



Ars Inveniendi Analytica

Francesco Maggi

University of Texas at Austin

Enrico Valdinoci

University of Western Australia

Abstract. *A new open access journal in Mathematical Analysis based on the arXiv overlay model is announced. In this model, at no cost charged to authors, published papers are freely available to readers. Storage costs are entirely sustained by the arXiv repository through its various supporting institutions. The only operating costs of an arXiv overlay journal are those generated by the management of its editorial flow and by the indexing of published papers. These costs are very contained, and comparable to those typically charged to a single library for obtaining online access to a single traditional journal.*

Keywords. Diamond Open Access, Mathematical Analysis.

1. INTRODUCTION

The mathematical community seems eager, at this historical moment, to revisit various aspects of its main publication vehicle, the peer-reviewed journal. Among the factors which have been playing a clear role in putting this venerable paradigm in discussion are:

(i): the “technological revolution” brought by tools such as the LaTeX document preparation system and the arXiv open-access repository, which have largely deprived the traditional publishing process of its typesetting and distribution functions;

(ii): the unresolved tensions between different points of view on scientific publishing, like that of traditional publishers, increasingly centered on growth and profitability; that of funding agencies, especially when seeking for quantitative, simplistic shortcuts aimed at making research evaluation automatic and “objective”; and, of course, the point of view of mathematicians, which aims at preserving and fostering the values of creativity, openness, and universal accessibility that are so characteristic of their discipline, and lie at the very core of its cultural and scientific relevance.

The undertaking of constructive actions is what, in our opinion, will eventually lead to a positive resolution of these tensions. In this direction, we believe that the mathematical community could and should engage into the creation of a line of arXiv overlay journals, covering the various areas of Mathematics, and publishing papers of the highest quality. We are thus launching, with the support of a group of colleagues who have accepted our invitation to serve as editors, an arXiv overlay journal in Mathematical Analysis, called *Ars Inveniendi Analytica*. This journal will benefit from the financial support of the University of Texas Libraries, and has been assisted in these initial stages by the Harvard Library, a member of the Confederation of Open Access Repositories.

2. THE ARXIV OVERLAY JOURNAL MODEL

Over the last three decades the mathematical community has experimented with various formats which combine the typesetting functions of the LaTeX system with the dissemination power of the internet to rethink the functioning of peer-reviewed journals. In the meanwhile, peer-reviewed journals have been dramatically transformed by these same tools. An overwhelming majority of authors prepares manuscripts with the LaTeX system, and post preprint versions of their work on online, public repositories. A major shift also seems to have happened in the way a majority of readers is accessing to papers: rather than through physical copies of entire issues of a journal, papers are now first read on a web browser, and then individually printed if needed. Finally, a large swath of the editorial flow generated by the peer-review process is now managed through web based applications. Traditional journals have, as a matter of fact, completed a transition into online publications, whose functioning can be entirely replicated, at extremely contained costs, by the *arXiv overlay journal model*.

This model has been strongly promoted in recent years by Tim Gowers, with the launch of the journals *Discrete Analysis* and *Advances in Combinatorics*. In the arXiv overlay model, authors initiate the publication process of their work by posting on the arXiv repository a preprint version of their paper. The arXiv preprint is then submitted to an arXiv overlay journal, and undergoes the usual peer-review process: an editor in chief assigns the submission to a managing editor, who contacts referee(s), gathers opinions and produces a recommendation. When a paper is eventually accepted, the accepted version is compiled in the typographical style of the journal (the same used for this announcement), and, at the same time, is deposited on the arXiv repository (independently of the occurrence of revisions with respect to its submitted version) and it is published on the journal's website. Readers can then freely access the published version of the paper either by the arXiv repository, or by the journal's website (which links to the arXiv); authors are charged no cost for publishing their reviewed work; and all the *storage and accessibility costs* are those covered by the institutional participants to the arXiv platform.

The only operating costs sustained by an arXiv overlay journal are those related to indexing, to the existence and maintenance of a website, and to the running of an online platform needed for managing the editorial flow. All these services are currently made

available by institutional and private providers at costs that are minimal, and dramatically so if compared to the costs sustained by libraries for bundled subscriptions to journals published by traditional publishers.

In summary, as a byproduct of this optimization of expenses and resources, the journal is running at no cost for authors and readers, as all the articles are freely available on the arXiv; operating costs are so contained to be sustainable by a single library, like in the case of *Advances in Combinatorics*, whose financial and administrative support is entirely covered by the Queen's University Library at Kingston; and the journal is functionally equivalent, for what concerns the typical needs of modern readers, to a traditional journal.

3. ARS INVENIENDI ANALYTICA

The title of this new journal refers to the term *ars inveniendi*, coined by Leibnitz to identify the art of discovering new mathematical statements, methods and arguments. This reference aims at highlighting a blooming time for exciting mathematical discoveries in the field of Analysis, and at celebrating the creativity of researchers.

We hope that this editorial enterprise, undertaken in full service of our community, will add up to similar efforts and will encourage the launch of similar operations. Scholars need not only new lines of investigation and new methodologies, but also new and reliable forms for communicating their work. Creating top quality journals, founded and managed by academics, freely accessible to authors and readers, and with minimal management costs entirely sustainable by academic institutions, is the main constructive step that scientist can take to help shaping the future landscape of scientific publishing into something that is more true to the spirit of scientific discovery.

FRANCESCO MAGGI, DEPARTMENT OF MATHEMATICS, UNIVERSITY OF TEXAS AT AUSTIN
Email address: maggi@math.utexas.edu

ENRICO VALDINOCI, DEPARTMENT OF MATHEMATICS AND STATISTICS, UNIVERSITY OF WESTERN AUSTRALIA
Email address: enrico.valdinoci@uwa.edu.au