

NEWS No. 1

March 2023

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



This Newsletter is intended to keep IAVCEI Members and individual scientists informed about the activities of the Association and its bodies, and the actions of the IAVCEI Executive Committee. Past issues are posted on the IAVCEI website. Your comments are welcome. The IAVCEI Newsletter may be forwarded to non-members who may benefit from the information.

FROM THE PRESIDENT



Photo by © Francesca Zizola

Dear IAVCEI colleagues,

I hope 2023 has started under positive perspectives for each of you.

This Newsletter 2023/1 first reports on our Scientific Assembly in Rotorua (New Zealand) in last January–February. After two Covid-due postponements in 2021–2022, and despite flight cancellations due to heavy rainfalls from a coincidental tropical storm on January 27–29, our SA2023 resulted to be a great success, with a total of ca. 1100 participants. Details are given in the summary report by the NZ organizing committee.

You will then read information on our next SA in 2025 and updates on our IAVCEI General Assembly in Berlin (July 15–20) during the 28th IUGG GA. As already outlined, the IAVCEI faces the unprecedented, difficult situation of holding both its SA and GA only 6 months apart in the same year, which the Executive board has tried to manage at its best.

Other information in this Newsletter concern the 2023 IAVCEI Awards, the nomination of four Honorary Life members, Bulletin of Volcanology's editorial activities, awards and next Editorial team for 2023–2027, IUGG-related business, workshop announcement of some Commissions, and new books.

Finally, our 2023 General Assembly in Berlin will close the mandate of the current IAVCEI Executive Committee and his changeover to the new Committee elected for the 2023–2027 term. The call to submit nominations for electing the next IAVCEI Exec was launched on January 17 and will be closed on April 15. Let further highlight the importance for IAVCEI to have an active and representative Executive board and, therefore, that numerous enough nominations of strong multidisciplinary candidates be submitted prior to the April 15 deadline. Two reminds were published on February 21 then March 27. Renewal in 2023 is for the roles of President, Career Researchers. Submission guidelines are accessible on the Statute-and-by-law sub-page of our website. Nominations (as one-single pdf file) must be emailed to Prof. Ray Cas (ray.cas@monash.edu), with copy to the IAVCEI secretariat (iavcei@associationhouse.cz).

Once validated by the Elections Committee, the submitted nominations and the timing of the electronic process will be soon communicated to all IAVCEI members. The Elections Committee, in charge of overseeing the lawfulness of the whole process, is now composed of:

Ray Cas (Australia)

Chair, IAVCEI President 2011–2015

Shanaka de Silva (USA)

Vice-President 2015–2019

Eliza Calder (UK)

Scientific counselor 2015–2019

Hiroshi Shinohara (Japan)

Scientific counselor 2011–2015

Francesca Bianco (Italy)

Director of INGV's Volcanology Department

As a last word, I am pleased to say that at the beginning of 2023 IAVCEI stands in very healthy financial conditions. This has allowed to support the activity of our Commissions and to offer 140 travel grants to young researchers and colleagues from low-income countries for attending COV11 in Crete (June 2022) then our SA2023 in New Zealand. Our financial report was communicated to IUGG, like every year, and will be summarized in our next Newsletter by our SG Roberto Sulpizio.

Best wishes,

Patrick Allard

March 31, 2023

IAVCEI MEETINGS

IAVCEI Scientific Assembly, Rotorua (New Zealand) January 30 – February 3, 2023



REPORT ON THE IAVCEI 2023 SCIENTIFIC ASSEMBLY, ROTORUA, AOTEAROA NEW ZEALAND

The IAVCEI 2023 Scientific Assembly in Rotorua, Aotearoa New Zealand was finally held on 30 January to 3 February, this year. This Assembly will, in part, be remembered for the unique series of long-term and sudden challenges that Nature placed on the organisation and running of the Assembly, and how community spirit won in the end to make it a success.

The challenges of Nature...

The long and uncertain COVID era had delayed the Assembly by two years, but New Zealand and the organising committee were now ready to host the international community. In the week before the event, we were expecting approximately 940 in-person delegates and a further 120 were registered for the virtual platform. This was to be the first large (>500) international conference for New Zealand in three years. It didn't matter that the New Zealand summer had so far been wetter than normal; we all expected it to be sunny by the end of January...right?

On Friday 27 January it rained in Auckland and across the upper North Island! It became Auckland's wettest day on record – a one-in-200-year flooding event. The biggest impact for the Assembly was flooding at Auckland Airport and closure of the international terminal until Sunday morning, disrupting flight plans for many delegates. Two flights en route from Dallas and Dubai, with cohorts of delegates on board, were returned to their port of origin, and many others (or their luggage) were stranded at airports around the Pacific, and maybe even on a tropical island or two. Domestic flights around New Zealand were also

disrupted. Pre-conference field trips were underway when the weather bomb hit. Unexpected travel experiences were shared thanks to social media (see #IAVCEIStranded).

Despite these troubles, delegates and the organising committee found ways to get themselves and others to the conference venue: over 600 delegates had checked in by the Sunday evening for the Icebreaker function. Disrupted travellers eventually arrived during the week, and the final official number of **in-person attendees reached 894**. Thanks to the digitally-innovative COVID era, a virtual conference platform was in place which meant delegates who could not arrive, could be transferred to the virtual programme, so the total number of **virtual attendees reached 205**. In-person attendees also had access to the virtual platform which was helpful for those delayed by flights or who were unwell.

The show must go on...

The Assembly was held in the Energy Events Centre in Rotorua (Fig. 1a). We enlisted a Professional Conference Organiser (Conferences and Events) to manage the Assembly and our organising committee of over 20 people comprised representatives from GNS Science and six universities across New Zealand (Auckland, Waikato, Massey, Victoria, Canterbury and Otago). The scientific committee comprised 17 local and international members. GNS Science and EQC were platinum sponsors and constituents associated with each of the six universities were bronze sponsors. Four organisations were exhibitors.

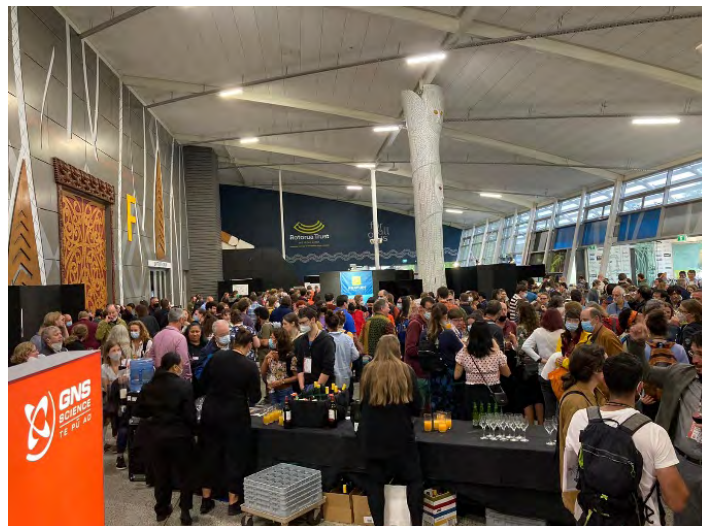


Figure 1. (a) The Energy Events Centre and the IAVCEI 2023 street flags flying proudly after a weather-beaten weekend (photo, Adrian Pittari). (b) The Icebreaker function. These weather-beaten delegates had just received an emotional boost following the pōhiri and powerful kapa haka performance by the Ngāti Whakaue tribe (photo, Anna Cardno).



Figure 2. (a) One of the plenary talks (photo, Danielle Charlton). (b) Socialising at one of the poster sessions (photo, Danielle Charlton)

According to custom in New Zealand, a pōhiri was held before the Icebreaker (Fig. 1b) on the Sunday evening in which the IAVCEI executive and delegates were formally welcomed at the conference venue by the traditional tribal owners of the land, Ngāti Whakaue. The powerful performance of the national award-winning Ngāti Whakaue Senior Kapa Haka (performing arts) group provided the much-needed emotional boost at the end of the weather-beaten weekend and set a positive scene for the week-long Assembly to follow. At the opening ceremony we were told that this group were “going to be a force” at the national kapa haka championships [Te Matatini](#) in Auckland later in February. The koha (contribution) provided by the IAVCEI organising committee supported this group at the festival and they won eight Firsts, one Second, and were equal Runner-Up overall. See their performance at the Te Matatini festival [here](#).

The opening ceremony on the Monday morning marked the start of the formal programme with a series of welcomes and well-wishes from Ngāti Whakaue, political and IAVCEI leaders. The ceremony concluded with short talks on Māori perspectives of volcanology and an overview on New Zealand volcanic research.

The scientific committee of the Assembly accepted **82 symposia** and received **1,265 abstracts**. 594 abstracts were accepted for oral presentations, 606 for poster presentations and the remaining 65 were withdrawn. The regular oral programme was run across nine parallel streams over Monday, Tuesday, Thursday and Friday. Each symposium was allocated one or more one-hour-long sessions (four talk slots) within a stream: two sessions were held before morning tea, another two before lunch, and another two in the early afternoon; five-minute breaks separated each lot of two sessions. Single streams were dedicated to the opening ceremony (first session on Monday), the plenary sessions (second session of each day) and the IAVCEI awards ceremony (two late morning sessions on Thursday). Four plenary sessions (Fig. 2a), each with a half-hour standard plenary talk and a half-hour ECR plenary talk, were held each day. Three two-hour poster sessions (Fig. 2b) were held with refreshments in the late afternoon on Monday, Tuesday and Thursday, and a fourth virtual poster session was held on the Wednesday evening. The flight delays caused by the weather event disrupted the scheduled times for some presenters and session chairs, and this was partly alleviated through use of the virtual platform, or substitute co-author presenters and session chairs.



Figure 3. (a) Māori rock carving on the shore of Lake Taupō; boat trip for the mid-conference field trip to the Taupō supervolcano (photo, Graham Leonard). (b) Lady Knox Geyser at the Wai-o-Tapu geothermal field, during the geothermal mid-conference field trip (photo, Isabelle Chambeft).



Figure 4. (a) Great community interest in the public outreach day of VolcanoFest (photo, Danielle Charlton). (b) Children learning about fractional crystallisation on 'MagmaPop' at VolcanoFest (photo, Ben Kennedy).

Five mid-conference field trips had been organised for the Wednesday and 620 delegates had been registered for these. Unfortunately, three field trips across the northern end of the central North Island had to be cancelled due to poor weather. Two southerly field trips to a developed geothermal field and to the Taupō volcano were still able to go ahead amidst mixed rain and sunshine, and these were thoroughly enjoyed by those who attended (Fig. 3a, b).

A significant new initiative of IAVCEI 2023 was **VolcanoFest**, which amalgamated and highlighted a range of social functions for delegates (movies, music, sports and games), volcano art and photography displays and public outreach activities mostly held in a dedicated arena space at the venue. The public outreach programme included a school teacher professional development workshop, meet-a-volcanologist panels, outreach booths, volcano games and experiments demonstrations. Activities on the Tuesday were focussed on school teachers. The Thursday programme was open all day to the public and, although it was the first week of the New Zealand school year, the space

was buzzing with children, parents, seniors and all manner of interested persons (Fig. 4a, b).

Evening films were shown on Monday (*Fire of Love*), Tuesday (*Lava Bombs: Truths behind the Volcano*, re the La Palma eruption) and Thursday (*The Volcano: Rescue from Whakaari*), and panel discussions were held following the latter two films. Many IAVCEI Commissions, starved of in-person interaction for over three years, finally regrouped over various lunch time meetings and evening dinners.

The conference ended at the closing ceremony on the Friday afternoon (Fig. 5) with conference wrap-ups and many thanks. The next IAVCEI 2025 in Geneva, Switzerland was announced, and finally all were given a Māori blessing. That evening, the Farewell Function featured a live performance by local Māori roots reggae band *Lost Tribe Aotearoa*.

Four pre-conference and **four post-conference field trips** were scheduled and all were fully booked (125 pre-conference



Figure 5. The official IAVCEI 2023 Scientific Assembly group photo, taken at the closing ceremony. Homework for the reader: Guess how many delegates are in the photo (imaging analysis software not allowed!)...and who stays under the masks.

registrants; 68 post-conference registrants). The pre-conference field trips struggled through the Friday – Saturday/Sunday rain event; although some managed to get some sunshine beforehand; golden pockets of fair weather were experienced around mounts Ruapehu and Tongariro even over the weekend (Fig. 6a). However, many activities simply had to be modified or cancelled. ‘Hats off’ to the leaders who had to make quick judgements and adjustments to these field trips, and to the attendees for their understanding – certainly adventures were had by all over these days. Post-conference field trips enjoyed the best weather of the week and were a memorable experience for all (Fig. 6b).

Ten pre-conference and five post-conference workshops were organised (229 pre-conference registrants; 152 post-conference registrants) at the conference venue or a nearby hotel. These were focussed meetings on various scientific and technological developments in volcanology, teaching and learning volcanology, interfacing between volcanologists and society and engaging early career volcanologists. The World Meteorological Organisation teamed up with IAVCEI and held their 8th International Workshop on Volcanic Ash after the Assembly on February 4–5.



Figure 6. (a) Despite the rainy weather continuing through Saturday before the conference, the pre-conference field trip on volcano-ice interaction at Ruapehu and Tongariro, managed a good walk up the Mangatepopo Valley (photo, Graham Leonard). (b) Examining the Ongatiti Ignimbrite at the Hinuera Quarry, during the post-conference “Marshall’s Ignimbrites” field trip (photo, Adrian Pittari).

The student-ECR factor...

At this Assembly the rise of the next generation of volcanologists was apparent. With respect to Assembly demographics the combined student and recent early career registrations* slightly exceeded the professional full registrations for the in-person cohort (Fig. 7).

The local organising committee early career researcher (LOC ECR) representatives and IAVCEI ECR-Net oversaw a diverse range of ECR initiatives and events over the entire structure of the Assembly. For the first time four ECR plenary speakers ran alongside the four conventional plenary speakers; these were selected by the LOC ECR representatives through a competitive application process. Efforts were made to include ECRs



as symposia convenors and session chairs, ECRs were involved in the organisation of most Assembly activities and had a presence at the opening and closing ceremonies. ECR-Net ran an ECR social and movie night, a lunch-time panel discussion with the authors of *Volcanologists – who are we and where are*

we going?, a pre-conference workshop (*PhDone? So, what next? IAVCEI ECR-Net career paths workshop*), and co-hosted a virtual quiz alongside the ECR Volcanology Reading-Rendezvous Group. A second pre-conference workshop was aimed at ECRs (*Navigating the publication process: Best publishing practices in volcanology and the geological sciences for early-career scientists*), and local ECRs organised a fully booked pre-conference ECR field trip (*An early career perspective on the volcanism of the North Island of New Zealand*).

*Recent early career researcher (ECR) was defined as being within seven years of graduation from the terminal degree, excluding parental or other relevant leave, counted up to 2021 to account for ECRs that would have been considered for the originally-planned date of the Assembly.

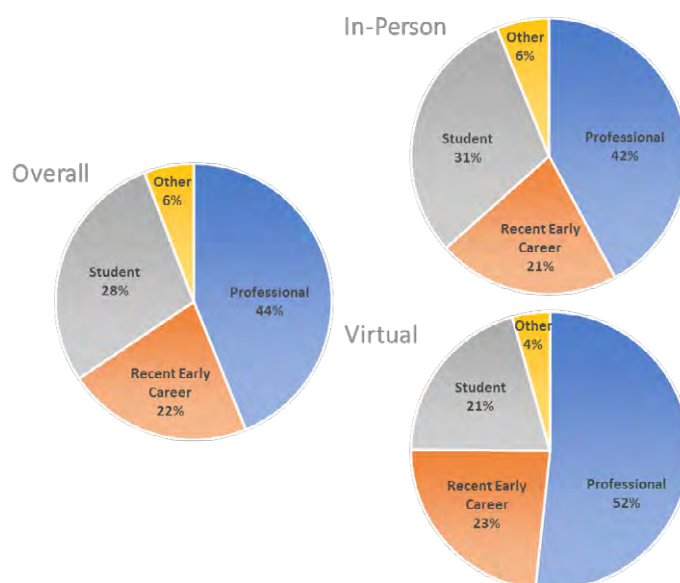


Figure 7. Pie charts showing the relative proportions of professional, recent early career and student registrations overall and for the in-person and virtual cohorts. ‘Other’ comprises a mixture of day registrations and various complimentary registrations which would comprise proportions of the three named categories. This data includes 72 registrations (6.5% of the total) that were converted to virtual registrations late, mostly due to travel disruptions caused by the Auckland flooding. NB: prior to these late conversions to virtual, the virtual cohort comprised 56% professional, 25% recent ECR, 15% student and 4% other registrations.

Making it the best experience for all...

For this Assembly we tried to make the event accessible and inclusive to a diverse delegate demographic. **44 countries** were represented at the Assembly with strong contingents from North American and European countries, Japan, Singapore and Australia, along with the strong local New Zealand cohort (Fig. 8). About 2% were collectively from a range of Latin American countries, and smaller contingents from other Asian and Pacific nations. Unfortunately, we do not have other demographic data to report (e.g. age, gender). The hybrid format was also important for increasing accessibility.

A code of conduct was established and communicated. Attention was given to communication and assistance, the range of food and drink options, managing spare food and waste, audio, mobility, bathrooms (e.g., provision of gender-neutral bathrooms and period products), childcare and provision of a quiet room. Some of our aspirations were not feasible within the physical constraints of the venue and audiovisual technology (e.g., closed captions during presentations) but we hope they will be explored for future IAVCEI events.

Following reports that COVID-19 was still having a significant impact on conferences within New Zealand and globally in late 2022, a need to develop a robust COVID-19 policy became apparent to ensure the safety of all delegates. We concentrated on repetitive communication online and at daily events. We required masks to be worn at indoor events and on field trip buses, and were encouraged by the high level of compliance by most attendees. Delegates were asked to take RAT tests before attending the conference and before the mid-conference field trips and were asked to report their COVID-19 status through an anonymous online form. 877 tests were reported over the conference period, and only 18 reported positive results. We also monitored the CO₂ concentration in session rooms to understand ventilation.

Total Registrations (In-Person and Virtual) by Country

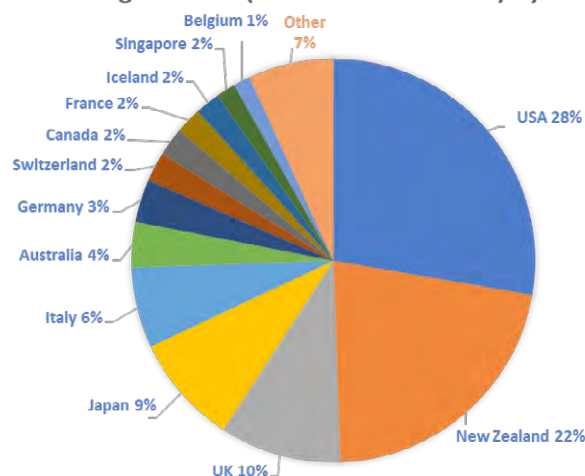


Figure 8. Pie chart showing the total percentage registrations of the top 13 of 44 countries. The 'other' category includes all countries with less than 10 delegates, including: Spain (9), Chile (6), Ireland, Mexico, Philippines, South Korea, Sweden, China, Hong Kong, Netherlands, Trinidad and Tobago, Argentina, Brazil, Colombia, Denmark, Ecuador, Indonesia, New Caledonia, Tonga, Bulgaria, Costa Rica, Czech Republic, Georgia, Hungary, Norway, Peru, Poland, Portugal, Puerto Rico, Russia and Vanuatu (all < 5 each).

The Organising Committee wishes to thank the IAVCEI Membership for their understanding and patience during the COVID years and for their supportive patronage of the Assembly after waiting so long. Thank you to all the delegates for enduring our unprecedented weather and we hope that somehow this Assembly has enriched your scientific career. Our strong support and best wishes go out to the organisers of the next Assembly in Geneva.

Adrian Pittari, Graham Leonard, Ery Hughes, Rebecca Fitzgerald

On behalf of the IAVCEI 2023 Organising Committee.

Thanks to Danielle Charlton, Geoff Kilgour and *Conferences and Events* for providing data and information for this report.



IAVCEI MEETINGS

2025 Scientific Assembly in Geneva

During the closing ceremony of our SA2023 were announced the location and dates of the next IAVCEI Scientific Assembly. Coming back to pre-Covid standard scheduling, the IAVCEI Executive Committee approved the submitted project that our next SA be held in **Geneva on July 6–11, 2025**. The SA2025 will thus be hosted by Switzerland but co-organised with France, Germany and Italy. Below is the summary presented by Prof. Luca Caricchi, Chair of the Organizing Committee. Compositions of the local Organizing Committee and the Scientific Committee are given thereafter.

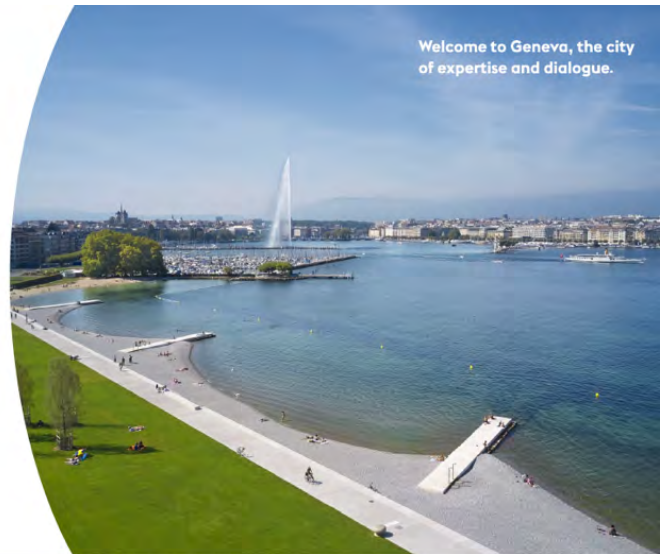


Prof. Luca Caricchi
Congress chair
University of Geneva



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

from July 06th to 11th, 2025



"The idea to bid to host the Scientific Assembly of IAVCEI in Geneva in 2025 together with France, Germany and Italy has both geographical and scientific roots. Switzerland is at the core of the magmatic beating heart of Europe, with the Alps and the Mont Blanc Massif in close reach and surrounded by the active volcanoes of France, Germany and Italy. This not only stimulated the creation of a long standing and well supported research program in volcanology and petrology in Switzerland, but also reinforced the scientific and social connections between our countries.

I have the honour of chairing the organising committee that would oversee the organisation of the scientific assembly of IAVCEI in 2025. It was a very easy endeavour to put together a group of scientists willing to commit part of their already limited time to work on such an event. The reason is simple, all of us consider this meeting the most important event for the scientific

community focusing on magmatic studies and we are strongly committed to make it a landmark event.

*This will be the first European IAVCEI with four countries directly involved in the logistic of the organisation, and **representatives from all countries of geographical Europe constituting the Scientific Committee.***

The meeting will include fundamental science but also thematic that are very close to our society as volcanic hazard, the production of energy from magmatic systems and the recovery of magmatic resources necessary for the transition to the production of renewable energies.

In short, we will be honoured to host the Scientific assembly of IAVCEI in 2025 and we are already working to make it an memorable event."

A HUB OF EXPERTISE **OUR LOCAL ORGANISING COMMITTEE**



Congress treasurer
Prof. Dr. Olivier Bachmann
Petrology and volcanology
ETH Zürich



Congress co-chair
Prof. Costanza Bonadonna
Physical Volcanology and Geological Risk
University of Geneva



Florence Bégué PhD
Mineralogy
University of Geneva



Congress chair
Prof. Luca Caricchi
Petrology and volcanology
University of Geneva



Prof. Matteo Lupi
Crustal Deformation and Fluid Flow
University of Geneva



Prof. Othmar Müntener
Petrology
University of Lausanne



Jabi Ruch
Volcano-tectonics
University of Geneva



Prof. Tom Sheldrake
Geology
University of Geneva



Prof. Dr. Peter Ulmer
Petrology
ETH Zürich



Prof. Zoltan Zajacz
Mineral Resources
University of Geneva



A HUB OF EXPERTISE **THE INTERNATIONAL ORGANISING COMMITTEE**



Dr. Héléne Balcone-Boissard
Petrology and volcanology
Sorbonne University (France)



Prof. Guido Giordano
Volcanology and Geothermics
Roma Tre University (Italy)



Prof. Severine Mouné
Volcanology
Observatoire Guadeloupe (France)



Dr. Ulrich Küppers
Experimental & Physical Volcanology
Ludwig Maximilian University of Munich (Germany)



Prof. Nicole Richter
Remote Sensing of Natural Hazards
RWTH Aachen University (Germany)



Prof. Jean Vandemeulbroek
Geophysics
Université Savoie Mont Blanc (France)



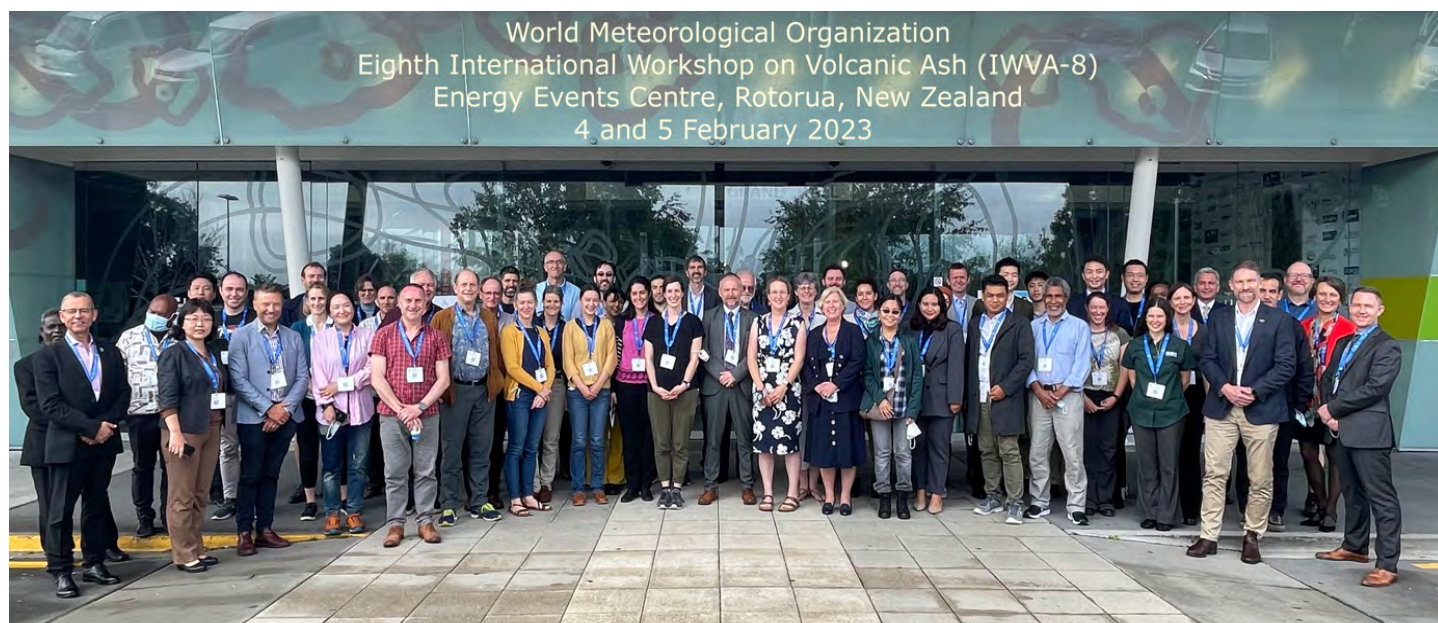
Dr. Augusto Neri
Volcano modelling and hazards
Istituto Nazionale di Geofisica e Vulcanologia (Italy)

The Scientific Committee will be constituted of members of all institutions located in geographical Europe.



IAVCEI MEETINGS

8th WMO International Workshop on Volcanic Ash (IWVA-8)



The 8th WMO International Workshop on Volcanic Ash (IWVA-8), teamed up with IAVCEI, was held in Rotorua on February 4-5, immediately after the SA2023. It was entitled “Managing and mitigating volcanic risks to aviation with an explosion of science!”. For those unaware of, the IAVW was established in the 1980s by the International Civil Aviation Organization (ICAO), with the assistance of WMO (the World Meteorological Agency) and other partners, with the objective to support continued safe and efficient aviation operations on the ground and in the air whenever and wherever volcanic eruptions are occurring and/or whenever and wherever volcanic ash clouds and gases are present in the atmosphere. Since then IAVW has become a mature worldwide system comprising meteorological, volcanological, and geological services, plus other facilities and services. The IWVA-8 in Rotorua involved meteorological and volcanological scientists from various parts of the world (including the IAVCEI

presidency), researchers and operational personnel of State volcano Observatories and Volcanic Advisory Ash Centers (VAACs), as well as airport and airspace managers, engine and avionics equipment manufacturers, and aviation users (flight crew).

Presentations and discussions in three main Sessions have resulted in **3 main Recommendations** and a series of **6 Statements** that are annexed to this Newsletter and accessible at: <https://community.wmo.int/en/activity-areas/aviation/workshops/iwva-8>

Finally, let also remind that WMO will act as coordinator of the 5-yr **UN's Initiative on “Global Early Warning Systems”**, developed within the Sendai Framework for Disaster Risk Reduction 2015–2030, in which IAVCEI is expected to be involved (see our Newsletter 2022-3).

IAVCEI General Assembly, Berlin, 15–19 July 2023



The IAVCEI General Assembly in Berlin will last from July 15 to July 20, during the 28th IUGG General Assembly (July 11-20). Abstract submission and request for IUGG travel grants were closed on February 22 and acceptances were to be notified by late March. **Early bird registration remains open until April 28** (<https://www.iugg2023berlin.org>).

IUGG Assemblies offer us key opportunities to interact with multidisciplinary Earth scientists from other IUGG's Associations (IASPEI, IAGA, IAG, IAHS, IACS, IAMAS and IAPSO). 14 IAVCEI

scientific Sessions and 20 joint Sessions with other Associations were planned. The final IAVCEI scientific programme will be adjusted in function of the number of submitted abstracts and registrations.

The IAVCEI **Union lecture**, on July 18, will be given by Robin Matoza on the *January 2022 Hunga Tonga-Hunga Ha'apai eruption*. The 2.5-hours IAVCEI Assembly session will occur on July 19. Finally, the IAVCEI will have a dedicated space board in the CityCube conference center.

We are looking forward to meeting you as numerous as possible in Berlin!



IAVCEI Awards

Awards are important milestones in the career of scientists. Owing to the Covid pandemic, in 2023 the IAVCEI has to attribute the George Walker Award (7-yr after PhD) and the Wager Medal (15-yr after PhD) in two rounds, both at its SA and GA. The first-round nominees were selected by our Awards Committee keeping on with the practice of two nominees for each award and warranting gender equality. The winners, honored during the SA2023 in Rotorua, are presented below. Again, warm congratulations to each of them!

George Walker Award (SA2023)



Emma LIU-NICHOLSON
Associate Professor, Earth Sciences
University College of London, UK
Lead-nominator: Marie Edmonds



Andrea BEVILACQUA,
Research scientist at INGV-Pisa, Italy
Lead-nominator: Barry Voigt

Wager Medal (SA2023)



Suzanna JENKINS
Tenured Professor, Asian School of Environment
Nanyang Technological University, Singapore
Lead-nominator: Steve Sparks



Yves MOUSSALLAM
Assistant Professor, Earth & Environmental Sciences
Columbia University, USA
Lead-nominator: Clive Oppenheimer

Second-round Walker Award and Wager Medal (GA2023, Berlin)

The nomination call was launched on **February 14** and the submission deadline is **April 10**.

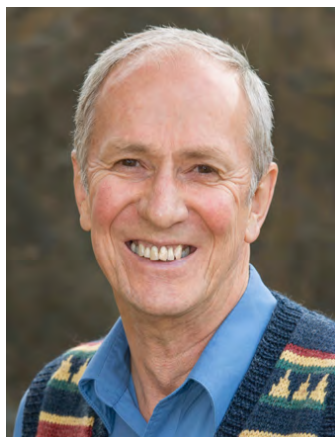
Thorarinsson, Fisher and Krafft Medals (GA2023, Berlin)

These three senior IAVCEI Medals will be attributed during our General Assembly in Berlin. The submission call was issued on January 6 and closed on March 20. Outstanding nominations for the 2023 Thorarinsson (3), Fisher (4) and Krafft (5) medals were received. These are now being evaluated by the IAVCEI Awards Committee. Results will be kept confidential until the award ceremony on July 19 in Berlin.



2023 Honorary Life Members

It's a tradition for IAVCEI, every four years, to honor distinguished volcanologists as Honorary Life Members in recognition of their important services to the IAVCEI and/or remarkable contribution to Volcanology. After approval by the Executive Committee, the following four colleagues were honored on occasion of our SA2023:



Ray Cas is Emeritus Professor at Monash University, Victoria, Australia. He is renowned for his studies of ancient and modern volcanic successions, and associated mineral deposits. He was President of IAVCEI in 2011–2015, and he currently chairs the 2023 IAVCEI Elections Committee.



Marta Lucia Calvache, recently retired, was Director of Geological Hazards in the Columbian Geological Survey. She actively contributed to the development of volcano monitoring in Columbia and was previously responsible of the Galeras volcano Observatory. Marta served IAVCEI as member of the Sub-Committee for Crisis Protocols (1998–99) then as scientific counselor in the 2007–2011 Exec Committee.



Lionel Wilson is Emeritus Professor in Lancaster University, UK. He pioneered physics-based models of explosive volcanic eruptions on Earth then studies of volcanism on other planets. His publication record is quite exceptional. Lionel was Editor-in-Chief of JVGR for... 25 years! A tribute to him, written by Steve Sparks, is provided thereafter.



Patricia (Patty) Mothes is Professor at the Instituto Geofísico-EPN in Quito, Ecuador, of which she was a former Director. Patty is renowned for her pioneering studies of Columbian volcanoes and leading efforts to develop volcanic hazard mitigation in Columbia, together with Minard Hall.

A special tribute to Prof. Lionel Wilson, by Steve Sparks, February 2023

Lionel Wilson is one of the most significant researchers in volcanology, pioneering physics-based models of explosive volcanic eruptions and through his seminal research on volcanism of other planets.

Lionel Wilson started his career in the early days of planetary missions with a background in physics. Following his PhD and a post-doc at University College London, he became a founding member of the Lunar and Planetary unit at Lancaster University in 1970. The early Images of planetary surfaces in the 1960's revealed that many of the features were likely to have a volcanic origin and this motivated Lionel to start research into the physics of volcanic processes and collaborate with George Walker and later with Steve Sparks. At that time there were essentially no physics-based models of volcanic eruptions.

His series of papers called "Explosive Volcanic Eruptions" were pioneering and the first dynamical models of explosive volcanic eruptions in which several fundamental advances and discoveries

were made. At the time he utilized classic fluid dynamical treatments of jets and plumes from giants of fluid mechanics like L Prandtl, G.I Taylor and JS Turner and adapted them to the case of volcanic flows. These were not simple applications of existing theory because for volcanic flows one had to include heat and mass transfers between air, hot magma particles and gases so there was here great originality in how Lionel developed the models using numerical methods at a time when this kind of modelling was in its infancy within Earth Sciences. The inclusion of mass and heat transfer were essential as new phenomena in volcanic flows, such as reversing buoyancy, were discovered. His seminal work included: quantifying the trajectories of volcanic particles from large ballistic blocks ejected in explosions and smaller particles in wind-blown plumes; understanding how entrainment and heating of ash-laden volcanic jets led to two fundamental dynamical regimes of buoyant plume rise and column collapse to generate pyroclastic flows; establishing the basic control on plume rise as mass eruption rate; generating the first models of explosive flows along volcanic conduits showing how gas content and conduit dimensions were the key controls on dynamical regime of volcanoes; and studying the dynamics

of transient volcanic explosions and showing that pressures had been previously greatly overestimated.

Lionel can be regarded as the founding father of the quantitative physics-based study of explosive volcanic eruption dynamics. Since then the whole field has expanded exponentially with the most recent models being hugely more complex with the benefit of the advances in computer power and much better observations at volcanoes to test and tune the models. However, the first order discoveries led by Lionel have not changed and form the foundation of understanding dynamical eruption regimes, quantification of volcanic plume dynamics and understanding volcanic ejecta transport.

While volcanoes on Earth were the best place to develop models Lionel's passion and motivation was to understand the volcanic features on the surfaces of other planets and their satellites. His research on basic volcanic processes was based on the notion that if we don't even understand the physics of eruptions on Earth where we have some direct observations then we are going to struggle to understand what happened on other planets where the main observations are largely limited to images and spectral data. Lionel continued work on terrestrial volcanism and he made important contributions to lava flow dynamics and magma transport in dykes. However, from the 1980's onwards his research increasingly focused on planetary volcanism.

Lionel is the acknowledged master of planetary volcanism. The scientific challenge here is significantly greater than for terrestrial volcanism. With the exception of Io no eruptions have been witnessed and sampling is sparse or absent, so the main observations are images and spectral data. He has investigated volcanic features on all the rocky planets and moons, and also considered volcanism in relation to asteroids and icy planets. His research has involved analysis of data from most of the major planetary missions of the past 50 years. His work includes the Moon, Mars, Venus, Mercury, icy planets and asteroids.

His research follows a characteristic pattern of developing numerical models based on the underlying physics of the processes and compares the results with observations, such as the morphology and surface patterns of a lava field or pyroclastic deposits or volcanic edifice. He then goes to make quantitative

inferences such as discharge rates and subterranean conditions such as vent diameter and existence of dykes. He is also often able to distinguish different styles of volcanism. From these analyses he has been able to make inferences about deeper processes within planetary interiors and make significant re-interpretations. An example of the latter is his identification of lahars rather than lavas on Mars, with implications for water on the planet in the past. While some of these models can reference comparable processes on Earth he has had to consider fundamentally different conditions such as reduced gravity and presence of very different atmospheres and indeed in some cases no atmosphere. His work on asteroids where the small gravity allows escape velocities to be achieved with implications for their chemical evolution.

His research on the lavas on the Moon has been ground-breaking. Perhaps the most striking observation of the Moon is the huge dark areas within great impact craters that are so prominent at full moon. These dark areas are consequence of huge lava eruptions early in the Moon's history. The space missions found that these volcanic features are absent on other side of the Moon. A significant amount of Lionel's research has been dedicated to understanding this spectacular volcanism and what it means for the evolution of the Moon. This research culminated in his 2017 papers with Jim Head reconstructing the styles of lunar volcanism, constraining the deep source of the magma in the lunar interior and providing a compelling explanation of the focus of volcanism being on the side of the Moon facing the Earth. It is worth remarking here that Lionel is highly collaborative and he has developed strong partnerships with many distinguished researchers and with his students. His collaborations with Jim Head and with Klaus Keil have been at the forefront on planetary volcanism over for more than four decades.

Although planetary volcanism has been the main focus of his research he has also delved into other planetary topics, such as impact structures and past water flows on Mars. He has also continued to contribute to volcanism on Earth with important highly cited papers on kimberlite volcanism and deep submarine eruptions. As well as an exceptional list of publications Lionel has been involved in supporting many planetary missions with recent work on the Chinese lunar space missions. Honorary membership of IAVCEI recognises the importance of his research in advancing volcanology over the last half century.



BULLETIN

Bulletin of Volcanology

<https://www.springer.com/journal/445>

Publication activity

BV continues growing in terms of number of submissions, publication rate and impact factor, thanks to the efforts of its current Editorial team.

Special issue bundles

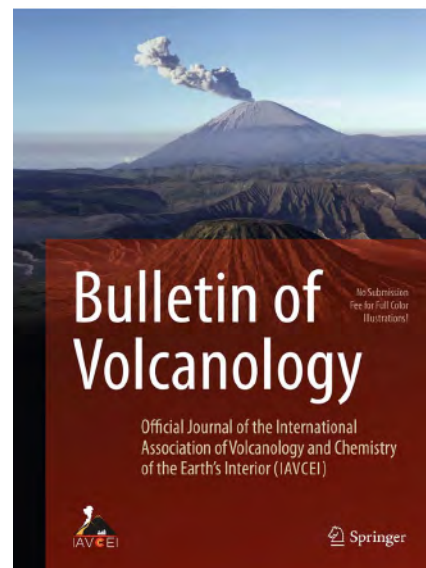
Special issue bundles, reserved in open access to IAVCEI members, are now accessible on the Bulletin page of the IAVCEI website. The first special issue was on “The 2016-17 shallow submarine eruption of Bogoslof volcano, Alaska” (16 papers). The second one, coordinated by Jon Fink, is entitled “Looking Backwards and Forwards in Volcanology (2020)”. Two more special issues are ready.

Data Reports

In agreement with the Exec Committee and with Springer, Bulletin of Volcanology will offer the new possibility to publish short (2–3 journal pages) **Data Reports** presenting and describing various kinds of data related to eruptive activity, unrest, and other types of volcanic manifestations. Published reports will receive a DOI and copyright protection, and therefore be citable. Data types could arise from volcano monitoring, field measurements, geospatial imaging, laboratory analysis, experiments (images, laboratory measurements, etc.), simulation, etc.. Large data sets could be included as supplementary material. Managers of monitoring networks, in particular, will have the opportunity to quickly publish sensitive data through this platform.

Data Reports will have to include:

- (i) A short introduction to the eruptive setting and/or the context of the observations;
- (ii) A brief description of the network, equipment and/or methodological approach, supported by maps and schematics;
- (iii) A presentation of the data (as graphs and tables) with a description of changes in levels of activity, data trends, variations, etc.



Data Reports will be operated under the [type 4 research data policy](#) of Springer Nature ([Creative Commons Attribution 4.0 International License](#) CC-BY 4.0) and be directed to the Springer's BV repository (<https://www.springer.com/journal/445>). In addition, monitoring data sets attached to the Reports will be encouraged to be shared with and archived in [WOVO.dat](#), as part of the global initiative to build a comprehensive global database on volcanic unrest. Christina Widiwijayanti (EOS, Singapore) will be in charge of coordinating this link with [WOVO.dat](#) together with the BV's editorial team. More detailed information will be soon provided on the Bulletin of Volcanology page.

2021 award

MOST CITED AUTHOR OF THE YEAR 2021

M.J. Heap & M.E.S. Violay

For the paper:
Michael J. Heap & Marie E.S. Violay
The mechanical behaviour and failure modes of volcanic rocks: a review
Bulletin of Volcanology (2021) 83: 33
<https://doi.org/10.1007/s00445-021-01447-2>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Beate Hiernz, Senior Publishing Editor, Springer

2020 award

MOST CITED AUTHOR OF THE YEAR 2020

Alexander Belousov & Marina Belousova

For the paper:
Belousov A & Belousova A
Dynamics and viscosity of 'a' and pahoehoe lava flows of the 2012–2013 eruption of Tolbachik volcano, Kamchatka (Russia)
Bulletin of Volcanology (2018) 80: 6
<https://doi.org/10.1007/s00445-017-1180-2>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Johanna Schwarz, Senior Publishing Editor, Springer

2019 award

MOST CITED AUTHOR OF THE YEAR 2019

Michelle Coombs

For the paper:
Michelle Coombs, Kristi Wallace, Cheryl Camero, John Lyons, Aaron Wech, Kim Angeli & Peter Cervelli
Overview, chronology, and impacts of the 2016–2017 eruption of Bogoslof volcano, Alaska
Bulletin of Volcanology (2019) 81: 62
<https://doi.org/10.1007/s00445-019-1322-9>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Johanna Schwarz, Senior Publishing Editor, Springer

MOST CITED EARLY CAREER RESEARCHER 2021

Johan Gilchrist

For the paper:
Johan T. Gilchrist and A. Mark Jellinek
Sediment waves and the gravitational stability of volcanic jets
Bulletin of Volcanology (2021) 83: 64
<https://doi.org/10.1007/s00445-021-01472-1>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Julia Fycharova-Rowan, Representative, Early Career Researcher Initiative
Beate Hiernz, Senior Publishing Editor, Springer

MOST CITED EARLY CAREER RESEARCHER 2020

Edgar U. Zorn

For the paper:
Edgar U. Zorn, Michael C. Rowe, Shane J. Cronin, Amy G. Ryan, Lon A. Kennedy & James K. Russell
Influence of porosity and groundmass crystallinity on dome rock strength: a case study from Mt. Taranaki, New Zealand
Bulletin of Volcanology (2018) 80: 35
<https://doi.org/10.1007/s00445-018-1210-8>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Julia Fycharova-Rowan, Representative, Early Career Researcher Initiative
Johanna Schwarz, Senior Publishing Editor, Springer

MOST CITED EARLY CAREER RESEARCHER 2019

Matthew W. Loewen

For the paper:
Matthew W. Loewen, Pavel Irshakov, Jamshid Mostafaezadeh, Michelle Coombs, Jessica Larsen, Nathan Graham, Michelle Harbin, Christopher Waythomas & Kristi Wallace
Petrology of the 2016–2017 eruption of Bogoslof Island, Alaska
Bulletin of Volcanology (2019) 81: 72
<https://doi.org/10.1007/s00445-019-1333-6>

Andrew Harris, Executive Editor, Bulletin of Volcanology
Patrick Allard, President, IAVCEI
Julia Fycharova-Rowan, Representative, Early Career Researcher Initiative
Johanna Schwarz, Senior Publishing Editor, Springer

2019–2021 Awardees for the most-cited *Bulletin of Volcanology* papers (see previous page)

The *Bulletin of Volcanology* award is attributed to authors of a BV paper with the highest number of citations in all journals over the previous two years. For example, the 2001 award is based on citations during 2020–2021 and attributed on basis of statistics published in 2022. Besides the nomination, each award includes a book voucher of 150 euros value for Springer Books, plus a 4-year membership with IAVCEI. An Early Career Researcher makes part of awardees each year. Recipients of the most-cited BV paper awards in 2021, 2020 and 2019 are listed below. Congratulations to them!

The new BV Editorial team for 2023–2027!

Andy Harris and Frances van Wyk de Vries made a remarkable

job in managing the *Bulletin of Volcanology* since 2017, as attested by the substantial increase of BV's impact factor over the past years (see Newsletter 2022–3). They will step down their long and fruitful editorial service in June 2023, and a call to candidatures was opened for substituting them for the 2023–2027 term. After evaluation of candidatures, the IAVCEI Executive Committee has agreed to appoint Profs. **Marie Edmonds** (Cambridge University, UK) and **Richard Herd** (East Anglia University, UK) as new Executive Editor and Journal Administrator, respectively, of *Bulletin of Volcanology* in 2023–2027. Marie and Richard have started to interact with Andy and Fran in order to ensure overlap and continuity during the transition period until June. We warmly thank them for taking this key responsibility for the IAVCEI community and wish them a great success as well.



Andy Harris
UCA, France



Fran Van Wyk de Vries
UCA, France



Marie Edmonds
Cambridge Univ., UK



Richard Herd
Univ. East Anglia, UK





2023 IUGG Awardees

■ IUGG Early Career Scientist Award

The International Jury for the 2023 IUGG **Early Career Scientist Award** has decided to honor ten young scientists for their outstanding research in Earth and space sciences and for their international research cooperation, as listed below. The IAVCEI warmly congratulates **Jose Társilo Girona Hernandez** (University of Alaska, Fairbanks, USA) for being one of these nominees. IUGG's ECS Awards 2023 will be presented in July during the **IUGG General Assembly 2023**.

■ IUGG Gold Medal

Valérie Masson-Delmotte (LSCE, Saclay, France), vice-President of IPCC, was selected as recipient of the 2023 IUGG Gold Medal for her major contributions to the analysis and divulgation of global climate change. She will be honored during the 28th IUGG Assembly in Berlin. Our deep congratulations to her. The IAVCEI candidate, Don Dingwell, was ranked very close.

WEBINARS

IAVCEI Webinars and E-Volcano Platform

■ IAVCEI webinars

Our series of IAVCEI-sponsored webinars has started again in 2023. Video recordings are made accessible on our website.

The first webinar, on March 28, was planned by the Commission on Explosive Volcanism and given by Cristian Montanaro (LMU, Munich, Germany) on "**Phreatic and hydrothermal eruptions: Insights from fieldwork & lab experiments**". **133 IAVCEI members had registered and over 75 participated.**

A second webinar from the same Commission is planned on April 20 on the following topic: "**The causes and consequences of mafic explosive volcanic eruptions: A case study from the mafic Curacautín Eruption at Volcan Llaima, Chile**".

■ E-Volcano video platform

We're delighted to announce that the first eVolcano teaching video is now online. Our authors have been working hard in the past months to provide you with the best and state-of-the-art teaching videos in their fields. All the videos of the IAVCEI e-Volcano platform are peer-reviewed by experts in the field. They

are freely available to watch online and will hopefully be a useful resource for students, researchers, and actually, everyone with an interest in volcanoes to enhance their knowledge and broaden their horizons!

The first eVolcano lecture regards *pyroclastic fall deposits* and it is given by Samantha Engwell (British Geological Survey) and Julia Eychenne (Laboratoire Magmas et Volcans, France).

It provides insights into the sedimentary and textural characteristics of tephra fall deposits, from the outcrop scale to the individual grain scale. It presents typical deposit trends and methods on how to use such trends to understand the eruption that produced them. A list of resources and references is provided to direct viewers to further relevant work and tools.

Please find the video at this link:

<https://evolcano.iavceivolcano.org/pyroclastic-fall-deposits/>.

We hope to have many more videos published soon and are looking for your input, involvement, and feedback any time!



MEETINGS & WORKSHOPS

Upcoming Meetings

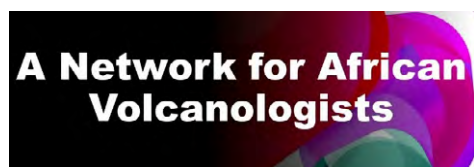
International Workshop on “Genesis and dynamics of large active calderas: the case of Campi Flegrei and the Campanian Plain”, Naples, May 2–5, 2023

We remind you of the invitation to participate in this International Workshop co-organized by the INGV-OV (Vesuvius Observatory), the IAVCEI, Naples University, and ECORD-IODP Italy, with support of Naples' Municipality.

The Workshop is aimed at making the point on our scientific understanding of the genesis and dynamics of large active calderas in general, with a focus on the very active Campi Flegrei volcanic system and new results from recent drillings in the area. Scientific sessions on May 2-4 will be hosted at the Conference hall of San Severo al Pendino Church, in the historic center of Naples. one-day field excursion in Campi Flegrei caldera and the Campanian Plain will follow on May 5 for those interested.

We welcome a large Italian and international participation to this Workshop, in particular from members of the IAVCEI Commission on Collapse Calderas. **There is no registration fee!** Abstracts must be submitted to Mauro de Vito (mauro.divito@ingv.it) and Giuseppe de Natale (giuseppe.denatale@ingv.it).

1st International Workshop of the Network for African Volcanologists



The establishment of the Network for African Volcanologists (NAV) was awarded a grant from the IUGG Grants Program 2022-2023 (Special Call dedicated to the International Year of Basic Sciences for Sustainable Development, IYBSSD2022) to oversee, promote, and strategise the future of volcanological education and research in Africa. **This project was supported by IASPEI and IAVCEI.**

African volcanism remains poorly represented in the academic literature. This is due to several reasons, among which are: (1) the rarity of volcanologists and volcanological programmes in university curricula in Africa; (2) the lack of local financial support for volcanological research; (3) the absence of government institutions, volcano observatories, and research centres with a clear mandate to monitor volcanoes for hazards assessment; and (4) the lack of strong international linkages and networks for research collaborations.

Recently, a group of African volcanologists has been working to establish NAV to foster a community of practice that addresses the above challenges and seeks to overcome the implied limitations. The NAV is to serve as a platform for researchers on the African continent, and in the diaspora, to get to know each other, easily interact and share experiences, carry out joint projects and contribute to international collaborations in the Earth and Space Sciences. The aim is to develop a forum for geoscientists from African countries, and motivate them to get involved in high-impact research and generate new knowledge applicable to African volcanoes and worldwide, promote volcanological studies within universities across the continent, enhance genuine international collaboration and training in volcanology, sustainably and beneficially. NAV also aims at facilitating access to data and methods for African graduates, postgraduates, and early-career researchers.

Our priority now is to formalise our network and give it international recognition. To this end, we are happy to invite you to participate in the [First International Workshop of the NAV](#), which will be held at Dedan Kimathi University of Technology, Nyeri, Kenya, from 24 to 28 July 2023. The goal of this event is to bring African volcanologists together from across the globe and officially launch the Network of African Volcanologists and take the opportunity to discuss the difficulties faced by our researchers and students across the continent, as this will help to identify the priorities and future for furthering Africa's understanding of volcanism. The workshop will consist of formal scientific sessions and roundtable discussions, with the opportunity for both virtual and physical participation.

Nicholas Mariita, Dedan Kimathi

University of Technology, Kenya, Organizing Committee

Commissions Workshops

11th Workshop on Volcanic Lakes, Sao Miguel, Azores, August 28 – September 5, 2023

The IAVCEI Commission on Volcanic Lakes and the Research Institute for Volcanology and Risks Assessment (IVAR) invite you to participate in the 11th Workshop on Volcanic Lakes on São Miguel Island, Azores, from August 28th to September 5th 2023 (<https://cvl11workshop.wixsite.com/2023>).

The goal of the workshop is to bring together scientists from a wide range of disciplines, such as hydrology, geochemistry, geophysics, limnology, microbiology, and physical volcanology to enable the exchange of ideas on a broad range of topics, including: state-of-the-art field measurement techniques; geochemical, geophysical, and microbiological characteristics and monitoring of volcanic lakes; modeling of volcanic lake system processes, and hazard forecasting and mitigation.

CVL 11 will offer formal scientific sessions and field visits to volcanic areas where intracaldera lakes exist. Visits are planned

to the lakes of the quiescent Fogo, Furnas and Sete Cidades volcanoes at São Miguel Island. These lakes offer ample field sampling and measurement opportunities, including water column sampling and lake-surface degassing measurements. Additional geochemical and geophysical measurements on the fumarolic field around Furnas Lake are also an option.

Annual Workshop of IAVCEI Commission on Volcano Seismology & Acoustics, Ischia, Italy, October 1–6, 2023

The next workshop of the Commission on Volcano Seismology and Acoustics will take place on the lovely island of Ischia, Italy. As usual, a wide spectrum of topics will be covered including seismic and acoustic signals from volcanoes, the seismic hazard in volcanic settings, new technologies, concepts, and

models. The special topic for this workshop will be “Volcano Seismology and Geodesy” where we will explore common links in observations, models, and interpretations. For updated information see:

<https://www.ov.ingv.it/index.php/news/236-iaspei-iafcei-annual-workshop-on-volcano-seismology-acoustics>

Convenors:

Stefano Carlino, Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Napoli

Nicola Alessandro Pino, Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Napoli

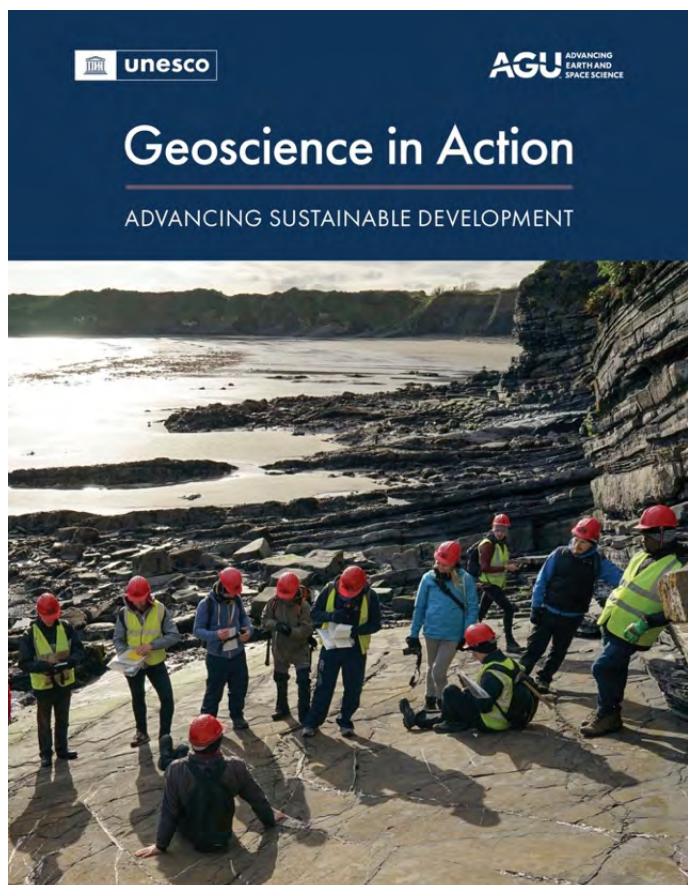
Umberto Riccardi, Università di Napoli, Dipartimento di Scienze della Terra dell'Ambiente e delle Risorse

Jurgen Neuberg, Institute of Geophysics & Tectonics, School of Earth & Environment, The University of Leeds (Commission Chair)



BOOKS

World Organization of Volcano Observatories database (WOVOdat) featured in new open access UNESCO-AGU Book on geoscience for sustainable development



WOVOdat has been featured within a new book “Geoscience in Action: Advancing Sustainable Development” an open access report co-published by UNESCO and AGU, authored by a team of international geoscientists, led by Maria A. Capello and including volcanologist and IAVCEI member, Heather Handley.

This practical roadmap illustrates how geoscientists can apply their talents and skills to solving the world’s environmental, social, and economic problems.

The report maps geoscience skills to the 17 United Nations Sustainable Development Goals through detailed case studies. Geoscience in Action presents three Sustainability Dimensions – People, Planet, and Prosperity – highlighting the positive impact geoscience has on individuals, physical systems, and social systems.

Core to the report are examples – projects and initiatives in which geoscientists develop solutions alongside health experts, regional policymakers, educators, community leaders, and other stakeholders.



Lunch with a view of Ngāuruhoe volcano during an undergraduate field trip to study the active Tongariro Volcanic Complex, New Zealand. © Heather K. Handley.

We are thrilled to see that **WOVOdat** was selected as one of these examples to show how global collaboration and partnerships and the sharing and exchange of data and experiences of past eruptions at a global are helping improve the management of volcanic crises and mitigate the risk of volcanic hazards.

Geoscience in Action also includes a catalog of geoscience competencies and a series of questions and activities for motivating engagement. By sharing how multinational, multidisciplinary initiatives are being shaped with contributions from geoscientists, we hope to inspire and enable the proliferation of similar projects.

Geoscientists are vital in the work to create a sustainable, thriving world. This work is a much-needed resource to show not only why, but how we can participate in these critical solutions.

The book is available to download here: <https://unesdoc.unesco.org/ark:/48223/pf0000384826>

For additional information please see the Geoscience in Action webpage: <https://geoscienceinaction.org/>

Authors: *Maria Angela Capello, Emer Caslin, Iain S. Stewart, Denise M. Cox, Anna C. Shaughnessy, Estella A. Atekwana, Heather K. Handley, Ted Bakamjian, Ludivine Wouters, Miriam S. Winsten, Vimal Singh and Kombada Mhopjani*

How can you advance sustainability goals?

Discover how to make an impact by downloading a copy of Geoscience in Action: Advancing Sustainable Development—available now!

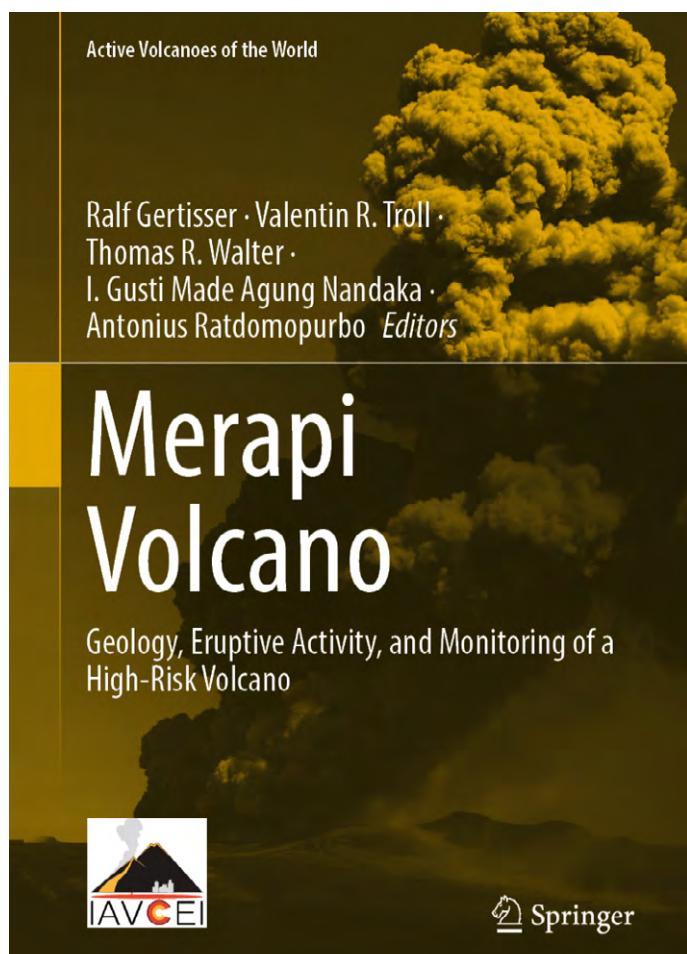
A freely available report from UNESCO and AGU at geoscienceinaction.org

Scan to download the report.

MERAPI VOLCANO, Springer

The latest addition to Springer's Active Volcanoes of the World book series, *'Merapi Volcano – Geology, Eruptive Activity, and Monitoring of a High-Risk Volcano'* provides the first comprehensive compilation of cutting-edge research on Merapi volcano on the island of Java, Indonesia. As one of the world's most frequently active and iconic volcanoes, Merapi is perhaps best known for its pyroclastic density currents, which are produced by gravitational or explosive lava dome failures (traditionally referred to as Merapi-type nuées ardentes). Merapi's eruptions have posed a persistent threat to life, property and infrastructure within the densely populated areas on the volcano's flanks, as demonstrated most recently by the catastrophic eruption in 2010.

In a collection of **18 chapters**, authored by **67 scientists** from Indonesia and abroad, and edited by Ralf Gertisser (Keele, UK), Valentin R. Troll (Uppsala University, Sweden), Thomas R. Walter (GFZ Potsdam, Germany), I Gusti Made Agung Nandaka (BPPTKG, Yogyakarta, Indonesia) and Antonius Ratdomopurbo (Geological Agency of Indonesia, Bandung, Indonesia), the book integrates, in 572 pages, the latest results from both the natural (geology, petrology, geochemistry, geophysics, physical volcanology) and social sciences, and provides state-of-the-art information on volcano monitoring, the assessment of volcanic hazards, and risk mitigation measures.



Following an opening letter by John Pallister and Jake Lowenstern (USGS), and a foreword by Andiani, the Head of

Indonesia's Center for Volcanology and Geological Hazard Mitigation (CVGHM), the book opens with a review of the scientific exploration and discovery, and the history of volcano monitoring at Merapi by Gertisser and co-authors (**Chapter 1**).

In **Chapter 2**, Lavigne and co-authors describe the physical environment and human context at Merapi, exploring the complex balance between accessing livelihoods and coping with volcanic hazards, drawing on lessons from the catastrophic eruption in 2010 and its aftermath.

In **Chapter 3**, Holmberg shows how an understanding of culture, ancient Javanese traditions and long-held beliefs, which remain prevalent today, is crucial for hazard communication, crisis response and risk reduction. The geological and tectonic setting, and the stratigraphy of the surrounding area and likely basement of Merapi is introduced by Harijoko and co-authors in **Chapter 4**. In **Chapter 5**, Lühr and co-authors review the large number of geophysical investigations at Merapi that have provided a detailed image of the magma-plumbing system, synthesizing information from large active and passive seismic experiments, gravity, tilt, GPS, electrical resistivity and ambient noise tomography data, and earthquake locations. A review of the geological history, chronology, and magmatic evolution of Merapi, and how the knowledge of the structure and stratigraphy of the volcano evolved, is given by Gertisser and co-authors in **Chapter 6**. An important contribution by Bronto and co-authors (**Chapter 7**) describes the discovery of a large debris avalanche deposit of Merapi and discusses the implications for the volcanoes structural evolution and potential future sector collapses. **Chapters 8-10** cover various petrological aspects of Merapi's magma plumbing system. In **Chapter 8**, Troll and Deegan characterize the petrology of Merapi lavas and the suite of inclusions found at the volcano and explore their petrogenetic significance. In **Chapter 9**, Preece and co-authors look carefully at the textural characteristics of phenocrysts and microlites, with a goal of understanding the timescales of crystallization, the interplay between crystallization and ascent rate, and the implications for eruption mechanisms and explosivity at Merapi. Deegan and co-authors (**Chapter 10**) summarize evidence for assimilation, metasomatism, and metamorphism of limestone in the Merapi magmas and show that gas production through metamorphism is an important process that increases the explosivity and consequently the hazards of Merapi's eruptions. The history and evolution of volcanic gas studies at Merapi are detailed in **Chapter 11** by Nadeau and co-authors. The authors demonstrate that studies of gases provide critical additional insights into recent eruptions and have improved understanding of magma ascent and evolution. **Chapter 12** by Subandriyo and co-authors covers the large-magnitude VEI 4 eruption of Merapi in 2010, the worst volcanic disaster at the volcano in 80 years, describing comprehensively eruption chronology, monitoring data, volcanic deposits, petrology, eruption impact, emergency response activities, and civil protection measures. Budi-Santoso and co-authors (**Chapter 13**) thoroughly document the history and current implementation of the monitoring system at Merapi, which is now the most modern and elaborate in Indonesia. In **Chapter 14**, Walter provides a review of synthetic aperture radar (SAR) and interferometric SAR (InSAR) methods, explaining how Merapi has served as a laboratory volcano, where these remotely

sensed radar data have helped track deformation, estimate rates of lava dome extrusion, map and estimate volumes of pyroclastic deposits, detect eruption plumes, evaluate damage, and assess risk. In **Chapter 15**, Darmawan and co-authors review the use of unoccupied aircraft systems (UAS) at Merapi, describing how high-resolution imagery and photogrammetric structure-from-motion (SfM) analyses have been used to interpret dome growth and explosions in the summit crater. Charbonnier and co-authors (**Chapter 16**) consider the hazards of pyroclastic density currents – the deadliest volcanic phenomenon at Merapi – explaining how these and other hazardous phenomena are represented in hazard maps used to reduce risk. In **Chapter 17**, Thouret and co-authors give a comprehensive review of lahars, another common phenomenon at Merapi, describing their physical characteristics and deposits, spatial and temporal distributions and flow regimes, as well as impacts, geophysical

signals, and warning systems. The chapter also presents the first use of FLO-2D computational lahar simulations at Merapi. The book closes with **Chapter 18** by Nandaka and co-authors, who describe how Merapi has served as a laboratory volcano for Indonesia and the world, and how it may help to address fundamental scientific questions in volcanology and risk mitigation in the future. In addition to summarizing post-2010 activity and the unusual present growth of two lava domes at the summit, they explore longer term trends and examine what is needed to prepare for future eruptions, some of which could be stronger and longer lasting than that of 2010.

This comprehensive collection of the latest research summarized in a single, 18-chapter book has been termed 'monumental' (Corrado Cimarelli) and a must read for any student of Merapi volcano (John Pallister).



EIGHTH INTERNATIONAL WORKSHOP ON VOLCANIC ASH (IWVA-8)



WORLD
METEOROLOGICAL
ORGANIZATION
AND PARTNERS



RECOMMENDATIONS AND STATEMENT OF THE EIGHTH INTERNATIONAL WORKSHOP ON VOLCANIC ASH (IWVA-8)

Convened by the World Meteorological Organization (WMO)
in Rotorua, New Zealand on 4 and 5 February 2023

Recommendation 1 (IWVA-8)

In the context of airframe, engine and avionics susceptibility developments and industry needs, the workshop *recommends* that:

- (a) The aviation industry, volcanological and meteorological communities should further their **proactive engagement** in the operation and development of the international airways volcano watch (IAVW), strengthening engagements where necessary and appropriate, and steered by the **articulation of aviation users' needs** and regulatory requirements, and the **harnessing of advances in volcanological and meteorological science, technology and operational capabilities**.
- (b) To support informed and consistent **cross-sector, data-driven intelligence**, the aviation industry, volcanological and meteorological communities should ensure a **timely sharing of relevant data**, ideally in near-real-time, such as aircraft encounters with volcanic ash and gases and reports of operational impacts at airports due to volcanic ash deposition.
- (c) Given an increasingly **complex operational environment** and a clear and stated request from aviation users to **avoid information overload**, agencies and stakeholders involved in the operation and development of the IAVW should strive to ensure that, when compared with legacy products and services, new data-centric services better support aviation users' safety risk assessment needs.
- (d) To support the implementation of new and emerging volcanic hazards-related service offerings, increased efforts should be **jointly** made by the aviation industry, volcanological and meteorological communities to **identify and address the educational needs** of the users.
- (e) In the interest of **co-designing and co-developing improvements** to IAVW-related services, aviation users should be encouraged to provide the volcanological and meteorological communities with information on the **nature and timing of strategic and operational decisions** associated with all volcanic hazards.

Recommendation 2 (IWVA-8)

In the context of recent developments and upcoming challenges and opportunities for volcano observatories and meteorological services, the workshop *recommends* that:

- (a) **Sustainable funding mechanisms** should be identified and secured to support State volcano observatories (SVOs) in the **monitoring of active and potentially active volcanoes**.
- (b) The **content and utility of the volcano observatory notice for aviation (VONA), including the aviation colour code, should be reviewed** as a matter of routine by the International Civil Aviation Organization (ICAO) and partner agencies considering an assessment of aviation users' needs, volcanic ash advisory centres' (VAAC) needs and State volcano observatories' (SVO) capabilities and responsibilities as well as consideration of the different types of volcanic eruption (explosivity index and duration).
- (c) The requirement for **volcano and eruption source parameter information** is recognized in support of the delivery of quantitative volcanic ash concentration information services and, therefore, the volcanological community should **regularly update and enable access to regional and global catalogues of volcano characteristics**.
- (d) SVOs, VAACs and meteorological watch offices should **strengthen their cooperation mechanisms** – thereby helping to better fulfil respective current mandates for the dissemination of the VONA (volcano observatory notice for aviation), volcanic ash advisories and SIGMET information – through, for example, co-organized **capacity-building activities, contingency/backup arrangements**, the development of **new or improved guidance** (making use of good practices where available), and the routine conducting of **volcanic ash exercises** to test emergency preparedness and response.
- (e) The VAACs, working with their associated national meteorological and hydrological services, should **engage closely** with relevant meteorological agencies and SVOs in their area of responsibility regarding the sharing of observations – for example **satellite-based remote sensing, ground-based and airborne data** – to ensure that SVOs have access to information necessary to support effective **volcanic hazards monitoring** and continuity of IAVW-related outputs, including the appropriate and timely dissemination of the VONA.

Recommendation 3 (IWVA-8)

In the context of the next generation of volcanic hazard services for aviation, the workshop *recommends* that:

- (a) **Education and training activities** should be **promoted and enhanced** by the volcanological and meteorological communities in support of the **consistent and timely transition** from traditional product-centric international airways volcano watch (IAVW)-related service offerings to contemporary data-centric services in line with global developments, in particular those conveyed in the Global Air Navigation Plan (GANP) of the International Civil Aviation Organization (ICAO).
- (b) Emerging, innovative scientific and technological advances, including **ensembles and data fusion**, should continue to be **actively explored** by the volcanological and meteorological communities and, where appropriate, **pulled-through** into operational use by the VAACs.
- (c) Aviation users' application of new and emerging volcanic hazard services, such as the implementation of the initial and ultimately full operational capabilities of the quantitative volcanic ash concentration information service, should be underpinned by **clear communication** from the volcanological and meteorological communities of the **strengths and limitations of the supporting science and the information being provided**.

Statement (IWVA-8)

The workshop *stated* that:

- (a) Within the **context of international civil aviation**, there is **enthusiastic support** for the **World Organization of Volcano Observatories (WOVO) to be reinvigorated** as a coordination and collaboration network under the International Union of Geodesy and Geophysics (IUGG)/International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) in order to represent the interests of, and to serve as a conduit to, State volcano observatories (SVOs).
- (b) The **accelerating pace of scientific and technological advancement** and the **comparative lag of international standards** set, for example, by the International Civil Aviation Organization (ICAO) and World Meteorological Organization (WMO) present both **challenges and opportunities** for the volcanological and meteorological communities in the context of the fulfilment of respective mandates within the framework of the international airways volcano watch (IAVW). Moreover, any challenges may be magnified and the realization of opportunities may be reduced by the **limited availability of resources, skills and expertise**.
- (c) Aviation users' demand for new and innovative data-centric information services that are delivered on-time and in-full, that conform to international standards and may be subject to cost recovery, necessitates **enhanced effort and collaboration** between the volcanological and meteorological communities across the service delivery value-cycle, including the **resourcing and scaling-up of current capabilities and emerging innovations**, thereby helping to close current and any future implementation gaps.
- (d) The typically **infrequent nature of explosive volcanic eruptions** that pose a significant hazard and impact on aviation, combined with the inevitable but **natural turnover of experts** within the aviation industry and the volcanological and meteorological communities, potentially presents **institutional knowledge gaps** that could hamper progress within the IAVW.
- (e) SVOs that **choose to not issue the volcano observatory notice for aviation (VONA)** and/or the aviation colour code – due, for example, to the existence of other notification mechanisms at the national level and/or a desire to avoid confusion that may arise from the multiple message-types containing the same or similar information – present **challenges for volcanic ash advisories centres (VAACs) and aviation users alike** who currently rely on the dissemination of the VONA (and the use of the aviation colour code) to make informed and timely decisions.
- (f) The need for a sulphur dioxide (SO₂) information service within the framework of the IAVW, and the capability and capacity of IAVW-related service providers in the future, requires **careful consideration** by ICAO and partner agencies to ensure that **volcanic SO₂ observation and forecast capabilities** are aligned with **aviation users' potential response to volcanic SO₂ in the atmosphere**.

— END —