

August 2004

VGP Section Newsletter#17

Dear Colleagues,

In this issue of the Volcanology, Geochemistry and Petrology Section newsletter:

(1) Message from VGP President

- New Committee Members
- Paul Renne Appointed as Eos Corresponding Editor
- Call for Nominations for VGP and AGU Honors

(2) 2004 Joint Assembly Outstanding Student Presentations

(3) 2004 AGU Fall Meeting Information

(1) MESSAGE FROM THE VGP SECTION PRESIDENT

As I begin my term, I first want to thank Past President Kathy Cashman for her capable service to the VGP Section as its President-elect (2000-2002) and President (2002-2004). With the change in officers come new section committee chairs and members. You can find the names of over 50 people who serve on VGP committees posted on the section's web page (<http://vgp.agu.org>).

Second, I'd like to announce that Paul Renne has been appointed Eos Corresponding Editor for our section. Paul has completed his term as one of the Editors of Eos and has agreed to take on the job of Corresponding Editor, a post in which he can focus exclusively on VGP-related articles. If you have an idea for an article for Eos, please contact Paul (prenne@bgc.org). We would like to see more VGP representation in Eos across more of the fields within the section.

Finally, I would like to call attention to impending deadlines for nominations for Union and Section awards, which are only two months away. I encourage section members to nominate deserving individuals for appropriate honors. Look at the AGU web site under Inside AGU/Honors (<http://www.agu.org/inside/insidaguhn.html>) for details of the various medals and awards, as well as past recipients and nomination procedures. The AGU Council has affirmed that eligibility for awards should be interpreted broadly, which gives VGP members opportunities to be considered for most of the Union Medals and Awards. Our section has great breadth and we should be able to capitalize on that strength in the realm of awards. For example, the Bucher Medal (Ross Taylor, 2002) and the Excellence in Geophysical Education Award (Cathy Manduca, 2004) recently went to VGP members.

The following honors are relevant to VGP members:

BOWEN AWARD: The deadline for the 2004 Bowen Award is October 1, which gives the committee time to select an awardee in time for presentation at the 2004 Fall Meeting. Nominations should be sent to Dominique Weis, Chair of the Bowen Award Committee (dweis@eos.ubc.ca).

MACELWANE MEDAL: The Macelwane medal is given Annually by the AGU for significant contributions to the geophysical sciences by a young scientist of outstanding ability. Nominations are due on October 15th, may be made by anyone, and should include:

- * A letter of nomination outlining the nominee's significant contributions and stating the nominee's birthday (which must be 1969 and later)
- * A curriculum vitae for the nominee
- * A bibliography for the nominee
- * A minimum of three but no more than six supporting letters, at least two of which must come from individuals with no current or recent association with the nominee's institution of graduate education or employment.

Nominations can be mailed to the following address:

Macelwane Nomination Committee
 c/o American Geophysical Union
 2000 Florida Avenue, NW
 Washington, DC 20009

If you are considering nominating a candidate whose contributions pertain to AGU's VGP section, you may contact John Eiler, Chair of the Macelwane Committee (eiler@gps.caltech.edu) for further information.

AGU FELLOWS: The deadline for nomination of 2005 AGU Fellows is October 1, 2004. Further information is available from <http://www.agu.org/inside/fellnom.html> or Alex Halliday, Chair of the Fellows Committee (alex.halliday@erdw.ethz.ch).

UNION MEDALS: A VGP committee has been newly established to assist VGP members in competing for Union medals. The nominations for AGU awards are due October 15, so it is important to identify key people well ahead of that deadline. Please check the AGU website for a list/description of the awards and past recipients and send your ideas for new nominees to our committee.

Sidney Hemming, Chair of the Union Medals Committee (sidney@ldeo.columbia.edu).

For advice or help with nominations feel free to contact the appropriate committee chair above, or e-mail me at cbacon@usgs.gov

*Charlie Bacon
 VGP President*

(2) 2004 JOINT ASSEMBLY OUTSTANDING STUDENT PRESENTATIONS

Congratulations to *Philip Benson*(1) and *Conor Gately*(2) for their excellent presentations at the 2004 Joint Assembly for which they will receive the VGP Outstanding Student Presentation Award. There were 79 VGP student presentations at the spring Joint assembly. The award will be in the form of a certificate from AGU as well as a \$200 prize.

With thanks to all those that helped judging the presentations.

(1) *Philip Benson*, University College London, Mineral, Ice and Rock Physics laboratory, Department of Earth Sciences, United Kingdom, "Modelling the physical properties of cracked rocks 2: application to transversely isotropic granite from the Japanese Alps", V21C-02.

(2) *Conor Gately*, Dept. of Earth and Environmental Sciences, Wesleyan University "Geochemistry of the Hydrothermal System of Peteroa Volcano, Chile-Argentina" V51C-08.

(3) 2004 AGU FALL MEETING INFORMATION

Important Dates:

Abstract Submission Opens: **15 July**

Abstract Deadline by mail: **1 Sept**

Abstract Deadline by website: **9 Sept.**

The 2004 Fall Meeting in San Francisco (13-17 December) should prove to be an exciting one for members of VGP. We have a diverse group of special sessions sponsored by VGP, as well as a number of sessions sponsored by other sections that should be of direct interest. AGU has introduced a new section, entitled "Special Focus", with this year's theme being Data, Acquisition, and Analysis, with the idea of gathering/attracting presentations that are aimed at managing, assembling, generating, and utilizing large, multidisciplinary, and/or novel data sets. Members of VGP will be interested in the Special Focus session on Cyberinfrastructure in Geochemistry. Listed below are the titles, description and conveners of VGP-sponsored special sessions, along with some others that may be of interest. Be sure to consult the AGU website for a full listing. Thanks to all that submitted proposals for special sessions - your effort is what makes the Fall Meeting such a success. I'd also like to offer a special thanks to Tom Sisson for his help in organizing the VGP contribution to the Fall Meeting.

James Brenan, VGP Secretary

Special Sessions for Fall 2004 Meeting

Volcanology, Geochemistry, and Petrology

V02 Sources of Oscillatory Phenomena in Volcanic Systems. This session aims to give an overview of the range of physical and chemical source processes that can result in the field measurement of an oscillating parameter generated directly or indirectly by a volcanic system. This could include, for example, ground motion, changes in air pressure, and fluctuating fluxes of chemical species resulting from, for instance, magmatic, hydrothermal or slope instability events. The time-scales of these processes may range from edifice lifetime (or longer) to ultra-sonic (or shorter). Any research approach may be taken, for instance, field measurement and observation, experimental analogue, computer modeling, and combined methods. Submissions should all aim to isolate the physical and/or chemical phenomena that form the key source process, together with how this source process may result in a field-measurable signal.

Conveners:

Stephen Lane, Lancaster University, Department of Environmental Science,
Lancaster, LA1 4YQ GBR, email: s.lane@lancaster.ac.uk,

Michael James, Lancaster University, Department of Environmental Science,
Lancaster, LA1 4YQ GBR, email: m.james@lancaster.ac.uk,

Bernard Chouet, USGS, 345 Middlefield Road MS 910, Menlo Park, CA 94025
USA, email: chouet@usgs.gov

V03 Chinese Continental Scientific Drilling (CCSD): Continental Deep Subduction and Exhumation Dynamics. The Chinese Continental Scientific Drilling (CCSD) project is designed to unravel the structure and composition of the root zone of a large-scale, ultra-high pressure metamorphic belt (UHPM) between the North and South China blocks. Since the inception of this project in 1998, three pre-pilot holes have been completed and the main hole has reached a depth of over 3500 m. The hole is expected to reach its target depth of 5000 m in early 2005. Subsurface structures have been obtained through regional

deep seismic profiles and kinematic data recovered from nearly continuously cores. These new geophysical and geological information together with previous findings are ready to quantify the processes of continental subduction and collision. This session will present new structural, mineralogical, petrochemical, geochronological, and geophysical data based on the drilling results and associated field studies, particularly in the Dabie-Sulu region. This session will bring together scientists from many countries who have been studying the geological and geophysical processes responsible for deep subduction and exhumation of continental crustal material. It will offer participants from different disciplines the opportunity to exchange ideas and discuss new models for crustal evolution. We expect that such a gathering will assist in identifying new directions for future research in this evolving field.

Conveners:

Jingsui Yang, Key Laboratory for Continental Dynamics of MLR, Institute of Geology, CAGS, , Beijing, 100037 CHN, email: yangjsui@ccsd.org.cn,

J.G. Liou, Department of Geological and Environmental Sciences, Stanford University, , Stanford, CA 94305 USA, email: liou@pangea.stanford.edu,

Paul T. Robinson, Department of Earth Sciences, Dalhousie University, , Halifax, CAN, email: robinso@dal.ca,

Zhiqin Xu, Key Laboratory for Continental Dynamics of MLR, Institute of Geology, CAGS, , Beijing, 100037 CHN, email: xzq@ccsd.org.cn

V04 Rates and Time Scales of Magmatic Processes. Analytical and conceptual advances in petrology and geochemistry have made it possible to quantify the rates and time scales of magmatic processes at active and ancient volcanoes. These advances have led to a better understanding of the dynamics of magmatic systems, including estimates of (1) the rates of melt generation and transport beneath mid-ocean ridges, ocean islands, and arc volcanoes, (2) the ages of different magma pulses that make up a single pluton, (3) the pace of magmatic differentiation, and (4) the residence times of crystals and magma within crustal reservoir systems. Particularly striking results have been obtained using multiple techniques to investigate the timing of magmatic processes. For example, the combination of absolute dating with other geochemical information (e.g., major- and trace-element diffusion profiles of crystals) or comparisons between increasingly complex, and more realistic, numerical models and high-resolution compositional data. We invite contributions that explore all facets of the rates and time scales of magmatic processes using any of a range of approaches, including observations from experimental and analytical petrology, numerical modeling, geochemistry and geochronology, and physical volcanology. Papers that bridge multiple techniques are particularly encouraged.

Conveners:

Aaron J. Pietruszka, San Diego State University, Department of Geological Sciences 5500 Campanile Dr. , San Diego, CA 92182-1020 USA, Tel: (619) 594-2648, Fax: (619) 594-4372, email: apietruszka@geology.sdsu.edu,

Kari M. Cooper, University of Washington, Department of Earth and Space Sciences 310 Condon Hall Box 351310, Seattle, WA 98195 USA, Tel: (206) 543-9041, Fax: (206) 543-0489, email: kmcooper@u.washington.edu ,

Alexander Cruden, Dept. of Chemical & Physical Sciences, University of Toronto at Mississauga, 3359 Mississauga Rd, Mississauga, ON L5L 1C6 CAN, Tel: 905 828-5368, Fax: 905 569-4929, email: cruden@utm.utoronto.ca,

John Grocott, School of Earth Sciences and Geography, Kingston University, Kingston University Penrhyn Road, Kingston-upon-Thames, SUR KT1 2EE GBR, Tel: 44 20 8547 7530, Fax: 44 20 8547 7497, email: j.grocott@kingston.ac.uk,

Carlos Arevalo, Servicio Nacional de Geología y Minería, Av. Santa María 0104 Providencia, Santiago, CHL, Tel: 56 2 7375050, Fax: 56 2 7776802, email: carevalo@sernageomin.cl

V05 Halogens in subduction zones. This symposium aims to trace the behavior of halogens throughout the entire subduction process. It will examine their behavior during transfer from the subducting slab through the mantle wedge to subduction zone volcanoes. Global cycles of halogens will be addressed via mass balance calculations based on chemical analyses of volcanic material, metamorphic rocks from subduction zones, mantle xenoliths from subduction zones, oceanic sediments, etc. The symposium also aims to address the influence of halogens on the stability of key minerals in subduction zones. Furthermore, the symposium tries to address the effect of halogens on melting behavior in the Earth's mantle, solubility and solubility mechanisms of halogens in silicate melts, relationships between halogen contents of silicate melt and rheological, physical and chemical properties of halogen-rich melts in the Earth's interior. We would like to encourage contributions from a wide range of disciplines (e.g., petrology, geochemistry, mineral and melt physics, etc) to provoke stimulating discussions on the aforementioned matters.

Conveners:

Stephan Klemme, University of Heidelberg, Im Neuenheimer Feld 236, Heidelberg, 69120 DEU, Tel: +49-6221-546039, email: sklemme@min.uni-heidelberg.de,

Sharon Webb, University of Goettingen, Goldschmidtstr. 1, Goettingen, 37077 DEU, Tel: +49-551-393861, Fax: +49-551-393863, email: swebb@gwdg.de

V06 The Role of Brines in Crustal Processes. NaCl, KCl, and CaCl₂ brines play a wide and varied role in crustal processes. These include high grade metasomatism, both in the deep crust as well as at the crust-mantle boundary; deep-seated migration of brines and meteoric waters in the mid to upper crust; dehydration during subduction of oceanic crust; origin and evolution of carbonatitic magmas; evolution of magmas associated with volcanic processes; crystallization of magmatic intrusions in the crust including formation of contact aureoles; formation of ore deposits, both hydrothermal as well as magmatic; and the various processes present during consolidation and lithification of sediments. The goal of this session would be to bring together a diverse group of geoscientists covering the wide variety of disciplines implied above. This could include workers in petrology, mineralogy, geochemistry, e.g. fluid inclusions and stable isotopes, economic geology, seismology, rheology, structural geology, and sedimentology; as well as both experimental petrology and geochemistry. Such a gathering would help to consolidate our understanding of brines in general and, as a consequence, allow us to ascertain more clearly where specific important questions and avenues for fruitful research still remain concerning the nature, chemistry, and varied roles of brines in the crust.

Conveners:

Daniel E Harlov, GeoForschungsZentrum Potsdam, Telegrafenberg, Potsdam, D-14473 DEU, Tel: 0049 (331) 288-1456, Fax: 0049 (331) 288-1402, email: dharlov@gfz-potsdam.de

V07 Ridge-Hotspot Interaction: Magmatic and Tectonic Influences and Effects. This session will showcase recent geochemical, geophysical, and tectonic research on ridge-hotspot interactions. The session will focus on ridge and hotspot variables, such as ridge spreading rate, hotspot magmatic strength and temperature, ridge migration, plate thickness, and ridge-hotspot separation distance (in near-ridge systems). These play important roles in the nature of magmatism and tectonics of the combined ridge-hotspot system, influencing ridge morphology, the spatial distribution of magmatic activity, hotspot melt migration along the ridge, magma mixing, ridge capture, jumps, and asymmetric spreading.

Conveners:

John Chadwick, Idaho State University, Dept. of Geosciences, Pocatello, ID 83209 USA, Tel: 208-282-2949, email: chadjohn@isu.edu,

Mike Perfit, University of Florida, Dept. of Geological Sciences, Gainesville, FL 32611 USA, Tel: 352-392-2128, email: perfit@geology.ufl.edu

V08 Active Submarine Volcanic and Hydrothermal Systems of Western Pacific Intra-Oceanic Arcs. Recent expeditions to the submarine arc volcanoes and back-arc spreading centers along the Izu-Bonin-Mariana, Tonga-Kermadec and other intra-oceanic arcs of the western Pacific are rapidly increasing our knowledge base of these systems. Extensive sonar surveys and detailed water column sampling within the past five years have identified and characterized numerous active hydrothermal sites. Some of these sites have now been investigated by interdisciplinary teams using human-occupied and remotely operated vehicles to conduct geological, micro- and microbiological, and chemical studies. This session invites submissions reporting focused seafloor/water column studies and broad regional syntheses of hydrothermal activity at intra-oceanic arcs.

Conveners:

Jun-ichiro Ishibashi, Faculty of Science, Kyushu University, 6-10-1, Hakozaki, Fukuoka, 812-8581 JPN, Tel: 81-92-642-2664, email: ishi@geo.kyushu-u.ac.jp,

Bob Embley, NOAA/Pacific Marine Environmental Laboratory, 2115 SE O.S.U. Dr., Newport, OR 97365-5258 USA, Tel: 541-867-0275, Fax: 541-867-3907, email: robert.w.embley@noaa.gov

V09 Physical Properties of Melts, Magmas, and Lavas. Analytical and numerical modeling of magma storage, transport, and eruption processes are increasingly geared toward developing realistic predictive capabilities. Essential to parameterization of realistic models is the need for more and better data on the physical properties of melts, magmas, and lavas over a wide spectrum of pressure, temperature, composition, and physical states. In this VGP session, we will host a collection of studies highlighting recent experimental advances in quantifying the physical properties of silicate melts and melt-crystal-bubble mixtures. We invite papers that bear on the thermodynamic properties of melts and multiphase mixtures, their rheology and structure, volatile solubility, and redox conditions.

Conveners:

Donald B. Dingwell, University of Munich, Dept. of Earth & Environmental Science Theresienstr 41/III, Munchen, 80333 DEU, Tel: 49 89 2180 4250, Fax: 49 89 2180 4176, email: dingwell@lmu.de,

Margaret T. Mangan, U.S. Geological Survey, Volcano Hazards Team, MS 910 345 Middlefield Road, Menlo Park, CA 94025 USA, Tel: 650 329 5738, Fax: 650 329 5203, email: mmangan@usgs.gov

V10 Quantifying Volcanic Eruption Fluxes. The flux of gas and condensed phases are commonly used to quantify an eruption's magnitude and intensity. As such, recovering the time history of material erupted from a volcanic vent is a fundamental goal for those who both model and monitor volcanic eruptions. While existing tools, such as seismic, COSPEC, satellite remote sensing, and ground-based mapping have proven worth for assessing eruption size, new tools including miniature ultraviolet correlation spectrometers, thermal imagers, infrasound, and other tools provide additional potential for recovering eruption rates. The quantification of erupted flux is now possible with greater accuracy and at greater temporal resolution. We encourage the submission of abstracts related to the characterization of eruption flux and eruption magnitude using novel analytical approaches and/or diverse and integrated technologies.

Conveners:

Jeffrey B. Johnson, University of New Hampshire, Morse Hall, Durham, NH 03824 USA, Tel: 603 862-0711, Fax: 603 862-3874, email: jeff.johnson@unh.edu,
Dork Sahagian, University of New Hampshire, Morse Hall, Durham, NH 03824 USA, Tel: 603 862-3875, Fax: 603 862-3874, email: dork.sahagian@unh.edu

V11 The Oxidation State of the Mantle. The oxidation state of the mantle influences numerous properties and processes that have shaped the Earth's development throughout its history. Recent discoveries have raised our knowledge of this elusive variable to an unprecedented level, and brought several surprises regarding the lower mantle that impact properties and processes throughout the Earth. The development of new methods to probe oxidation state and new geochemical approaches to constrain oxygen fugacity has fuelled advances on several fronts. Natural samples from a range of tectonic environments place constraints on mantle processes, and provide temporal information on mantle oxidation state, for example how it relates to evolution of the atmosphere. We are soliciting papers from all fields, including mineral physics, geochemistry and geophysics which are relevant to any of these issues. This interdisciplinary session will showcase results that relate to mantle oxidation state and its impact on mantle properties and processes, not only to provide an overview of the current state of our knowledge, but also to identify important directions for future developments.

Conveners:

Catherine McCammon, Bayerisches Geoinstitut, Universität Bayreuth, Bayreuth, D-95440 DEU, Tel: +49-921-553709, Fax: +49-921-553769, email: catherine.mccammon@uni-bayreuth.de,

Cin-Ty Lee, Rice University, Department of Earth Science MS-126 6100 Main St., Houston, TX 77005 USA, Tel: 713-348-5084, Fax: 713-348-5214, email: ctlee@rice.edu,

Alan Woodland, University of Frankfurt, Institut für Mineralogie, Abt. Kristallographie Senckenberganlage 30, Frankfurt, D-60054 DEU, Tel: +49-69-79823104, Fax: +49-69-79822101, email: woodland@em.uni-frankfurt.de

V12 Fluid/Melt Transport through the Mantle Wedge at Subduction Zones. The subduction zone mantle wedge is a consequence of a unique setting, sandwiched between converging tectonic plates. The mantle wedge is set apart from mantle in other tectonic settings by the presence of high concentrations of H₂O, an inverted geothermal gradient imposed by the subducting slab, and the production and upward migration of melt despite a distinct downward orientation of solid flow, which raises many questions about the movements of fluids and melts through this dynamic setting. For example, how can we reconcile physical or geochemical models of reactive fluid/melt migration with geochemical and isotopic evidence suggesting rapid transport? Resolving such questions requires a broadly-based understanding of the combined effects of several critical factors including methods and rates of melt production, modes of transport, mantle flow, and the impact of volatile content on the physical/dynamical properties of both the solid mantle and liquid melts. For this special session, we therefore seek scientific contributions that employ innovative and multidisciplinary applications of petrological, geochemical, geophysical, and computational techniques towards constraining the movement of melts and fluids through the mantle wedge at subduction zones.

Conveners:

Katherine A. Kelley, Carnegie Institution of Washington, Department of Terrestrial Magnetism 5241 Broad Branch Rd. NW, Washington, DC 20015 USA, Tel: (202) 478-8475, Fax: (202) 478-8820, email: kelley@dtm.ciw.edu

Maureen Feineman, University of California, Berkeley, Department of Earth and Planetary Science Center for Isotope Geochemistry, Berkeley, CA 94720-4764 USA, Tel: (510) 642-9116, Fax: (510) 642-9520, email: feineman@uclink.berkeley.edu

V13 Investigating Silicon and Germanium Geochemical Cycles. There is a renewed interest in the importance of silica biomineralization in global geochemical cycles. Silicon is an important nutrient in aqueous environments and useful proxies for biomineralization are required in geochemical studies. These may be assessed with stable isotope composition of Si and Ge and from Ge/Si ratios. Contributions are invited that address all aspects of Si and Ge geochemistry, from biomineralization to weathering processes. In addition contributions in techniques of sample preparation and analysis will be welcome.

Conveners:

Ben C Reynolds, IMGR, ETH Zurich, ETH Zentrum NO Sonneggstrasse 5, Zurich, CH-8092 CHE, Tel: +41 632 6869, Fax: +41 632 1179, email: reynolds@etdw.ethz.ch

Pieter Z Vroon, Free University Amsterdam, Faculteit Aard-en Levenswetenschappen De Boelelann 1085, Amsterdam, HV 1081 NLD, Tel: +31 20 444 7404, Fax: +31 20 656 8296, email: pieter.vroon@falw.vu.nl

V14 Low temperature metal stable isotope geochemistry. The field of heavy metal stable isotope geochemistry (e.g. Fe, Zn, Cu, Mo, Tl) has expanded rapidly in the past 5 years. In part, the expansion in this research area has been driven by new mass spectrometric technology. Early applications have been in subject areas as diverse as solid Earth geochemistry, the identification of biosignatures in ancient rocks and the redox history of the oceans. There is significant further potential in their use as tracers of biogeochemical processes in the modern and recent oceans and in biomedicine. In particular, these systems have the potential to add significantly to the tool kit available for the study of biogeochemical processes at all timescales. Following an early phase of technique development the field is now beginning to expand rapidly and more robust applications of these tracers are beginning to be undertaken. This session aims to bring together researchers involved in this effort. We particularly encourage papers that clarify the basic processes that cause variation in these isotopes systems, be they from a geochemical or from a biological perspective, whether they present isotopic or ancillary data that contribute towards an understanding of the systems involved.

Conveners:

Derek Vance, University of Bristol, Department of Earth Sciences Wills Memorial Building, Bristol, BS8 1RJ GBR, Tel: 00 44 117 954 5418, Fax: 00 44 117 925 3385, email: d.vance@bristol.ac.uk

Mark Rehkämper, ETH Zürich, Department of Earth Sciences ETH Zentrum Sonnegstrasse 5, Zürich, CHE, Tel: 00 41 1 632 7922, Fax: 00 41 1 632 1179, email: markr@erdw.ethz.ch

V15 Quantitative Constraints On Rates Of Crustal Reactions, Deformation And Mass Transfer.

Reaction, deformation, and mass transfer (via diffusion or advection) control the chemical, petrological, and structural evolution of the Earth. Numerous studies have described how these processes operate, how they are manifested in natural and laboratory settings, and how they are related to each other. In this session, we focus on the rates of these processes. Knowledge of the rates of reaction, deformation, and mass transfer – and the factors that control those rates – is fundamental to understanding and modeling crustal evolution. However, quantitative analysis of the rates of these processes is challenging given the timescales over which they operate and the inherent difficulties in direct observation. This session provides a forum to bring together a varied group of scientists who each bring a different contribution to our understanding of the rates of these processes and their inter-relationships. We invite papers describing novel methods used to quantitatively constrain the rates of reaction, deformation, and/or mass transfer in the Earth's crust. Research focusing on any part of the

crust, including divergent margins, convergent margins, or plate interiors, is welcome. Studies based on laboratory or natural observations are welcomed. We encourage papers that discuss relationships between the rates of these processes. While the emphasis is decidedly on discussing quantitative constraints on geologic rates, we also welcome papers on the modeling of crustal processes wherein such rates are required and employed. In this way, both the current level of knowledge about these rates, and their importance in the field of geosciences will be illuminated.

Conveners:

Ethan Baxter, Boston University, Earth Sciences 685 Commonwealth Ave, Boston, MA 02215 USA, Tel: 617 358-2844, email: efb@bu.edu

Jay Ague, Yale University, Geology & Geophysics PO Box 208109, New Haven, CT 06520-8109 USA, email: jay.ague@yale.edu

J. Gregory Hirth, Woods Hole Oceanographic Institution, USA, email: ghirth@whoi.edu

V16 Plumes or Not? A global debate has recently developed concerning whether or not mantle plumes exist. This has provided focus for studies of fundamental aspects of the plume model, e.g., seismic structure, geochemical tracers, mantle potential temperature, the physics of the deep mantle, relationships with surface tectonics, uplift prior to the emplacement of large igneous provinces and subsequent subsidence. Recent hot spot lists have reduced to less than ten the number of proposed deep plume locales, but disagree regarding which these are. These developments raise the question of the origins of major volcanic anomalies on Earth's surface commonly attributed to plumes. This multi-disciplinary special session will include papers that contribute to the current debate regarding the origin of large-volume, mid-plate or ridge-centered magmatism, linear volcanic chains and large igneous provinces. It will include observations, case-histories, theory, and models covering geophysics, noble gases, heat and temperature, tectonics, petrology, mantle dynamics, integrated studies and syntheses reconciling geophysics and geochemistry. The oral part of the session will include both talks that advocate the plume model and talks that advocate alternative views. Time will be reserved for discussion and comments from the audience. A lively session is anticipated.

Conveners:

Gillian R. Foulger, University of Durham, Dept. Earth Sciences, Science Laboratories, South Rd., , Durham, DH1 3LE GBR, Tel: +44-191-386-4533, Fax: +44-191-334-2320, email: g.r.foulger@durham.ac.uk

Norman H. Sleep, Stanford University, Mitchell Building, Stanford, Palo Alto, CA 94305-2215 USA, Tel: 650 723-0882, Fax: 650 725-7344, email: norm@geo.stanford.edu

James H. Natland, University of Miami, Rosenstiel School of Marine & Atmospheric Science, 4600 Rickenbacker Causeway, Miami, FL 33149 USA, Tel: 305 361 1819, Fax: 305 361 4632, email: jnatland@msn.com

V17 Arenal Volcano: magma genesis, volcanological processes, and societal responses. Arenal Volcano in Costa Rica is experiencing the longest-lived steady-state eruption on Earth. The ongoing eruption began with an explosive phase lasting from July through September, 1968, followed by near-continual eruption of lava, punctuated by small Strombolian explosions and rare pyroclastic flows. This eruption has been an ideal laboratory for the international scientific community to evaluate the petrology and geochemistry of andesitic ejecta (using whole-rock major and trace element concentrations, detailed mineral chemistry, isotope geochemistry, degassing and phase relationships gained through experimental petrological studies), the dynamics of a long-lived andesitic eruption (using seismicity, acoustics, electromagnetism, and geodesy), and the potential hazards posed by Arenal for local inhabitants (using cartography and aerial photography, land use zonation, tephrochronology,

hazard mitigation, and emergency response). Many investigations of Arenal are entering a mature phase and we anticipate bringing together scientists from diverse backgrounds and countries with a goal of gaining a holistic view of one of the longest-lived andesitic eruptions of historic times. Towards this end, we invite contributions examining the petrology, geochemistry, geophysics and volcanology of Arenal and its recent ejecta. We also invite contributions that explore the effects of the ongoing Arenal eruption on Costa Rican society.

Conveners:

Frank James Tepley, University of California, Santa Cruz, Dept of Earth Sciences, Santa Cruz, CA 95064 USA, Tel: 831 459 5228, Fax: 831 459 3074, email: ftepley@es.ucsc.edu

Mark Reagan, University of Iowa, Dept. of Geosciences, Iowa City, IA 52242 USA, Tel: 319 335 1802, Fax: 319 335 1821, email: mark-reagan@uiowa.edu

Eduardo Malavassi, OVSICORI, Universidad Nacional, Heredia, CRI, Tel: 506 261 0611, Fax: 506 261 0303, email: emalava@una.ac.cr

V18 Tephrochronology of North Pacific Volcanic Arcs. This special session will bring together scientists with active research interests and significant expertise in the collection, analysis, and interpretation of tephra deposits preserved on land and in ice, marine, and lacustrine sediment cores to explore opportunities for better collaboration and integration of results. Decades of tephrochronologic studies have produced a number of high quality but largely disconnected data sets that if better integrated could have important implications for a range of topics in the Earth and environmental sciences. We will address topics such as (1) the status of existing work and major findings, (2) development of integrated tephra databases, (3) data gathering protocols and analytical techniques, (4) the nature and problems associated with interpreting tephrostratigraphic records, (5) geochronology and correlation of volcanic ash deposits, (6) long-distance transport of volcanic ash and its relation to climate change, (7) environmental impacts of volcanic ash fallout, (8) future collaborative opportunities and needs. With increasing interest across many organizational and disciplinary boundaries in information about eruption frequency, volcanic hazard analysis, paleoclimate, paleoenvironmental conditions, and other key aspects of Quaternary history, the time has come to examine the status of tephrochronology in the north Pacific and to improve cross-disciplinary collaboration, application, interpretation, and integration of results.

Conveners:

Christopher F Waythomas, USGS, Alaska Volcano Observatory, 4230 University Drive, Suite 201, Anchorage, AK 99508 USA, Tel: 907-786-7122, Fax: 907-786-7150, email: chris@usgs.gov

Kristi L Wallace, USGS, Alaska Volcano Observatory, 4230 University Drive, Suite 201, Anchorage, AK 99508 USA, Tel: 907-786--7109, Fax: 907-786-7150, email: kwallace@usgs.gov

V19 Field Experiments and Models of Effusive Volcanic Eruptions. Active volcanoes provide unparalleled natural laboratories for the study of eruption and emplacement processes. However, in the absence of the framework of theoretical studies, field observations can be unfocused and difficult to use in testing specific scientific hypotheses. Conversely, theoretical or laboratory studies that are not tied to field observations run the risk of missing key emplacement phenomena. We solicit abstracts that (1) present new results from field experiments conducted in situ on active volcanoes and designed to test models of effusive volcanic processes, (2) field observations of active lavas (flows or domes) that have not been explained by models, and/or (3) theoretical studies that can be realistically tested with in situ experiments. The goal of this session is to bring together volcanologists who specialize in field observations and more theoretical work to promote greater linkage between these areas, and continue to

advance volcanology as a quantitative science.

Conveners:

Carl Thornber, U.S. Geological Survey, USA, email: cthornber@usgs.gov

Laszlo Keszthelyi, U.S. Geological Survey, USA, email: laz@usgs.gov

Harry Pinkerton, University of Lancaster, GBR, email: h.pinkerton@lancaster.ac.uk

V20 Remote Sensing of Volcanoes on Earth, Mars and Beyond. A virtual flood of remote sensing data with increased temporal, spatial, and spectral breadth and resolution is becoming widely available on Earth and other planets of the solar system. These new data are well suited to understanding past eruptions, eruption precursors and eruption dynamics. Presentations are invited for this special session on any aspect of remote sensing to observe volcanic phenomena including radar-interferometry, thermal flux measurements, analysis of eruption plumes, UV and IR of gas plumes, and multispectral time-series mapping. Abstracts that demonstrate the fusion of data from several instruments, spacecraft, or planets, are especially encouraged.

Conveners:

Rick Wessels, USGS-Alaska Volcano Observatory, 4200 University Dr., Anchorage, AK 99508 USA, Tel: 907-786-7492, Fax: 907-786-7425, email: rwessels@usgs.gov

Laszlo Keszthelyi, USGS - Astrogeology Team, 2255 N. Gemini Dr, Flagstaff, AK 86001 USA, Tel: 928-556-7002, Fax: 928-556-7014, email: laz@usgs.gov

John Chadwick, Idaho State University, Dept. of Geosciences, Pocatello, ID 83209 USA, Tel: 208-282-2949, email: chadjohn@isu.edu

Scott Hughes, Idaho State University, Dept. of Geosciences, Pocatello, ID 83209 USA, Tel: 208-282-4387, email: hughscot@isu.edu

Jim Zimbelman, Smithsonian Institution, CEPS/NASM MRC 315, Washington, DC 20013 USA, email: jrz@nasm.si.edu

Susan Sakimoto, NASA Goddard Space Flight Center, Goddard Earth Sciences and Technology Center (GEST) Code 921, Geodynamics Branch NASA/Goddard Space Flight Center, Greenbelt, MD 20771 USA, email: sakimoto@core2.gsfc.nasa.gov

V21 Oxygen in the terrestrial planets. Oxygen is the most abundant element within the terrestrial planets. Its role as an oxidant is important in planetary differentiation, mantle redox states, and phase relationships in igneous rocks. The existence of three stable isotopes of oxygen coupled with its abundance allows its use as a geochemical tracer, from the composition of accretionary matter to the degassing of planetary atmospheres and processes within planetary hydrospheres. Furthermore, oxygen is crucial to life as we know it on Earth. The vast majority of our knowledge in this area is derived from studies of terrestrial systems – for this reason, contributions addressing current problems in terrestrial redox or stable isotopes are encouraged. The study of planetary materials, in particular from the Moon, Mars, and differentiated asteroids, by traditional and innovative techniques, has resulted in significant improvement in our understanding of the role of oxygen in planetary formation, differentiation, and evolution. This session will bring together scientists from across disciplines, and from the terrestrial and planetary communities, to engage in comparative planetary discussions relating to oxygen isotopic and redox variation within and between the terrestrial planets, the effect of redox state on geophysical planetology (e.g., mantle rheology), the influence of oxygen and redox state on core formation and early differentiation, and evolution of the atmosphere – hydrosphere – biosphere.

V22 Shallow mantle flow and magmatic processes beneath the mid-Atlantic ridge: Results from ODP Leg 209 and related studies. This session highlights advances in the understanding of mantle upwelling, deformation, and melt transport/petrogenesis beneath slow spreading ridges. Slow spreading ridges are notable for thin crustal sections and for exposures of peridotite, allowing for direct

observations of mantle-level effects of divergent boundary plate tectonics and consequent magmatism. ODP Leg 209 drilled 19 holes at 8 sites along the Mid-Atlantic Ridge from 14°43' to 15°44' N. We welcome results on mantle level processes from this leg and from related theoretical and geologic/petrologic studies at other localities. Observations and inferences on the depth-temperature structure of the upwelling mantle, the deformation processes associated with shallow mantle flow, alteration of peridotite, and the extraction and reimpregnation of melt are highlights of the ODP Leg 209 cruise.

V23 Conduits and interiors of active volcanoes. This summer saw the unprecedented engineering feat of direct observation and sampling of the conduit of Unzen Volcano, Japan, by means of a borehole directionally drilled from the volcano's flank. Volcanic conduits are paths, often repeatedly used, by which magma travels from source to surface. They are therefore a regime characterized by extreme thermal and chemical disequilibrium with attendant time dependent behavior. What occurs within conduits during magma transport dominates, more than magma storage or surface volcanic conditions, what happens during and eruption. Thus it is timely to consider the current state of knowledge about conduit processes, as well as to hear the first reports of data from the Unzen borehole. Contributions are solicited on the geological, geochemical, and geophysical results of the Unzen Scientific Drilling Project. We likewise encourage contributions concerning other field investigations of the subvolcanic regime, as well as theoretical and experimental studies addressing important general aspects of the development and stability of volcanic conduits and the behavior of magma within them.

Conveners:

Setsuya Nakada, University of Tokyo, nakada@eri.u-tokyo.ac.jp

John Eichelberger, University of Alaska Fairbanks, eich@gi.alaska.edu

Other Special Sessions of VGP interest:

Special Focus: Data, Acquisition, and Analysis

Cyberinfrastructure in Geochemistry Geochemistry has broad significance across the planetary sciences. However, such breadth requires a coherent and unifying set of concepts and principles to organize and present empirical data in a way that it can be used effectively by the broader geoscience community. A clear scientific vision, combined with a flexible information technology (IT) structure, will accelerate the rate of discovery and expand the breadth of impact of geochemical results in other disciplines. This session will focus on demonstrations of the utility and capabilities of existing and developing geochemical cyberinfrastructure efforts. Specifically, the session will address such issues as: • Science advances fostered by modern computation and visualization techniques for large datasets. • Expansion of existing datasets to better serve the needs of the geoscience community. • Identification of practical solutions and approaches that will help overcome the obstacles related to the interoperability of various existing and new databases within geochemistry and related fields, such as geochronology, paleomagnetism and the biogeosciences. • Proposed scientific data models to capture, archive and present the wide variety of geochemical data. • Development of innovative and user-friendly data population mechanisms. • Definition of standardized data collections and models for possible geochemical data federations. • Community approaches to metadata and data interoperability protocols, standards and interfaces that will enable more effective and enduring data integration within geochemistry, as well as between geochemistry and other disciplines.

Conveners:

Anthony A.P. Koppers, Scripps Institution of Oceanography, 8800 Biological Grade, La Jolla, CA 92093-0225 USA, Tel: 858 - 534 - 8771, Fax: 858 - 534 - 8090, email: akoppers@ucsd.edu

Rick Carlson, Carnegie Institution of Washington, 5241 Broad Branch Road, Washington, DC 20015 USA, Tel: 202-478-8474, Fax: 202-478-8821, email: carlson@dtm.ciw.edu

Steve L. Goldstein, Lamont-Doherty Earth Observatory, Rt 9W, Palisades, NY 10964-0190 USA, Tel: 1-914-365-8787, Fax: 1-914-365-8155, email: steveg@ldeo.columbia.edu

John Helly, San Diego Supercomputer Center, 9500 Gilman Dr., San Diego, CA 92093-0505 USA, Tel: 760 840 8660, email: hellyj@ucsd.edu

Kerstin Lehnert, Lamont-Doherty Earth Observatory, 61 Route 9W, Palisades, NY 10964 USA, Tel: 845-365-8506, Fax: 845-365-8162, email: lehnert@ldeo.columbia.edu

Hubert Staudigel, Scripps Institution of Oceanography, 8800 Biological Grade, La Jolla, CA 92093-0225 USA, Tel: 858 534 8764, Fax: 858 - 534 - 8090, email: hstaudig@ucsd.edu

Tectonophysics

Earth's Deep Water Cycle. The presence of water in Earth's crust and mantle, as fluids or in minerals or melts, has enormous effects on the dynamics of solid Earth processes. In addition to storage in hydrous minerals such as amphibole, serpentine and talc, water may be stored in nominally anhydrous minerals (NAMs) such as olivine. The hydrogen incorporated in these minerals may change their physical properties such as electrical conductivity, viscosity, and transformation kinetics. The release of water through dehydration processes may enhance the generation of melt and trigger earthquakes. Plate subduction may also be a means of transporting water into the Transition Zone and deeper into the lower mantle, while water is also outgassed from the mantle at ridges and hotspots. To determine the nature and temporal evolution of water cycling in the deep Earth requires a multidisciplinary approach, incorporating data from mineral physics with high-resolution seismological, geophysical, and geochemical observations, and geodynamic modeling. The aim of this session is to bring together scientists from these different disciplines to discuss these issues, to attempt to place better constraints on the amount of water in Earth's mantle.

Conveners:

Jason Phipps Morgan, Cornell University, 4164 Snee Hall, Cornell University, Ithaca, NY 14853 USA, Tel: 607 255-1631, email: jp369@cornell.edu

Monika Koch-Müller, GeoForschungsZentrum Potsdam, Telegrafenberg, Potsdam, 14473 DEU, Tel: ++ 49 331 288 1492, Fax: ++ 49 331 288 1402, email: mkoch@gfz-potsdam.de

Joseph R Smyth, University of Colorado, Department of Geological Sciences, Boulder, CO 80309-0399 USA, Tel: 303-492-5521, Fax: 303-492-2606, email: smyth@colorado.edu

Shun-Ichiro Karato, Yale University, Department of Geology and Geophysics, New Haven, CT 06520-8109 USA, Tel: 203-432-3147, Fax: 203-432-3134, email: shun-ichiro.karato@yale.edu

Lars Ruepke, IfM-GEOMAR, Wischhofstr. 1-3, Kiel, 24148 DEU, Tel: +49.431.6002324, email: lruepke@ifm-geomar.de

Alison Pawley, University of Manchester, Department of Earth Sciences,

Manchester, M139PL GBR, Tel: ++44 161 275 3804, Fax: ++44 161 275 3947, email: alison.pawley@man.ac.uk

Suzan van der Lee, Northwestern University, Department of Geological Sciences 1850 Campus Drive, Evanston, IL 60208-2150 USA, Tel: 847-491-8183, Fax: 847-491-8060, email: suzan@earth.northwestern.edu

Eiji Ohtani, Tohoku University, Institute of Mineralogy, Petrology, and Economic Geology, Faculty of Science, Sendai, 980-8578 JPN, Tel: +81-22-217-6662, Fax: +81-22-217-6662, email: ohtani@mail.tains.tohoku.ac.jp

Steven D Jacobsen, Carnegie Institution of Washington, Geophysical Laboratory 5251 Broad Branch Rd. NW, Washington, DC 20015-1305 USA, Tel: 202-478-7975, Fax: 202-478-8901, email: s.jacobsen@gl.ciw.edu

Union

Discovery of Post-Perovskite Phase Transition and the Deep Lower Mantle. In the past 30 years the whole lower mantle is commonly thought to contain the perovskite structure. Recently in the past 6 months, there have been simultaneous discoveries from both X-ray observations and first principles calculations that MgSiO₃ perovskite transforms into a new phase at a pressure range corresponding to a depth a couple of hundred kilometers above the core-mantle boundary. The elastic properties of this post-perovskite phase is also quite different from the perovskite that explains the seismic anomalies in the D" region. We are calling for papers from all fields, such as mineral physics, seismology, geochemistry and geodynamics which address this poignant issue. This session will draw attention from the entire community in the wake of this important discovery, which has far-reaching consequences.

Conveners:

Kei Hirose, Tokyo Tech, Earth & Planetary Sciences, Tokyo Tech 2-12-1 Ookayama, Meguro, Tokyo, 152-8551 JPN, Tel: +81-3-5734-2618, Fax: +81-3-5734-3538, email: kei@geo.titech.ac.jp

Thorne Lay, University of California, Santa Cruz, Earth Sciences Department and IGPP-UCSC, University of California, Santa Cruz, Santa Cruz, CA 95064 USA, Tel: 831-459-3164, Fax: 831-459-3074, email: tlay@es.ucsc.edu

Peter van Keken, University of Michigan, Department of Geological Sciences, 425 East University Avenue, University of Michigan, Ann Arbor, MI 48109-1063 USA, Tel: 734-764-1497, Fax: 734-763-4690, email: keken@umich.edu

Renata Wentzcovitch, University of Minnesota, Department of Chemical Engineering and Materials Science, University of Minnesota, 421 Washington Ave. SE, Minneapolis, MN 55455 USA, Tel: 612-625-6345, Fax: 612-626-7246, email: wentzcov@cems.umn.edu

The Deep Earth Engine: Geophysics and Geochemistry. The present-day state and dynamics of the Earth's deep interior provide the key to understanding the forces driving geology. A full characterization of the deep Earth engine is thus a prerequisite for our ultimate goal of understanding Earth circulation as a whole. This interdisciplinary session will bring together seismologists, geodynamicists, geomagnetists, mineral physicists, petrologists, and geochemists to explore global and regional aspects of the internal structure of the Earth's interior. This session promotes the goals of SEDI (Studies of the Earth's Deep Interior), CIDER (Cooperative Institute for Deep Earth Research) and GERM (Geochemical Earth Reference Model).

Conveners:

William F McDonough, Univ of Maryland, Dept of Geology, College Park,
MD 20782 USA, Tel: 301-405-5561, Fax: 301-405-3597, email:
mcdonough@geol.umd.edu

Louise Kellogg, Univ of California at Davis, Dept of Geology, Davis, CA
95616 USA, Tel: 530-752-3690, Fax: 530-752-0951, email:
kellogg@geology.ucdavis.edu

Bernie Wood, Univ of Bristol, Dept of Earth Sciences Wills Memorial
Building Queen's Road, Bristol, BS8 1RJ GBR, Tel: +44-117-954-5422, Fax:
+44-117-9253-385, email: B.J.Wood@bristol.ac.uk

Barbara Romanowicz, Univ of California at Berkeley, Dept. of Earth and
Planetary Sciences 307 McCone Hall, Berkeley, CA 94720 USA, Tel: 510-
642-1844, Fax: 510-643-5811, email: barbara@seismo.berkeley.edu

Uli Christensen, Max-Planck-Institut für Aeronomie, Max-Planck-Str. 2,
Katlenburg-Lindau, D-37191 DEU, Tel: +49-5556-979-542, Fax: +49-5556-
979-219, email: christensen@linmpi.mpg.de