

Introducing *Volcanica*: The first diamond open-access journal for volcanology

“The idea is to stop thinking of knowledge as a commodity to meter out to deserving customers, and to start thinking of it as a public good...”

– Peter Suber

INTRODUCING *Volcanica*

Welcome to *Volcanica*'s first issue! Our community of editors and *Volcanica* supporters are excited to present you with our inaugural issue of peer-reviewed volcano research. Throughout this issue, you can find studies that employ a variety of methods to interrogate different volcanic processes and problems: seismic reflection analysis [Reeves et al. 2018, p. 1], geochemical monitoring [Moussallam et al. 2018, p. 19], experimental rock deformation [Heap et al. 2018, p. 33], long-exposure photography [Bernard 2018, p. 49], and judgement-based fuzzy logic [Blong et al. 2018, p. 63] all make an appearance in these pages. Volcanic systems in Oceania, South America, and Europe are represented, some long extinct, and some in eruption at the time of writing.

This editorial accompanies these first articles so that we can provide you with some background to the *Volcanica* initiative, explain some of the evidence-based motivation for starting a new journal, and explore ways in which we can improve universal access to published research. We discuss our adopted model of “diamond open access”, which is entirely free for authors to publish and free for everyone to read. We will explain how this model is possible and state explicitly the challenges related to how this project can be sustainable and scalable. Finally, we will

signpost the information you may need to publish with *Volcanica* as we continue to grow.

As we will lay out here, where open-access options for volcanologists exist, they are usually provided to the reader for free by transferring the costs associated with publication onto the authors and the institutions that fund the research. This is achieved by charging article processing charges (APCs). The APC method is part of the familiar *gold open access* option, and has proved popular among large publishing groups and has even resulted in dedicated open access journals in our field. *Gold open access* is indeed free and open to readers, but the burden of the cost of publishing is taken by the researcher instead. A principal motivation for starting *Volcanica* was to demonstrate that this need not be

necessary. At *Volcanica* we do not charge an APC, nor do we charge the reader to view the content we publish. This is a less-common model called *diamond open access*. This editorial explains how we have delivered this cost-free option for volcanologists to publish their work and attempts to put our new approach in the context of what is currently available. To understand this better, we will first take a look at the barriers to publishing that exist in most current models.

WHAT ARE THE FINANCIAL BARRIERS TO ACADEMIC PUBLISHING?

Critics of academic publishing have pointed out that the industry (1) privatises knowledge produced by publicly funded research, (2) restricts access for individuals and institutions to human knowledge, (3) commodifies published work as opposed to democratising it, (4) exploits free labour of academics who serve as reviewers, editors, and authors without reimbursement, and (5)

✦ *An explosive beginning*

The front cover of *Volcanica*'s first issue, published July 2018. The cover image is reproduced with thanks to Bernard [2018], and showcases research into volcanic ballistic projectile dynamics.



preferentially disadvantages academics and members of the public in developing countries [Fuchs and Sandoval 2013].

Robert Darnton, who is director of Harvard University's library, summarised the most salient issues associated with the academic publishing industry: "We academics provide the content for scholarly journals. We evaluate articles as referees, we serve on editorial boards, we work as editors ourselves, yet the journals force us to buy back our work, in published form, at outrageous prices..." [Darnton 2009]. The Research Information Network (RIN) has estimated that the unpaid non-cash costs of peer review—tasks undertaken almost exclusively by academic researchers—amount to around £1.9 billion per year around the world [RIN 2008]. Indeed, as Darnton goes on to add, "The spiraling cost of journals has inflicted severe damage on research libraries".

As of 2015, the annual revenue of the academic publishing market was estimated to be US\$25.2 billion [Ware and Mabe 2015] and, in 2008, RIN reported that around a third of the global research budget (£59 billion out of £175 billion) was dedicated to publishing and accessing research results. An estimated £34 billion is spent globally each year just *accessing* published research. Access to research can be prohibitively expensive as a result of the for-profit business model of most large publishing houses. Significantly, the vast majority of people around the world—mostly likely well in excess of 99% of the global population—have no access to these results [e.g. Tennant et al. 2016].

Volcano-related research is no exception to this. Where open access options exist (i.e. where articles are free for people to read), they typically incur substantial article processing charges on the part of the authors or their institutions. Article processing charges (APCs) are commonly over US\$1000 for Earth Science journals and which can exceed US\$5000*. Alternatively, the research is paywalled, rendering it inaccessible without an institutional subscription or one-off per-article payments.

The current profit-driven paradigm of scholarly publishing has been shown to exacerbate bias and inequality [e.g. Ellers et al. 2017], and can keep information away from those who may need it most: globally, areas most at risk from volcanic hazard are often situated in less-economically developed regions (see Auker et al. [2013] for an overview). A staggering 88.2% of volcanic threats are concentrated in countries classified as "developing economies" by the International Monetary Fund (IMF) [IMF 2018]. Critically, Auker et al. [2013] estimate an overall reduction in global vulnerability to volcanic hazards over time, which they attribute to the emergence and establishment of volcanology as a scientific discipline from the c.1900s onwards. Relevant advances include improvements in evacuation protocols and other volcanic risk reduction strategies, and the

introduction and proliferation of remote sensing techniques. Ultimately, Auker et al. [2013] estimate that modern volcanology has prevented the deaths of over 85,000 people over the last century. Evidently, volcano-focused research plays a vital role in mitigating volcanic risk; *access* to this research is just as crucial.

To many members of the volcanology community, the case for open access, and freely available academic work, is clear. However, it is not necessarily clear how that openness of access should or could be delivered, and where the financial burdens should lie.

How much does it cost to publish?

Any publishing model has to ensure that the basic operating costs of the publisher are met. Typically these are divided into three categories [e.g. Tennant et al. 2016]:

1. management and investment costs: the set-up and marginal running costs of the journal itself;
2. article processing costs (APCs): costs involved with editing, typesetting, proofreading, and other article-level costs; and
3. other costs, which include infrastructure, hosting, and marketing.

Cited production costs vary widely from journal to journal. The multidisciplinary science journal *Nature*—part of the Nature Publishing Group (itself a division of Springer Nature)—has indicated that their cost per article is as high as US\$30,000 [Van Noorden 2013]: a justification for high subscription costs and APCs. On the other end of the spectrum is the *Journal of Machine Learning and Research*, for example, with estimated costs of US\$6.50 per article given their online-only format, volunteer-based labour system, and efficient use of L^AT_EX templates [Shieber 2012]. Accordingly, the average production cost of a single research article lies between these extremes at around US\$3500–US\$4000, estimated by Van Noorden [2013].

WHAT IS "OPEN ACCESS"?

The standard publishing route that currently dominates the publishing landscape is termed *toll access*, and implies that the work is not accessible without payment. The barrier that separates the reader from the work is often referred to as a *paywall*. In general, open access options remove paywalls, and refer to any publishing model that produces articles or published content that are free to the reader. There are many different terms for varying degrees of "openness". These typically relate to one question: how many barriers to publishing or reading are there in any particular publishing model? The simplest distinctions are the *green–gold–diamond* classification.

**Nature Communications* charges an APC of US\$5200 (£3300/€3850), pre-tax.

Green open access and *gold open access* refer to the method by which the paywall is removed. In *green open access*, the work is stored in a repository such as a pre- or post-print server (see below), which need not be associated with the publisher, whereas in *gold open access*, the publisher themselves distribute the work to the reader for free [e.g. [Suber 2012](#)].

Other terms that are used to describe components of access to research outputs can be mediated include *gratis open access* and *libre open access*. Barriers to access can be both financial- and permissions-related. Removal of the former is called *gratis open access*. If permissions barriers are also removed, then this is known as *libre open access* [[Suber 2012](#)]. Importantly, the *libre open access* system also implies the retention of copyright (that is, ownership) by the original authors: typically not the case in conventional scholarly publishing.

The advent of gold open access options, which provide free online access to research, offers a tantalising alternative to paywalls, opening scientific results up to the organisations or communities that need them most and—importantly—to the taxpayers who potentially funded the work in the first place. However, gold open access requires APCs, which can represent a substantial proportion of some research budgets. This effectively transfers the financial barrier from the reader to the researcher. Moreover, the majority of research conducted at universities is funded through taxes, and therefore, both institutional subscription charges and APCs can be viewed as government subsidies to publishing companies. A study by [Solomon and Björk \[2012\]](#) found that authors who were obliged to pay APCs for open access predominantly used research grant money or institutional funding to finance APCs > US\$1000, whereas personal funds were commonly used when the APCs was lower.

Gold open access options are becoming ever more prevalent, due in part to the fact that they can prove extremely lucrative for publishers. Perhaps unsurprisingly, the popularisation of gold open access options from legitimate publishing groups has been accompanied by the proliferation of publishing venues with somewhat less scrupulous selection criteria. So-called “subsidy publishing”—commonly referred to as “vanity press”—is a pay-to-publish model, often (though not always) associated with predatory publishing practices. In more extreme cases, articles are published without any formal peer review and with only cursory copy-editing.

Nevertheless, a lingering perception is that alternatives to these for-profit models are unsustainable (for example, advocates of traditional publishing models have stated that open access is not desirable because the general public could misinterpret or misuse esoteric scientific data[†] [see [Suber 2012](#)]).

[†]In a testimony before the UK Parliament’s House of Commons Select Committee on Science and Technology in March 2004, Dr John Jarvis—former Senior Vice President of Wiley

ACCESS TO VOLCANOLOGY

In his 2014 blog post, “The most important journals in volcanology”, Dr John Stevenson sought to identify the most important journals for volcano-based research. Stevenson’s approach was to quantify by journal each of the discrete references cited in [Cashman and Sparks \[2013\]](#), a 25-year review of volcanic processes. The article in question was chosen due to its broad scope, which encompasses many facets of modern volcanology, including “the physical processes that modulate magma accumulation in the upper crust, transport magma to the surface, and control eruptive activity” [[Cashman and Sparks 2013](#)]. Cashman and Sparks cite 362 discrete references from 67 journals and books.

Of the 360+ articles cited, only 113 of these (31%) are open access. The remainder are paywalled, with prices ranging from £9 (US\$12; €10) to £149 (US\$196; €168) per article for purchase or short-term rental. There are some important caveats to note in this rudimentary analysis. First, not all of the journals shown had open access options at the time (2013). Moreover, many of the articles have since been made available online via green open access options. Journals of the American Geophysical Union (AGU) in particular, including *Journal of Geophysical Research*, *Geochemistry*, *Geophysics*, *Geosystems*, and *Geophysical Research Letters*, are subject to an embargo period of 24 months, after which articles become open access[‡]. It is important to note also that new volcano-specific open-access journals have been launched or gained tractions since the work of [Cashman and Sparks \[2013\]](#): the *Journal of Applied Volcanology* only launched in 2012, and *Frontiers in Earth Science* only began publishing articles under a *Volcanology* section in the second quarter of 2014 (both journals offer open access).

Of the open access citations in [Cashman and Sparks \[2013\]](#), the AGU journals account for 51 of the 113 (45% of open access citations). If we discount embargoed publications (45) then we are left with only 62 articles that are gold open access—including professional papers and reports (9), and a newsletter (1)—of the 362 articles cited in their study (i.e. 17%). And, importantly, of those 17%, the majority required an APC. To access all 362 sources cited in [Cashman and Sparks \[2013\]](#) from the publishers, without an institutional subscription, would cost in excess of £6000 (around US\$8000/€6800 or more).

Although this analysis does not well represent all facets of volcanological research, it does bring to light an important underlying issue. Namely, that the majority of volcano-based research is inaccessible—other

Europe—stated: “[T]his rather enticing statement that everybody should be able to see everything could lead to chaos.” [[House of Commons Science and Technology Committee 2004](#)] [full transcript: <https://publications.parliament.uk/pa/cm200304/cmselect/cmcsctech/uc399-i/uc39902.htm>].

[‡]Despite the embargo, APCs are still required to publish in these journals.

the platform for publishing outputs, such as simulation tools or labs for classrooms and lectures, that may not be publishable via more traditional journals or e-books. At the time of writing, Vhub has enabled 11,542 computer simulations, by users across the world.

Pre- and post-print servers, including EarthArXiv

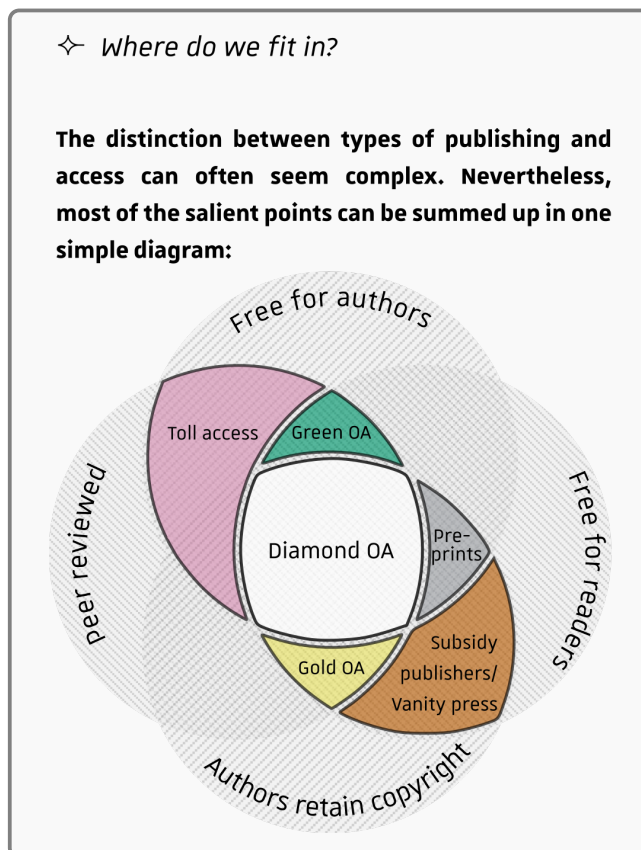
A model for circumventing the costs of publishing that has proved incredibly successful in many disciplines is the so-called pre-print server. Started in 1991, [ArXiv](#) is the online repository for physics, mathematics, and computer science manuscripts, among other disciplines. In 2017, [EarthArXiv](#) was established for the geoscience community. These pre-print servers host research manuscripts in a form other than a finally accepted and typeset journal article, and are free to use and free to access. While the common name for these is "pre-print servers", the manuscripts uploaded can indeed be re-formatted post-prints of already published work. These servers also do not require that the uploaded manuscript is (or is intended) to be formally published at all. In that way, this represents a mechanism to circulate work without cost. This model demonstrates that the online hosting and indexing of academic work can be sustainably achieved without APCs or subscription charges, and calls into question the necessity of those financial barriers to publishing.

The Diamond Open Access model

Pre-print servers clearly call us to question the apparent necessity for some of the financial costs of maintaining access to research online. However, they provide no editorial, peer-review, or typesetting and proofreading services, relying on authors to upload work in their own format, and a team of volunteers to moderate content. Those components of the services are provided by journals, and are critical for maintaining the standards of rigour and originality that good scholarship stands for. It has been argued that APCs are necessary to deliver

those services: editorial oversight, peer-review systems, typesetting, and quality control in the form of proof-reading, indexing and checking, not to mention the elements of design, marketing, and outreach which benefit the author in terms of the reach of their work.

A *diamond open access* model is one in which no financial burden is passed to the reader or the author at any stage of the process, but which still provides the usual services of an online journal. Moreover, copyright is typically retained by the author under diamond open access models, contrary to conventional scholarly publishing practice. Diamond open access, sometimes also referred to as "sponsored open access", has been employed in a number of research fields, including clinical and biomedical sciences (*Biomedical Journal*), literature analysis (*Orbit*), machine learning (*Journal of Machine Learning Research*), mathematics (*Theory and Applications of Categories*), and even Geosciences (*Turkish Journal of Earth Sciences*) demonstrating that—with support from the research community—research can be disseminated in a way that is truly free for authors, institutions, and readers whilst maintaining the rigour and quality associated with a traditional periodical.



A DIFFERENT PUBLISHING MODEL FOR VOLCANO RESEARCH: *Volcanica*

Volcanica is an alternative publishing solution for volcano-related research. We are the first diamond open access journal dedicated to publishing research on all aspects of volcanology and related disciplines. This includes field and experimental volcanology alongside the societal and the climate influence of volcanic phenomena throughout history, among many other possible topics.

By keeping working costs to a minimum and with financial backing from [Presses universitaires de Strasbourg](#), we do away with expensive article processing charges and subscription costs. In short, we are a volcanology journal that is free for authors and readers alike.

Aims, scope and classes of article

Volcanica aims to publish research that relates to volcanoes, volcanism, or volcanic areas, on Earth or other planets. In that way, the scope of this journal is the widest possible within an umbrella theme of volcanoes. This journal has been built and is sustained by a great many volunteer academics from across the field (see our [editorial team](#)), such that the foundation of expertise in the editorial board is as broad as the scope.

Like most journals, we offer authors a choice of article type, tailored to a range of needs. Currently, these include (1) the flagship *Research Article*, (2) a *Short Communication*, and (3) a *Report* format. The first two formats (*Research Article* and *Short Communication*), are common among most journals in the natural sciences and are for timely and original research. *Comments*, *Communication of Methods*, and other works benefitting from a short-format style may be submitted as a *Short Communication*.

The *Report* format is an initiative unique to this journal, and aims to be a venue for publishing observations from active volcanism worldwide, synthesised and contextualised in a piece of research, but which need not be subject to the same standards of novelty or hypothesis-driven work to which published research is usually held. We hope that this new format of article will be of particular interest to those working at volcano observatories.

More information on any of the accepted formats can be found on the [Author Guidelines](#) section of the *Volcanica* website[¶].

Removing language barriers and making science more accessible

Volcanica offers authors the opportunity to submit a translation of their abstract in a second language of their choice, to be published in their article. Additionally, authors can provide any number of subsequent versions of their abstract in other languages, to be published in separate documents alongside the main article. The first example of this in *Volcanica* appears in [Heap et al. \[2018\]](#), who included a French abstract (or *résumé*) in the article, and an Italian translation (*riassunto*) available as a supplementary file on the *Volcanica* website. [Blong et al. \[2018\]](#) also include a German summary (*zusammenfassung*) of their work on the Laacher See eruption. In the case of the multi-lingual abstracts, neither our editors nor the journal will take responsibility for the accuracy of the translation, but can offer guidance if necessary. These will not be subject to peer review.

We hope that this goes some way to increasing the access to volcanological research (at least in summary form) across language divides, paying particular atten-

tion to the aforementioned fact that so many active volcanoes are in countries for whom the first language is not English. We also encourage authors to submit a *non-technical summary* with their main article. This will be published online with the article and is aimed at explaining research to the non-specialist.

The cost of this free journal

As highlighted in this editorial, all publications involve some inherent costs. *Volcanica's* goal is that none of these costs are transferred to our readership, nor to the producers of volcano-related research. The current and predicted expenditures for *Volcanica* in 2018 are as follows:

- Web hosting and 2018[¶] archiving: £96. As an online-only journal, web-hosting is a key consideration. We are hosted by a company registered in the UK with excellent uptime and reliability.
- Subscription to Crossref: US\$275.00. Crossref is an official Digital Object Identifier (DOI) registration agency, responsible for allocating DOI numbers to *Volcanica* articles. A DOI is a serial code used to uniquely identify objects including online articles, for example: [10.30909/vol.01.01.0117](https://doi.org/10.30909/vol.01.01.0117).
- Subscription to CLOCKSS (short for Controlled LOCKSS [Lots of Copies Keep Stuff Safe]): US\$232 (predicted). CLOCKSS is an online archiving service, which means that data and documents are stored and preserved in a secure environment. CLOCKSS is a not-for-profit, open-access repository.

These are our *only* direct costs. Although these costs are subject to change (archiving rates can vary year-on-year, for example, and the 2018 expenditure on web hosting is higher than that predicted for future years by around a factor of 1.5), we highlight that together they are equivalent to only around £480 (US\$634; 542€) in 2018, predicted to be £443 (US\$585; 500€) in 2019. These costs in 2018 have been covered both by private donations and by the Presses universitaires de Strasbourg (Strasbourg University Press), who have agreed to contribute a fixed sum to *Volcanica* for a minimum of four years. In 2019, it is anticipated that *Volcanica* will be entirely financed by Presses universitaires de Strasbourg.

We can keep our running costs so low only due to the tireless support and commitment of a dedicated team of volunteers. These include a 29-strong editorial board, an ever-enthusiastic social media and outreach team, reviewers, and several other supporters

[¶]prior to allocation of an International Standard Serial Number (ISSN: pending 2018) archiving is facilitated through *Volcanica's* web host, which incurs temporary additional costs in terms of storage space.

[¶]www.jvolcanica.org

who offer their time to perform non-editorial duties such as proofreading. Many of the editors adopt multiple roles within the journal structure as well, doubling as finance officers, report coordinators, designers, typesetters, and web developers. Above all, each volunteer is an ambassador of open access.

Where do we go from here?

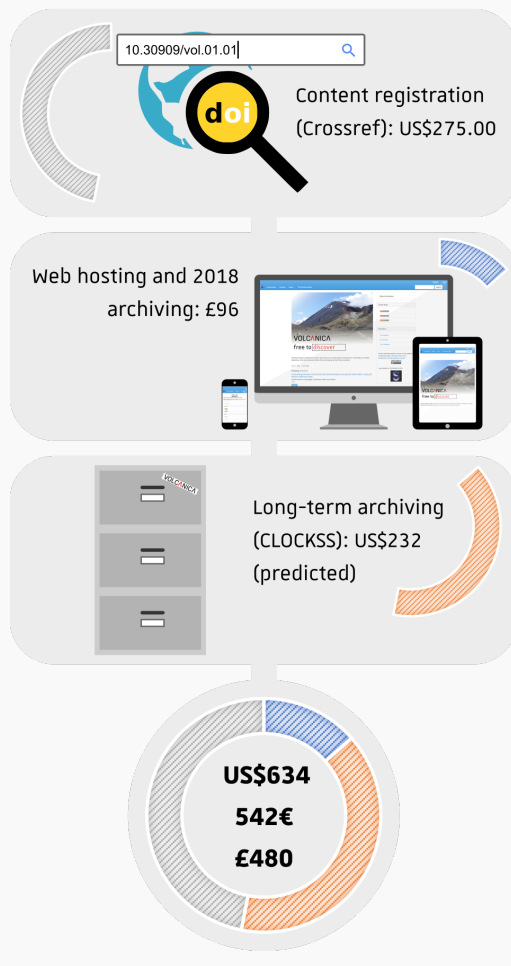
At *Volcanica*, we are committed to experimentation and innovation in publishing. To that end, we welcome ideas or new initiatives that may result in greater openness, diversity and inclusiveness of academic endeavour in the fields of volcanology. We also welcome expressions of interest for those who wish to actively contribute to the project.

Our inaugural issue demonstrates that it is possible to publish rigorously peer-reviewed volcano research without transferring costs to the readers or authors. Moreover, as the articles themselves ably confirm, it is possible to do so without compromising on research quality.

Now *Volcanica* faces the next challenge: upscaling. If we grow as we hope to, and attract submissions in larger volumes than we have handled thus far, it is easy to question how a small group of enthusiastic researchers will deal with this increased demand, without the mass of typesetters, IT-specialists, proofreaders and other experts available to larger publishing groups. With the funding we have, the answer to this challenge is hazy. But a part of the *Volcanica* vision is to demonstrate that scaling the endeavour does not necessarily mean scaling the funding necessary to sustain ourselves: bigger doesn't necessarily mean more costly. We are, by our own design and the nature of our conception, a community project, where the community is composed of the researchers themselves. This mentality has afforded us a

✧ *The cost of a free journal*

All publications involve some inherent costs. *Volcanica's* goal is that none of these costs are transferred to our readership, nor to the producers of volcano-related research. For transparency, here are the broken-down costs for *Volcanica* in 2018:



huge body of volunteers who have worked tirelessly to help in myriad different ways. We have to be sensitive to the fact that these volunteers are mostly from the early-career stages, and that their labour is given freely. Critics could tell us that we are yet another sink into which early-career researchers are asked to pour their time with only marginal, perhaps intangible benefits. A fair point, but *all* scholarly publishing involves volunteer time in editing and reviewing. We believe that our position as a community-led journal gives us the weight of community spirit to offer individual volunteers a firm place in the project. And, yes, our medium-term scaling would require an increase in volunteer numbers. We aim to carefully train and upskill selected early-career researchers in the use of L^AT_EX for typesetting and in proofreading best-practice by carrying out in-house one-on-one training via email and video conference. This will give volunteers a

concrete and transferable skillset from which to meet the demands of a growing journal. And, of course, we editors who have already made commitments to the success of this project, will be going above and beyond the usual limits of an editorial role.

These extra efforts are warranted simply because this project is a good one, and fills a genuine need in our community of volcanologists that is not met by alternative publishing groups. We hope you agree, and encourage you to join us along the road to open access.

Yours volcanically,

– Jamie I. Farquharson and Fabian B. Wadsworth

“Alchemists turned into chemists when they stopped keeping secrets.”

– Eric S. Raymond

ACKNOWLEDGEMENTS

A great many people have helped make *Volcanica* a reality and this project is, by the nature of its conception and execution, a community endeavour. First, we are grateful to the members of our elected Editorial Committee, who have taken on a central role in steering and realising the vision of this project. These people are Oryaëlle Chevrel, Pierre Delmelle, Michael Heap, Ben Kennedy, Alexandra Kushnir, and Rebecca Williams. Second, without the enthusiastic members of our Editorial Board, this project would not be possible: Jenni Barclay, Jacqueline Dohaney, Frédéric Dondin, Amy Donovan, Susanna Ebmeier, Alison Graettinger, Adrian Hornby, Kayla Iacovino, Mike James, Alison Jolley, Kyoko Kataoka, Janine Krippner, Ulrich Kueppers, Sami Mikhail, J. Maarten de Moor, Julie Morin, Dmitri Rouwet, Clara Solaro, Nick Varley, Jérémie Vasseur, and Felix von Aulock. Third, we are indebted to our social media and outreach team, Rebecca Coats and Jenny Schauroth.

There are many others who have expressed support for this project or joined our ranks in non-editorial roles, including the many reviewers and authors whose hard work has led to the publication of our first complete issue. We thank Presses universitaires de Strasbourg who have committed funding to the project, allowing us to take these first steps. We acknowledge John Stevenson for his excellent blog, [volcan01010](#), which provided the inspiration for part of this editorial. We are especially grateful to Alexandra Kushnir for her help with this editorial and to Ed Llewellyn and Fabian Ochsenfeld for reading critically an early version. Thanks also go to Jon Tennant, for illuminating discussion about access to research. We thank [Christopher Smith](#), for the initial design work for *Volcanica*'s logo.

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AUTHORS' NOTE

We have endeavoured to be exhaustive in researching this editorial, and, in particular, to give credit to the many initiatives that volcanologists have created that support openness in publishing or sharing research. However, it is inevitable that we have missed some important projects, for which we sincerely apologise.

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REFERENCES

- Auker, M. R., R. S. J. Sparks, L. Siebert, H. S. Crossweller, and J. Ewert (2013). "A statistical analysis of the global historical volcanic fatalities record". *Journal of Applied Volcanology* 2.1, p. 2. doi: [10.1186/2191-5040-2-2](#).
- Baskaran, A. (2017). "UNESCO Science Report: Towards 2030". *Institutions and Economies*, pp. 125–127.
- Bernard, B. (2018). "Rapid hazard assessment of volcanic ballistic projectiles using long-exposure photographs: insights from the 2010 eruptions at Tungurahua volcano, Ecuador". *Volcanica* 1.1, pp. 49–61. doi: [10.30909/vol.01.01.4961](#).
- Blong, R. J., F. Riede, and Q. Chen (2018). "A fuzzy logic methodology for assessing the resilience of past communities to tephra fall: a Laacher See eruption 13,000 year BP case". *Volcanica* 1.1, pp. 63–84. doi: [10.30909/vol.01.01.6384](#).
- Cashman, K. V. and R. S. J. Sparks (2013). "How volcanoes work: A 25 year perspective". *Geological Society of America Bulletin* 125.5-6, pp. 664–690. doi: [10.1130/b30720.1](#).
- Darnton, R. (2009). *The case for books: Past, present, and future*. PublicAffairs.
- Ellers, J., T. W. Crowther, and J. A. Harvey (2017). "Gold Open Access Publishing in Mega-Journals: Developing Countries Pay the Price of Western Premium Academic Output". *Journal of Scholarly Publishing* 49.1, pp. 89–102. doi: [10.3138/jsp.49.1.89](#).
- Fuchs, C. and M. Sandoval (2013). "The Diamond Model of Open Access Publishing: Why Policy Makers, Scholars, Universities, Libraries, Labour Unions and the Publishing World Need to Take

- Non-Commercial, Non-Profit Open Access Serious”. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 11.2, pp. 428–443. DOI: 10.31269/triplec.v11i2.502.
- Heap, M., A. Kushnir, L. Griffiths, F. Wadsworth, G. M. Marmoni, M. Fiorucci, S. Martino, P. Baud, H. A. Gilg, and T. Reuschlé (2018). “Fire resistance of the Mt. Epomeo Green Tuff, a widely-used building stone on Ischia Island (Italy)”. *Volcanica* 1.1, pp. 33–48. DOI: 10.30909/vol.01.01.3348.
- House of Commons Science and Technology Committee (2004). “Scientific publications, free for all?” *Tenth report of session 2003-04* 1.
- IMF (2018). *World Economic Outlook Database—WEO Groups and Aggregates Information*. URL: <http://www.imf.org/external/pubs/ft/weo/2018/01/weodata/groups.htm> (visited on 06/26/2018).
- Moussallam, Y., P. Bani, C. I. Schipper, C. Cardona, L. Franco, T. Barnie, Á. Amigo, A. Curtis, N. Peters, A. Aiuppa, G. Giudice, and C. Oppenheimer (2018). “Unrest at the Nevados de Chillán volcanic complex: a failed or yet to unfold magmatic eruption?” *Volcanica* 1.1, pp. 19–32. DOI: 10.30909/vol.01.01.1932.
- Reeves, J., C. Magee, and C. Jackson (2018). “Unravelling intrusion-induced forced fold kinematics and ground deformation using 3D seismic reflection data”. *Volcanica*, pp. 1–17. DOI: 10.30909/vol.01.01.0117.
- RIN (2008). *Activities, costs and funding flows in the scholarly communications system in the UK*. Tech. rep. Report commissioned by the Research Information Network.
- Shieber, S. (2012). *An efficient journal*. URL: <http://blogs.harvard.edu/pamphlet/2012/03/06/an-efficient-journal/> (visited on 06/26/2018).
- Solomon, D. J. and B.-C. Björk (2012). “A study of open access journals using article processing charges”. *Journal of the American Society for Information Science and Technology* 63.8, pp. 1485–1495. DOI: 10.1002/asi.22673.
- Stevenson, J. (2014). *The most important journals in volcanology*. URL: <http://all-geo.org/volcan01010/2014/03/the-most-important-journals-in-volcanology/> (visited on 06/22/2018).
- Suber, P. (2012). *Open Access*. The MIT Press Essential Knowledge series. The MIT Press. ISBN: 978-0-262-30098-8.
- Tennant, J. P., F. Waldner, D. C. Jacques, P. Masuzzo, L. B. Collister, and C. H. J. Hartgerink (2016). “The academic, economic and societal impacts of Open Access: an evidence-based review”. *F1000Research* 5, p. 632. DOI: 10.12688/f1000research.8460.3.
- UNESCO International Institute for Education Planning (2017). “Six ways to ensure higher education leaves no one behind”.
- Van Noorden, R. (2013). “Open access: The true cost of science publishing”. *Nature* 495.7442, pp. 426–429. DOI: 10.1038/495426a.
- Ware, M. and M. Mabe (2015). “The STM report: An overview of scientific and scholarly journal publishing”. *International Association of Scientific, Technical and Medical Publishers, The Netherlands*.