



Volcanic and Magmatic Studies Group

May 2019 Newsletter (No. 42, The answer to life, the universe and everything)

May 2019 VMSG newsletter

Welcome to the first instalment of the VMSG Newsletter for 2019! Apologies for the less than smooth transition towards a new Editor, which means a couple of 'dropped issues' (mea culpa). Big thanks to John Millett who did such a good job of keeping the regular updates going. I'm (Jenni Barclay) delighted to take over. VMSG should be the conduit for healthy collaborations and nurturing talent in our community. Right now, more than ever, we should be focussing on creating connections and the contents of this letter are a testimony to that. This includes a great 'Impact in Focus' contribution from Stephen Blake, a call for community support for the Lochaber Geopark, and a reflection on first experience of a conference, co-sponsored by our community.

STOP PRESS: Plymouth VMSG 2020.

The 2020 VMSG annual conference will be hosted by Plymouth University from **7th–9th January**. This year promises to be a great event and one not to miss, put it in your diaries!

VMSG 2019 St. Andrews: Highland Hospitality and Happy Magmatism

Contributed by Sally Gibson and Jenni Barclay

Some 211 delegates from the 'United Kingdom' and 11 other countries worldwide congregated in St. Andrews to enjoy 96 poster

presentations and 54 oral presentation over 2.5 days!

'Volcanism' and 'magmatism' is a broad kirk! We considered topics ranging from eruption processes and monitoring across scales to ore deposition, extra-terrestrial volcanism and the tracking of carbon budgets. Where else can you get all of the volcano-magmatic goodness in one room?

It was a pleasure to hear from both the *Thermofisher Scientific Award* Winners from 2019 and 2018. Both **Marie Edmonds** (University of Cambridge) and **Hugh Tuffen** (Lancaster University) are world leaders in their field and it was exhilarating to hear of the contributions they are making, and important to hear of the wonderful impact their 'early career' colleagues have had on these discoveries. **Jon Stone**, *Willy Aspinall Awardee*, who now works at the Department for International Development (DfID) provided some fascinating insights into 'what works' in putting hazard knowledge into practice.

Of course VMSG meetings are as much about nurturing new talent as it is celebrating current pioneers, and the contest for best presentations was hard won. Congratulations to **Ben Clarke** from the University of Edinburgh who won the *Bob Hunter Prize* for Best Oral Presentation and **Elliot Carter** (University of Manchester) who received the *Geoff Brown Prize* for Best Poster Presentation.

A new feature for VMSG this year was a pre-conference outreach event in Dundee, targeting 'hard to reach' science audiences. 100% enjoyed the event! Result! Thanks to Steve Sparks and Rosaly Lopes (NASA) for their 'star' appearances.



If you know of some deserving Award Nominees for this year please get in touch with the Committee.

Impact in Focus: this issue comes from **Prof. Stephen Blake** of the Open University who has chosen a classic volcanology paper where multiple insights have come from direct sampling.

Citation: Wright, T.L. and Okamura, R.T. (1977) *Cooling and crystallization of tholeiitic basalt, 1965 Makaopuhi Lava Lake, Hawaii. US Geological Survey Professional Paper 1004.*

Recommendation:

The job of most geologists is to "read the rocks" by interpreting field relations and rock samples that are usually far removed in space and time from the conditions in which they formed. Volcanology is one area, however, where observations of geological processes such as cooling magma, flowing lava, and pyroclastic transport and deposition can sometimes be made "in situ", at least within the limits of practicality and safety. Realising that this was the case while an

undergraduate at the University of St Andrews focussed my geological interests on volcanology.

Foremost among the papers that ignited my interest were those on the cooling of lava lakes formed by lava flowing into and filling pit craters at Kilauea, Hawaii. Wright and Okamura (1977) is packed full of amazing data and is perhaps my favourite of the literature (but for an overview, see Wright, T.L. and Swanson, D.A., 1987, The significance of observations at active volcanoes: A review and annotated bibliography of studies at Kilauea and Mount St. Helens. In *Magmatic Processes: Physicochemical Principles, Geochem. Soc., Spec. Pub. 1*, 231-240). These lakes are closed bodies of magma that are no longer physically connected to underlying magma, unlike active lava lakes such as seen filling the crater at Erebus in Antarctica. Hundreds of metres across and tens of metres deep, Kilauea Iki, Alae and Makaopuhi lava lakes were repeatedly drilled by USGS scientists to monitor the cooling and crystallization of basaltic magma in a natural setting over several years. Drilling through the thickening crust to recover samples and measure temperatures at different depths and at different times since the lakes were emplaced gave unprecedented insights on fundamental igneous processes in natural settings.

These bold investigations revealed quantitative links between the thermal history of magma on one hand and the changing petrographic and geochemical features of magma as it turned into cold igneous rock on the other hand. For example, the transition from molten magma to strong lava crust was found to occur around the 1065 to 1090 °C isotherm (varying between the three lava lakes). This and other isotherms migrated down into the lake in proportion to the square root of time until non-conductive processes came into play. The transition from mobile to immobile magma remains an important one not just to problems about lava flow mobility but to the eruptibility of magmas and mushes. The rheology of mobile basalt in Makaopuhi lava lake was measured in situ by Shaw et al. (1968, *Amer. J. Sci.* 266, 255-264) in a study which remains one of the few investigations of magma rheology in a natural setting. Lava lake studies also revealed the conditions of crystal-melt separation and the differentiation of basalts, including the generation and segregation of highly evolved melts. Although inevitably confined to a

narrow range of magma compositions at near-surface pressures and therefore to degassed but vesicular magma, the paper by Wright and Okamura detailing the most recently emplaced lava lake (Makaopuhi), as well as the papers on earlier lava lakes, remain go-to sources of data on the physical and petrological evolution of cooling basalt magma under natural conditions.

Later studies have built on the lava lake samples and data to develop and test new models of magma evolution, proving the value of systematic sampling of high temperature magma bodies as functions of position and time. The results from lava lake drilling in the 1960s and 1970s continue to impact the advancement of igneous petrology. One wonders how scientists would tackle the opportunities presented wherever such lava lakes form in the future.

A Hawaiian Volcano Observatory team uses a drilling rig to extract drill core from the cooling lava lake in Kilauea Iki crater. At the time of this 1968 project, nearly a decade after a lava lake filled Kilauea Iki during the 1959 eruption, the crust had solidified to a depth of about 30 m. Photo by Jean Tobin. Photo and caption from https://volcano.si.edu/learn_galleries.cfm?p=16



Help Save Lochaber Geopark!



Lochaber Geopark, based in Fort William, is a not-for-profit organization, run mainly by volunteers.

Lochaber District covers 4648 km², includes Britain's highest mountain and has a wild western coastline of exceptional beauty. Our objective is to tell the story of Lochaber's exceptionally varied geology to some of the

million+ visitors who come here every summer, and to its 20,000 inhabitants. It is a story that has played a pivotal role in the evolution of Geology as a science.

For VMSG members the names of our star igneous attractions will ring out like the great battles of history: Ardnamurchan, Eigg, Rùm! We have lavas from Mull in Morvern and on Ardnamurchan. To the east, Glen Coe (the first ancient caldera recognized anywhere), Ben Nevis, the Ballachulish complex, Strontian with Europe's largest granite superquarry at Glensanda, Kentallen...!

Since April 2014 we have received funding from the Scottish government on a declining scale with the understanding that we would become financially self-sufficient in 2019. We have made great strides towards self-sufficiency, mainly through retail sales in our visitor centres, but the winters are long and cold, and rents are high.

To keep going we have launched a Crowdfunding campaign at

<https://www.crowdfunder.co.uk/save-lochaber-geopark>

and a Membership and field-trips (Geotours) scheme on our website at

www.lochabergeopark.org.uk.

Please help us survive, through Crowdfunding and/or our Membership scheme. A large number of modest donations could save us from extinction!

Please pass this on to your students too.

Ian Parsons (Geopark Vice-chair and Edinburgh University)

Isla Mackay (Staff geologist)



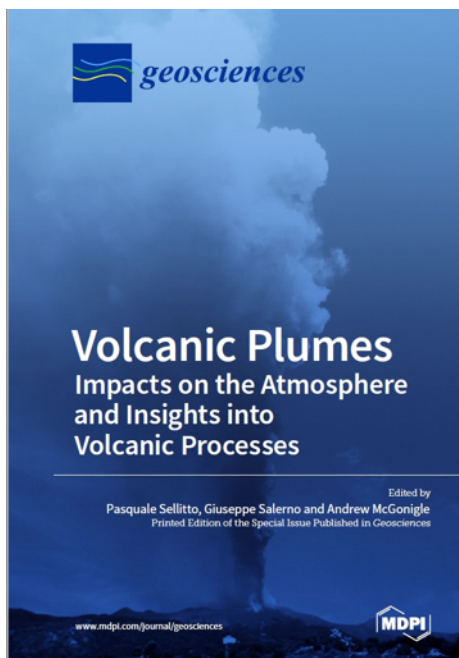
No prizes to avid VMSG readers for guessing this world-class field locality in the Lochaber Geopark! If you guess right give yourself a shiny and don't forget to click the link to donate.
Photo: Neil Slinger

Its Plume Time!

Two contributions by Giuseppe Salerno

New book: Volcanic Plumes: Impacts on the Atmosphere and Insights into Volcanic Processes'.

Pasquale Sellitto, Andrew McGonigle and I, are pleased to announce the publication of printed Edition of the Special Issue 'Volcanic Plumes: Impacts on the Atmosphere and Insights into Volcanic Processes'. The book is open access and download by the link: <https://www.mdpi.com/books/pdfview/book/1179>, printed copy may be ordered.



In this book, we present the state of the art of recent research in volcanic plumes in a synoptic approach, from volcanology to atmospheric sciences and from observation to modelling. This edition was produced to be a concise, well-oriented text for both students and researchers in Geosciences who wish to gain further insight into the subject. We hope that the wide scientific coverage of the book will provide the reader with a good overview of the state-of-the-art research across the breadth of this field.

Giuseppe, Pasquale and Andrew

5th International Training School on **Convective** and **Volcanic** Clouds (**CVC**) detection, monitoring and modelling

<http://www.CVCtrainingschool.org>

The purpose of the School is to train students, with outstanding research interest, in: 1) the techniques allowing to detect, monitor, and model convective and volcanic clouds, 2) the state-of-the-art instruments and satellite missions (present and

future), and 3) the type of studies needed for supporting policymakers, early warning systems and aviation safety uncertainties. There is a fab line up of speakers and lecturers including some VMSG superstars.

Applications

The School is open to all the researchers, pilots, air traffic managers and anybody interested in the topic giving priority to graduate students, PhD students and early career researchers. More info about this school and the previous editions are available at the website above. See you in Nicolosi!

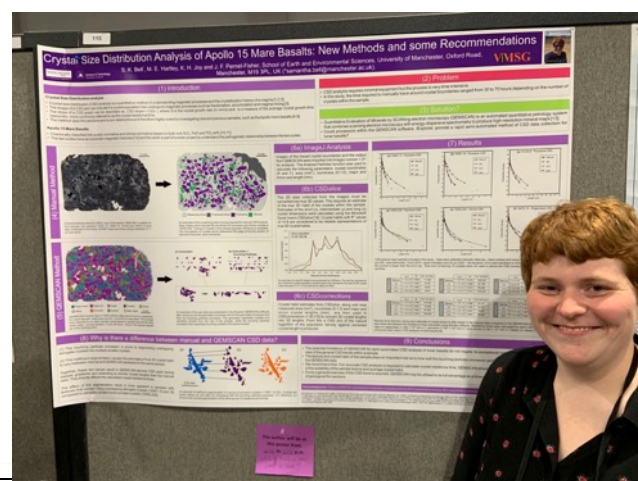
Student Bursary Reports

Within this section, we have just one short report sent in by a PhD students who received a VMSG bursary funding to attend conferences. Thanks Samantha! Don't forgot this is available to all VMSG attendees studying for a PhD!

50th Lunar and Planetary Science Conference (LPSC) in Houston, Texas

Attendee: Samantha Bell

Affiliation: University of Manchester



With support from the VMSG travel bursary, I was able to attend the 50th Lunar and Planetary Science Conference (LPSC) in Houston, Texas. The conference was attended by over 2000 planetary scientists with interests in extra-terrestrial petrology, geochemistry, geophysics, geology and astronomy.

I presented a poster titled “*Crystal Size Distribution Analysis of Apollo 15 Mare Basalts: New Methods and some Recommendations*”. The poster session was a valuable opportunity to gain feedback from experts in my field, as a large proportion of work on lunar samples is conducted in the US. I was able to discuss my work with fellow researchers who also conduct crystal size distribution analysis on lunar samples and make many new contacts in the process.

As this year's conference coincided with the 50th anniversary of Apollo 11, several special lunar science sessions were held with talks from leading scientists in the lunar community. Other highlights of the week included a plenary talk by Apollo 17 astronaut and geologist Harrison “Jack” Schmitt, a screening of the new Apollo 11 documentary film, and walking on a giant map of the Moon!

Many thanks to VMSG for helping me to attend my first LPSC!



Craig Magee contemplates the Honour of receiving the First Henry Emeleus Fieldwork Award (Photo: via VMSG Twitter)

Congratulations Time!

Congratulations to the First Recipient of the *Henry Emeleus Fieldwork Award*: **Craig Magee** of the University of Leeds. We look forwards to hearing all about the secrets of sills in the British Igneous Province unlocked in a future Newsletter!

It was also fantastic to be able to celebrate the winning of the Collins Medal by Brian Upton of the University of Edinburgh.

The Collins Medal is awarded annually to scientists who have made an outstanding contribution to pure or applied aspects of Mineral Sciences and associated studies

Well done Brian!

Upcoming awards of relevance to the VMSG community:

Do you know an outstanding member of the VMSG community? Please consider nominating them for awards and medals bestowed by other societies. Remember, these recognise both early

career scientists as well as those well established.

Links between VMSG & the international scientific community (from Sally Gibson, VMSG Chair)

We're always keen to promote the activities of the VMSG community to a wider audience and so recently accepted an invitation from the Mineralogical Society to write a spotlight article for *Elements*. This will showcase the activities of VMSG (including conferences, fieldtrips and bursaries) to the international mineralogy, geochemistry and petrology community.

VMSG also represents IAVCEI on the UK IUGG panel and so we've been jointly working with colleagues from across the UK Earth Science community to help promote our science at an international level. We would welcome the opportunity to further strengthen these links so please let us know if you're involved in any IAVCEI related activities.

Code of Conduct policies for members of VMSG

Behind the scenes at VMSG we've been actively working with our 'umbrella' organisations, the Geological Society of London and Mineralogical Society, to ensure that we fulfil our mission which is to *'facilitate discussion, in an inclusive environment, amongst researchers with interests in volcanology, igneous petrology and geochemistry and allied fields'*. Attendees at all future VMSG events (conferences, fieldtrips etc) will be required to abide by the Code of Conduct policies that have recently been agreed by the Geological Society and Mineralogical Society. You can find out more about these at <https://www.minersoc.org/code-of-conduct.html> and <https://www.geolsoc.org.uk/codeofconduct>.

at <https://www.minersoc.org/code-of->

[conduct.html](https://www.geolsoc.org.uk/codeofconduct) and <https://www.geolsoc.org.uk/codeofconduct>.

VMSG Distribution List

The VMSG mailing list is managed by jisc-mail. As a list member, you can subscribe to the list or change all your details yourself by subscribing to jisc-mail.

VMSG can also be found on [Twitter](#), [Facebook](#) and [LinkedIn](#).

Sami Mikhail (sm342@st-andrews.ac.uk) runs the VMSG twitter account with a great range of links to papers, positions, articles/news of interest being updated on a regular basis so do follow!!

How to join or leave the group?

Go to the group homepage at www.jiscmail.ac.uk/vmsg and choose the 'Subscribe or Unsubscribe' link from that page. You will receive a confirmation email which you need to respond to.

VMSG Committee 2019

Chair: Sally Gibson (Cambridge)

Secretary: Rich Brown (Durham)

Treasurer: Victoria Smith (Oxford)

Student Rep: Jess Pugsley (Aberdeen)

Common People (aka Ordinary Members)

Jenni Barclay (UEA), Mike Cassidy (Oxford), George Cooper (Bristol) Sam Engwell (BGS), James Hickey (Exeter, Cambourne), Jackie Kendrick (Liverpool), Sami Mikhail (St. Andrews)

Editorial

Many thanks again to those who have contributed to this issue. **Next Issue we would like to highlight all the newly**

minted 'Drs' in our community: so if you've 'levelled up' since Christmas drop the Editor a line with your thesis title, University and what you are up to now in or outside volcano world!