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PRESIDENT'S LETTER

Diamond — Premier Mineral for Understanding the Geology of the Deep Earth

The following is a summary of my Mineralogical Society of America presidential address that will be delivered at the next Geological Society of America meeting, which is to take place 1–4 November 2015 in Baltimore (Maryland, USA). Such addresses are normally the time for the MSA President to present some aspect of his/her research, especially if it has mineralogical relevance. For almost 20 years, I have been working on radiogenic isotopic dating of diamonds by analyzing their sulfide inclusions using the Re–Os system. What started as a geochronological tool for single diamonds, has expanded into a broader field of study that attempts to understand various geological aspects of the mantle at depths far below the region of basaltic magma generation.

Diamond provides extraordinary information about Earth's interior. Diamond is the only mineral that can trap other phases growing in the mantle (at depths to 800 km) and then can fully isolate the included minerals from chemically reacting with any surrounding fluids, melts or solids. These diamond “capsules” themselves crystallize from highly mobile C–O–H-bearing fluids or melts and display remarkable growth textures. A diamond's preserved growth history can be used to track carbon sources and carbon mobility in the deep mantle. Information about fluid sources, host lithologies, diamond ages, mantle mineralogy, diamond-forming reactions, and the reduction–oxidation (redox) state of the mantle can all be obtained via the fortuitous co-crystallization or entrapment of silicate, sulfide, metal, and carbide inclusions.

Information on diamond ages, C and N isotopic compositions, and inclusion mineralogy gleaned from many single diamonds can be combined into large-scale patterns that reveal continental-scale geological structures and/or remote aspects of mantle geodynamics. Because diamonds from the continental lithospheric mantle are of great antiquity (in some cases up to 3.5 Ga), their study allows one to look back into the ancient geologic past. Direct studies on diamond, as well as theoretical studies that consider its role in mantle mineralogy, have helped us to pinpoint the initiation of subduction, to trace recycled crustal components (including water) into the mantle transition zone, to record the passage of fluids into the continental lithosphere, to see the preserved signature of carbonatitic fluids that trigger deep mantle melting, and to reveal the change in mantle redox state with depth. In the future, a better knowledge of fluid compositions, of diamond-forming reactions, of C and N isotopic fractionation factors, plus analyzing new suites of sublithospheric (superdeep) diamonds, all hold the promise of changing our understanding of the geology of the deep Earth.

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NOTES FROM CHANTILLY

- 2015 election results** – the 2016 MSA President is Rebecca Lange, the MSA Vice President is George E. Harlow, and the MSA Past President is Steven B. Shirey. Bryan Chakoumakos was elected secretary. Howard W. Day remains in office as treasurer. Rajdeep Dasgupta and Peter Nabelek join as new councilors, while Edward S. Grew, Wendy Panero, Abby Kavner, and Matthew J. (Matt) Kohn remain as continuing councilors. Our outgoing councilors are Isabelle Daniel and Kirsten Nicolaysen, and the outgoing secretary is Andrea Koziol.
- MSA 2016 membership renewals** will start early October 2015, with notices sent electronically, followed by several electronic reminders before a paper copy is sent to those who do not renew online by the end of October. Members who renew and pay online before 31 October 2015 will receive a \$5 dues discount; the discount reflects cost savings to MSA from members who renew early online.
- Members and Fellows who are in the senior, honorary, and life categories are sent renewal notices. They need not pay dues, but are, nevertheless, sent notices as the best way to prompt an update of membership information, particularly mail and e-mail addresses.
- If you subscribe to other journals through MSA—*Gems & Gemology*, *Journal of Petrology*, *Mineral News*, *Physics and Chemistry of Minerals*, *Mineralogy and Petrology*, or *Rocks & Minerals*—please renew early. MSA needs to forward your renewal to those publishers before your subscription runs out.
- The 2015 MSA Awards Lunch will be held in Holiday Ballroom number 4 of the Hilton Baltimore Hotel (Baltimore, Maryland, USA) on Tuesday, 3 November 2015, at 12:15–2:30 p.m. At the lunch, **Rodney C. Ewing** (Stanford University) will receive the Roebing Medal, **Nicholas J. Tosca** (University of Oxford) the MSA Award, and MSA's own **J. Alex Speer** the Distinguished Public Service Medal. There is also recognition of the 2013–14 MSA Lecturers: Bethany Ehlmann, Colleen Hansel, and Lutz Nasdala, as well as Timothy W. Grover, the outgoing MSA Lecture Administrator.
- The MSA Awards Lectures, Annual Business Meeting, and Presidential Address at the 2015 GSA Annual Meeting are on Tuesday, 3 November 2015, 3:00–5:30 p.m., at the Baltimore Convention Center (BCC 317). Rodney C. Ewing will deliver the “MSA Roebing Medal Lecture: The Science-Policy Interface”; Nicholas J. Tosca gives his “MSA Award Lecture: Mineralogy as a Bridge between Geochemistry and Earth History”; and Steve Shirey his “MSA Presidential Address: Diamond: Premier Mineral for Understanding the Geology of the Deep Earth”. The Annual Business Meeting will follow the lectures, then there will be the MSA/GS/MGPV Joint Reception.
- During the Annual Meeting there are topical sessions for the two MSA awardees. Session T134: “Radiation Effects, Mineralogy, and Materials Science of Actinides: In Honor of Rodney C. Ewing, 2015 Roebing Medalist,” with both oral (Sunday, 1 November 2015: 8:00 a.m.–5:00 p.m.; BCC 317) and poster (Monday, 2 November 2015: 9:00 a.m.–6:30 p.m.; Exhibit Hall) sessions. Session T132: “Mineralogy of Diagenesis on Earth and Mars: In Honor of Nicholas J. Tosca, 2015 MSA Awardee” (Monday, 2 November 2015: 8:00 a.m.–12:00 p.m.; BCC 342). There are also sessions honoring MSA members: Session T133: “Mineralogy Writ Small: A Tribute to the Distinguished Career of **David R. Veblen**” (Monday, 2 November 2015: 8:00 a.m.–12:00 p.m.; BCC 317); Session T168: “Subduction, Fluids, Accessory Minerals, and Trace Elements: A Celebration of **Sorena Sorensen**'s Career” with both oral (Monday, 2 November 2015: 1:30–5:30 p.m.; BCC 341) and poster (Wednesday, 4 November 2015: 9:00 a.m.–6:30 p.m.; Exhibit Hall) sessions. Session T165: “Zen and Now: Honoring the Legacy of **E-an Zen**'s Contributions to Geology” (Tuesday, 3 November 2015: 8:00 a.m.–12:00 p.m. BCC 317).

J. Alex Speer, MSA Executive Director
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NEW TITLE

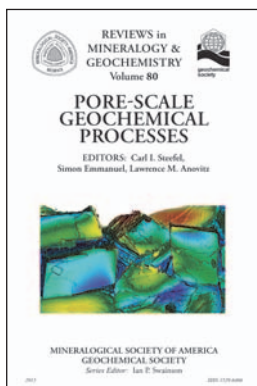
Reviews in Mineralogy and Geochemistry

Mineralogical Society of America
and The Geochemical Society

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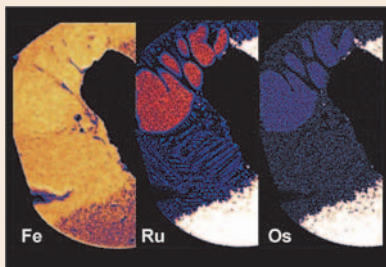
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SHORT COURSE ANNOUNCEMENT

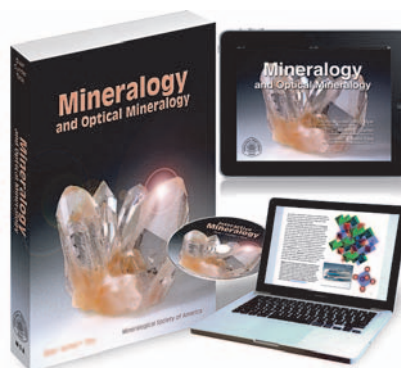
Siderophile and Chalcophile Elements

ORGANIZERS: JASON HARVEY and JAMES DAY
14-18 December 2015, Scripps Oceanographic Institute
San Diego, CA, US

The strongly chalcophile (sulfur-loving) elements include Se and Te, while the highly siderophile (iron-loving) elements are the platinum-group elements (PGEs: Ir, Os, Pt, Pd, Rh, Ru), Re, and Au, and include the long-lived isotope systems based on the decay of Re and Pt to isotopes of Os (^{187}Re – ^{187}Os and ^{190}Pt – ^{186}Os , respectively). As a result of the strong partitioning of siderophile and chalcophile elements into metals, alloys, and sulfides, the study of the distribution and behavior of the siderophile and chalcophile elements, and of the phases that host them, may provide a unique perspective on how the major geochemical reservoirs of the Earth and other rocky planets formed and developed.



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