pay for the registration fee.

**AIPEA Bradley Award** – The Bradley Award offers financial assistance to the recipient to enable him or her to participate in an International Clay Conference for the purpose of presenting a scientific contribution. Persons eligible for the award shall be under 35 years of age on the closing date for submission, and no restriction is placed on the sex or nationality of the candidate or the nature of his or her employment. Every application must be supported in writing by two members of AIPEA. Deadline for the receipt of applications is 31 December 2016. Candidates must submit an electronic copy, preferably in Microsoft Word, of a 4,000-word paper on a topic relevant to one of the sessions at the conference. The paper should be written in a format acceptable for publication in an international journal. Assessment will be based on scientific content only and the winning entry shall form the substance of a paper to be presented by the successful candidate at the conference to which the award relates.

Finally, to support students (or those under 35 years of age) to participate in the 16<sup>th</sup> International Clay Conference, AIPEA will assign financial contributions. To participate in the **Student Travel Funds** program, the student should submit an abstract and his/her curriculum vitae. This submission must be supported in writing by his/her supervisor. Both the student and the supervisor must be members of AIPEA. Financial support can be up to \$500 and can only be used to attend the meeting or any of its associated field trips and workshops.

All correspondence related to the awards must be addressed to Dr. Saverio Fiore, President of AIPEA, by email ([president@aipea.org](mailto:president@aipea.org)). Further information can be found at [www.aipea.org](http://www.aipea.org).

Saverio Fiore, AIPEA President