Mineralogical Society of America and *Geochemical Society*

Short Course Announcement

HIGHLY SIDEROPHILE AND STRONGLY CHALCOPHILE ELEMENTS IN HIGH TEMPERATURE GEOCHEMISTRY AND COSMOCHEMISTRY

Dates: Short Course sessions are Friday and Saturday, 11-12 December 2015 (ahead of the American Geophysical Union's 48th Annual Fall Meeting, 14-18 December 2015).

Location: Short Course sessions will be held at Scripps Institution of Oceanography, 8610 Kennel Way, La Jolla, CA 92037 (Scripps Seaside Forum)

Convenors: *James Day*, Scripps Institution of Oceanography, University of California San Diego, 8675 Discovery Way, La Jolla, CA 92093-0244 USA jmdday@ucsd.edu

Jason Harvey, Institute of Geophysics and Tectonics, School of Earth and Environment, University of Leeds, Leeds LS2 9JT, UK feejh@leeds.ac.uk

Short Course description:

This Short Course will be followed by the AGU session: "Highly siderophile and strongly chalcophile elements in high temperature geochemistry and cosmochemistry" (schedule available October 1 at http://fallmeeting.agu.org/2015)

In high temperature geochemistry and cosmochemistry, highly siderophile and strongly chalophile elements comprise Re, Os, Ir, Ru, Pt, Rh, Pd, Au, Te, Se and S and are defined by their strong partitioning into the metallic phase, but will also strongly partition into sulfide phases, in the absence of metal. The strongly chalcophile elements can be considered to include S, Se and Te. These three elements are distinguished from other chalcophile elements, such as Cd or Pb, because, like the highly siderophile elements (HSE), they are all in very low abundances in the bulk silicate Earth.

The chemical properties of the HSE set them apart from any other elements in the periodic table and have made them geochemical tracers par excellence. As tracers of key processes, the HSE have found application in virtually all areas of the physical Earth sciences. These elements have been used to inform on the nucleosynthetic sources and formation of the Solar System, planetary differentiation, late accretion addition of elements to planets, core-formation and possible core-mantle interaction, crust-mantle partitioning, volcanic processes and outgassing, formation of magmatic, hydrothermal and epithermal ore deposits. Studies of strongly chalcophile elements are finding a similar range of applications. Their utility lies in the fact that these elements will behave as siderophile or strongly chalcophile elements under reducing conditions, but will also behave as lithophile or atmophile elements under oxidizing conditions, as experienced at the present day Earth's surface. A key aspect of the HSE is that three long-lived, geologically useful decay systems exist with the HSE as parent (^{107}Pd-^{107}Ag), or parent-daughter isotopes (^{187}Re-^{187}Os and ^{190}Pt-^{186}Os). This short course, and associated Reviews in Mineralogy and Geochemistry volume are dedicated to some of the processes that can be investigated at high-temperatures in planets using the HSE and strongly chalcophile elements.

Key areas that will be covered include analytical methods; experimental constraints applied to understanding HSE partitioning under a range of conditions; nucleosynthetic isotopic variations of siderophile and chalcophile elements in Solar System materials; HSE in planetary materials, including the Earth, Moon, Mars and asteroidal bodies for which we have materials as meteorites; our understanding of Earth's mantle from direct study of mantle materials; chalcophile and siderophile elements as tracers within minerals; the importance of the HSE for studying volcanic and magmatic processes, and appraisal of the importance of magmatic HSE ore formation in Earth's crust.

Fees:

		on or before 10/01/2015	*after 10/01/2015*
Professional Registration:	Member ‡	$300	$350
	Non-member	$380*	$430*
Student Registration:	Member ‡	$120	$190
	Non-member	$140*	$210*
Speaker		no cost	no cost

‡ Mineralogical Society of America (MSA) and Geochemical Society (GS) members.
*includes 2016 MSA membership dues and electronic access to *American Mineralogist*.

Registering: Online registration is at <https://msa.minsocam.org/ShortCourses2.html>. Print registration forms are also available online, and from the MSA Business Office, 3635 Concorde Pkwy Suite 500, Chantilly, VA 20151-1110 USA. phone: +1 (703) 652-9950; fax: +1 (703) 652-9951; e-mail: jaspeer@minsocam.org. Registration forms with payment must be returned to the MSA Business Office. Registration fees will be partially refunded if cancellation is received in writing on or before 10 November 2015. All participants and speakers must register.

Practical: Registration fee includes the following:

- MSA/GS short course sessions
- *Reviews in Mineralogy and Geochemistry* volume
- Meals: Morning/afternoon refreshments and lunch (Fri and Sat); ice-breaker on Thursday and dinner banquet on Friday evening

Registration fee does not include lodging, other meals not specified, or other travel costs.

Recommended Hotels (within walking distance of the short course venue)

- Hotel La Jolla - 7955 La Jolla Shores Drive, La Jolla, CA 92037
  Tel: +1 (800) 941-1149
  Website: http://www.hotellajolla.com/
  30 room deals are available to delegates at this hotel for $149/night through until the 19 November 2015

- La Jolla Shores Hotel - 8110 Camino Del Oro, La Jolla, CA 92037
  Tel: +1 (877) 346-6714 Int'l: 001-858-412-0721
  Website: http://www.ljshoreshotel.com/

Hotel reservations should be made as soon as possible. Other hotels are available, but are not within walking distance of the venue and will require transportation (not included in fees).

Short Course Topics and Lecturers

Introduction to the short course .....
..... James Day (*UC San Diego, USA*) and Jason Harvey (*University of Leeds, UK*)

Analytical methods for the highly siderophile elements.....
Thomas Meisel (*Montanuniversität, Austria*), Mary Horan (*Carnegie Institution of Washington, USA)*

Fractionation of the highly siderophile elements (HSE) during planetary differentiation .....
James Brenan (*University of Toronto, Canada*), Neil Bennett (*Carnegie Institution of Washington, USA),* and Zoltan Zajacz *(University of Toronto, Canada)*

Nucleosynthetic variations of siderophile and chalcophile elements in the solar system .....
Tetsuya Yokoyama (*Tokyo Institute of Technology, Japan*) and Richard Walker (*University of Maryland, USA)*

Highly siderophile elements in Earth, Mars, the Moon and asteroids .....
James Day (*UC San Diego, USA*), Alan Brandon (*University of Houston, USA*), and Richard Walker (*University of Maryland, USA)*

Distribution and processing of highly siderophile elements in cratonic mantle lithosphere .....
Sonja Aulbach (*University of Frankfurt, Germany*), James Mungall (*University of Toronto, Canada*), and Graham Pearson (*University of Alberta, Canada)*

Highly Siderophile Element and ^{187}Os signatures in non-cratonic basalt-hosted peridotite xenoliths..
Laurie Reisberg (*CNRS, Nancy, France*) and Ambre Luguet (*University of Bonn, Germany*)

Re-Pt-Os Isotopic and Highly Siderophile Element Behavior in Mantle Tectonites .....
...Harry Becker (*University of Berlin, Germany*) and Chris Dale (*Durham University, UK)*

Chalcophile/siderophile elements in mantle rocks: trace elements in trace minerals.....
Jean-Pierre Lorand (*Universite de Nantes, France*) and Ambre Luguet (*University of Bonn, Germany)*

An inventory and overview of natural occurrences of the platinum-group minerals (PGM) in extraterrestrial and terrestrial rocks .....
Brian O'Driscoll (*University of Manchester, UK*) and José Maria González-Jiménez (*Macquarie University, Australia)*

Mantle sulfides and their role in Re-Os-Pb geochronology.....
Jason Harvey (*University of Leeds, UK*), Jessica Warren *(Stanford University, USA*), and Steven Shirey *(Carnegie Institution of Washington, USA)*

Basalt HSE and Re-Pt-Os .....
Abdelmoucine Gannoun (*Université Blaise Pascal, France*), Kevin Burton *(Durham University, UK),* Pierre Schiano *(Université Blaise Pascal, France),* Jason Harvey *(University of Leeds, UK),* and James Day *(UC San Diego, USA)*

Highly siderophile and strongly chalcophile elements in magmatic ore deposits .....
Sarah-Jane Barnes (*Université du Québec à Chicoutimi, Canada*) and Edward Ripley *(Indiana University, USA)*