

Mineralogical Society of America and Geochemical Society Short Course Announcement

DIFFUSION IN MINERALS AND MELTS

Dates: Short Course sessions are Saturday and Sunday, December 11-12, 2010 (preceding the Annual fall meeting of the American Geophysical Union in San Francisco). The Short Course will start at 8:30 am on Saturday, December 11, and end 4 pm on Sunday, December 12.

Location: Short Course sessions are at the Napa Valley Marriott Hotel and Spa (3425 Solano Avenue, Napa, CA, USA; Ph: 1-707-253-8600; Fax: 1-707-258-1320, www.napavalleymarriott.com), about 60 minutes drive from San Francisco.

Convenors: *Youxue Zhang*: University of Michigan, Dept of Geological Sciences, 1100 N. University Ave., Ann Arbor, MI 48109-1006, USA; Tel: 1-734-763-0947; youxue@umich.edu.
Daniele Cherniak: Department of Earth and Environmental Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180, USA; Tel. 1-518-276-8827; chernd@rpi.edu.

Fees:		<i>on or before 10/31/2010</i>	<i>after 10/31/2010</i>
Professional Registration:	Member ‡	\$330	\$380
	Non-member	\$425*	\$475*
Postdoc Registration:	Member ‡	\$100	\$150
	Non-member	\$195*	\$245*
Student Registration:	Member ‡	\$50	\$100
	Non-member	\$90*	\$140*
Speaker		no cost	no cost

‡ Mineralogical Society of America (MSA) and Geochemical Society (GS) members.
*includes 2011 MSA membership dues and electronic access to *American Mineralogist*.

Registering: Online registration is at <http://www.minsocam.org/MSA/SC1/>. Printable registration forms are also available online there, as well as 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 November 15, 2010. All participants and speakers must register.

Practical: Registration fee includes MSA/GS short course sessions, *Reviews in Mineralogy and Geochemistry* volume, mid-morning, mid-afternoon refreshments on Saturday and Sunday, and dinner on Saturday. Registration fee does not include room, other meals, or any transportation costs to or from the short course site.

Both participants and speakers must make arrangements and pay their own lodging and transportation. Participants can use a personalized group web page for lodging at <<http://www.marriott.com/hotels/travel/sfomp?groupCode=rpipia&app=resvlink&fromDate=12/10/10&toDate=12/12/10>> or contact the Napa Valley Marriott Hotel and Spa (3425 Solano Avenue, Napa, CA, USA; Ph: 1-707-253-8600; Fax: 1-707-258-1320, www.napavalleymarriott.com), mention this conference, make reservations and pay for your lodging before 11/10/2010.

Arrangements have been made for discounted group transportation from the short-course site to the Moscone Center following the conclusion of the short course on the afternoon of Sunday, December 12. Please contact the short-course convenors if you wish to reserve a seat on transportation from the short course site to San Francisco.

Short Course Description: The objective of this course is to review diffusion at high to moderate temperatures in minerals and silicate melts, focusing on basic theory, experimental methods and analytical techniques in diffusion studies, diffusion data in minerals and melts and their applications to geology. The aim is to help students and practitioners to understand the basics of diffusion, the experimental diffusion data and how they can be applied to geological problems.

Because diffusion plays a critical role in numerous geological processes, petrologists and geochemists (as well as other geologists and even geophysicists) often apply diffusion in their studies to interpret the age of rocks, the zoning in minerals, bubble sizes in volcanic rocks, etc. A major challenge in the many applications of diffusion is for practitioners to find the relevant and reliable diffusion data. For example, diffusivities from different labs may differ by orders of magnitude. Sometimes the difference is a result of limitations not recognized in certain diffusion studies due to materials or methodologies, or to subtle differences in experimental conditions (such as oxygen fugacity, pressure or H₂O content). Experts in the field may be able to understand and evaluate these differences, but those unfamiliar with the field, and even some experimental practitioners and experienced users of diffusion data, may have difficulty discerning and interpreting differences among diffusion findings. For those who want to investigate diffusion through experiments, it is critical to understand the advantages and limitations of various experimental approaches and analytical methods in order to optimize future studies, and to obtain a clear sense of the “state of the art” to put their own findings in perspective with earlier work. The expertise of those who are active and experienced in the field will be communicated to students and professionals in related fields so that they can study diffusion-related processes with confidence and ease.

Short Course Topics and Speakers

- Basic concepts and theory of diffusion *Youxue Zhang (University of Michigan)*
- Experimental methods in diffusion studies *Bruce Watson (Rensselaer Polytechnic Institute)*
- Analytical techniques in diffusion studies *Daniele Cherniak (Rensselaer Polytechnic Institute)*
- H and O diffusion in silicate melts *Youxue Zhang (University of Michigan)*
- Self diffusion and isotope diffusion in silicate melts *Charles Lesher (University of California-Davis)*
- Multicomponent diffusion in silicate melts *Yan Liang (Brown University)*
- Cation diffusion in garnet *Jibamitra Ganguly (University of Arizona)*
- Noble gas diffusion in minerals *Ethan Baxter (Boston University)*
- Diffusion of radiogenic species in minerals *Daniele Cherniak (Rensselaer Polytechnic Institute)*
- Computation of diffusivities in minerals and melts *Nico de Koker (Universitat Bayreuth)*

Chapter titles for RiMG Volume

- Diffusion in minerals and melts: Introduction *Youxue Zhang and Daniele Cherniak*
- Diffusion in minerals and melts: Theoretical background *Youxue Zhang*
- Experimental methods in diffusion studies *Bruce Watson and Ralf Dohmen*
- Analytical techniques in diffusion studies *Daniele Cherniak, Richard Hervig, Jürgen Koepke, Youxue Zhang, and Donggao Zhao*
- H, C and O diffusion in silicate melts *Youxue Zhang and Huaiwei Ni*
- Noble gas diffusion in silicate melts and glasses *Harald Behrens*
- Effective binary diffusion data in silicate melts *Youxue Zhang, Huaiwei Ni, and Yang Chen*
- Self diffusion and isotope diffusion in silicate melts *Charles Lesher*
- Multicomponent diffusion in silicate melts *Yan Liang*
- H and O diffusion in minerals *John Farver*
- Noble gas diffusion in minerals *Ethan Baxter*
- Cation diffusion in garnet *Jibamitra Ganguly*
- Cation diffusion in olivine, wadsleyite and ringwoodite *Sumit Chakraborty*
- Diffusion in pyroxene, amphibole and mica *Daniele Cherniak and Alexandre Dimanov*
- Cation diffusion in feldspars *Daniele Cherniak*
- Diffusion in quartz, melilite, silicate perovskite, and mullite *Daniele Cherniak*
- Diffusion in oxides *James Van Orman and Katherine Crispin*
- Diffusion in accessory minerals: zircon, titanite, apatite, monazite and xenotime *Daniele Cherniak*
- Diffusion in carbonates, fluorite, sulfide minerals and diamond *Daniele Cherniak*
- Diffusion in minerals: An overview of published experimental diffusion data *John Brady and Daniele Cherniak*
- Diffusion in polycrystalline materials: Mathematical models and experimental data *Ralf Dohmen and Ralf Milke*
- Theoretical computation of diffusion in minerals and melts *Nico de Koker and Lars Stixrude*
- Applications of diffusion data to solid-Earth systems *Thomas Mueller, Bruce Watson, and Mark Harrison*

AGU Fall Meeting Session: The short course will be held in conjunction with an AGU-sponsored topical session at the subsequent annual fall AGU meeting (the session will have the same title as the RiMG volume: *Diffusion in minerals and melts*). If you submit an abstract for this session, please inform the convenors.