

## August, 2010

### VGP Section Newsletter #41

Dear colleagues,

There is much information to impart in this latest issue of the AGU Volcanology, Geochemistry and Petrology Section newsletter, including changes in VGP leadership, as well as various aspects of the upcoming Fall Meeting. Archives of the newsletter, as well as a host of useful VGP-related information, can be found at <http://vgp.agu.org>. Please provide any feedback or items for future newsletters to Sarah Fagents at <mailto:fagents@hawaii.edu>.

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***(1) MESSAGE FROM THE VGP PRESIDENT***

This is my first Newsletter as President of VGP. I start work at an exciting and challenging time. Major changes are occurring within AGU as it changes its Governance, with the start of a new Executive Secretary (Christine McEntee) in September and many ideas in the ether on how to make AGU an even more effective and excellent organisation. I attended the leadership meeting of Council in June and there is a real buzz about the AGU leadership and many exciting ideas, including plenty that the Sections will need to play a key role in. I hope that VGP can play a leading role in these new developments.

I can do no better here than to re-state the core guiding values of AGU from the new strategic plan:

1. The scientific method
2. The generation and dissemination of scientific knowledge
3. Open exchange of ideas and information
4. Diversity of backgrounds, scientific ideas and approaches
5. Benefit of science for a sustainable future
6. International and interdisciplinary cooperation
7. Equality and inclusiveness
8. An active role in educating and nurturing the next generation of scientists
9. An engaged membership
10. Unselfish cooperation in research
11. Excellence and integrity in everything we do

Over the last few months I have experienced the importance of "international and interdisciplinary co-operation" during the Icelandic ash crisis. As a member of the UK's advisory group advising Government and working closely with the UK Met office it has become clear there is room for improvement with regard to international co-operation and integration.

A change in leadership should acknowledge the great work of past leaders of VGP. Bernie Wood steps down from the Executive Committee in his role as Past President and Alex Halliday moves into that role. Both Bernie and Alex have continued progress and innovation within VGP in many different ways. There will be a break in the UK Presidents of VGP with Catherine McCammon coming in as President-elect. The two VGP Secretaries play a key role and have a time-consuming job in organizing scientific sessions for the Fall meeting. Thanks to Janne Blichert-Toft and Paul Wallace who are stepping down as the Geochemistry and Volcanology Secretaries for a great job, and welcome to the incoming Secretaries Matthew Kohn and Anita Grunder, who have already started work on this coming Fall AGU. The VGP committees continue to do an outstanding job and their roles are greatly appreciated. Some of the Chairs are stepping down, namely Jon Davidson (Kuno) and Catherine McCammon (Fellows). They are being replaced by Bruce Houghton (Kuno) and Bernard Marty (Fellows). I would like to thank Simon Turner and Georg Zellmer for their roles in organizing VGP sessions at the Western Pacific Meetings, and to Don Baker for his work in organizing VGP sessions at the Spring Meeting in Toronto and the Meeting of the Americas meeting in Brazil this August.

The VGP Section thrives on volunteers. If any member wishes to play a role then please contact me. I am sure we can find a role. The new Executive Committee is particularly keen on involving young scientists and students, so please send me suggestions for people who might be interested and enthusiastic.

#### *Review of VGP*

The Executive Committee will be carrying out over the next several months a review of the way VGP functions and its long term strategy. Members'™ views are of course essential in looking for ideas, so if there is anything you think that we should be doing but are not, please contact me. More details on the review will be provided in future newsletters.

#### *New VGP Web Site Host*

VGP has a new host for its web site at the University of South Florida and Diana Roman has kindly agreed to run the web site, taking over from Chris Nye. VGP is greatly indebted to Chris for supporting the web site for many years and also very grateful to Diana for taking over this key task. The new USF web site is up and running so members are encouraged to have a look at it (<http://vgp.agu.org/>). If you have ideas on what additional material should be on the web site, then please let the officers and Diana ([droman@usf.edu](mailto:droman@usf.edu)) know.

#### *AGU Fellowship, Medals and Awards*

First of all, VGP announces that the two Bowen Award winners for 2010 are Hans Keppler and Sam Bowring. Again two outstanding VGP colleagues have been identified and the Executive Committee gives their congratulations to Hans and Sam. Also thanks to the Bowen Award Committee for their excellent work under the Chair of Frank Spear.

AGU has extended the deadline for the nomination for AGU Fellows to 1st October. Fellows will be

honored at the Fall meeting starting in 2011, rather than at the Spring meeting as in previous years, thus allowing more time for the nomination procedure. AGU Fellowship is a hugely important part of the AGU Awards system and is a high honor. Please give careful consideration about colleagues who should be acknowledged by being elected a VGP Fellow. The list of current AGU Fellows with VGP affiliation can be found on the VGP web site, as can the instructions on how to prepare and submit a nomination package (see <http://www.agu.org/about/honors/fellows/nominations/>). VGP has been very successful in getting VGP members elected - tVGP SESSIONS AT THE AGU FALL MEETING, SAN FRANCISCO, 13-17 DECEMBER 2010 here were 14 new VGP Fellows in 2010 - so let's keep this great record going.

Likewise please consider colleagues within the VGP Section for major AGU Awards. As detailed on the VGP web site there are a number of possibilities. There are the most prestigious Union Medals; Charlie Langmuir is chairing that Committee. There is the Bowen Award; the deadline for next year is 1st May 2011. There is the Macelwene Medal for really outstanding rising stars; the VGP committee for that award is chaired by John Eiler (deadline 15 March 2011).

One immediate issue is the Kuno Award. The Award Committee asks members to submit nominations for an extended deadline of 17th September 2010. The Kuno Award committee is now chaired by Bruce Houghton ([bhought@soest.hawaii.edu](mailto:bhought@soest.hawaii.edu)). The nomination file should include: (1) a nominating letter from a colleague, (2) a CV for the candidate, (3) a list of publications by the candidate, and (4) up to three supporting letters. The nomination file should be submitted electronically to the Chair of the Committee.

#### *Daly Lecture 2010*

I have great pleasure in announcing the Daly Lecturer for 2010 as Dominique Weiss (University of British Columbia, Canada). This year the Daly lecture will be delivered at Fall AGU. The title, time and venue will be announced later, but Dominique plans to discuss exciting new results on Hawaii that have implications for understanding the mantle plume.

#### *Best Student Presentations: Request for Conveners of VGP Sessions*

One of the most important jobs at the Fall meeting rests with the Education and Outreach Committee. Last Fall meeting there were 425 VGP student presentations from which the Committee selected 11 of the best for awards. The collaboration of session conveners is very important and much appreciated. Conveners are asked to identify two people to assess the student presentations at their session. The conveners can of course do this themselves, but sometimes have conflicts if their own students are presenting. The solution is to identify colleagues at the sessions who are willing to do this job. Students are always thrilled to receive this award, so conveners' support for the process is much appreciated.

#### ***(2) VGP SESSIONS AT THE AGU FALL MEETING, SAN FRANCISCO, 13-17 DECEMBER 2010***

The deadline for submission of abstracts for the AGU Fall meeting is 2 September 2010. Once again, there is a large number of VGP-sponsored sessions that will be of interest to the VGP community. Session descriptions are given below. Further details for the Fall Meeting can be found at <http://www.agu.org/meetings/fm10/>

V01: Volcanology, Geochemistry, and Petrology General Contributions

Convener: Anita Grunder, Oregon State University (grundera@geo.oregonstate.edu) Matthew Kohn, Boise State University (mattkohn@boisestate.edu)

V02: Looking Backward and Forward: Volcanology in 2010 and 2020

Conveners: Jonathan Fink, Arizona State University, jon.fink@asu.edu  
John Eichelberger, US Geological Survey, jeichelberger@usgs.gov

In a session at Fall 2000's AGU called "Volcanology 2010: How Will the Science and Practice of Volcanology Change in the Coming Decade?" 12 presentations laid out visions for how volcanology might evolve in the coming ten years. Now, in 2010, we have the unique opportunity to look back to see how accurate those forecasts were (and why), and to repeat the exercise for the year 2020. In the proposed session, many of the original speakers will review their predictions and make new assessments of the future, joined by other geoscientists, futurologists, and policy experts offering science-based predictions about volcanology in 2020.

V03: Innovations in Isotope Mass Spectrometry and Isotope Metrology in Geosciences

Conveners: Stephan Richter, IRMM-JRC-EU, stephan.richter@ec.europa.eu  
Chuan-Chou Shen, National Taiwan University, river@ntu.edu.tw  
Jacqueline Mann, NIST, jmann@nist.gov  
Lars Borg, Lawrence Livermore National Laboratory, borg5@llnl.gov

Isotope Mass Spectrometry is essential to geochemical research, and recent advances in technologies and methodologies have spawned new applications in diverse fields of earth sciences. We invite contributions that emphasize new developments in isotope mass spectrometry, including advances in instrumentation, establishment of isotope reference materials, techniques for high precision ratio determinations, and methods for measuring radiogenic, cosmogenic, and stable isotopes, among others.

V04: Geologic Maps and Quantitative Applications

Conveners: Julie Donnelly-Nolan, jdnolan@usgs.gov, Ray Wells, rwells@usgs.gov  
Michael Clynne, mclynne@usgs.gov, Russell Graymer, rgraymer@usgs.gov  
US Geological Survey

Geologic maps present spatial and temporal information on the composition, orientation, and evolution of earth materials and structures. New digital geologic maps facilitate quantitative assessment of, e.g., earthquake, volcanic, and landslide hazards, deformation and eruption rates, subsurface structure, petrologic modeling, surface processes, and climate change through time. We solicit poster contributions of geologic maps, both digital and traditional, including innovative 3D and 4D maps and those utilizing web-based visualization software, that provide solutions to problems of geologic history, tectonism, hazards, and resources.

V05: The 2010 Eruption of Eyjafjallajokull A Landmark Event for Volcanic Cloud Hazards

Conveners: Simon Carn, Michigan Technological University, scarn@mtu.edu  
Fred Prata, Norwegian Institute for Air Research, fred.prata@nilu.no  
Sigrun Karlsdottir, Icelandic Meteorological Office, sigk@vedur.is  
Andrew Tupper, Australian Bureau of Meteorology, A.Tupper@bom.gov.au

Eyjafjallajokull (Iceland) began erupting on March 20, 2010 with a basaltic fissure eruption that evolved into an explosive, phreatomagmatic event. Clouds of fine volcanic ash dispersed over mainland Europe, triggering an unprecedented closure of airspace. The crisis led to the designation of a

safe concentration of airborne ash for jet aircraft operations ( $0.002 \text{ g m}^{-3}$ ). We solicit contributions on the forecasting, tracking, transport, fate and sampling of emissions from the eruption, including dispersion modeling, remote sensing of ash and gas emissions from the ground/air/space, direct sampling, ash analysis, health and environmental impacts, and analysis of the new ash tolerance criteria.

#### V06: 175 Years of Geological Research in the Galapagos

Conveners: Dennis Geist, University of Idaho, [dgeist@uidaho.edu](mailto:dgeist@uidaho.edu)

Karen Harpp, Colgate University, [kharpp@mail.colgate.edu](mailto:kharpp@mail.colgate.edu)

Eric Mittelstaedt, Laboratoire FAST, [mittelstaedt@fast.u-psud.fr](mailto:mittelstaedt@fast.u-psud.fr)

Christopher Sinton, University of Redlands, [chris\\_sinton@redlands.edu](mailto:chris_sinton@redlands.edu)

The Galapagos Islands and the Galapagos Spreading Center constitute one of the planet's best systems for understanding tectonic processes at all scales, including mid-ocean ridge magmatism, hotspots, and interaction between the two. Moreover, recent geophysical studies within the archipelago are providing key insight into volcano dynamics. Three oceanographic cruises are taking place in the region in 2010, and this session will be devoted to synthesizing that work in addition to studies within the archipelago itself.

#### V07: Tracking Magma Through the Crust to Eruption

Conveners: Thora Arnadottir, University of Iceland, [thora1@hi.is](mailto:thora1@hi.is)

Olgeir Sigmarsson, CNRS, [o.sigmarsson@opgc.univ-bpclermont.fr](mailto:o.sigmarsson@opgc.univ-bpclermont.fr)

Kristin Vogfjord, Icelandic Meteorological Office, [vogfjord@vedur.is](mailto:vogfjord@vedur.is)

Christopher Bean, University College Dublin, [chris.bean@ucd.ie](mailto:chris.bean@ucd.ie)

The 2010 eruption of Eyjafjallajokull (Iceland) demonstrates the importance of being able to monitor changes in magma volume and pathways in real time. In the case of Eyjafjallajokull, intrusive activity led to a basaltic flank eruption on March 20, which in turn was followed by a second more explosive eruption in the ice covered summit caldera on April 14. Eruptive behavior depends on the vent location, as well as magma volume and composition, which can be difficult to forecast. The correspondence between observed volcanic tremor and eruption activity is clearly complex. The aim of this session is to bring together interdisciplinary studies from volcanoes worldwide to shed light on magma storage, ascent as well as intrusive and eruptive behavior.

#### V08: Volcanism and Environmental Change

Conveners: Susanne Straub, Lamont Doherty Earth Observatory, [smstraub@ldeo.columbia.edu](mailto:smstraub@ldeo.columbia.edu)

Maria Luisa Tejada, University of the Philippines, [ma\\_luisa.tejada@up.edu.ph](mailto:ma_luisa.tejada@up.edu.ph)

Volcanism has long been recognized as a driver of short term ( $<10^6$  yrs) and long term ( $\approx 10^6$  yrs) environmental change. Gaseous and aerosol emanations, the varying pressure of glacial loading, the recycling of seafloor carbonates have all been linked to Cenozoic climate evolution, whereas oceanic circulation and chemistry may be influenced by emplacement and erosion of large volumes of volcanic rocks. We invite papers on all aspects that relate volcanism and its products to the mechanisms of the ocean-atmosphere systems that shape the environment on Earth. Contributions that highlight causative links and assess the magnitude of the volcanic influence on environmental, and consequent biotic changes, throughout geological time are particularly welcome.

#### V09: Dynamics of Pyroclastic Density Currents

Conveners: Benjamin Andrews, UC Berkeley, [andrews@eps.berkeley.edu](mailto:andrews@eps.berkeley.edu)

Josef Dufek, Georgia Institute of Technology, dufek@gatech.edu

Pyroclastic density currents (PDCs) encompass a range of physical processes from dense granular flows to dilute, turbulent multiphase flows. These flows can travel great distances, generate buoyant plumes, have broad grain size distributions, and display a range of interactions with their beds. This session is intended to promote a multidisciplinary discussion incorporating information from depositional studies, experiments, numerical models, and geophysical approaches. We hope for contributions that discuss: 1) current transport and what eruption parameters govern transport; 2) transfer of heat, mass, and momentum within the current, to the ground, and to coignimbrite plumes; 3) effects of landscape and topography; 4) depositional processes.

#### V10: Quantifying Magma Mixing Processes

Conveners: Benjamin Andrews, UC Berkeley, andrews@eps.berkeley.edu  
Brandon Browne, California State University, bbrowne@fullerton.edu

Magma mixing events affect magma bodies in myriad ways. Mixing can produce rapid (and spatially variable) changes in composition, phase assemblage, temperature, and volatile content, and trigger eruption. Although many studies have described the magnitudes of thermal and compositional changes during mixing, comparatively little work has quantified the timescales and length-scales of mixing events. We hope for contributions that use a combination of modeling and petrological or geochemical observations to discuss: 1) Transient effects of recharge on the host magma; 2) Timescales and length-scales of mixing, hybridization, and homogenization; 4) Trends in mixing processes over the lifetime of volcanoes; 5) Magma mixing events as triggers for eruption.

#### V11: The Causes and Consequences of Rhyolite Volcanism at Chaiten Volcano, Southern Chile

Conveners: Jonathan Castro, Monash University, Jonathan.Castro@monash.edu  
John Pallister, USGS, jpallist@usgs.gov  
Alvaro Amigo, SERNAGEOMIN, aamigo@sernageomin.cl  
Frederick Swanson, Forestry Sciences Lab, fred.swanson@oregonstate.edu

The May 2008-present eruption of Chaiten volcano, Chile, is the first high-silica rhyolite eruption to have been monitored, and the only one to be witnessed and well described in decades. Hence, abundant new data have emerged concerning eruption mechanisms at silicic volcanoes and the immediate impacts of Chaiten's eruption on surrounding ecological and fluvial systems. This session will foster multidisciplinary exchange among workers researching this unique volcano. We encourage papers that synthesize eruption monitoring, biological, hydrological, remote sensing and geological field observations, laboratory investigations, and synoptic studies of the current and pre-historic eruptions at Chaiten.

#### V12: Metamorphic Perspectives of Subduction Zone Evolution

Conveners: Gray Bebout, Lehigh University, geb0@lehigh.edu  
Bradley Hacker, UC Santa Barbara, hacker@geol.ucsb.edu  
Horst Marschall, University of Bristol, horst.marschall@bristol.ac.uk

This session is devoted to understanding metamorphic evolution of subducting oceanic slabs and sediments and the slab-mantle interface (subduction channel). Petrological, geophysical, geochemical and theoretical perspectives are encouraged. Issues examined include (1) relationships among deformation, seismicity, devolatilization, fluid flow, and phase changes in subducting slabs, (2) geochemical and mechanical processes illuminated by exposed HP to UHP metamorphic rocks, (3)

sources, sinks, and pathways (rates, element transport, and connections with arc magmatism), (4) nature, mechanical properties, and evolution of the subduction channel, and (5) phases and volatiles that survive subduction into the deeper mantle.

#### V13: EARTHTIME Geochronology

Conveners: Paul Renne, Berkeley Geochronology Center, [prenne@bgc.org](mailto:prenne@bgc.org)

Samuel Bowring, MIT, [sbowring@mit.edu](mailto:sbowring@mit.edu)

Leah Morgan, Vrije Universiteit, [leah.morgan@falw.vu.nl](mailto:leah.morgan@falw.vu.nl)

Joseph Hiess, British Geological Survey, [jies@bgs.ac.uk](mailto:jies@bgs.ac.uk)

The NSF- and ESF- funded EARTHTIME initiatives seek to enhance and widely implement the ability to resolve geologic time with accuracy and precision at the  $\pm 0.1\%$  level or better. While ambitious, this goal is proving achievable in some cases and further improvement can be envisioned. This session will highlight the state of the art in high-precision, high-accuracy radioisotope geochronology including advances in analytical and computational methods as well as their applications to any field in the Earth, life, and planetary sciences. Though EARTHTIME efforts thus far have emphasized the U/Pb and Ar/Ar techniques, contributions dealing with other radioisotopic systems (e.g. Re/Os, Lu/Hf, U-series) with potential for improved accuracy and precision are encouraged.

#### V14: The 2008-2010 Eruption of Halema'uma'u, Kilauea II: Eruption, Ascent and Plume Dynamics

Conveners: James Kauahikaua, Hawaiian Volcano Observatory, [jimk@usgs.gov](mailto:jimk@usgs.gov)

Bruce Houghton, University of Hawaii, [bhought@soest.hawaii.edu](mailto:bhought@soest.hawaii.edu)

Matthew Patrick, USGS-HVO, [mpatrick@usgs.gov](mailto:mpatrick@usgs.gov)

Rebecca Carey, University of Hawaii, [beccarey@hawaii.edu](mailto:beccarey@hawaii.edu)

The ongoing eruption of Halema'uma'u crater at Kilauea, is an unprecedented opportunity to match closely timed eruption observations from video cameras with geophysical, geological and microtextural data sets. For much of the eruption the magma free surface has been at depths of c. 200 m in the cylindrical conduit, and undergoing open-system outgassing. Activity has taken two forms: short-lived impulsive explosions linked to vent-wall failures and long intervals of pulsating, nearly continuous outgassing with minor ash  $\pm$  spatter emission. Following last year's successful session, we welcome contributions from geophysics, petrology and gas geochemistry, physical volcanology and numerical modeling.

#### V15: The Subduction Filter: Effects on the Mantle, Arcs and Continents

Conveners: Catherine Chauvel, University of Grenoble, [catherine.chauvel@ujf-grenoble.fr](mailto:catherine.chauvel@ujf-grenoble.fr)

Terry Plank, Columbia University, [tplank@ldeo.columbia.edu](mailto:tplank@ldeo.columbia.edu)

Cornelia Class, Lamont Doherty Earth Observatory, [class@ldeo.columbia.edu](mailto:class@ldeo.columbia.edu)

Roberta Rudnick, University of Maryland, [rudnick@geol.umd.edu](mailto:rudnick@geol.umd.edu)

Subduction zones are the places where material from the surface of the Earth is sent back into the mantle after being changed by mineral-fluid/melt reactions. They act as filters separating material added to continental crust through arc volcanism, from residues that are recycled into the mantle, and whose compositions may differ markedly from the original subducted slab. This session aims at evaluating information provided by studies of volcanic arcs, mineral-fluid processes in the slab, newly formed crust, and mantle melts. The aim is to highlight the key processes that occur in subduction zones and how they influence the differentiation of the Earth and the long-term evolution of continental crust and mantle.

#### V16: Chemical, Physical and Petrographic Perspectives on Magmatic Differentiation

Conveners: Adam Kent, Oregon State Univ, adam.kent@science.oregonstate.edu

Sarah Collins, Durham University, s.j.collins@durham.ac.uk

Claire McLeod, Durham University, c.l.mcleod@dur.ac.uk

George Bergantz, Univ Washington, bergantz@u.washington.edu

Advances in microanalytical techniques have made it possible to study the composition and history of igneous rocks in intricate detail. It is of critical importance to place these fine scale measurements in a clear petrological, textural and physical framework. This session aims to bring together workers interested in the processes of magmatic differentiation. We are especially interested in submissions that combine geochemical microanalysis and rock microstructure with observations from petrologic studies and physical and theoretical modeling in order to examine the sequence and timing of physical and chemical processes during differentiation and how these events relate to the behavior of volcanic systems.

#### V17: Supervolcanoes: Modeling of Eruption Scenarios and their Regional and Global Impacts

Conveners: Michael Rampino, New York University, mrr1@nyu.edu

Flavio Dobran, dobran@westnet.com

Supervolcanoes can affect the land and atmosphere on regional and global scales. Modeling of these eruptions is in its infancy, both in terms of utilizing adequate physical models and in numerically solving the resulting mathematical equations. The session is organized for the purpose of bringing together a multidisciplinary group of researchers interested in producing data and physico-chemical mathematical models of large-scale volcanic eruptions. Volcanological, climatological and geological data are sought to establish the provenance and characterization of magma and distribution of deposits, with the aim of producing a bound volume of original contributions.

#### V18: Life After Collapse: Five Decades of Edifice Reconstruction at Bezymianny Volcano, Kamchatka

Conveners: Pavel Izbekov, Geophysical Institute, pavel@gi.alaska.edu

Jeffrey Freymueller, University of Alaska Fairbanks, jeff.freymueller@gi.alaska.edu

Evgeny Gordeev, Institute of Volcanology and Seismology, gordeev@kscnet.ru

John Pallister, USGS, jpallist@usgs.gov

Partial edifice collapse followed by a renewal of eruptive activity has been witnessed at several volcanic systems during the 20th century, including Bezymianny and Shiveluch in Kamchatka and Mt. St. Helens in Cascadia. The 1956 Bezymianny eruption followed by five decades of a nearly continuous eruptive activity provides an excellent example of magma system response to the edifice collapse. This session will bring together multi-disciplinary studies that document and explain changes in Bezymianny magma system since the onset of the ongoing eruptive activity. Contributions that highlight similar volcanic systems such as Mount St Helens, Shiveluch, and Montserrat are particularly welcome.

#### V19: Magmatic Architecture During Flow: Constraints on Timescales and Dynamics of Magma Ascent

Conveners: Luca Caricchi, University of Bristol, l.caricchi@bristol.ac.uk

Jonathan Castro, Monash University, Jonathan.Castro@monash.edu

Yan Lavalley, LMU Munchen, lavalley@min.uni-muenchen.de

Hugh Tuffen, Lancaster University, h.tuffen@lancaster.ac.uk

During magma ascent, changes in pressure and temperature lead to crystallisation, volatile exsolution



and, ultimately, profound changes in flow properties. The resulting fabrics such as aligned crystals, sheared vesicles or flow bands record the deformation history. Complementarily, timescales of degassing can be quantified from volatile concentration gradients at fractures and bubble margins. The interpretation and quantification of such features is important for understanding the dynamics and timescale of magma ascent. We solicit multidisciplinary contributions that include field descriptions, numerical, analytical and experimental studies of textural and chemical architecture of deformed magmas.

#### V20: Volatiles in Magmas: the Breath of the Deep Earth

Conveners: Philipp Ruprecht, Lamont-Doherty Earth Observatory, ruprecht@ldeo.columbia.edu  
Sylvie Demouchy, Geosciences Montpellier -CNRS-, demouchy@gm.univ-montp2.fr

H<sub>2</sub>O, CO<sub>2</sub>, sulfur, and other volatile elements are major players in controlling magma generation and transport, especially the final degassing and eruption processes. In addition to the overall volatile budget that controls those processes and large-scale geochemical cycling, diffusion of volatile elements in mantle and magmatic minerals permits to time-scales magmatic processes, providing an exclusive kinematic window toward the Earth's interior. This session invites abstracts on experimental, computational and field-based analytical studies that shed new light on magmatic processes that range from the mantle composition to eruption dynamics, in which volatiles are key parameters in developing new ideas in igneous petrology and volcanology.

#### V21: Mass Independent Isotope Fractionations: Empirical, Experimental and Theoretical Perspectives

Conveners: John Eiler, Caltech, eiler@gps.caltech.edu  
Pierre Cartigny, IGP-Paris, cartigny@ipgp.jussieu.fr  
Edwin Schauble, UCLA, schauble@ucla.edu

The occurrence of mass-independent isotope fractionations have been increasingly reported in both terrestrial and non-terrestrial objects for both light (O, S) and heavy stable isotopes (U, Hg etc...). These gave rise to geochemical tools that contribute to our understanding of the formation and dynamic of our solar nebula, present-day and past atmospheric chemical cycles. The physical, including quantum mechanical, basis of mass-independent fractionations are not fully understood - and probably not all identified. This session will focus on the empirical, experimental and theoretical approaches to understanding the occurrence or absence of mass-independent fractionations of isotopes.

#### V22: Lakes in Volcanic Environments: Geochemical, Limnological, Biological and Geophysical Aspects

Convener: Dmitri Rouwet, Istituto Nazionale di Geofisica e Vulcanologia, dmitrirouwet@gmail.com  
Franco Tassi, University of Florence, franco.tassi@unifi.it  
Shaul Hurwitz, U.S. Geological Survey, shaulh@usgs.gov  
Lisa Morgan, lmorgan@usgs.gov

Volcanic lakes can be viewed as windows into the deeper parts of active magmatic-hydrothermal systems. Variations in the volcanic activity are preserved in the chemical and physical state of the lakes, providing valuable information for volcano surveillance and monitoring. Crater lakes at actively degassing volcanoes are among the most acidic and saline features on the Earth's surface, while the deep neutral pH lakes may host huge CO<sub>2</sub>-CH<sub>4</sub> reservoirs able to trigger gas bursts. The present session will focus on these extreme environments employing geochemistry, geophysics, limnology, modelling, and biology to better understand a variety of volcanic processes and potential geologic hazards.

### V23: What Can Pyroclasts Tell Us?

Conveners: Ulrich Kueppers, University of Munich, ulli@min.uni-muenchen.de

Richard Brown, drrichyjamesbrown@hotmail.com

Corrado Cimarelli, University of Munich, cimarelli@min.uni-muenchen.de

Many active volcanoes are equipped with various scientific instruments, nonetheless, our mechanistic understanding of the processes behind recorded signals and observed phenomena is still insufficient. Pyroclasts, the only direct witness of an eruption, contain information on the physical processes during an eruption, transport, and deposition. This session is addressing scientists from all disciplines analysing volcanic activity with a deposit-based approach. We seek contributions from field and experimental volcanology, monitoring and computational modelling. We want to explore the state-of-the-art in analysing and interpreting pyroclasts, build dialogue about how best to decipher eruption mechanisms from pyroclastic deposits and share best practice.

### V24: Diffusion in Minerals and Melts

Conveners: Youxue Zhang, Univ of Michigan, youxue@umich.edu

Daniele Cherniak, Rensselaer Polytechnic Inst, chernd@rpi.edu

Diffusion in minerals and melts greatly affects many geological processes and the evolution of geological systems. Innovations in experimental methods are expanding our ability to study diffusion in geological materials, and advances in analytical techniques are improving resolution and sensitivity. Theoretical and computational developments have permitted deeper understanding of diffusional processes and properties. We invite submissions from studies of diffusion in minerals and melts from theoretical, experimental and empirical perspectives, and from modeling of processes that depend significantly on diffusive transport. The session will highlight and extend the themes presented in the short course 'Diffusion in Minerals and Melts' sponsored by MSA and GS.

### V25: Generation and Evolution of Alkaline to Sub-alkaline Magmas

Conveners: Romain Meyer, MIT, mail@romain-meyer.eu

Sebastien Pilet, University of Lausanne, Sebastien.Pilet@unil.ch

Etienne Medard, Universite Blaise Pascal, E.Medard@opgc.univ-bpclermont.fr

Ralf Gertisser, Keele University, r.gertisser@esci.keele.ac.uk

This session is designed to bring together multiple disciplines to understand the generation and evolution of alkaline to sub-alkaline magmas observed in rift volcanic systems and intraplate settings. This session will include discussion on the mechanism of magma generation (asthenospheric vs. lithospheric), on source characteristics (implication of recycled material, metasomatism, crustal anatexis), and on processes related to the chemical evolution of these magmas from mantle depths to shallow level (fractional crystallization, assimilation, magma mixing). We encourage contributions that explore new petrogenetic scenarios using field observation, petrological constraints as well as geophysical observations or numerical modeling.

### V26: The Constraint of Magma and Gas Transport by Geophysical and Geochemical Data

Conveners: Fred Witham, University of Bristol, fred.witham@bristol.ac.uk

Juliet Biggs, University of Oxford, Juliet.Biggs@earth.ox.ac.uk

Thierry Menand, Univ Bristol, t.menand@bristol.ac.uk

James Hammond, University of Bristol, j.hammond@bristol.ac.uk

Theoretical, computational and analogue models have elucidated the mass transport processes in volcanic systems. Validation of these models is of utmost importance to improve volcano monitoring and hazard assessment. Geophysical techniques (e.g. seismology, INSAR, strain measurement) and geochemical measurements (e.g. gas fluxes and compositions, melt inclusion chemistry) have the potential to constrain models of magma and gas transport. Data acquisition techniques should be tailored to the needs of modellers. Likewise, models should seek to incorporate and test against field data. Through the trans-disciplinary exchange of ideas we aim to identify strategies to better unify these complementary fields.

V27: Magma-Ice-Meltwater Interactions: Physical Processes and Implications for Volcanic Hazards  
Conveners: Hugh Tuffen, Lancaster University, h.tuffen@lancaster.ac.uk  
Christopher Waythomas, Alaska Volcano Observatory, chris@usgs.gov

Magma-ice interactions may greatly influence the style, duration, and products generated during eruptions at ice and snow clad volcanoes. External water from ice melt plays a key role in the eruptive process and may exacerbate the explosive component of an eruption. Meltwater may initiate other hazardous phenomena, such as outburst flooding and lahars. Our goal in this session is to bring together scientists engaged in studies of magma-ice interaction who are focused on the physical processes and hazards posed by these interactions. We are particularly seeking new results and perspectives from field, laboratory or theoretical studies of recent eruptions involving magma-ice interactions.

V28: Building the Volcanic Oceanic Crust  
Conveners: Roger Searle, Durham University, r.c.searle@durham.ac.uk  
Kay Achenbach, Durham University, kay.achenbach@durham.ac.u  
Bramley Murton, National Oceanography Centre, bjm@noc.soton.ac.uk  
Chris Waters, Woods Hole Oceanographic Institution, clwaters@mit.edu

One current focus of mid-ocean ridge research is the mechanisms and timescales of volcanic oceanic crust construction, with detailed studies at Lau Basin, EPR, Juan de Fuca, MAR, SWIR and elsewhere. Topics include the rate of melt delivery, its distribution in the crust, melt aggregation and interaction, relations between melt source, gabbroic crust and surface volcanism, episodicity and interplay of volcanism and faulting. Methodologies include high-resolution imaging and geophysics, detailed geochemistry, U-series and other dating methods. Cross-disciplinary and regional perspectives are important for attaining solutions. We solicit contributions on any aspect of these problems. Such diverse studies will provide an exciting and stimulating session.

V29: Microanalysis in Geoscience: Advances and Challenges CoSponsors: Atmospheric and Space Electricity, Mineral and Rock Physics, Tectonophysics  
Conveners: John Fournelle, University of Wisconsin, johnf@geology.wisc.edu  
Brian Jicha, University of Wisconsin, bjicha@geology.wisc.edu  
Heather Lowers, USGS, hlowers@usgs.gov  
Alan Koenig, USGS, akoenig@usgs.gov

Advances in microanalytic technology and instrumentation have given geoscientists new possibilities in examining earth materials. Low kV electron probe microanalysis with field emission guns, femto-second lasers, more versatile CL detectors, high precision Ar/Ar mass spectrometry for geochronology, EBSD-detectors hooked to SEMs, and improved SIMS analysis of smaller volumes, to name some. Challenges exist, e.g. interpreting and quantifying the results. There is an increasing need for development of well characterized standards. Sample preparation may be a stumbling block (e.g.

EBSD). We particularly invite abstracts which document unresolved problems. Co-sponsor: Microbeam Analysis Society.

#### V30: Innovative Geothermal Exploration Methods

Conveners: Daniel Stockli, The University of Kansas, [stockli@ku.edu](mailto:stockli@ku.edu)  
Brigitte Martini, Ormat Technologies, [bmartini@ormat.com](mailto:bmartini@ormat.com)

New research and development of renewable energy resources with special emphasis on geothermal exploration has experienced an unprecedented federal funding increase over the past few years. This renewed focus has attracted a new generation of geoscientists to the field of geothermal exploration and geothermal occurrence models, making this proposed session very timely. We attempt to attract scientists from academia, industry, and government to invigorate innovative geothermal exploration techniques, incl. seismology, magnetotellurics, remote sensing, isotope geochemistry, thermochronometry, etc. We seek to focus this session on latest developments in this revived field and attract researchers from diverse fields to help propel the science forward.

#### V31: Geochemistry and Geochronology of Accessory Phases

Conveners: Thomas Zack, Universitaet Mainz, [zack@uni-mainz.de](mailto:zack@uni-mainz.de)  
Daniel Stockli, The University of Kansas, [stockli@ku.edu](mailto:stockli@ku.edu)

Our understanding of accessory phases has expanded almost exponentially over the last decade. While progress in geochronology is strongly driven by technical advances, research on the geochemistry of accessory phases has intensified significantly by the emergence of accessory thermobarometry. Still, numerous other characteristics of accessory minerals give important constraints on geological processes. Unquestionable, the most versatile accessory phase is zircon. However, other phases are getting into the focus of intense studies, e.g. monazite, rutile, titanite and apatite. We seek to focus this session on latest developments and draw researchers together from such diverse fields as petrology, provenance studies and economic geology.

#### V32: Texture Controlled Geochronology: Linking Petrography, Mineral Zoning and Dating

Conveners: Andreas Moeller, University of Kansas, [amoller@ku.edu](mailto:amoller@ku.edu)  
Nigel Kelly, Colorado School of Mines, [nkelly@exchange.mines.edu](mailto:nkelly@exchange.mines.edu)

Providing a direct link between geochronological and petrological data by in-situ analysis is the key for robust constraints on the rates on local to crustal scale geologic processes including: deformation, metamorphism, mineral alteration, mountain building and mountain collapse. This session invites contributions using combinations of textural, geochemical and geochronological data to provide P-T-t-d histories by in situ methods. We aim to address process questions relating to the utility of macro- or microscale mineral textures as reliable relative timemarkers and to the rates of regional scale crustal processes. Studies using innovative imaging techniques to characterize and interpret textures are welcome.

#### V33: Ultrahigh-Pressure Metamorphism: 25 Years After the Discovery of Coesite and Microdiamond

Conveners: Larissa Dobrzhinetskaya, UC Riverside, [larissa@ucr.edu](mailto:larissa@ucr.edu)  
Richard Wirth, GFZ Potsdam, [wirth@gfz-potsdam.de](mailto:wirth@gfz-potsdam.de)  
Junfeng Zhang, Faculty of Earth Sciences, [jfzhang@cug.edu.cn](mailto:jfzhang@cug.edu.cn)

Exposures of UHP rocks, once thought to be restricted to European belts, are found in Asia, Africa, South-North Americas and Greenland. We invite contributions summarizing achievements in UHPM

discipline, and recent discoveries of new UHPM terranes, as well as advanced studies of petrology, mineralogy, rheology, geochemistry, zirconometry in well-known UHPM areas. Session will highlight studies of UHP metamorphism in different scales - collisional belts, mineral/rock slides in laboratories with the aid of advanced state-of-art analytical instruments, and experimental and numerical modeling of the UHPM processes related to deep subduction of continental lithosphere.

V34: Bowen Lecture

V35 Daly Lecture - Dominique Weiss

V36: Earth's First Few Hundred Million Years

Convener: James Badro, Institut de Physique du Globe de Paris, badro@ipgp.fr

Michael Walter, University of Bristol, M.J.Walter@bristol.ac.uk

Important recent findings in experimental petrology, cosmochemistry, geochemistry, and numerical modelling, have alternately corroborated or challenged the current paradigms surrounding the history and evolution of the early Hadean Earth. We seek to discuss and inter-relate these fundamental geological processes. We seek contributions from experimental/theoretical petrology and geochemistry, geochemistry and geochemical modelling, cosmochemistry and cosmochemical modelling, and geodynamics. We welcome contributions related to: accretion and giant impacts; core formation; crystallisation and degassing processes in the molten early mantle; formation of the earliest crust and oceans; initiation of the geodynamo and the magnetic field. This session is accompanied by an overview Union session, U05.

V37: Are Hotspots Hot?

Conveners: Gillian Foulger, University of Durham, g.r.foulger@durham.ac.uk

Peter Clift, University of Aberdeen, p.clift@abdn.ac.uk

James Natland, Rosenstiel School of Marine and Atmospheric Science, jnatland@rsmas.miami.edu

An anomalously hot mantle source is a requirement of the Plume hypothesis, but not of the shallow Plate hypothesis. Whether or not the temperature beneath "hotspots" is unusually high is a matter of current dispute. Methods used to measure mantle temperature include seismology, petrology, heat flow, and modeling ocean-floor topography, e.g., swells. A critical underpinning of these efforts is the thermal structure of the mantle, including the thickness of the surface conduction layer and expected lateral variations. This session solicits contributions, from all subdisciplines, that bear on estimating the temperature of the mantle beneath "hotspots". A diversity of viewpoints is anticipated and session time will be allocated to discussion.

In addition, the following sessions are co-sponsored by the VGP section, and may also be of interest to VGP members:

A50: Understanding atmospheric and terrestrial hydrological cycles with isotopes in water

A51: Physics and Chemistry of the Upper Troposphere and Lower Stratosphere

AE07: Volcano Lightning

B02: Microbes and Organic Matter in Marine Environments

B06: Linkages in Biogeochemical Cycles Between the Surface Ocean and Lower Atmosphere Over the Pacific Ocean

B07: The Ecosystem of Silicon Utilizing Organisms

B09: Metal Sorption on Organic and Inorganic Surfaces: From Laboratory to Model to Field  
B10: Monitoring and Modeling Biogenic Volatile Organic Compound Emissions: From the Leaf to the Landscape in the Past, Present and Future  
B14: Phosphorus: from Geochemistry to Genomes to Global Sustainability  
B16: Process-based Approaches in Geobiology: Understanding Modern and Ancient Systems  
B24: Cryospheric Biogeochemistry - Microbially Mediated Processes Within Ice, Water and Till  
B25: Biogeochemical Cycling in Glacial Ecosystems  
B34: Biogeochemistry of Urban and Suburban Ecosystems  
B36: Quantifying the Impact of Vegetation and Soil Weathering Processes on the Hydrosphere Using Biogeochemical Tracers  
B38: Stable Isotope Fluxes in Carbon and Water Cycles of Terrestrial Ecosystems  
B48: Geochemical Signals of Early Diagenesis  
B50: Linking Dissolved Organic Matter (DOM) Quality with Biogeochemical Cycles  
B51: Mercury Cycling in Heterogeneous Environments  
B53: The Role Of Methane Hydrates In The Earth System: Burps Of Death Or Seductive Irrelevance?  
B57: Geochemistry and Geobiology of Terrestrial Thermal Systems  
B58: Metal and Radionuclide Remediation in Biogeochemically-Dynamic Subsurface Environments  
B64: Climate and the Nitrogen Cycle  
B69: Nanoscale Insights into Aqueous and High Temperature Geochemistry  
B72: Application of Isotope and Genetic Platforms to Develop Spatial and Temporal Perspectives in Ecosystem Ecology  
DI06: The Transition Zone: Improved Scrutiny, Greater Complexity  
DI07: Structure and Dynamics of Earth's Core  
DI13: New Views on the Lithosphere-Asthenosphere Boundary  
DI14: Melts and Fluids in the Deep Mantle  
DI15: Mantle Heterogeneities  
ED06: Using Real- and Near-Real-Time Data in the Classroom  
ED11: New Resources, Approaches and Technologies for Teaching about Plate Margins  
ED12: Learning and Understanding Complexity in the Geosciences  
ED17: Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom  
ED18: Does Citizen-Science Equal Science Plus Public?  
ED19: Using Water Resource Issues to Engage and Educate  
EP02: General Contributions: Earth and Planetary Surface Processes Posters  
EP05: Advances in the Systematics of Terrestrial Cosmogenic Nuclides  
EP07: Quantifying Present and Ancient Rates of Earth Surface Processes  
G03: The Art and Science of Volcano Geodesy  
G21: Ground Based Geodetic Techniques and Science Applications  
GC42: Carbon Dioxide Sequestration via Mineral Carbonation: Insights from Field Observations, Experiments and Modeling  
GC43: Promising Paths of Research in Geological Storage of Anthropogenic CO<sub>2</sub>  
GP08: Magnetism of Glassy Materials  
H14: Enhanced Geothermal Systems: Characterization, Integration, Stimulation, Simulation and Induced Seismicity  
H37: CO<sub>2</sub> Sequestration Inside Pores: From Molecules to Microbes  
H45: Is microscale information needed in reactive transport models?  
H80: The Future of Arsenic: Emerging Threats and Scalable Solutions  
IN05: Sensor Networks: From Sensors to the Web  
IN08: Interoperability Barriers for Earth Science Data Systems

IN09: Use of Ontologies in Earth Science Informatics  
IN19: Information Technology Infusion Success Strategies  
IN23: Photography as Data: Applications to the Earth Sciences  
MR02: Stability, Elasticity and Rheology of Hydrous Phases: Geodynamical Implications  
MR05: The D' Layer  
MR08: Post Perovskite Under High Pressure-Temperature  
MR11: Physical State of Planetary Cores  
MR12: Mudstone Multiphysics  
NG03: Complex Networks in Geosciences  
NG04: Nonlinear Dynamics of Geochemical Systems: Feedbacks, Stability, Complexity and Pattern Formation  
NH03: Land-Ocean-Atmospheric Processes: Implication to Natural Hazards and Global Carbon Cycle  
NH04: Hazards Associated With Snow- and Ice-Capped Volcanoes  
NH13: Correlation and Coupling from Underground, Surface, to the Ionosphere  
NS05: Airborne Geophysics for Geohazards and Environmental Problems  
OS08: Trace Metals in Sulfidic Environments  
OS13: Fluid Flow and Gas Hydrates in Continental Margins  
OS14: Integrated Studies at Oceanic Spreading Centers: Linking Spreading Center Processes Across Disciplinary Boundaries  
OS15: Ocean Exploration  
OS20: Ocean Acidification: Observation and Prediction of Biogeochemical and Ecosystem-Scale Responses  
OS26: Deep-Sea Hydrothermal Systems: New Knowledge from New Discoveries and New Technology  
P07: Changes in the Lunar Paradigm: Implications of Hydrous Magmatism on Lunar Evolution  
P20: Explosive Volcanism in the Solar System  
PP06: Breakthroughs in Continental Paleothermometry: Applications of Terrestrial Proxies  
PP07: Studying Uncertainty in Paleoclimate Reconstruction  
PP11: Nitrogen Cycle in the Oceans, Past and Present  
PP12: Carbon Isotopes in Biogenic Carbonates  
S06: Monitoring Temporal Changes of Earth's Properties with Seismic Waves  
S07: Recent Advances in Infrasound Science  
SA13: Chemistry and Temperatures in the Upper Mesosphere and Lower Thermosphere  
T05: Interaction Between Magmatic and Tectonic Processes in Continental and Incipient Oceanic Rifts  
T06: Structure, Dynamics, and Evolution of the African-Arabian Rift Systems  
T11: The Global Low Velocity Zone  
T13: The Accidental GeoSwath  
T17: The Cenozoic West Antarctic Rift System (WARS): Observations, Interpretations, Models and Implications  
T18: Advances in Understanding the Central Andean Crust and Mantle Through Seismology and Geochemistry  
T19: Geologic and Geophysical Modeling of Supercontinent Dispersals  
T20: Investigation of the Earth's Interior Using Geophysical and Laboratory Measurements  
T21: The Wilson Cycle Revisited: Orogenic Cycles in Space and Time  
T22: New Views On Melt-Present Deformation In The Oceanic Lithosphere  
T23: The Formation and Deformation of the Mediterranean Basins, Continental Margins and Arcs  
T24: Recent Submarine Volcano-Tectonic Events Along Western Pacific Island-arcs, Back-arcs, and Subduction Zones  
T26: From Sediment Inputs to Seismogenesis at Subduction Zones  
T37: New Advances on Studies of the Tibetan Plateau and the Himalayas

T41: Contemporary Stress Field: Where We Come From and Where We Are Going  
T42: Evolution of the Amerasia Basin of the Arctic and its Continental Margins  
T43: The Colorado Plateau and Its Margins

Questions or ideas? Contact VGP Secretaries *Anita Grunder* ([grundera@geo.oregonstate.edu](mailto:grundera@geo.oregonstate.edu)) or *Matt Kohn* ([mattkohn@boisestate.edu](mailto:mattkohn@boisestate.edu))