Japan Association of Mineralogical Sciences

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ONLINE TEACHING RESOURCES

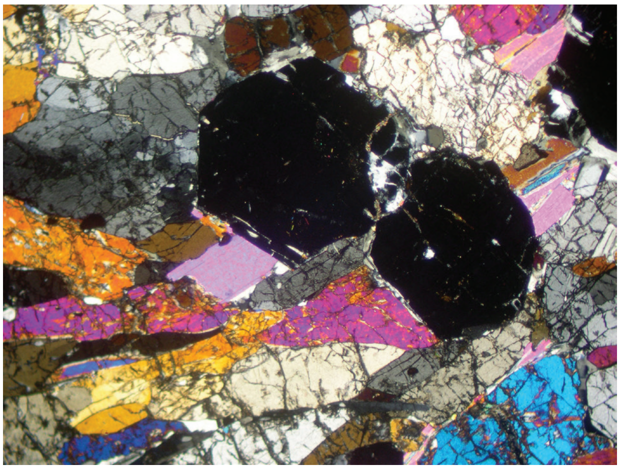

Photo credit: B. R. Frost

Earlier this year, a number of subscribers to MSA-Talk contributed resources and suggestions for teaching mineralogy and petrology courses online. These suggestions have been (and are being) collected and organized and are available on the MSA's website: see http://www.minsocam.org/msa/Teaching_Resources.html and http://www.minsocam.org/msa/Teaching_Suggestions.html.

The resources include videos, animations, images, models, textbooks, databases, thin section scans, quizzes, Mineralogy4Kids, and much more. The MSA extends its deep thanks to all of those in the community who contributed (and continue to contribute) to these helpful resources and teaching ideas.

ANNUAL MEETING

The Annual Meeting of MSA members will be held virtually via Zoom at 3:00 PM Eastern Time on Saturday, 24 October 2020. The meeting will include presentations by MSA President Carol Frost, Secretary Kimberly Tait, and Treasurer Thomas Duffy. Details for how to register will be sent to all MSA members prior to the meeting.

DID YOU KNOW?

The MSA has a variety of open access publications on its website available at www.minsocam.org/msa/openaccess_publications/. These include the *Guide to Thin Section Microscopy*; *Teaching Mineralogy*; *Reviews in Mineralogy and Geochemistry* Volumes 75 (*Carbon in Earth*) and 80 (*Pore-Scale Geochemical Processes*); *American Mineralogist* from 1916–1999; the *Handbook of Mineralogy*; and a number of other monographs and special papers.

JAPAN ASSOCIATION OF MINERALOGICAL SCIENCES AWARDEES

The Japan Association of Mineralogical Sciences (JAMS) is proud to announce the recipients of its 2020 society awards. The **Japan Association of Mineralogical Sciences Award** is presented to a maximum of two scientists in any one year for exceptional contributions to mineralogical and related sciences. The **Manjiro Watanabe Award**—named in honor of Professor Manjiro Watanabe, a famous Japanese mineralogist, and founded by his bequest—is awarded every year to one scientist who has significantly contributed to mineralogical and related sciences over his or her career. The **Sakurai Medal**—named in honor of Dr. Kin-ichi Sakurai, who discovered many new minerals—is awarded to a scientist who has made a lasting contribution to the study of new minerals.

Japan Association of Mineralogical Sciences Award to Takuo Okuchi

Takuo Okuchi is an associate professor at the Institute for Planetary Materials, Okayama University (Japan). By the time news of his award has been published he will have been promoted to professor at the Institute for Integrated Radiation and Nuclear Science, Kyoto University (Japan). Prof. Okuchi revealed how hydrogen was incorporated into the molten metallic core of the Earth: essentially, due to an iron–water reaction that occurred during the accretion phase of the early solar system. This was his PhD research at Tokyo Institute of Technology, and, since then, he had been continuously aiming and working to understand hydrogen's behavior inside Earth and other planets. He has developed several novel experimental methods for solving these topics. For example, at Nagoya University (Japan) and Geophysical Laboratory (USA) he developed an ultrahigh-pressure high-resolution nuclear magnetic resonance (NMR) spectroscopy method using diamond anvil cells; another example is how, at Okayama University together with his PhD student Purevjav Narangoo, he structurally analysed deep-Earth hydrous minerals using time-of-flight Laue single crystal neutron diffraction. With other high-pressure mineralogists, he also contributed to the development of experimental techniques for in situ high-pressure neutron powder diffraction measurements at the Japan Proton Accelerator Research Complex (J-PARC).

In addition, he has been working on laser-driven shock compression experiments of planetary materials, including dense water, minerals, and extremely compressed magmas. He has played a central role in developing a community of researchers in this field within the region of Japan and east Asia. Laser shock is a very effective way to study planetary shock processes and for analyzing extreme states of matter. Thus, developing a community around this technique and forging links with those who study the mineralogy of meteorites is an important goal for Prof. Okuchi: it helps activate research into planetary materials and advances our understanding of solar system evolution. To this day, Prof. Okuchi continues his cutting-edge research into Earth and planetary minerals.

Japan Association of Mineralogical Sciences Award to Kazuki Komatsu

Kazuki Komatsu is an associate professor at the Geochemical Research Center, Graduate School of Science, University of Tokyo (Japan). He started studying the high-temperature and high-pressure behavior of hydrous minerals (e.g., muscovite, topaz-OH, δ-AlOOH) at the mineralogy group in Tohoku

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University (Japan), significantly contributing to the systematic understanding of the role of hydrogen bonds to phase transitions and the structural changes in hydrous minerals under high pressure. After receiving his PhD in 2006, he was a visiting scientist at the Centre for Science at Extreme Conditions at the University of Edinburgh (UK), where he more rigorously studied hydrogen-bonded materials. His focus was on ice polymorphs, which he studied using high-pressure neutron diffraction techniques. In 2009, he obtained a position at the University of Tokyo and joined a project to construct a high-pressure beamline (currently called 'PLANET') at the Materials and Life Science Experimental Facility (MLF) in J-PARC, Ibaraki (Japan). Kazuki Komatsu developed a high-pressure and low- to high-temperature device called the 'Mito-system', which can operate at pressures up to 15 GPa and temperatures from 35 K up to 400 K. By using the Mito system, he has made important progress on questions concerning the phase transition mechanism of ice polymorphs. For example, ice I_c is a cubic polymorph of ice first found in 1945, and it has been synthesized by many different routes. However, all such ice included at least some stacking disorder. Kazuki Komatsu found a way to synthesize ice I_c without any stacking disorder. He also investigated the phase transition between ice VII and ice VIII and advocated a scenario that quantitatively explains many anomalies found in ice VII at around 10 GPa. He recently developed a new high-pressure device using nano-polycrystalline diamond that could be useful for neutron diffraction studies. With it, he managed to obtain the neutron diffraction patterns of ice VII up to 82 GPa, where it might transform to ice X.

Manjiro Watanabe Award to Hidehiko Shimazaki

Hidehiko Shimazaki received his doctor of science degree in 1968 from the University of Tokyo. His doctoral research, supervised by Prof. Takeo Watanabe, was on the Yaguki skarn–type deposits of the Abukuma Region (northern Honshu). After becoming an assistant professor at the University of Tokyo, he worked as a postdoctoral fellow in Montreal and Saskatoon (both in Canada) for three years, engaged in experimental research with Canadian geologists on liquid immiscibility in magmatic systems. Returning to the University of Tokyo, his research focused on the origin of skarn-type deposits in Japan, Korea, and China. He recognized the occurrence of a new iron-bearing calc-silicate mineral and found it to have a bustamite structure with a composition of $Ca_5FeSi_6O_{18}$. The mineral was later named ferrobustamite. Dr. Shimazaki established that this skarn mineral forms under relatively low temperatures in skarnization compared to igneous activity. When skarnization occurs in limestone-bearing sedimentary formations, characteristic skarns occur along the boundary between the limestone and the associated clastic sedimentary rocks. They are usually epidote skarns or plagioclase–hedenbergite skarns. Dr. Shimazaki concluded that the epidote skarns form under relatively oxidizing conditions, the plagioclase–hedenbergite skarns under reducing conditions. Based on such observations, he could recognize oxidation conditions in skarn formations and so establish a correlation between the oxidation conditions of skarns and the magnetite- and ilmenite-series of their associated granitic rocks. Several new minerals, like tsumoite (BiTe) were found by him from mineral deposits in Japan and China. Dr. Shimazaki has held several positions on geoscience committees and has dedicated almost his whole career to mineralogy and mineral resource science.

Sakurai Medal to Takahiro Kuribayashi

The Sakurai Medal has been awarded to **Takahiro Kuribayashi**, an associate professor at the Department of Earth Science, Graduate School of Science, Tohoku University, Sendai (Japan), for his discovery of hitachiite (IMA 2018-027). Dr. Kuribayashi has contributed significantly both to field-based mineralogy and descriptive mineralogy through his investigation of new minerals using single-crystal X-ray diffraction.

He and his coworkers discovered a new Pb–Bi–Te–S compound to the tetradymite mineral group (see 9th edition of the Strunz mineral classification system). This group is of interest as such materials are topological insulators and superconductors. This compound was later named hitachiite after the place where it was discovered: the Hitachi Mine in the Ibaraki Prefecture (Japan). The Hitachi deposit is classified as a volcanic massive sulfide deposit whose age of formation, including the hitachiite, is the oldest in Japan. The empirical chemical formula, which is based on 15 atoms per formula unit, is $(Pb_{4.75}Fe_{0.23})_{\Sigma 4.98}(Bi_{2.09}Sb_{0.03})_{\Sigma 2.12}Te_{2.04}(S_{5.73}Se_{0.13})_{\Sigma 5.86}$, ideally $Pb_5Bi_2Te_2S_6$. The crystal structure of hitachiite was determined using synchrotron radiation and is based on an ABC-type stacking of 15 layers (five Pb, two Bi, two Te, and six S layers) along the [001] direction, each layer ideally containing only one kind of atom. The stacking sequence is described as Te–Bi–S–Pb–S–Pb–S–Pb–S–Pb–S–Pb–S–Bi–Te. The structure of hitachiite should help clarify the classification of minerals along the $Bi_2(Te, S)_3$–Pb(Te, S) join in the system Pb–Bi–(Te, S), which comprises the tetradymite group and its archetype minerals.

Dr. Kuribayashi also used his skills at structural and crystallographic analyses with X-ray diffraction to help characterize tanohataite (IMA 2007-019) and bosoite (IMA 2014-023).

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Original Articles