Feedback from the *European Mathematical Society* on the Guidance on the Implementation of Plan S

1 Toward the Implementation of a Fair, Accessible, Transparent and Efficient Scholarly Publishing System Serving the Needs of the European Mathematical Community

The mathematical community has been for a long time on the forefront of establishing an accessible, efficient, fair and transparent scholarly publishing system, and as such concurs with the objectives of Plan S. From its beginning, mathematicians have been very engaged in making their papers available via the arXiv[1]. European mathematicians use this platform as a de facto standard for Green Open Access deposits, and have now achieved that most of their recent papers are available via the arXiv in a majority of mathematical fields. Furthermore, crucial initiatives like the Cost of Knowledge movement[2], the flipping of several important journals to Open Access (OA) platforms, or the establishment of several community-driven non-Article-Processing-Charge-Gold-Open-Access (APC Gold OA) Journals started by European mathematicians. An important factor in this movement has been the experience that generic platforms and solutions, which tend to dominate the business model of large publishers, will often not fulfil the specific needs of mathematics. The purpose of this feedback to the implementation guidelines of Plan S is to emphasize the needs of the European mathematical community, as represented by the European Mathematical Society.

2 The European Mathematical Society

The European Mathematical Society (EMS) was founded in 1990, and has been representing the European mathematical community since then.

In the area of scholarly publishing, ensuring scientific quality and improving availability have been the most important objectives for the EMS, reflecting the priorities of its members. The Publication and Ethics Committees of the EMS

[1] The e-print service owned and operated by Cornell University (USA), `https://arxiv.org/`.

[2] See `http://thecostofknowledge.com/`.

have worked constantly to address these aims. Due to the cumulative nature of mathematical knowledge, and its role as a foundation of science, deduction from wrongly established results or even scientific misbehaviour can have severe and widespread consequences. Along these lines, the EMS has also strongly objected to the implementation of incentives that may pose a danger to scientific quality, like an economic bias towards wealthy authors or institutions, or the substitution of content assessment in science by bibliometric measures. Therefore, the EMS was also among initial signatories of the San Francisco Declaration of Research Assessment[3] (DORA).

In the creation of mathematical knowledge, open tools designed for the needs of mathematics–with the prominent example of LaTeX–are crucial. The EMS is a strong advocate of infrastructures that support such tools addressing the needs of mathematicians, and is sceptical of generic implementation that tends to disregard these needs.

Along with the consent of its community, it has advocated making their publications quickly available on platforms like the arXiv, and supported the establishment of and transformation to non-APC Gold OA journals. Scientific and financial transparency were the guiding principles in the formation of the EMS publishing house, which as an independent foundation does not serve to subsidise the society. Many journals from EMS-PH are now either immediately OA available like its journal of record, the Newsletter of the EMS, or after an embargo period, like the Journal of the EMS.

The EMS is leading the European Digital Mathematics Library (EuDML) initiative, which established the largest currently openly available digital library of published mathematics. Moreover, it has been co-editing the Zentralblatt Mathematics (zbMATH) reviewing service jointly with FIZ Karlsruhe and Heidelberg Academy of Science for more than two decades, and has been a driving force in the transformation of zbMATH toward an open service during this period. This resulted in collaborations of zbMATH with open platforms like the arXiv or MathOverflow, opening up the published reviews, establishing open Application Programming Inferface (APIs), and currently fundamental support in the initiative to facilitate its transformation to a fully open platform via a proposal of FIZ Karlsruhe to the German Government. zbMATH serves also a an essential measure to ensure continued scientific quality in mathematics.

For a long time, the EMS has put a strong emphasis on the support of mathematics in developing countries, notably through its special committee for these countries (CDC). With respect to the scholarly publication system, it has put especially strong support on erasing barriers to the availability of scholarly communication resulting from local economic conditions. This is true as well for the large and important mathematical communities from Eastern and Southern Europe represented by the EMS, which have often experienced challenging restrictions resulting from the economic situations throughout the last decades. Therefore, it is a primary objective of the EMS that the implementation of Plan S leads to no drawbacks to scientists in countries which are less economically developed.

[3]See `https://sfdora.org/`.

3 OA Statement

The EMS is in favour of Open Access to the scientific literature. By Open Access, we mean "free to read, without any economic, legal, or technical barrier." Authors should be free to choose the most relevant avenue for their publications. Publication should only be based on the scientific merits of the work, no economic or other considerations should interfere in the selection process. Quality control through peer-review is a fundamental feature of publishing mathematics.

The mathematical community has long opted in favour of three complementary paths to Open Access:

1. Dissemination via platforms supporting forms of Green OA like the arXiv;
2. Establishing community-driven non-APC Gold OA journals (sometimes called Diamond, or Platinum OA);
3. Making the mathematical heritage universally available via moving wall policies.

In comparison, the route via Gold-OA journals requiring APCs is mostly rejected, since there is an overwhelming perception of their possible negative incentives to scientific quality. A large part of mathematical research is not conducted under contract with funding organisations, APC-Gold OA thus introduces non-scientific discriminations.

In support of Green OA as enabled by platforms like the arXiv, we wholeheartedly support the feedback given in the responses of the arXiv[4] and the Confederation of Open Access Repositories[5]. Therefore, in the discussions of the details below, we will not reiterate all issues already discussed in these statements. Moreover, we stress that local institutional repositories, which are of growing importance, should be eligible as an efficient Green OA way to comply with Plan S objectives.

In support of community-driven non-APC Gold OA journals, we encourage funders to provide resources to develop and meet standards to maintain and extend their share in the scientific infrastructures. We advocate against requirements that may have a prohibitive impact on these community efforts, by raising unnecessary technical barriers or incurring prohibitive production costs.

The issue of making the past scientific heritage freely and easily accessible is currently not addressed within Plan S. It is of paramount importance for mathematical knowledge as an enabling resource for science and innovation. It should not be confused with mechanisms for the preservation of newly published material. We strongly suggest including practical ways toward this goal as eligibility criteria for publishers and platforms.

We cannot support measures that may provide negative incentives to scientific quality. Criteria to ensure scientific quality should follow the recommendations of the learned societies representing the specific needs of their subject.

[4]See https://blogs.cornell.edu/arxiv/2019/02/04/arxivs-feedback-on-the-guidance-on-the-implementation-of-plan-s/.

[5]See https://www.coar-repositories.org/news-media/coar-feedback-on-the-guidance-on-implementation-of-plan-s/.

4 Detailed feedback on Plan S implementation planned guidelines

We support a global move to Open Access publishing for scientific publications.

This has to be introduced in a responsible way, taking into account the publishing standards of different research communities. We emphasize that compliance criteria should be practical, with only a reasonable burden put on authors. Scientific authors are not information specialists, but they know the reputations of journals, and usually succeed in finding the most respected and reputable one for their results. However, one cannot expect a scientific author to check technical features of a platform. Given the very limited time frame left for preparing compliance, a very practical approach should be adopted. Thus we suggest that many required criteria be moved to recommended criteria. This way, existing infrastructures can adapt, knowing the target, while new infrastructures can program Plan S compliance. Publicly funded infrastructures (or infrastructures mainly subsidised by public money) could be given stronger incentives to move into the right direction, subject to the provision of adequate resources.

We concur with the principle that authors retain copyright of their publication with no restrictions as a good measure to prevent results from being locked away by copyright. We fully agree that an explicit licence is necessary, although we see no reason for defining preferences among the various options that meet the requirements of the Berlin declaration. There are concerns in the community about the possibility of misconduct by profit-only oriented agents when too liberal licences such as Creative Commons CC-BY are used. Publishers or authors should be allowed to restrict to non-commercial use on purpose.

We welcome the development of transparent criteria, which should also include making the intention, purpose, and effects connected with them explicit. The guiding principle should be that compliance criteria should not place artificial barriers to agents setting up scientifically sound solutions. They should not raise too much production and exploitation costs. They should be open to a diversity of actors, scientific and publishing practices. The incentives announced within Plan S to create, develop, and maintain high quality OA journals or platforms are highly welcome, but we could not identify them in the implementation details; instead, several issues could create burdens to existing solutions. In mathematics, by far the largest demand in the transition process toward OA is the funding of high-quality publication venues, which currently rely on subscription, to enable them to switch to non-APC Gold OA. Details about how this could be made feasible in a sustainable way would be highly welcome.

We appreciate efforts to increase transparency of publication costs, fees, and waivers. However, the requirements concerning waivers for authors from low-income countries and discounts for authors from middle-income countries are nowhere made precise within Plan S, in contrast to other requirements, and are thus not enforceable. The refusal to support hybrid OA apart from transformative agreements is welcome. However, Plan S overall lacks an explicit commitment by the funders to ensure the ability of researchers to publish their work independently of the funds of their institutions. The establishment of a cap does not serve as an adequate measure, especially given the diverse economic conditions determined both by subject and geography.

We do not consider the Directory of Open Access Journals (DOAJ) as a neutral agent, given that it has its own definition of Open Access and preferred OA, as exemplified by the DOAJ seal. In the past, a number of journals have been included, whose policy and content are considered to be questionable by the mathematical community. Also, the list of sponsors of the DOAJ might suggest a risk of conflict of interest.

Concerning text & data mining (TDM), the purpose of "Free to read or process by machines" is out of the scope of open access *per se*. It might rather be viewed as a component of Open Science. In the case of mathematics, we should be very cautious with TDM as crucial elements in the mathematical discourse are neither text nor data. Current TDM techniques do not sufficiently address crucial elements of mathematical knowledge, like formulas. They might handle a structured semantic version of an approximation of the knowledge contained in a paper which may omit crucial information. It might be worse for science to have easy access to a more powerful and usable representation of knowledge inadequate to the one conveyed in the original paper. Nevertheless, further technological progress can be expected. To be able to facilitate adequate machine-readable solutions in the future, it would be essential to have at least a LaTeX source available. Currently, the arXiv serves optimally this need, contrary to most publishers (independent of OA or subscription models). Supporting a LaTeX-based infrastructure of open formats would be an important feature for open infrastructures from mathematicians' viewpoint, not adequately replaceable by generic Extended markup Language (XML) Journal Article Tag Suite (JATS) structures. Moreover, the availability of LaTeX sources enhances accessibility for visually impaired readers, typically in a more suitable way for the working mathematician than current generic XML-based screen readers. Requiring the availability of LaTeX sources would be the adequate measure to enable future options for processing mathematics by machines.

We notice the emphasis laid upon support for Permanent Identifiers (PIDs) for authors, funders, funding programmes, grants, institutions, etc. This would primarily serve feed automated evaluation database, contrary to at least the spirit of DORA. These requirements could be hard to meet for independent publishers and small operation platforms. We do not see them as required features to make Open Access a reality, but rather as a barrier to that target.

The requirement of Committee on Publication Ethics (COPE) standards is acknowledged, but experience shows just the claim of details for an appropriate peer review system within the relevant discipline on a journal website is not sufficient to maintain a high scientific quality. For example, there are publishers formally complying with these principles but whose results appear questionable. Some have employed measures that may affect scientific quality, like acceptance pressure on boards or technical features making rejections difficult, often in connection with APCs. Only the scientific community itself can determine whether an appropriate review system is actually implemented, and hence which publishers should be eligible.

Concerning repositories, we fully support the comments from arXiv and COAR, without duplicating them in all details here. Especially, our remarks concerning TDM also apply here. Moreover, the requirements formulated that "metadata must fulfil the same quality criteria as Open Access journals and platforms (see above)" lack adequacy and efficiency. Generating quality metadata is a task to be carried out by publishers, and we see no good reason why

repositories should duplicate this work without compensation. In fact, the current wording of the guidelines suggests that repositories should provide *more services* than publishers, while the formers are not allowed to charge for them but the latters can!