NEWS No. 1

April 2020

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

IAVCEI

FROM THE PRESIDENT

Dear Colleagues,

This first issue of the IAVCEI Newsletter in 2020 has been delayed by the dramatic outbreak of Covid-19 pandemic and its impact on our quotidian life at local, national and global scales. I hope you all take care and are generally in good health! Let me express a special thought to our colleagues working in volcano observatories worldwide, who can hardly stay at home and expose themselves while interacting with each other in their observatory in order to warrant the continuity of volcano monitoring. Like the medical staff in hospitals, they are our front line staff on active volcanoes.

The Covid-19 pandemic has rapidly disrupted our personal and professional plans. Several volcano-related international meetings and workshops have been either postponed or transformed into videoconferences. The first ALVO Conference was thus hold in virtual mode by the end of March (see the report below) Other international meetings now planned as purely videoconferences include the EGU General Assembly (May 3–8, #shareEGU20), the JpGU-AGU joint meeting (May 24-28), and the 2020 Goldschmidt Conference (June 21–26).

As regards IAVCEI, you were already informed on March 18 that the COV11 Conference in Crete (Heraklion) has tentatively been rescheduled on September 25-30, 2020. The IAVCEI Exec, the CaV leaders and the Local Organizing Committee in Greece are closely interacting to carefully evaluate the outcoming conditions linked to the Covid-19 crisis and to keep you updated on COV11 issues (www.citiesonvolcanoes11.com), including the possible combination of physical and online participation. Other postponed meetings include the Soufrière Hills Volcano 25 Years Conference (SHV25), whose new dates still remain to be defined (http://shv25.com/), and the 14th Field Workshop of the IAVCEI Commission on Volcanic Gases in Hokkaido, delayed by one year (June 2021). You will be soon informed of our evaluation and decision regarding the 2021 IAVCEI Scientific Assembly in New Zealand.

In fact, we still face tremendous uncertainty as to the potential severity, length and impacts of the Covid-19 crisis. Be sure that IAVCEI will rank the safety of its members as the highest priority in any of its decisions. Despite this incredible situation, don't forget to renew your IAVCEI membership in order to help us maintaining the financial capabilities of our Association once we'll become again fully operational.

While our meeting plans for 2020 are being strongly impacted, both scientific research and volcano monitoring (as outlined above) are continuing. As already said in my previous message on March 17, the Covid-19 crisis further highlights how increased scientific networking and international preparedness are crucial to anticipate and mitigate the global effects of a natural hazard. Again, this is a lesson to our community if one wishes being ready to anticipate and face low-probability but high-magnitude volcanic events, with potential worldwide effects, that might happen in the current decade and later on (e.g. *Newhall et al.,* Geosphere 2018). This strongly reinforces the willing of IAVCEI to renew the networking capabilities of our World Organization of Volcano Observatories (WOVO).

Coming back to more standard stuff, here below are a few information coming from IUGG:

a) The official report on the 27th IUGG General Assembly in 2019 is now available at http://www.iugg.org;
b) Stephen McNutt (USF), former Secretary-General of IAVCEI in 1999–2007, is a member of the IUGG Bureau for the term 2019–2023;
c) Due to the coronavirus pandemic, the deadline to submit project proposals for the IUGG Grants Program 2020/21 (http://www.iugg.org/programs/grants_program_2020-2023.php) is extended until June 1, 2020 (instead of April 1);
d) The Group on Earth Observations (GEO) calls Members and Participating Organizations (including IUGG) to nominate individuals with relevant expertise to join its new Working Groups. Among these are the Disaster Risk Reduction Working Group (DRR-WG) and the Data Working Group (Data-WG) (see http://earthobservations.org/geo_blog_obs.php?id=417). For those interested, please notify the IAVCEI SG who will transfer to Michael Sideris (sideris@ucalgary.ca; the GEO Principal of IUGG).

Obituary: on January 15, 2020 we lost Alfred T. Anderson (1937–2020), Professor at the Department of Geophysical Sciences of Chicago University for over 40 years, who made pioneering contributions to the field of volcanology. Fred's memory is honored below by his friend Bill Rose. Among his major contributions, Fred Anderson developed pioneering studies of the melt and fluid inclusions entrapped in crystals during magma storage and ascent. As a personal highlight, his remarkable review paper entitled "Some basaltic and andesitic gases" (*Reviews in Geophysics*, vol. 13, 1, 37-55, February 1975) has been of fantastic inspiration to many of us in studying the cycling of magmatic volatiles at regional and global scale.

Take care of you. My very best wishes,

Patrick Allard
Paris, April 6, 2020

OBITUARY

Fred Anderson and the *asymmetric doublet* pattern

The volcanological community just lost a great thinker and role model: **Alfred T. Anderson Jr.**

Fred was a friend for 45 years, but for me one period of a year or so (~ 1980) is so indelible and representative of his lasting and effective leadership in volcanic petrology. It captures his style of modesty and advanced curious thinking. It made me feel so privileged to learn so much from him about **really** reading rocks. Fred took thinking farther than anyone I have known and he shared it so well. We were thinking about the crystals of plagioclase in the Fuego basalts of 1974.

His petrology lab was so wondrous he was doing high magnification Nomarski phase contrast optics on oscillatory zoned crystals. We spent two days reviewing many, many crystals (a review of years of his own work). The walls of the lab were papered with hundreds of microphotographs. He showed me countless examples of repeated pairs of wider and thinner zones of tree ring like sequences. They numbered in groups that peaked at 25 and 50. Fred recognised a pattern that mimicked earth tidal changes. This observation opened up the issues of movements in the conduit, magma mixing and eruption evolution in a thrilling way by introducing a time record for crystal growth. (one of several articles is *Amer. Mineral*. 69 (8) 660-676)

I learned so much from him. He surely was a volcanologic hero in leading understanding from melt inclusions.

I think his **style of discovery** was even more compelling. A giant personality, a great teacher, an original thinker, an example of learning at the highest level, a leader in open communication with no pretentiousness. He never minded my naiveté.

Caroline and Fred Anderson at Lake Superior in summer of 2007 (Photo Bill Rose)

I feel so lucky and happy to have spent quality time with this wonderful friend. He and Caroline felt peace and discovery and shared so much.

I know there are so many who treasure Fred's influences on learning about volcanic rocks. Charles Bacon wrote a wonderful Bowen award statement which enumerates many more of his disciples (https://honors.agu.org/sfg-awardees/anderson-receives-2001-bowen-award/).

Bill Rose
March 4, 2020

MESSAGE FROM THE SECRETARY GENERAL

Dear Colleagues,

First of all, my dearest wishes of good health for you and your beloved ones.

We are just facing a global crisis that we never faced before, as previously highlighted in the message of our President.

What I would like to add in these few lines is that, despite such a critical situation, IAVCEI still continues working. We are organizing the re-scheduling of our international meetings and workshops, and you will be provided regularly with updated information. I'm absolutely confident that we will quite soon meet again by person, enjoying the pleasure of talking of science with colleagues in front of a beer. I have also to say that, thanks to the healthy financial situation of IAVCEI, the support to our community (grants, travels, etc.) will be operational as soon as our international mobility will be reactivated.

I'd also like to stress that we can get positive lessons from the current crisis. This time the crisis is due to a biological hazard, but next time it could arise from a major volcanic event. Today we are witnessing the effects of broad unpreparedness in managing a (possible) biological disaster, as a consequence of inefficient use of scientific knowledge and public unawareness about the severity and reproductiveness of the coronavirus (its transmission rate). As scientists, we need to learn from this crisis in order to avoid the same path in future. We need research, communication, reaction and resilience. It will be a duty for each of us to remember this and to promote appropriate actions both in our respective countries and at the international scale.

Stay safe and healthy!

Roberto Sulpizio
IAVCEI Secretary General

UPDATES

Cities on Volcanoes 11 Update

Dear participants to the COV11, dear colleagues,

We hope that you and your beloved ones are safe and well in these especially hard times. We are facing an unprecedented international crisis that has been raising great uncertainties in project our immediate future.

In previous communications we promised you a periodic and timely information about our actions for the organization of the postponed COV11. We are daily watching the evolving situation of the epidemics in Greece, whole Europe and worldwide, and regularly update our plans in order to guarantee both a safe and well attended COV11 in Crete.

At present, we still keep on with holding the meeting in the period of September 25–30, 2020. We work on options for a re-opening of the procedure for registration to the meeting, the workshops and the field trips at a reasonable deadline that we'll communicate you in due time.

Obviously, we all are strongly dependent on the evolution of the crisis, and we'll take actions accordingly.

Soufrière Hills Volcano 25 Years on Conference

Updates by SHV25 Organizing Committee

Following the postponement of the Soufrière Hills Volcano 25 Years on conference interested participants are asked to please fill out our expression of interest form – http://shv25.com/online-submissions/expression-of-interest/. As this is a small conference with limited availability, this will help us to ensure that we can meet your need and those of any accompanying persons.

Despite the postponement, participants interested in submitting an abstract may do so at any time using this link – http://shv25.com/online-submissions/submitting-an-abstract/. We will update the deadlines for abstract and registration once the revised conference dates have been set.

Please keep following our Facebook page at https://www.facebook.com/mvoms/ or visit our conference website at http://www.shv25.com for updates on new abstract and registration procedures and dates as they become available.

We hope that you, your colleagues and family are all staying safe and healthy during this time.

Would you like to get more information SHV25?
E-mail: info@shv25.com

VOLCANOLOGY IN TIMES OF PANDEMIC

The first ALVO *virtual* conference

After overcoming several difficulties, the first Congress of the Latin American Association of Volcanology (*1er Congreso ALVO: Volcanología en y para Latinoamérica*) was successfully held in a virtual mode during March 2020 (https://www.1ercongresoalvo.com/). The congress should have been held in November 2019 in Antofagasta (Chile), but due to the serious political and social crisis that affected the country during that period the conference was postponed to March 22–26, 2020. Shortly before this new date, the COVID-19 outbreak reached South America, jeopardizing one more time the conference. The solution found to face this new scenario was to change the modality of the conference to a virtual event. This involved a huge logistical challenge in a very short time (10 days), which was successfully resolved by the local organizing committee and accompanied by the great support of the participants from the Latin American volcanological community and from the sponsors (including USAID and IAVCEI).

The 1st ALVO congress was successfully carried out on an online format between March 23 and 26, 2020, where the broadcast was done by the local organizing committee (mostly from Antofagasta, Chile), using the platform Zoom(c). The working group was constituted by 21 people, who were in charge of hosting the 7 virtual rooms for oral presentations, poster sessions and plenary talks, during the four days of the conference.

The Congress was constituted by 5 thematic areas and 30 scientific sessions, covering a wide spectrum of topics, including physical volcanology, geochemistry, seismology, remote sensing, volcano observatories, instrumentation, volcanic hazards and risks, outreach, and artistic expressions, among others. From the first call, 304 abstracts were received, including 152 for talks and 152 for posters. Complementary events included 3 plenary talks, 1 photograph exhibition and 3 forums. During the virtual congress, 112 talks were presented (75% of the original program) and 99 posters (65%; where each participant had 3 minutes to explain their posters), 2 plenary talks (*VDAP experience in Latin America*, by USGS volcanologists and *Evolution of the Central Andes*, by Dr. Jose Viramonte, volcanologist from the Universidad Nacional de Salta, Argentina),1 forum about *ALVO future perspectives* and the photograph exhibition was open during the four days (at https://www.1ercongresoalvo.com/muestra-permanente).

The 1st ALVO Congress each day hosted up to 200 participants simultaneously among the virtual rooms; the peak in audience was for the two plenary talks, with an audience of ~145 participants, which is ~74% of the originally registered participants. Despite minor problems, including that the local organizing committee members were broadcasting from their homes, dealing with a massive use of internet connection and consequently with a slower service, and the time/hour differences between the participants, the congress was carried out successfully, being positively evaluated by the participants and the ALVO executive committee.

The ALVO Congress and the difficulties and solutions that existed before the postponement scenarios and its realization online, are an example of the strong ties of Latin American collaboration and interest in the development of volcanology. We are very happy with this great achievement that was the 1st ALVO Congress and to share it with all of you.

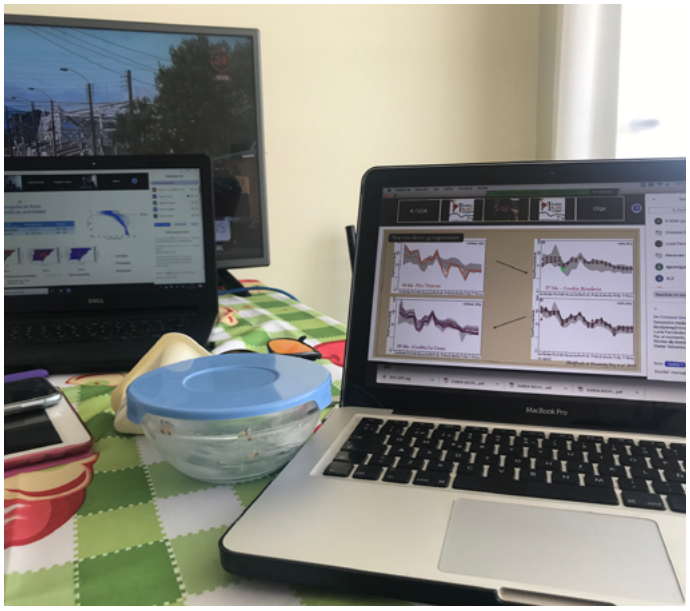
Videos of the 1st ALVO Congress can be accessed in the next link: https://www.youtube.com/channel/UCctO_UvBhjLLVp0A5WCMb9Q.

For more photos, videos and information about the Congress you can visit @1erCongresoALVO in facebook, twitter and instagram.

Finally, we invite you to keep an eye on all ALVO projects following us on our social networks: @OficialALVO (Facebook) and @oficialalvo (Instagram).

Remember that any person dedicated to Latin American volcanology, either from Latin America, living there or doing research in the region can belong to ALVO. If you require more information or are interested in becoming a member (free membership), please write to alvo.comunicaciones@gmail.com.

Local Organizing Committee – 1st ALVO Congress
ALVO Executive Committee



ECR-NET REPORT

Early Career Researchers Network (ECR-Net) 2019 activity report

I. Introduction

The ECR-Net has been active since 2013 and has been officially recognized as a part of IAVCEI since 2017. The ECR-Net is dedicated to offer a portal for the ECRs across our community to gather and share experiences. The ECR-Net is represented by a self-nominated working group (WG), which is in charge of keeping the network active through social media, as well as organizing events at conferences.

In 2019, for the first time, the IAVCEI has offered the opportunity to the ECR community of IAVCEI to elect a representative (ECR-rep) that will sit among the executive committee (EC).

The WG of the ECR-Net will still stay active and regularly communicate as well as advise the ECR- rep.

This document has been written by the WG and the ECR-Rep and reports on the ECR-Net activities held in 2019, as well as the financial details with respect to the budget provided by IAVCEI for ECR-Net activities.

II. Membership

It is difficult to evaluate how many participants are part of the ECR-Net. On Facebook there are 684 members (+ 60 from 2018), the Twitter account has 947 followers (+ 208 from 2018). This, however, may also include non-ECRs, advanced scientists and non-scientists. During conferences, it is easier to evaluate the impact of the network. For example, at IAVCEI 2017 in Portland, about 400 ECRs were present throughout the conference and participated in a range of events. At CoV10 in Naples in 2018, more than 150 ECRs were counted at the social event. At IUGG in Montreal in 2019, about 70 ECRs participated at the social event. We expect a high number of ECRs at the next IAVCEI conference in NZ in 2021. It would be interesting to compare with the number of registered students.

III. The working group

Representatives: Oryaëlle Chevrel (Researcher, France) and James Muller (PhD student, USA) **Members:** Sam Poppe (Post-doc; Belgium/USA), Hannah Dietterich (Researcher, USA), Pablo Forte (Post-doc, Argentina), James Hickey (Researcher, UK), Rebecca Fitzgerald (PhD student, NZ), Leticia Freitas Guimarães (PhD student, Brazil).

Meeting and communicating within the WG: A WhatsApp group in addition to e-mails are our main way of communication. All documents related to our group are stored on a Google drive (ecrnetiavcei@gmail.com). Besides various WhatsApp/email conversations, we had two video- conference meetings via Skype in 2019. These meetings are fundamental to discuss important matters mainly before conferences or when organizing a big event (this year was mainly about the new ECR-Rep). In general, one of the representatives of the group is in charge of organizing the meeting and keeping minutes.

IV. A representative on the IAVCEI EC

This year was definitely marked by the election of an Early Career Representative within the executive committee of IAVCEI. We greatly acknowledge the IAVCEI to recognize the importance of having an early career scientist as part of the executive committee.

Two people were nominated with the help of the ECR-Net working group: Julia Eychenne (France, LMV) and Josh Hayes (NZ), out of which Julia was elected with a majority of votes.

It was not easy to find people that would apply for the position. This is mainly due to the fact that it is a new position and no one really understood the exact role and responsibilities. From the moment the representative was elected, we started to have regular communication. We shared with Julia the experience we gained through the ECR-Net.

V. ECR-Net activities

Participation to conferences:

EGU-AGU 2019
Both EGU and AGU have strong Early-Career programs of themselves running at their assemblies. It is therefore our view not to intervene or organize a parallel program, but rather support the existing programs where possible by raising awareness of the ongoing ECR programs as much as possible with IAVCEI ECR members through our social media channels. The AGU Volcanology, Geochemistry, Petrology section had their own ECR event with mentors that we helped advertise. We did not run a separate event.

IUGG 2019: Montreal
During IUGG 2019 an "Early-Career Fair" entitled " Forming and enhancing connections between ECR's and experts from Academia, Publishing and Industry" was organized to connect ECR's to experts from academia, publishing and industry with the core aim of allowing ECR's to ask questions about career paths within and outside of academia as well as on how to get published. The event was mainly organized by Stephan Kolzenburg and Romain Lauzeral and supported by members of the ECR-Net WG and the ECR-Rep: Sam Poppe, Oryaëlle Chevrel, Elisa Rumpf, James Muller, Hannah Dietterich and Julia Eychenne.

→

The event took place between 6:30 and 10 pm at Thompson house, 3650 McTavish street, Montreal. We offered tickets for two drinks at the entrance to all ECRs. Overall, we had ~70 ECR participants total (people come and go during the mixer) and nine expert guest speakers. This was financed by the IAVCEI budget for ECR-Net activities (930 $CAN).

We started the social event with a quick and informal 1–2minute introduction of each expert/mentor (see picture). Following this, the participants were invited to disperse around the room and find the expert they are interested in talking to. Each expert was assigned a table that included a label with the respective name and topic. For some topics there were multiple mentors, and we grouped these at adjoining tables so they could group together if needed. We invited participants and experts to let the discussion go wherever it takes them and did not prescribe a specific topic or agenda – allowing for the participants to ask for any career related information they might be interested in.

This event was a great occasion to meet the ECR community of IUGG as well as international experts. Many new connections were made between generations (from masters to senior scientists and publishers) and between nationalities. The very positive feedbacks we received strengthened the idea that such activities are needed. In particular, many ECRs were grateful for the event because they got to know new people and realized they were not alone being at a conference for the first time.

Logo contest for AVCEI

After the success of the ECR-Net logo contest, the IAVCEI EC, which planned to renew their logo for the society's centennial celebration, asked us to organize a logo contest on social media. We therefore sent announcements on Twitter and Facebook. The call opened on Oct 25 and closed on Dec. 23 2018. Six people responded with a total of 9 designs. These were sent to IAVCEI EC in early January 2019. From those, the new IAVCEI logo was chosen.

Activity on social media and the web

Throughout the year, we are regularly posting announcements of job opportunities as well as any grant opportunities to attend conferences, lectures etc. We are also encouraging people to post their announcements directly on our Facebook page, which has become a second channel additional to the VolcanoList mailing server. We have also supported the "Volcanologists Outside Academia" blog throughout the year, sharing the survey and linking to new profiles and resources for helping ECRs navigate the transition to non-academic jobs (https://volcanologistsoutsideacademia.wordpress.com/)

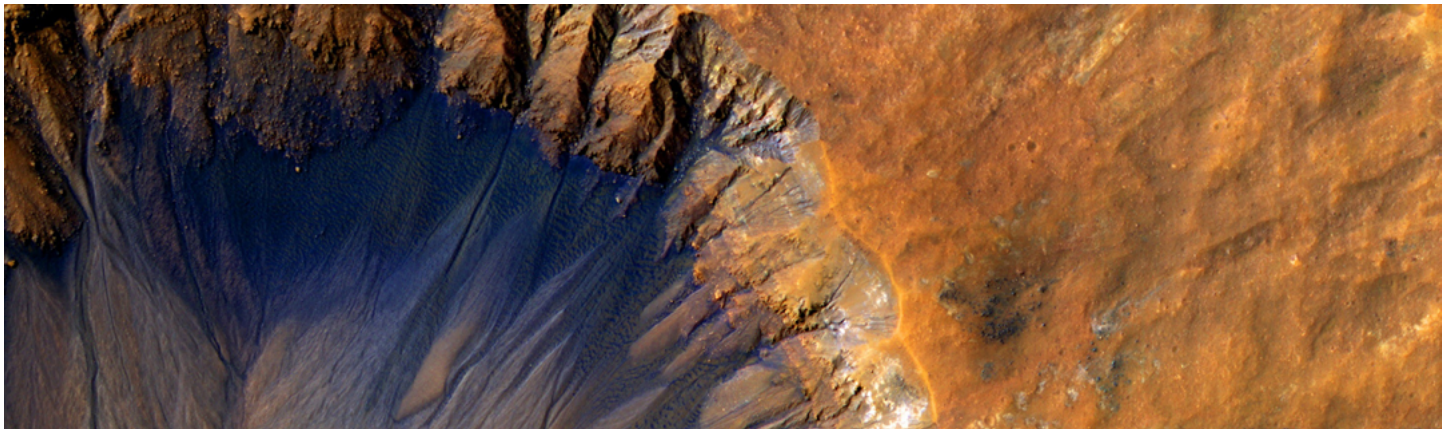
Relationship with other early career organizations

The ECR-Net has been invited by the Jóvenes Volcanólogos Latinoamericanos (JVLA) to give a presentation on the ECR-Net initiative for the 1st ALVO conference: "Conectar jóvenes volcanólogos a nivel mundial: el desafío de la Early-Career Researchers Network (ECR-Net) de la IAVCEI". This meeting was delayed and re-scheduled to March 2020 due to the social unrest in Chile.

VI. Bulletin of Volcanology for their ECR award

The most highly-cited ECR article in 2018 published in Bulletin of Volcanology (BV) was offered to Stephan Kolzenburg for the article entitled "The rheological evolution of the 2014/2015 eruption at Holuhraun, cental Iceland". The prize is a Springer book voucher, and five years membership to IAVCEI. The award is based on citations in all journals during 2017 and 2016, and is based on statistics published in 2019 (hence it is an award given in 2019 for performance in 2018). The award was given in December and announced in the last IAVCEI newsletter of 2019. BV plans to present the award at CoV 2020. Like for the last year award, the ECR-Net WG provided support to BV to verify who was ECR at the time of the published article and is still ECR today.

This year the award was signed by Julia Eychenne, the elected ECR-Net Rep (last year it was signed by the non-elected ECR-Net WG representative). →



VII. Budget table

Description	Cost/Profit
Total Financial Support by IAVCEI in 2017	**+2500 €**
Total benefit from T-shirt Sale in 2018 (68)	+1011€
1. TOTAL spent in 2018 (extra)	-956 € (IAVCEI)
2. TOTAL spent in 2018 (CoV)	-720 € (IAVCEI) – 550 € (paid with T-shirt sale)
Total Rest of Financial Support by IAVCEI to date	**+940 €**
Total benefit from T-shirt Sale	**+311 €**
Total ECR-Net envelope at the end of 2018	**+1251 €**
Total benefit from T-shirt Sale in 2019 (6)	+132 $ CAD (98€)
3. TOTAL spent in 2019 (IUGG)	-930 $CAD (IAVCEI) – 20 € (paid with T-shirt sale) (694 €)
Total ECR-Net envelope at the end of 2019	**+635 €**

VII. Conclusion and Perspectives

The year 2019 was marked by the election of the ECR-Net Rep, the organization of the Fair event at IUGG 2019, and organizational support to finding IAVCEI's new logo.

We are grateful to the EC of IAVCEI for the creation of an ECR position on the EC that is an amazing opportunity for the young generation to contribute. We hope that this will also permit for organizing committees at future IAVCEI-related conferences to have someone in charge of the link with the ECR-Net (to facilitate event organization).

Like last year, among future perspectives, we suggest that the definition of ECR should be revisited (homogenized) by the EC and the ECR-Rep, in agreement with IUGG. The ECR-Net WG believes a definition of "within 7 years of terminal degree" is more inclusive compared to a fixed age limit. Discussions regarding additional considerations, such as stopping the ECR "clock" as a result of an absence (e.g., maternity/paternity leave), would likely be beneficial.

We still hope that people from Asia, Africa and the Caribbean will participate more actively in the ECR-Net Working Group.

We are now preparing a workshop and a social event at CoV, Heraklion in 2020 and the future IAVCEI conference in NZ, for which Rebecca Fitzgerald will be the local ECR-Rep. By date of the IAVCEI 2021 conference, we will also make an evaluation of the organizational sustainability of the ECR-Net, and plan to hold a gathering of ECRs at the conference to set out our future, as well as renew WG members.

The ECR-Net page embedded in the IAVCEI website urgently needs to be updated as well.

THE INTER-ASSOCIATION WORKING GROUP

Electro-magnetic Studies of Earthquakes and Volcanoes (EMSEV)

EMSEV website: www.emsev-iugg.org/emsev/

1. Introduction

EMSEV ('Electromagnetic Studies of Earthquakes and Volcanoes') is an Inter-Association Working Group of the International Union of Geodesy and Geophysics (IUGG). The three International IUGG Associations of Geomagnetism (IAGA), Volcanology and Chemistry of the Earth's Interior (IAVCEI), and Seismology and Physics of the Earth's Interior (IASPEI) powerfully support EMSEV and promote its activities.

During the past 20 years of activity, EMSEV has continuously investigated tectonic and geological setting of active faults and active volcanoes and has constantly worked for a better knowledge of the physical and dynamical processes leading to fault rupture and volcanic eruptions. Based on the expertise of a worldwide community of more than 350 researchers, engineers and students, EMSEV sustains innovative researches and findings in electromagnetism (EM), integration of new EM methodologies with other geophysical data to describe, monitor, analyse, and model fault systems and volcanoes.

EMSEV scientists have really expanded methodologies, increased ground observations, satellite observations and carried out laboratory measurements for understanding earthquake and volcanic processes.

EMSEV objectives are: (1) evaluation and endorsement of advanced studies in the electromagnetic field through international cooperation, conferences and workshops, and high levels international publications, (2) integration of electromagnetic methods together with other geophysical techniques to identify physical processes on all scales before, during and after earthquakes and volcanic eruptions, (3) organization and management of international and regional workshops including sponsorship of sessions at international meetings that describe these results and (4) participation in educational and field programs relating to observed results and the reduction of an earthquake and volcanic hazards.

Administration

In 2018, the structure of the EMSEV changed significantly. From 1999, date of EMSEV building, the EMSEV body consisted of the 1) Executive Bureau, 2) Working Group Members that included all scientists interested and involved in EMSEV activities, 3) National Representatives (about two per country) and 4) EMSEV collaborators that included all interested scientists from other geophysical disciplines. The executive bureau is elected every four-years.

From 2007 to 2019, every four years Chairperson (J. Zlotnicki), Vice-Chairperson (M.J.S. Johnston), and Secretary (T. Nagao) were elected for driving EMSEV bureau and community. J. Zlotnicki and M.J.S. Johnston asked to renew the bureau and a new election was organized during and after the biennial 2018 EMSEV meeting in Italy.

The EMSEV body will now consist of the 1) Bureau, 2) Country Liaison Members, 3) EMSEV members and 4) EMSEV Collaborators.

EMSEV bureau. Since March 2019, Toshiyasu Nagao (Japan) assumes the EMSEV Chair, Valerio Tramutoli (Italy) was elected as Vice-Chairperson, and Jann-Yeng Liu (Taiwan) was selected as Secretary.

EMSEV bureau gathers the following association liaison members:
- IAVCEI: Takeshi Hashimoto from Hokkaido University (Japan),
- IASPEI: Qinghua Huang from Beijing University (China),
- IAGA: Jann-Yeng Liu from the National Central University (Taiwan),

At this moment, EMSEV bureau contains 15 members from 10 countries. Detailed member list is presented on http://www.emsev-iugg.org/emsev/profile.html.

Country liaison members. Country liaison members are representative scientists from each country (about two per country) who promote electromagnetic studies related to earthquakes and volcanoes and contribute to EMSEV activities in their country and internationally. 36 scientists from 16 countries represent this EMSEV sub-body. Detailed country liaison list is available on http://www.emsev-iugg.org/emsev/profile1.html.

EMSEV Members. An EMSEV Member is anyone who has an interest and participates in EMSEV activities. Exchange of information is facilitated through EMSEV meetings, which are organized every two years, and/or IUGG General Assemblies (including IAGA, IASPEI, and IAVCEI meetings) and EMSEV mailing list.

EMSEV Collaborators. They are active scientists working in Natural Hazards in any related field of research whose expertise does not primarily belong in the EM field but are interested in and involved in the development of new geophysical knowledge. They are interested in participating in EMSEV activities, including cross-disciplinary analysis of observations and understanding of physical processes from different perspectives. Two collaborations, one in Seismology and one in Geochemistry, are already active. These groups will be developed in the next future. →

Business meetings will continue to be regularly organized at the EMSEV meetings and International General Assemblies. Minutes of the meetings will be distributed through EMSEV mailing list as usual. Information, activities, and annual and business meetings reports are kept on the EMSEV website that is mainly managed by T. Nagao (webmaster@emsev-iugg.org). Messages and information on activities are also distributed by T. Nagao through the EMSEV mailing list.

2. Conference activities

In 2019, EMSEV activities continued to be numerous and rewarding for the benefit of the scientific community. EMSEV was involved in several international meetings, organizing sessions devoted to EM phenomena. EMSEV paid close attention to research achieved and published in international journals in which the sponsorship of EMSEV and the support of IUGG and EMSEV are clearly mentioned.

Meetings and Workshops

Important sessions at international conferences that were sponsored or organized by EMSEV members and, for which, a high level of participation occurred are:

EGU, Vienna, Austria (April 7–12, 2019)
NH4.3: Short-term Earthquakes Forecast (StEF) and multi-parametric time-Dependent Assessment of Seismic Hazard (t-DASH), Co-organized as AS4.62/EMRP2.40/ESSI1.7/GI2.13/SM3.9, Co-sponsored by JpGU. Convener: Valerio Tramutoli. Co-conveners: Mariano Lisi, Pier Francesco Biagi, Katsumi Hattori, Filippos Vallianatos.

JpGU, Chiba, Japan (May 26–30, 2019)
M-IS04, Interdisciplinary studies on pre-earthquake processes, Conveners: K. Hattori, J. Y. Liu, D. Ouzounov, Q. Huang.

IWEP6, Chiba, Japan (May 31–June 1, 2019)
6th International Workshop on Earthquake Preparation Process, Chiba, Japan (Co-sponsored by Chiba University, Tokai University, National Central University, Chapman University)

IUGG GA, Montreal, Canada (July 8–18, 2019)
S15, Interdisciplinary Observations of Pre-Earthquake Processes: A New Approach Towards Earthquake Prediction Studies, Convener: Dimitar Ouzounov, Co-Conveners: Sergey Pulinets, Katsumi Hattori, Patrick Taylor.

JA10, Electromagnetic Signals Generated by Volcanic Eruption/Activity, Fluid Pressure, Earthquakes and Aseismic Fault Slip (IAGA, IAVCEI, IASPEI), Convener: Jacques Zlotnicki (IAGA), Co-Conveners: Malcolm Johnston (IAGA/IASPEI), Takeshi Hashimoto (IASPEI/IAVCEI), Xuhui Shen (IASPEI), Yoichi Sasai (IAVCEI)

The 4th International Workshop of CSES Mission, Changsha, China (October 17–20, 2019)

AGU Fall meeting, San Francisco, USA (December 9–13, 2019)
NH029 – Multi-sensor observations of pre-earthquake signals, geo-hazards, and space weather from space and ground observations. Conveners: Dimitar Ouzounov, Tiger Liu, Livio Conti, Patrick Taylor. The principal focus of the session was on the latest satellite missions to study Earth EM environment, pre-earthquake processes, and the Space weather. During both Oral and Poster sessions, a total of 19 papers were presented. Two presentations were solicited – Prof. Pergiorgio Picozza on behalf of CSES mission and Dr. Fu-Yuan Chang on behalf of FORMOSAT-7/COSMIC-2 mission. Two young scientists, Dr. F.-Y. Chang (NCU, Taiwan) and Ms. Weiyun Xie (Chiba University, Japan) were recognized for their excellence in the presentations and were awarded travel support grants from EMSEV.

3. Joint International Activities

EMSEV activity on volcanoes
A cooperative program on Taal volcano between EMSEV and the Philippines Institute of Volcanology and Seismology (PHIVOLCS https://www.phivolcs.dost.gov.ph/) evolved from a Workshop in Manila, the capital of the Philippines, in 2003. Taal volcano is a very dangerous and hazardous volcano which may cause serious death and devastation in Luzon Island. Taal Volcano is classified as "DECADE VOLCANOES" by IAVCEI. There have been 33 recorded eruptions at Taal from 1572 to 1977. It means that during the last 40 years, no eruptive activity was recorded. Taking into account the past eruption history, it is quite an unusual quiescence.

EMSEV applied electromagnetic methods for imaging the 3-dimensional structure of the volcano then combined later with geodetic and other geophysical monitoring systems for monitoring the ongoing activity. Structural information indicates a shallow magmatic source located at a depth between 4 and 6 km below the current Main Crater Lake (MCL) on Volcano Island. Volcano Island is surrounded by Taal Lake that fills the prehistoric caldera of Taal Volcano.

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To monitor this system, EMSEV and PHIVOLCS installed a number of multi-parameter stations. These stations recorded magnetic, electric, tilt, resistivity, ground and water temperature data with continuous data telemetry to PHIVOLCS (leading EMSEV team, J. Zlotnicki, Y. Sasai, M.J.S. Johnston, T. Nagao). Migrating intrusions at depths of 5 km to 2.5 km with accompanying seismic, uplift, electromagnetic, hydrologic, thermal and geochemical activity occurred during 2010 under the North edge of the Main Crater Lake (Zlotnicki et al., 2019). More recently, ash and lava eruptions (VEI 4) occurred initially from this shallower source location in January 2020 with accompanying high seismicity (see Addendum below). These latest results clearly indicate that further large episodes of eruptive activity (VEI ≥ 4) are likely to occur within MCL and from subsidiary cones surrounding the Main Crater.

This international cooperative program has involved teams from Japan, France, USA, Greece, Italy, and Belgium. During the past 15 years of cooperative work, EMSEV provided training to PHIVOLCS members on the installation techniques, analysis of electromagnetic data and the best way to monitor the volcano. Further education of the PHIVOLCS team has included scholarships in Japan (PhD in Japan directed by T. Nagao and Y. Sasai) and Belgium. These skilled scientists from PHIVOLCS can now take over the monitoring tasks and EMSEV will continue to deliver expertise to PHIVOLCS when requested. A number of articles have been jointly published and some others are still in process.

The joint research between EMSEV and PHIVOLCS was evaluated by the Japanese government. As a result, from 2009 to 2014, comprehensive research including electromagnetic studies of Taal volcano was adopted (SATREPS; Science and Technology Research Partnership for Sustainable Development), and various observation networks were renewed. The project strengthened not only electromagnetic observations but also broadband seismometer networks and GNSS observation networks. Furthermore, in FY2016, a new 3-year international research program was adopted by JSPS (project leader; Toshiyasu Nagao), and studies on gravity measurement and volcanic gas were added.

EMSEV activity related to Earthquake Processes

In 2011, EMSEV started a new research effort focused on understanding fault failure and failure mechanisms of earthquakes. This was developed through a cooperative research program with Bishkek Research Station (Bishkek RS) in Kyrgyzstan, Russian Academy of Sciences where outstanding research on the relation between EM phenomena and electrical resistivity changes with earthquakes has been being carried out during the last 30 years.

The cooperative agreement between EMSEV and the Bishkek Research Station was initially signed in November 2011 and renewed during EMSEV workshop in Athens in April 2015.

During the IUGG GA in Montreal, EMSEV and the Bishkek Research Station decided to continue further cooperation not only on electromagnetic study but also seismicity study by using the Kyrgyz seismic network catalog.

Chinese Seimo-Electric Satellite mission and EMSEV

Following the promising results obtained during the DEMETER mission between 2006 and 2010 (https://demeter.cnes.fr/en/DEMETER/index.htm, http://demeter.cnrs-orleans.fr/) on the possible statistical significant occurrence of the ionospheric disturbances a few hours prior to large earthquakes (Magnitude above 5), the Chinese Earthquake Administration has implemented a new satellite monitoring program in which a flotilla of dedicated satellites should be regularly launched. The first EM satellite has been launched from China in February 2018. Professor Xuhui Shen, Head Scientist and Coordinator of China Earthquake-related Satellite Missions and Director of the Center of Earthquake Observation from Space, is an EMSEV Country liaison member.

A Memorandum of Agreement between Institute of Crustal Dynamics (CEA) and EMSEV was signed during the *International Conference for the Decade Memory of the Wenchuan Earthquake* held in Chengdu in May 2018 (http://www.4thicce.com/).

The purpose of this Agreement is to provide scientific and technical interaction between the two sides for collaborative research on active faults and volcanoes, for theoretical and experimental investigations into physical processes related to earthquakes and volcanic eruptions, for promoting new investigations using electromagnetic and other geophysical methods and to enhance data processing and analyses.

Actually, at the 4th CSES meeting in Changsha, more than 20 EMSEV members attended the meeting.

FUTURE ACTIVITIES

In 2020 EMSEV biennial meeting will be held in Taiwan (https://irsl.ss.ncu.edu.tw/emsev2020). Furthermore, EMSEV plans to deeply work in two directions. The first one is to keep strong participation in international meetings such as EGU, AOGS, JpGU, CSES, AGU. In addition, a number of EMSEV members will organize regional meetings and educational workshops as in the Philippines or Kyrgyzstan. The second direction is to strengthen EMSEV activities through international cooperation. This will be achieved by the pursuit of cooperation with Philippines (JPSP-KAKENHI program), Bishkek-Research station, Russian Academy of Sciences (EMSEV) and the development of EMSEV's involvement in the Chinese satellite mission (CSES mission).

On January 12, 2020, the Taal volcano erupted again, 43 years after the 1977 eruption. The eruption started almost suddenly in the main crater on Volcano Island. Before the eruption, local seismic activities were increased. Furthermore, CO2 gas increased since last September. At the time of the eruption, the population of the Volcano Island was about 8,000. However, in advance, PHIVOLCS provided information on Taal Volcano activity. Therefore, no fatalities were reported. Really PHIVOLCS did a great job.

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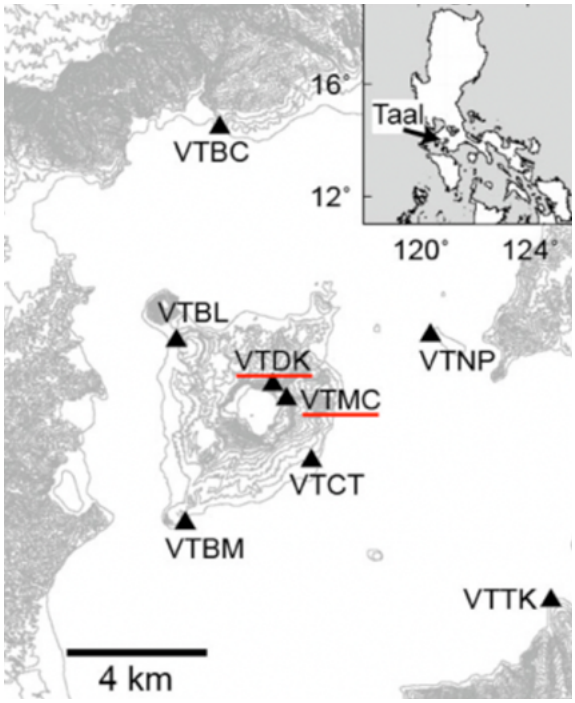
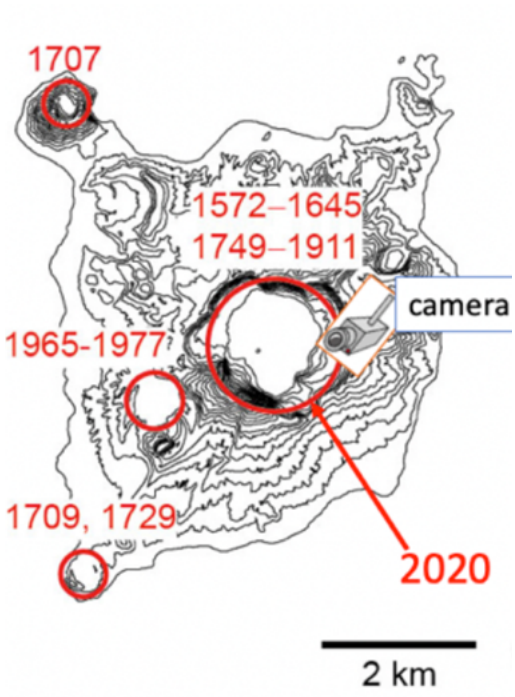
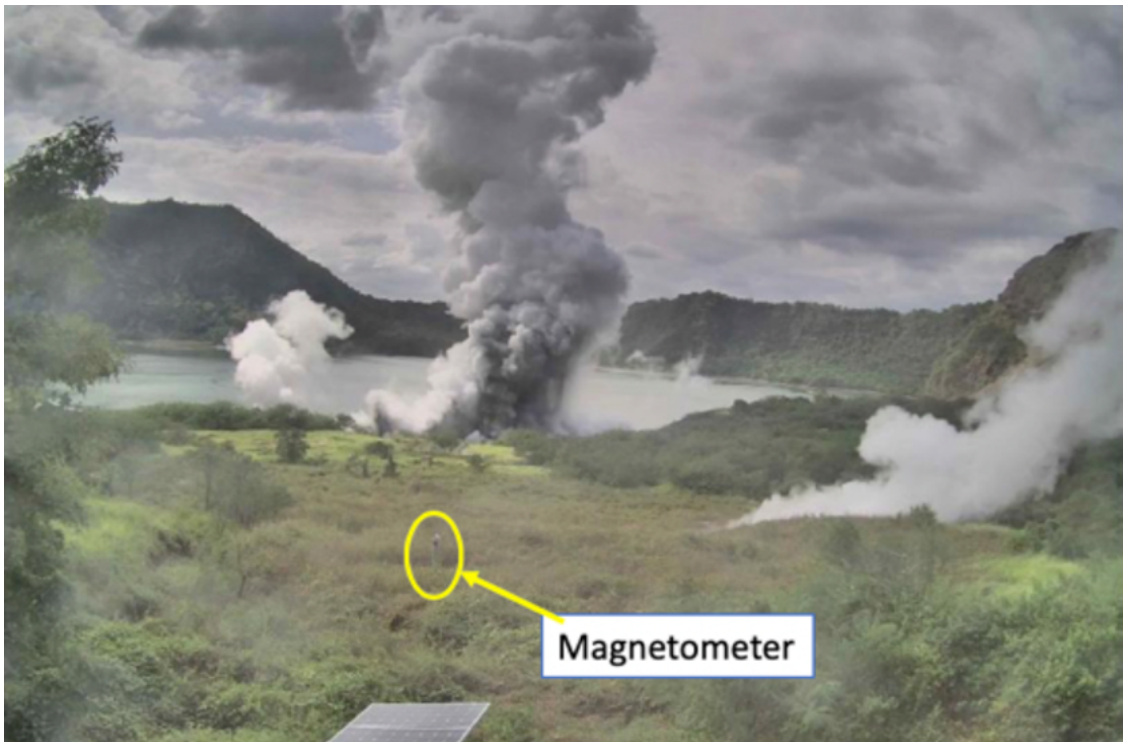




Left: Taal geophysical monitoring stations. We totally lost VTDK and VTMC stations.

Right: 2020 eruption started in main crater lake like the 1911 devastating eruption. Camera location is also displayed.



Beginning of the eruption.

Left: Initiation of the January 12 eruption. Yellow circle shows our magnetometer.

Right: A few minutes later the eruption. We lost VTMC station.

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