

IAVCEI *News* 2006 No: 2

INTERNATIONAL ASSOCIATION OF VOLCANOLOGY AND CHEMISTRY OF THE EARTH'S INTERIOR

President's Message

Dear IAVCEI Members,

In the coming months we will be involved with the process of electing new officers for the association. Summer 2007 and the IUGG meeting in Perugia, Italy mark the end of term for our devoted Secretary General, Steve McNutt, and the two vice-presidents, Jocelyn McPhie and Toshitsugu Fuji after eight years in office. I end my term as president and Renato Solidum has also asked to end his term in the Executive Committee (EC).

I call all members to look for fine candidates for the new Executive Committee for the years 2007-2011, to urge suitable persons to run, and to send nominations to the nomination committee. The association needs strong candidates and members should be offered a choice with more than a single candidate for each position. The nomination committee will also look for suitable candidates, but every IAVCEI member can suggest a candidate for any of the eight positions of the EC (President, Secretary General, two vice presidents, and four members).

The procedure is simple: Any Affiliate or National Correspondent may nominate in writing any other current Affiliate or National Correspondent as an office-bearer for the Association provided (1) the nomination is seconded by three other current Affiliates or National Correspondents each from countries other than that of the nominee and (2) the nominee, nominator, and seconders are all from a country belonging to IUGG (the International Union of Geodesy and Geophysics).

Thus, each nomination should include (1) a short nomination letter that explains the qualities of the candidate and why he/she would make a fine EC member, (2) the CV of the candidate, and (3) three letters of support. All nominations must be sent to the



*Oded Navon
President*

chair of the nomination committee, Dr. Grant Heiken, at: 331 Windantide Place, Freeland, WA 98249-9683, USA (heiken@whidbey.com) and received by Dec. 15, 2006. The other members of the nomination committee are: Dr. Moyra Gardeweg – Chile, Dr. Wally Johnson – Australia, Dr. John Stix – Canada, Dr. Tad Ui –

Japan, and Dr. Sylvie Vergnolle – France.

The nomination committee will consider all candidates and, where necessary, will limit the number of candidates for each position to three. Ballots with the final list of candidates will be sent to all members in February or March 2007. Please read Grant Heiken's call in this newsletter, follow his advice and take an active part in these elections.

What are "members," "affiliates," and "National correspondents"? IAVCEI is part of IUGG and functions within the rules and regulations of the union. Countries and not individuals are members of IUGG (and of most of its associations). The representatives of each member-country are nominated by the "adhering body," which is usually a national academy or a similar institute. These bodies may nominate National Correspondents to the various associations of IUGG. When individual membership was established in IAVCEI, back in 1996 by president Grant Heiken and secretary general Wally Johnson, it was decided that each individual member (affiliate) and each national correspondent would have one vote in the election of the officers. I refer to all as "members."

The reason I went into this lengthy explanation is that these days there are discussions in various coun-

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President's Message

tries as to the right way to nominate the national affiliates. In Romania a democratic process was established a few years ago and now Mexico is undergoing a similar process. I believe that these processes will strengthen IAVCEI. We will hear more on that subject in the next newsletter.

Last, I would like to tell you about two initiatives aimed at volcanologists who work in developing countries. First, thanks to Steve Sparks who initiated the idea and to the great efforts of John Stix, the editor of *Bulletin of Volcanology* and of Maggie Mangan, the editor of *Journal of Volcanology and Geothermal Research*, Springer and Elsevier publishers agreed to add the two journals to the AGORA initiative. This means that universities and government institutes that subscribe to AGORA will gain access to these two journals as well. The project provides free access to literature related to food, agriculture, and environmental issues to institutions in countries with GNP of less than \$1,000 per capita. For example, a volcanologist at the University of Buea, Cameroon, will now have access to the electronic version of the two main volcanological journals. Institutions in countries where the GNP per capita is below \$3,000 also can subscribe to AGORA for a modest payment. I know that AGORA does not cover volcanologists in many countries that are threatened by volcanic hazards, but it is an important start. I hope that we will be able to extend the project to additional countries and perhaps find other initiatives that will allow more countries to join in. Please go to <http://www.agointernetnetwork.org> in order to learn more about that important initiative.

To work efficiently, we all need more than access to the two volcanology journals. We also need much more than just access to journals. In the more industrialized countries, we have access to search machines, we have very fast Internet connections that allow us to download programs and databases, and we have books, maps, and other resources in our libraries. Many of us are an office away from colleagues who have accumulated experience that is helpful to our own efforts and who are willing to help. Not all volcanologists have these working conditions. Not all geologists who have to deal with volcanic problems have received training in volcanology, either.

We should do more in order to allow all those that monitor and study volcanoes to get the needed information. We should try to reach out to them and offer to help them reach the rest of us, if they so desire. We must remember that many active or dormant volcanoes are located in developing countries and have yet

IUGG 2007 web site:
<http://www.iugg2007perugia.it>

to be documented systematically or to be monitored with modern methods, for the benefit of our colleagues and the communities they serve and for the benefit of our science.

I believe that we can easily start doing something by helping each other on a personal basis. The idea is simple, costs very little and can be implemented immediately by matching someone who lacks these resources with a volunteer that can help him/her on a personal basis. Gerald Ernst has agreed to act as a match-maker. He is waiting for emails from colleagues who are looking for such help and he will try to match each person with someone who works in a related area and who is willing to help. I hope that the initiative will be beneficial to both parties and that close links that may have started with a short search for a specific bit of information will grow and develop to working relations and strong ties. This initiative, which may also help our science to become more egalitarian, is open to any colleagues involved in volcano observation, monitoring, or research. So if you feel that you may benefit from this informal initiative, Gerald's email address is plumeman2000@yahoo.co.uk. If you have suggestions as to how we may improve the service, please let me or Gerald know. Our main concern is that those who could benefit the most from such an initiative may not be Internet-connected, they may not be known to any IAVCEI members. Most likely they may be known only to those few IAVCEI members who have encountered them. So please help us spread the word around and help us become aware of colleagues who could benefit.

Last, I would like to thank Yigang Xu for the wonderful IAVCEI meeting on Continental Volcanism held in Guangzhou, China, in May 2006 (see article in this newsletter). Remember that we would be pleased to see you all in Perugia on July 2007 at the IUGG General Assembly. The program is superb. For sure, we will see you all in Iceland in August 2008 at the IAVCEI General Assembly.

Oded Navon
President

Call for Nominations IAVCEI Officers 2007-2011

It is time for organizing the effort to nominate IAVCEI officers for the term of July 2007 to July 2011. The IAVCEI officers are:

President

[nominations needed]

Two Vice Presidents

[at least two nominations needed]

Secretary General

[nominations needed]

Four Executive Committee members

[at least four nominations needed]

The current IAVCEI Executive Committee recently formed a nominations committee:

Dr. Grant Heiken - USA, Chair

331 Windantide Place

Freeland, WA 98249-9683 USA

360-331-5904; heiken@whidbey.com

Dr. Wally Johnson - Australia

Dr. Sylvie Vergniolle - France

Dr. John Stix - Canada

Dr. Moyra Gardeweg - Chile

Dr. Tad Ui - Japan

Nominations are invited from the community, according to the guidelines below (from the IAVCEI Statutes and By-Laws; also can be found on Web page <http://www.iavcei.org>). Nominations must be sent to the chair of the committee, and must be received by December 15, 2006.

The election will be held by postal vote and will take place in April 2007. The "current year" for voting purposes will be 2007. Further information and updates will appear in future issues of the newsletter and on the IAVCEI Web page. In the sections that follow, note that an "affiliate" is a member.

Relevant Portions of IAVCEI Statutes and By-Laws:

IV. Voting

10. Affiliates from member countries who have paid their dues for the current year and National Correspondents shall receive ballots for new office-bearers and for any proposed changes to the Association's Statutes and By-Laws.

11. Ballots will be distributed at least three months before, and must be returned no later than one month before IUGG General Assemblies.

12. Any Affiliate or National Correspondent may nominate in writing any other current Affiliate or National Correspondent as an office-bearer of the Association provided (1) the nomination is seconded by three other current Affiliates or National Correspondents each from countries other than that of the nominee and (2) the nominee, nominator, and seconders are all from a country belonging to the union. All nominations must be received no later than six months before the General assemblies of the Union.

13. All nominations shall be considered by a Nominating Committee, which will produce a shortlist of at least two, but no more than three, candidates for each of the positions on the new Executive Committee. No more than two candidates from the same country can be proposed by the Nominating Committee for all of the positions. The Nominating Committee will be appointed by the Executive Committee no later than nine months before the General Assemblies of the Union. It will consist of no less than five current Affiliates or National Correspondents, one of whom will be nominated by the Executive Committee as a Receiving Officer for postal votes. The outgoing Executive Committee has the power to appoint candidates of its own where only one, or no, candidates are nominated by Affiliates and National Correspondents.

14. Voters shall be required to rank candidates in order of their preference. The candidate with the largest number of first-place votes will be elected in cases where there are only two candidates. In cases where there are three candidates and none has a majority of first-place votes, then the candidate with the fewest first-place votes will be eliminated. The one of the two remaining candidates having the higher number of second-place votes will be elected. The third-place votes will be used in cases where the second-place votes are equal.

New Life Members

Prof. John Sinton

Dr. Roderick Stewart

Cities-on-Volcanoes-4 Conference Quito, Ecuador

International Meeting of the Cities on Volcanoes Commission of the International Association of Volcanology IAVCEI.

The Fourth Conference of Cities-On-Volcanoes (CoV4-IAVCEI) was held in Quito, Ecuador Jan. 22-27, 2006.

In the tradition of the first three Cities-on-Volcanoes held in Rome, Italy in 1998, Auckland, NZ in 2000 and Hilo, Hawaii 2003. The meeting focused on the dialogue between volcanologists, social scientists, community and emergency managers, medical doctors, and all those who consider information and education, in parallel with monitoring and hazard assessment, to prepare a potentially threatened population for volcanic hazards.

Quito and the Metropolitan area with the wider Inter-Andean Valley host more than 30 active and potentially very dangerous volcanoes. Quito was one of the most appropriate places for a Cities-on-Volcanoes meeting.

The Official Inauguration Ceremony was held in the Iglesia de la Compañía de Jesús, the Church of the Jesuit Order, for many, one of the most beautiful Spanish architecture churches in Latin America. The Mayor of Quito, Paco Moncayo Gallegos, and the Chairman of CoV4, Hugo Yépes, solemnly opened the conference in this extraordinary setting. The audience shared an emotional moment when our friend and colleague Dr. Minard (Pete) Hall received the Condecoración de la Orden Nacional "Al Mérito", en el Grado de Gran Oficial, presented by the President of Ecuador, Dr. Alfredo Palacios. This was the recognition to honor Dr. Hall's scientific and academic contributions to Ecuador. For more than 30 years at the Geophysical Institute of the Escuela Politecnica Nacional in Quito, Dr. Hall has led and developed a 50 station national seismic network that has been critical for the day-to-day vigilance of the on-going volcanic activity of Guagua Pichincha, Tungurahua, Reventador and Cotopaxi volcanoes and which has become a model for other Latin American countries.

The conference venue in Quito's historical center, founded by the Spanish Conquistadores in 1534 and now the UNESCO World Heritage Site added special flair and character to the meeting. The meetings were held in the impressive 16th century Convento San Francisco, dominating historic El Tianguéz Square, the heart of pre-Hispanic Quito. It was the first time

that such a large meeting was held in the old center of Quito. Beyond the historical significance of the conference, the Mayor of Quito supported the CoV meeting also as a successful experiment to promote conventions and tourism in colonial Quito. The San Francisco Convent provided the necessary infrastructure for a modern conference. The large green patio, with fountains and palm trees inside the grand complex, gave a stimulating ambience inviting discussions and informal exchange between the sessions. The posters were placed under the open arcades surrounding the patio on two floors. The lunches each day of the conference were held in another old convent courtyard, or under the patio arcades.

With more than 550 registered participants from 33 different countries and 548 abstracts submitted, the Fourth Conference of Cities on Volcanoes was very well attended. Noteworthy was the high participation of scientists from South American countries, including 128 registered Ecuadorians. This underlines the awareness and recognition of the Andean countries for the CoV themes. Together, with the equally successful IAVCEI General Assembly 2004 in Pucon, Chile, these conferences underscored the importance of volcanology in Latin-America and high interest from the international community.

Oral presentations and posters were organized in nine symposia introduced with invited and plenary talks. The Symposia on Lahars and Debris Flows (I) and on Ash Falls and Aerosols (II) dealt with dynamics and processes of these volcanic phenomena, their destructive effects and hence monitoring, mitigation and emergency management. Symposium III, New Computational Techniques for Mitigation Volcanic Hazards, discussed advances in modeling of volcanic phenomena, computation, and data bank techniques and their application during volcanic crises. With a total of 220 contributions, covering a wide spectrum of volcanological subjects and case studies of monitoring approaches, Symposium IV, Volcano Studies and Monitoring, was split into two symposia, Volcano Studies and Monitoring. Symposium V, Risk management, and VI, Emergency Management, received 81 and 40 contributions respectively. This was followed by the Symposium VII on Human Health Impact of Volcanism, which dealt with many aspects of physical and mental consequences of eruptive phenomena to health issues. Understanding the direct and indirect consequences of volcanic events to human health leads to risk reduction measures. The presentations concluded with Symposium IX, History, Archeology, and Legends. Beyond the cultural interest in past

volcanic eruptions, emergency cases, and catastrophes, both pre-historic and historic, their analysis allows important insights on how ancient populations faced and reacted to volcanic crisis.

All of the abstracts are available at www.citieson-volcanoes4.com.

A large number of varied field trips were offered and requested. From Quito's volcano-on-the-city Guagua Pichincha, to dominator Chimborazo and very active Tungurahua, to the unforgettable rain-forest adventure into the Reventador Caldera with its 2002 destruction field to Quilatoa and Cayambe. A special excursion focus was on Cotopaxi, with several excursions, including the Intra-Meeting field trip. Besides the long-term evolution of this volcano, its role as the potentially most dangerous of the active volcanoes, threatening with its lahar potential the populated Chillos valley, was the center of interest. Public awareness of the lahar hazard of Cotopaxi and the hazard-conscious education of people living in the high-risk zone of Cotopaxi lahars, and starting at school-children level, was demonstrated during the visit of the Barrio La Betania School. The participants were received by the school children and informed by members of the Casa Cotopaxi Organization about the community activities and their exemplary voluntary engagement for the purpose of risk awareness and co-existence with the volcano.

Well attended and enthusiastically commented were upon the three Galapagos excursions that exposed participants to unique volcanic features of these oceanic islands. The excursions left participants equally impressed by the beauty, richness, and diversity of unique fauna and flora of the Galapagos.

In praising the excursions and the field trip leaders, the remarkable care with which the field guides were prepared also should be mentioned. They were all informative and materials were beautifully illustrated and well printed, as was all the conference material.

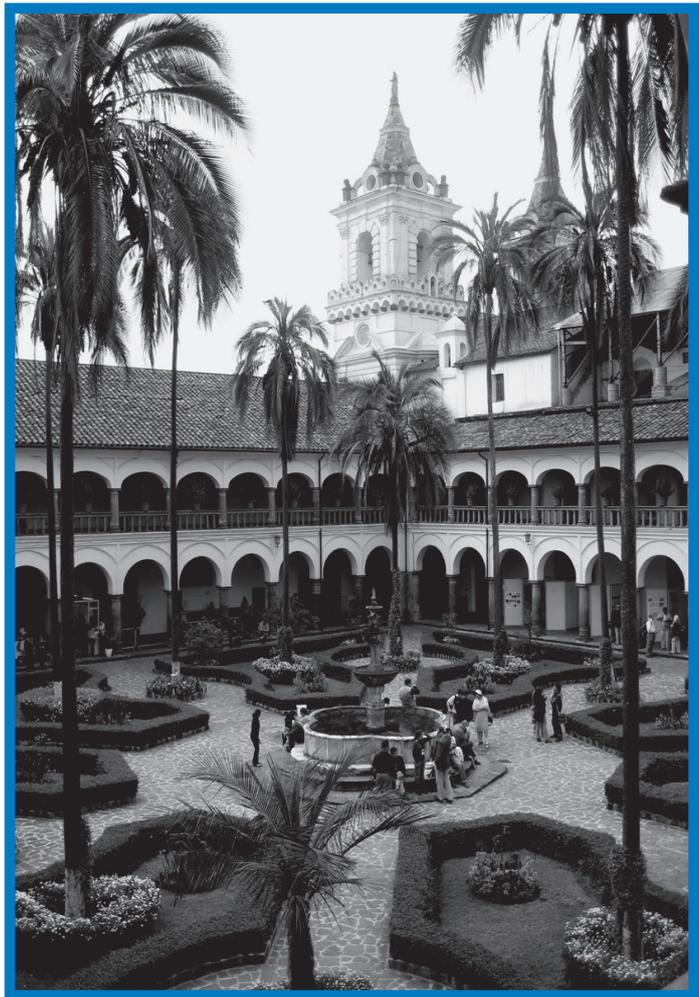
A number of parallel scientific and annexed activities were offered. Special courses, workshops, working group meetings, etc., broadened and deepened the aspects of the meeting in many ways and provided additional fora for public information. An example was the Foro Publico Ciudades en Riesgo where public decision-makers and people living with highly active volcanoes received the necessary volcanological background information. The well-attended field workshop discussing the 800 yr. BP Quilotoa eruption, organized by the very active IAVCEI Commission on Explosive Volcanism, focused on the eruptive dynamics of this remarkable caldera

eruption was informative to the general public. Many more annexed activities assured the outreach success of CoV4.

The closing ceremony was another unforgettable festival. It was held in La Capilla del Hombre Guayasamín, the museum for the famous artist of the Indigénismo. We were treated to Andean folklore costumes, music, and dances, and a splendid buffet dinner to say farewell.

In summary: This was a very successful volcanological meeting and a great experience. Our wholehearted thanks for all their efforts to the organizing committee, the convenors, the field trip leaders, and to about one hundred volunteers.

Finally, it was great to start the year with a true volcanological highlight. No wonder the announcement of the IAVCEI CoV-Commission of a continuation of the CoV series for November 2007 in Shimabara, Japan, was welcomed with enthusiasm.



San Francisco Convent, patio

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Conference lunch at Centro Cultural Metropolitano



Buffet lunch on January 27th, served by the friendly Fathers of Convento San Francisco



Mid-conference excursion, meeting with the Casa Cotopaxi community activities



Galapagos Excursion: Tagus Cove Tuff Ring, Isabella. Darwin and the Beagle were here! Photo L. & S. Malone 15 Sierra Negra Caldera, Isabella. Lava flooding from October 2005.

International Conference on Continental Volcanism

Guangzhou, China, May 14-18, 2006
White Swan Hotel

The International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) sponsored a meeting on "Continental Volcanism" in Guangzhou China on May 14-18, 2006. The meeting was supported by the Chinese Academy of Sciences, the Guangzhou Association for Science and Technology, China National Natural Science Foundation, the Association for Science and Technology of the Guangdong Province, and the Chinese Society for Mineralogy, Petrology, and Geochemistry. The meeting was organized by the Guangzhou Institute of Geochemistry and the Chinese Committee for IAVCEI, attracting 200 scientists (including 53 students) (Figure 1) from 28 countries/regions, involved in 123 oral and 55 poster presentations.



Figure 1. IAVCEI 2006 delegates

The meeting opened with three plenary talks covering the thermal and mechanical structure of the continental lithosphere (McKenzie Cambridge), volcanism and climate change (Robock, Rutgers USA), and volcanoes of China (Liu, Beijing). This was followed by four days of dual sessions on aspects of volcanology and chemistry of Earth's interior. Each session opened with a keynote lecture followed by invited and contributed oral presentations and a poster session were part of the venue.

Age, Composition, and Evolution of the Mantle Conveners: Martin Menzies and Xin-Hua Zhou

The keynote by William Griffin (GEMOC, Australia) described the nature of the shallow continental mantle and the marked differences between the depleted and highly stratified Archaean mantle and

post-Archaean fertile mantle. The fact that trace elements and isotopes define a progression from dunite/harzburgite to depleted lherzolite, then fertile lherzolite has important implications for the origin of the protolith in the lower lithosphere and to what extent lherzolites are primary compositions. The North China Craton was the focus of several presentations using mantle xenoliths or alkaline-potassic intrusions as probes of the composition of the deep lithosphere in an attempt to constrain the change from cratonic to oceanic lithosphere during the Phanerozoic. Litho-probes included the mineral chemistry of peridotite xenoliths, the elemental and isotopic geochemistry of peridotite xenoliths, the Sr-Nd-Hf isotope characteristics of syenites and the geochemistry of lamprophyres. It was clear that these record different aspects of the thermal and chemical evolution of the lithosphere (crust and mantle). Other presentations considered the multi-stage evolutionary history of mantle peridotites beneath the Izu-Bonin-Mariana arc and the Mediterranean, how kimberlites (Groups I & II)

provide crucial information about lithospheric and sub-lithospheric processes, the complex origin of poly-mict xenoliths and the possibility that the Lherz lherzolite is a refertilized harzburgite. In-situ isotopic analysis reveals the complexity of the mantle system and the need for an understanding of the petrography of the rocks in question prior to geochemical analysis.

Mechanisms and Effects of Lithosphere Destruction

Conveners: Roberta Rudnick and Shan Gao

The keynote address Dan McKenzie (Cambridge, UK) who reported the results of recent seismic investigations into continental lithospheric thickness. The

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most surprising result from this work is the finding that, contrary to previous belief, the Tibetan plateau is underlain by very thick lithosphere (to depths of 300 km), with the implication that models for “delamination” in this region are not correct. Contributed and invited presentations addressed lithosphere destruction in different regions of the world (e.g., North Atlantic, Arabia), but the overwhelming majority of the talks and discussion focused on how the deep, ancient and refractory lithosphere beneath the North China Craton was removed during the Mesozoic/Cenozoic. The survival of Proterozoic lithospheric mantle in the western craton supports the assertion that Phanerozoic reactivation only affected the eastern craton. Suggested mechanisms for reactivation ranged from stretching, followed by new lithosphere accretion due to upwelling to transformation through melt-rock reaction, through removal via thermal erosion or density foundering and delamination. Melt-rock reaction models need vast volumes of mafic melt to impregnate and refertilize the refractory protolith, a mechanism that would leave a metasomatic imprint on much of the mantle. Delamination needs eclogitisation of a significant thickness of lower crust, and/or conversion of large tracts of buoyant refractory to fertile denser mantle to overcome the density contrast between the keel and the asthenosphere. The consensus that emerged is that the North China Craton is a classic example of a re-activated craton where the temporal constraints are reasonably well defined. Clearly more data (particularly geophysical data) and plausible physical models are required before the mechanism can be fully understood.

Role of Mantle Plumes

Conveners: Ian Campbell and Weidong Sun



Figure 2. Emeishan LIP

The keynote address (Campbell, ANU) used the evidence for pre-volcanic uplift in the Emeishan LIP and the occurrence of picrites in Karoo, Emeishan, and North Atlantic LIPs to support the plume hypothesis for LIPs. In the presentations that followed all of the speakers advocated a direct relationship between mantle plumes and LIPs. Alternative hypotheses were conspicuously absent. Presentations covered a broad range of topics from the classification of LIPs, placing special emphasis on Archaean and Proterozoic LIPs, including dyke swarms and layered intrusions to mantle differentiation achieved through gravity separation of magnesium and calcium silicate perovskite in the ultra-low velocity zone above the core, leaving lighter SiO₂-rich mantle that is preferentially entrained in plumes. Presentations on the Siberian Traps were of special interest in the light of a recent suggestion that this LIP lacks uplift prior to volcanism and therefore cannot be due to a mantle plume. Melt inclusion studies in olivines from the Siberian Traps revealed that they formed at a pressure of 7 to 9 GPa from high temperature mantle (i.e., excess temperature of 400 degrees celsius) - melting conditions that can only be achieved in a mantle plume. The LIP that attracted most interest was the well-preserved late Permian Emeishan flood basalt province in southwestern China. Five talks were presented on this LIP covering domal uplift prior to volcanism, geochemistry and geochronology. The age the LIP (initiation and termination) was hotly debated.

Ultradeep Samples and the Earth's Interior

Conveners: Bill Griffin and Ming Chen

The keynote talk by Craig O'Neil used new modelling approaches to evaluate the conditions required for the survival of cratons in a convecting Earth. The strength and buoyancy of cratons is crucial but circum-cratonic belts have a role to play in keeping cratonic nuclei free of water which would affect viscosity. The presentations that followed used seismic tomography, gravity and dynamic topography to argue for whole-mantle flow and to show that the African and Pacific superswells are different from the surrounding mantle. Seismic tomographic models were used to suggest that cratonic roots may extend deeper than commonly supposed. Remnant blobs of subcontinental lithosphere in the ocean basins may affect the isotopic systematics of oceanic basalts and may explain the Re-Os data indicative of ancient depleted mantle beneath the ocean basins. Fluid inclusions in diamonds were used to define the nature and evolution of silicate to carbonate fluids in the deepest lithospheric mantle. The fate of subducted material

was the focus of several presentations covering the nature and origin of eclogites (recycled or underplated magmas), the contribution of subducted material to the deep mantle and basalt source regions and post-spinel transformations of subducting material in the deep Earth. Fe isotope fractionation in mantle minerals were shown to have some utility in understanding subduction and partial melting processes, while Tl isotopes may turn out to be a unique tracer for subducted material in basalt sources.

Sources and Origin of Continental Volcanism

Conveners: Lang Farmer and Yong-Fei Zhang

In a keynote talk, Helen Williams emphasized the distinction between the chemical and isotopic compositions of many continental "basalts" and typical MORB and/or OIB and argued that SCLM remains a viable source for many continental mafic rocks, particularly continental potassic basalts. However, generation of large volume mafic melts from the SCLM remains an issue because of the refractory nature of the SCLM and the need for considerable volatile input. In the presentations that followed, descriptions were given of the petrology and geochemistry of Phanerozoic igneous rocks from Turkey, northern Patagonia, northeast Iran, and western North America, and continental igneous rocks from China. A common theme in many of these talks was the issue of the relative roles of sublithospheric mantle, subcontinental lithospheric mantle (SCLM), and continental crust as sources for continental magmas. Other speakers suggested that even OIB-like sodic continental basalts also could be derived from SCLM if the mantle were previously metasomatized by carbonate rich fluids. Clearly an important remaining question is what compositions of SCLM can actually undergo partial melting, and if refertilization of SCLM with basaltic components and volatiles is necessary before such melting can occur. Trigger mechanisms for continental magmatism were also widely discussed in this session, including lithospheric "delamination". The latter has become one of the most popular mechanisms of producing post-orogenic continental magmatism, but additional studies will be needed to critically assess what portions of the mantle or continental crust can actually be induced to melt during such a process.

From Source to Surface: Processes and Time Scales of Magma Generation, Extraction, and Ascent

Conveners: David Peate and Jiaqi Liu

The keynote presentation by Ken Sims (WHOI)

provided an accessible overview of how U-series disequilibrium can be used to provide constraints on the rate of melting, the melt migration velocity and the magma storage time. Presentations in this session covered a range of inter-related topics: experimental data on nucleation of CO₂ bubbles in alkali melts as a potential mechanism to trigger wallrock fracturing and the formation of xenoliths; how temporal changes in crustal assimilation constrained the magmatic plumbing systems during the development of the East Greenland LIP, and emplacement timing using pressure estimates from fluid inclusions in the Skaergaard intrusion with a cooling model for the intrusion. Several presentations used elemental diffusion profiles (Li, Be, B, Sr, Ba) to determine residence times for phenocrysts in magma chambers. The causes and implications of dome-forming to lava-forming eruptions within subduction zones were considered in terms of crustal heat flux and differentiation mechanisms. Adakitic magmas in China were investigated in several presentations using field data, experimental constraints and Cu-Au mineralization.

Silicic and Alkaline Magmatism

Conveners: Scott Bryan and Xianhua Li

The keynote lecture by Else Ragnhild-Neumann (Oslo) covered, in detail, the petrology and geochemistry of the Permo-Carboniferous Oslo Rift/Graben. The possible existence of a PREMA reservoir in or below the SCLM of northern Europe was discussed and the survival of Variscan-age subduction signatures in the SCLM. This was followed by presentations on the Tertiary Sierra Madre Occidental and Gulf Alkaline provinces of Mexico, the Snake River Plain-Yellowstone bimodal volcanic field of northwestern USA, and large volume rhyolitic eruptions from the Afro-Arabian flood basalt province. Age and petrogenetic aspects of episodes of bimodal and A-type magmatism across the North and South China cratons were discussed, and thermomechanical effects on crustal structure and rheology during 'ignimbrite flare-ups' were also presented. Two important issues arising from this session were that mass balance calculations and the changing thermal profile of the crust with time are important considerations in understanding the generation of widespread and large volume (>0.1 Mkm³) silicic magmatism. Large thermal and material inputs to the continental crust are clearly required, but that the relative proportion of crustal partial melting, especially of Precambrian crustal sources, to mantle-derived magmas often ap-

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pears to be small. Results of thermomechanical modelling indicate that the crustal profile becomes hotter and more ductile with time in response to the thermal and mass input of mantle-derived magmas. This can lead to the development of larger silicic magma chambers, catastrophic eruption pulses and the eruption of batholiths.

Environmental Impact of Continental Volcanism *Conveners: Alan Robock and Hong-Fu Yin*

The keynote by Hans Graf contrasted how permanently degassing volcanic systems mainly affect the troposphere by increased sulphur aerosol abundance, whereas super eruptions lead to more complex disturbances in the troposphere-stratosphere system affecting stratospheric ozone and tropospheric circulation. Papers in this session covered the entire range of the scale of volcanic eruptions, from the effects of small Indonesian eruptions on sulfur depositions in peat and subsequent effects on Asian haze, to the effects of flood basalts on mass extinctions. Several papers discussed climate model simulations of the effects of large explosive volcanic eruptions, showing how low latitude eruptions produce a winter warming response, while high latitude eruptions reduce the Indian and African summer monsoons, producing warmer temperatures and reduced precipitation. Open questions remain as to whether much larger eruptions can cause ice ages or mass extinctions. Simulations of the climatic effect of the Toba eruption showed large cooling lasting a decade but no ice age initiation. The Deccan and Siberian Traps, however, could have emitted enough material to cause significant climate change over a significant period, but we are still lacking good estimates of the rate of emission and length of large emission periods. As aerosols have a short lifetime in the atmosphere, continuous emissions over a large period of time, lasting decades, would be necessary for change large enough to cause mass extinctions. Papers also addressed observations of volcanic eruptions, including ice core records of past volcanism and remote sensing of sulfate emissions from African volcanoes.

Economic Geology of Continental Volcanism and Magmatism

Conveners: Mei-Fu Zhou and N. Arndt

Peter Lightfoot gave a keynote talk on the Noril'sk-Talnakh Ni-Cu-PGE deposits, arguably the richest of all mineral deposits and source of much of our understanding of the formation of magmatic ores. The presentations that followed involved the Pechenga deposits in Finland; the Pd reefs in the Skaergaard



Figure 3. North China craton

intrusion; deposits in the Emeishan LIP in China; the Platreef PGE deposit of the Bushveld intrusion and ore formation and mantle dynamics. Attempts were made to establish a geochemical criteria capable of distinguished ore-bearing and barren continental volcanic provinces. The final session dealt with deposits in China including the recent work on the Jinchuan deposit and economic deposits associated with the Emeishan province especially PGE deposits related to the low-Ti mafic-ultramafic intrusions and Fe-Ti oxide deposits in Fe-rich alkaline intrusions. Detailed information about the geochemistry and mineralogy of ores and host intrusions was given in posters.

During the meeting, a visit was made to the Guangzhou Institute of Geochemistry where an impressive array of laboratories and equipment are available for research activities. At the end of the opening day delegates were taken on a cruise/banquet on the Pearl River with entertainment by Chinese dancers. Post-conference field excursions visited the Emeishan large igneous province (Figure 2) led by Professors Yigang Xu, Bin He, and Hong Zhong and the xenolith bearing basaltic volcanoes and kimberlite diatremes of eastern China (Figure 3) led by Dr. Hongfu Zhang and Dr. Jian-ping Zheng.

Acknowledgements: All session conveners are thanked for their help with this conference report.

*By Yigang Xu
and
Martin A Menzies*

IUGG Program

UNION AND JOINT SYMPOSIA

U30 Modelling and Simulation of Geophysical Flows: Present and Future. (**IAVCEI**-led Union Symposium) **Convenors:** Augusto Neri (Istituto Nazionale di Geofisica e Vulcanol.) email:neri@pi.ingv.it; Einat Aharonov (Weizmann Inst. of Sci., Israel); George Bergantz (Univ. of Washington, USA); Oleg Melnik (Moscow State Univ., Russia).

V3 Large-Volume Eruptions, Including Environmental Effects. (**IAVCEI**-led Interassociation Symposia) **Convenors:** Steve Self (Open Univ., UK) email: stephen.self@open.ac.uk; Roberto Isaia.

V18 Progress in Electromagnetic Studies on Earthquakes and Volcanoes. (Joint **IAVCEI**, IASPEI, IAGA) **Convenor:** Viacheslav V. Spichak (Geoelectromag. Res. Inst., Russia) email:v.spichak@g23.relcom.ru. **Co-convenors:** Jacques Zlotnicki, email:jacques.zlotnicki@wanadoo.fr; Yoichi Sasai, email:yosasai@zag.att.ne.jp; Domenico Patella, email:domenico.patella@na.infn.it; Ciro Del Negro, email:delnegro@ct.ingv.it.

V21 Ice-Volcano Interactions. (Joint **IAVCEI**, UCCS, IAHS, IGS) **Lead Convenor:** Ben Brock (Univ. of Dundee, UK) email:b.w.brock@dundee.ac.uk. **Co-convenor:** Andrés Rivera (Centre for Scientific Studies, Chile) email: arivera@cecs.cl.

V23 Volcano Seismology. (Joint **IAVCEI**, IASPEI) **Convenors:** Prof. Jurgen Neuberg (Univ. of Leeds, UK) email:Locko@earth.leeds.ac.uk; Prof. Maurizio Ripepe (Univ. di Firenze, Italy) email:Maurizio.ripepe@unifi.it; Prof. Stephen R. McNutt (Univ. of Alaska Fairbanks, USA) email:steve@giseis.alaska.edu.

V24 The 25 Anniversary of the El Chichón Eruption. (Joint **IAVCEI**, IAMAS) **Convenors:** Yuri Taran, email:taran@geofisica.unam.mx; Jose Luis Macias, email:macias@geofisica.unam.mx; Dmitri Rouwet, email:dmitrirouwet@gmail.com (UNAM, Mexico).

IAVCEI ONLY SYMPOSIA

V1 Sediment-laden Gravity Flows in Volcanic Settings: Generation, Sedimentation, Prediction, and Hazard Assessment. **Convenors:** Maria Teresa Pareschi (INGV, Italy) email:pareschi@pi.ingv.it; Kevin M. Scott (Cascades Volcano Observ., WA, USA) email: kscott@usgs.gov; Giovanni Zanchetta (Univ. of Pisa, Italy) email:zanchetta@dst.unipi.it.

V2 Submarine Volcanism: Eruption Processes,

Transport Mechanisms, and Links with Hydrothermal Systems. **Convenors:** Dr. Sharon Allen and Jocelyn McPhie (Univ. of Tasmania, Australia); Fabiano Gamberi (tent).

U4 Volcanic Flows: Observation, Experiment, and Theory. **Convenors:** Dr. Shinji Takarada (Geol. Survey of Japan) email:s-takarada@aist.go.jp; Prof. Tim Druitt (Univ. Blaise Pascal, France), email:T.Druitt@opgc.univ-bpclermont.fr.

V5 Intraplate Monogenetic Basaltic Volcanic Provinces and Processes. **Convenors:** Dr. Guido Giordano (Univ. Roma Tre, Italia) email:giordano@uniroma3.it; Prof. Raymond Cas (Monash Univ., Australia) email:Ray.Cas@sci.monash.edu.au.

V9 The Magma Feeding System of Persistently Active Basaltic Volcanoes: Mount Etna and Others. **Convenors:** Renato Cristofolini, email:rcristof@unict.it; Patrick Allard, email:Patrick.Allard@cea.fr or allard@ct.ingv.it; Giuseppe Puglisi, email:puglisi-g@ct.ingv.it.

V12 Calderas I - Calderas and Resurgent Calderas (IAVCEI Only Symposia) **Convenors:** Giovanni Orsi (INGV, Italy) email:orsi@ov.ingv.it; Grant Heiken (Freeland, USA) email:heiken@whidbey.com; Sandro de Vita (INGV, Italy).

V11 Calderas II: Calderas and Caldera Forming Eruptions. **Convenors:** Gianfilippo De Astis (INGV, Italy); Peter Lipman (USGS, USA) email:plipman@usgs.gov; Roberto Scandone (Univ. Roma TRE, Italia) e-mail:scandone@fis.uniroma3.it; Guido Ventura (INGV, Italy).

V13 Volcanic Hazard Evaluation: Methodologies and Applications. **Convenors:** Roberto Carniel (Univ. di Udine, Italy); Susanna Falsaperla (INGV, Italy).

V14 Models and Products of Mafic Explosive Activity. **Convenors:** Dr. Jacopo Taddeucci (INGV, Italy) email:taddeucci@ingv.it; Dr. Greg Valentine (Los Alamos Nat'l. Lab., USA) email:gav@lanl.gov.

V15 Modeling the Plumbing System of Active Volcanoes by Integrated Petrological, Geophysical, and Fluid Inclusion Studies. **Convenors:** Angelo Peccerillo (Univ. of Perugia, Italy) email: pecceang@unipg.it; Robert J. Bodnar (Virginia Polytech. Inst., USA); Maria Luce Frezzotti (Univ. of Siena, Italy).

V16 Modelling and Simulation of Volcanic Related Phenomena for Hazard Mitigation. **Convenors:** Prof. Gino M. Crisci, email:Crisci@Fis.Unical.It and Prof. Salvatore Di Gregorio, email:[\(Continued on next page\)](mailto:Dig@</p></div><div data-bbox=)

Unical.It, (both of Univ. of Urbino, Italy)

V17 Cities on Volcanoes: Looking at the Links Between Volcanology and Communities Issues Around Volcanoes. *Conveners:* David Johnston (Inst. of Geological & Nuclear Sci., New Zealand) email:david.johnston@gns.cri.nz; Giovanni Orsi (Osservatorio Vesuviano, Italy) email:orsi@ov.ingv.it.

V26 Quantifying and Expressing Volcanic Risk: A Challenge for the Millennium. *Conveners:* Peter Baxter (Univ. of Cambridge, UK) email:pjb21@medschl.cam.ac.uk; Willy Aspinall (Aspinall and Assoc., UK); Augusto Neri (INGV, Italy) email:neri@pi.ingv.it; Giulio Zuccaro (Univ. of Naples, Italy).

V28 New Techniques using Remote Sensing Data for Volcano Monitoring and Analysis: Observations, Integration, Hazard Assessments, and Modeling. *Conveners:* Ken Dean (Univ. of Alaska Fairbanks, USA) email:kdean@gi.alaska.edu; David Rothery (Open Univ., UK) email:D.A.Rothery@open.ac.uk; Valerio Lombardo.

V29 Volcanic-plutonic Provinces: A Tool to Understand Magma Genesis and Geodynamics. *Conveners:* Giampieri Poli (Univ. of Perugia, Italy); Bernard Bonin (Univ. de Paris-Sud, France) email:bbonin@geol.upsud.fr.

V31 Pedagogical and Didactical Methods in Earth Science Education and Geopark Concepts in Demonstrating Volcanic Processes. *Conveners:* Dr. Ulrike Martin (Univ. Wuerzburg, Germany) email:ceboruco@web.de; Dr. Karoly Nemeth, email:nemeth_karoly@hotmail.com.

V32 New Advances in Understanding Phreatomagmatism: From Experiments to Volcanic Facies Analyses. *Conveners:* Dr. Ulrike Martin (Univ. Wuerzburg, Germany) email:ceboruco@web.de; Dr. Karoly Nemeth, email:nemeth_karoly@hotmail.com.

V33 Large Igneous Provinces. *Conveners:* Richard Ernst (Ernst Geosci., Canada) email:Richard.Ernst@ErnstGeosciences.com; Ian H. Campbell (Australian Nat'l. Univ.) email:Ian.Campbell@anu.edu.au.

V43 Volcanic Health Hazard Assessment: Focus on Multidisciplinary Collaboration and Integration. *Conveners:* Dr. Claire Horwell and Peter Baxter (Web site:www.ivhhn.org, Univ. of Cambridge, UK) email:pjb21@medschl.cam.ac.uk.

V6 Tsunami: Generation and Hazard (Joint IASPEI, IAVCEI, IAPSO) *Convener:* Kenji Satake (Geol. Survey of Japan) email:kenji.satake@aist.go.jp. *Co-conveners:* Gerassimos A. Papadopoulos (Nat'l. Observ. of Athens), email:g.papad@gein.noa.gr; Frank Gonzalez (NOAA/PMEL), email:[\[I.Gonzalez@noaa.gov\]\(mailto:I.Gonzalez@noaa.gov\); Fumihiko Imamura \(Tohoku Univ.\), email:\[imamura@tsunami2.civil.tohoku.ac.jp\]\(mailto:imamura@tsunami2.civil.tohoku.ac.jp\).](mailto:Frank.</p>
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V7 Early Warning of Natural Hazards (Joint IASPEI, IAVCEI, IAPSO) *Principal Convener:* Ramesh P. Singh (Indian Inst. of Technol., India) email:ramesh@iitk.ac.in. *Co-Conveners:* DanLing Tang (Chinese Acad. of Sci., China) email:lingzistdl@126.com; Manfred Buchroithner (Univ. of Dresden, Germany) email:Manfred.Buchroithner@mail-box.tu-dresden.de; Vittorio Sgrigna (Univ. of Rome Tre, Italy) email:sgrigna@fis.uniroma3.it.

U8 High-performance Computations in Geosciences and Implication for Geohazard and Risk Analysis (Union, IASPEI Lead) (Joint IASPEI, IAVCEI, IAPSO) *Principal Conveners:* Alik Ismail-Zadeh (Univ. of Karlsruhe, Germany) email:alik.ismail-zadeh@gpi.uni-karlsruhe.de; Zhongliang Wu (Grad. School of the Chinese Acad. of Sci., China) email:wuzhl@gscas.ac.cn. *Co-Conveners:* Slava Gusiakov (Russian Acad. of Sci., Russia) email:gvk@sscc.ru; John Rundle (Univ. of California, USA) email:jbrundle@ucdavis.edu.

V19 Early Warning of Natural Hazards (Joint IASPEI, IAVCEI, IAGA) *Principal Convener:* Ramesh P. Singh (Indian Inst. of Technol., India) email:ramesh@iitk.ac.in. *Co-Conveners:* DanLing Tang (Chinese Acad. of Sci., China) email:lingzistdl@126.com; Manfred Buchroithner (Univ. of Dresden, Germany) email:Manfred.Buchroithner@mail-box.tu-dresden.de; Vittorio Sgrigna (Univ. of Rome Tre, Italy) email:sgrigna@fis.uniroma3.it.

V34 Subduction Zone Related Volcanism and Hazard Mitigation (Joint IASPEI, IAVCEI) *Convener:* Dr. Sri Widiyantoro (Bandung Inst. of Technol., Indonesia) email:sriwid@geoph.itb.ac.id.

V35 Earthquake and Volcano Geodesy (Joint IAG, IAVCEI, IASPEI) *Conveners:* Dr. Jeffrey T. Freymueller (Univ. of Alaska Fairbanks, USA) Web site:www.gps.alaska.edu/jeff/jeff.html, email:jeff@giseis.alaska.edu; Dr. Geoff Blewitt (Univ. of Nevada, USA) Web site:www.nbmng.unr.edu/staff/geoff.htm; Eric Calais (Purdue Univ., USA) Web site:www.eas.purdue.edu/~ecalais, email:ecalais@purdue.edu; David Jackson (Univ. of California, USA) email:djackson@ucla.edu.

V37 Planetary Cores: Physics, Chemistry, and Dynamics (Joint IAGA, IAVCEI) *Conveners:* Phillipe Cardin; David Loper.

V39 Abrupt Climate Change (Joint IAPSO, IAVCEI, IAMAS, UCCS) *Conveners:* Hans Renssen, email:hans.rensen@geo.falw.vu.nl; Michael Schlesinger.

V40 Symposium on Physics and Chemistry of

Earth Materials (Joint **IAVCEI**, IASPEI) **Convener:** Ian Jackson (Australian Nat'l. Univ.) email:Ian.Jackson@anu.edu.au. **Co-conveners:** IAVCEI Rep.: Sharon Webb* (Georg-August-Universität, Germany), email:swebb@gwdg.de. *to be confirmed

V41 Underwater Observatories (Joint IASPEI, IAPSO, IAGA, **IAVCEI**, ION) **Conveners:** Barbara Romanowicz (Univ. of California, USA) email:barbara@seismo.berkeley.edu; Adam Schultz (USA), email:adam@coas.oregonstate.edu; Domenico Giardini (Switzerland), email:giardini@seismo.ifg.ethz.ch; Valery Korepanov (Ukraine), email:vakor@isr.lviv.ua.

V42 Early-warning Systems (Joint IASPEI, **IAVCEI**, IAGA, IAMAS, UCCS) **Convener:** Jochen Zschau (GeoForschungsZentrum Potsdam, Germany) email:zschau@gfz-potsdam.de.

WORKSHOPS

W1 Guidelines for the Preparation of Volcanic Hazards Maps (Workshop) **Conveners:** Giovanni Orsi (INGV, Italy); Claus Siebe; Jan Lindsay.

W2 Non-localised Volcanic Hazards - Interagency and International Communications (Workshop) **Conveners:** Andrew Tupper (Bureau of Meteorology, Australia) email:andrewt@bom.gov.au; Warner Marzocchi (INGV, Italy) email:marzocchi@bo.ingv.it or warner@ov.ingv.it; Glen Mattioli (Univ. of Arkansas, USA) email:mattioli@uark.edu.

W3 Magmatic (Fluid and Melt) Inclusion Studies in Active Volcanoes Magmatic Systems (Workshop) **Conveners:** Prof. De Benedetto Vivo (Univ. of Napoli Federico II) email:bdevivo@unina.it; Dr. James D. Webster (Amer. Museum Natural History, USA) email:jdw@amnh.edu.

FIELD TRIPS

F1 Volcanic Activity at Mount Etna. **Leader:** Prof. Renato Cristofolini (Univ. of Catania, Italy) email:Rcristof@Unict.It. **Assoc. Leader:** Xdr. Ferlito (Carmelouniversity of Catania, Italy) email:Cferlito@Unict.It.

F2 Pyroclastic Products of the Quaternary Age in Central Italy: Ignimbritic Deposits and Related Calderas. **Leader:** Prof. Giovanni Nappi, email:G.Nappi@Geo.Uniurb.It. **Assoc. Leader:** Dr. Laura Valentini, email:L.Valentini@Geo.Uniurb.It (both of Univ. of Urbino, Italy).

F3 Calderas Types and Ignimbrite Types (Field Trip) **Leader:** Dr. Guido Giordano (Univ.' Roma Tre, Italia) email:giordano@uniroma3.it; Prof. Raymond Cas (Monash Univ., Australia) email:Ray.Cas@sci.monash.edu.au.

F4 Volcanic History of Nisyros Island (Greece). **Leader:** Dr. Claudia Principe (Istituto di Geoscienze e Georisorse, Italy) e-mail:c.principe@igg.cnr.it. **Associate Leader:** Prof. Johannes C. Hunziker (Univ. de Lausanne, Switzerland).

F5 Facies and Depositional Mechanisms of the Aeolian Pyroclasts and Lavas as A Tool for the Evaluation of Volcanic Hazard. **Leaders:** Prof. Rossanna De Rosa, e-mail:derosa@unical.it and Dr. Paola Donato, email:donatop@unical.it; (Univ. della Calabria, Italy); Prof. Pier Francesco Dellino (Univ. di Bari, Italy) e-mail:dellino@lgxserve.ciseca.uniba.it; Prof. Lorella Francalanci (Univ. di Firenze, Italy) email:lorella@unifi.it; Dr. Anna Gioncada, email:gioncada@dst.unipi.it and Prof. Mauro Rosi, email:rosi@dst.unipi.it (Univ. di Pisa, Italy) Dr. Roberto Sulpizio (Univ. di Bari, Italy) email:sulpizio@dst.unipi.it.

F6 Monte Vulture Volcano (Basilicata) and the Umbria and Latium Italian Extrusive Carbonates. **Leader:** Claudia Principe (Istituto di Geoscienze e Georisorse, Italy) email:C.Principe@igg.cnr.it. **Associate Leader:** Prof. Francesco Stoppa (Univ.' D'annunzio Chieti-Pescara, Italy)

F7 Neapolitan Volcanoes: Vesuvius and Campi Flegrei. **Leaders:** Giovanni Orsi, Sandro de Vita, and Mauro Di Vito (INGV, Italy) email:orsi@ov.ingv.it; Roberto Santacroce (Univ. of Pisa, Italy).

F8 Volcanic and Plutonic Association in the Miocene-Pliocene Tuscan Magmatic Province. **Leaders:** Giampieri Poli (Univ. of Perugia, Italy); Bernard Bonin (Univ. de Paris-Sud, France) email:bbonin@geol.u-psud.fr.

F9 Phreatomagmatic Volcanic Field in a Mio/Pliocene Lacustrine Basin: Pannonian Basin. **Leaders:** Dr. Ulrike Martin (Univ. Wuerzburg, Germany) email:ceboruco@web.de; Karoly Nemeth, email:nemeth_karoly@hotmail.com.

Future Meetings

State of the Arc 2007, Termas Puyehue, Chile
 Jan. 28-Feb. 2, 2007
 Contact: www.iavcei-arcs.org.uk

International Workshop on Volcanism and Tectonics, Havana, Cuba
 March 20-23, 2007
 Contact: www.scg.cu/geoc/geofisica/1tvt_ing.htm

El Chichon Volcano 25 Years Later, Chiapas, Mexico
 March 20-25, 2007
 Contact: www.geofisica.unam.mx/vulcanologia/chichon/

Evolution, Transfer, and Release of Magmas and Volcanic Gases, Academia Sinica, Taipei
 April 22-27, 2007
 Contact: www.earth.sinica.edu.tw/~mag2007

IUGG General Assembly, Perugia, Italy
 July 2-13, 2007 (IAVCEI 2nd week)
 Contact: www.iugg2007perugia.it

Cities on Volcanoes 5, Shimabara, Japan
 Nov. 19-23, 2007
 Contact: www.citiesonvolcanoes5.com/index

IAVCEI 2008 General Assembly, Reykjavik, Iceland
 Aug. 18-24, 2008
 Contact: armh@hi.is

3rd International Maar Conference, Malargue, Argentina
 April 2009
 Contact: corinarisso@fibertel.com.ar

IAVCEI 2012 Alaska, Centennial of 1912 Katmai Eruption (tentative)
 June 2012

Further information may be found on the IAVCEI Web site at www.IAVCEI.org

IAVCEI 2003 – 2007 Executive Committee

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2001	588
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2005	730

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*This issue was edited by
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