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CEIC BEST PRACTICES

(edited by Ewing)

Communication of mathematical research and scholarship is undergoing profound change as new technology creates new ways to disseminate and access the literature. More than technology is changing, however; the culture and practices of those who create, disseminate, and archive the mathematical literature are changing as well. For the sake of present and future mathematicians, we should shape those changes to make them suit the needs of the discipline.

For this reason, we have identified a number of "best practices" for those involved with the mathematical literature --- mathematicians, librarians, and publishers.

Our advice is meant to guide practice as it changes rather than to set forth a collection of firm rules and admonitions. The recommendations concern all forms of scholarly publishing and do not promote any particular form. Indeed, the authors of this document hold many differing views on the future of scholarly publishing. The common principle used to formulate our recommendations is that those who create, disseminate, and store mathematical literature should act in ways that serve the interests of mathematics, first and foremost.

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FOR MATHEMATICIANS

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1. Structure and Format

Logically structured documents correctly reflect the content of a mathematician's work, setting forth results, arguments, and explanations to make them understandable to readers. But a logical structure also makes it possible to retrieve and eventually to update the document. Identifying the constituent parts of an electronic document is essential in order to move from one format to another without human intervention. Authoring documents should be more than setting down mathematical research in a pleasing format.

Authors should provide the structure necessary to use their documents now and in the future. In mathematics, LaTeX2e is currently the most congenial and accessible way to give documents some structure without adding unreasonable burdens on the author.

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2. Linking and Enrichment

An electronic publication can offer much more than a print publication. Electronic publication gives the user the ability to move effortlessly among the various parts of a paper or even from one paper to another. In order to make this possible,

however, someone must add the necessary information to establish links in the electronic version.

Every mathematics paper should contain the necessary information to establish links. Correct cross-referencing and citation in LaTeX transforms readily into hyperlinks, yielding enriched electronic versions of one's work. Such hyperlinks persist into PDF (Adobe Acrobat) distilled versions.

Moreover, electronic co-publication or publication is not restricted by the constraints of the traditional print medium. This provides an opportunity to detail material that might otherwise be dismissed as "well known" and to add explanatory appendices. A little less easily, one may include graphic enhancements; animations; extensive data; tools to analyze that data; or even active examples that may be varied by the reader.

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3. Versions

Online publication can lead to severe problems in citation, because the posted paper can be replaced continually until it bears little resemblance to the original, as an author corrects, adds, and deletes material. As the mathematical literature grows, references to non-existent papers and results will eventually jeopardize its coherence.

To avoid this problem, papers that have achieved a sufficiently final state should be stored in an immutable form. This includes any paper to which others may make reference, whether published in refereed journals or posted as a preprint. If revisions subsequently are necessary, each released version should be clearly labeled with its own version number.

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4. Personal Homepages

Mathematical communication is more than merely posting or publishing papers. Information about the mathematical community and its activities is valuable to all mathematicians, and it is now easier than ever to circulate and to find such material.

All mathematicians should have their own homepage. Ideally, basic data on such a page (or on a 'secondary' homepage) should be presented in standard form to allow ready automatic compilation into databases. (The Math-Net project provides standardized homepages for departments and institutes; see http://www.math-net.de/Math-Net_Page_Help.html.)

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5. Personal Collected Works

Mathematics ages slowly. Access to older literature is important for most mathematicians, and most of that older literature is likely to remain unavailable in

electronic form in the immediate future. Mathematicians can change that by taking collective action.

Mathematicians are encouraged to scan their old (pre-TeX) papers and post them on their homepages, making their `collected work' readily available to all. This relatively small effort on the part of every mathematician will provide enormous benefit to the entire community. (See the `call to mathematicians' at http://elib.zib.de/IMU/IMU_Committees/call_authors.html.)

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6. Preprints and archives

Mathematical writing is ineffective if it is not communicated. A generation ago, the photocopier made it easy to send preprints to one's peers. Today, we have departmental servers and our home pages, but a public archive is even better. The arXiv (http://front.math.ucdavis.edu\) is a prominent example.

It is a good practice to place one's preprints in an appropriate archive and to put pointers to those papers (rather than the papers themselves) on one's homepage.

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7. Copyright

Copyright is a complex subject, far removed from mathematics. On the other hand, copyright law and policy can profoundly affect the ways in which mathematics is disseminated and used. Copyright is important for mathematicians.

Authors should be aware of the basic principles of copyright law and custom. Decisions about copyright for one's own work should be made thoughtfully. The material at http://www.maths.qmul.ac.uk/~wilfrid/copyright.html is an invaluable reference.

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FOR LIBRARIANS (AND MATHEMATICIANS)

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8. Journal Price and Policy

Libraries have limited budgets, which often grow more slowly than the prices of journals, forcing libraries to cancel subscriptions. The cumulative effect of cancellations goes beyond individual institutions because it shifts costs to an ever smaller number of subscribers, accelerating the process of price increase and cancellation. Journal prices matter to all mathematicians.

When deciding where to submit a paper an author may choose to be aware of a journal's standing and impact, but it is also appropriate to take account of a journal's price (as well as its general policies, including archiving). In addition, one might consider a journal's price and policies when considering whether to referee or serve on an editorial board.

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9. Validation.

Publication and peer review processes are increasingly detached. The emergence of overlay journals, archival preprint servers, and other new structures of publication raise new and pressing questions about the appropriate forms of validation.

Both mathematicians and decision makers need to be alert to the distinction between posting and providing validation. Editorial Boards should be explicit about the form and the level of validation they provide for papers.

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10. Statistics

Electronic delivery of information provides new opportunities to compile statistics about usage of the literature. Gathering statistics from the web is notoriously complicated, however, and even those who are knowledgeable about the pitfalls can be misled.

As librarians and others increasingly rely on web statistics, it is important to be informed of the nature of such measurements and the difficulty in interpreting them. Moreover, the value of a particular resource may not be measured best by simply counting how many times it is currently used. Statistics can be valuable, but they also can be misused.

[On the other hand, statistics about usage can also be valuable in making arguments. Our national societies should be encouraged to coordinate the collection of data that protect the interests of the mathematics community.]

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FOR PUBLISHERS

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11. Partial Access

Many journals restrict access to (paying) subscribers. On the other hand, as the web of mathematical literature grows, it will be increasingly important for all mathematicians to navigate that web, whether or not they have access to complete articles. This allows mathematicians to learn basic information about an article, even when they do not belong to institutions that have the financial resources to support the journal. It is especially advantageous to mathematicians from the developing world.

Journals should provide unrestricted access to tables of contents, abstracts of papers, and other data, such as keywords. Where practical, journals should also provide unrestricted access to reference lists (with links).

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12. Eventual Free Access
The scholarly enterprise rests on the free exchange of ideas, and scholars need to have easy access to those ideas. Many journals rely on subscriptions to recover costs and provide an incentive to publish, however, making it necessary to limit access to subscribers. Access should be a balance between those two needs, of scholars and of publishers.

Limiting access to subscribers for a fixed period of time after publication may be necessary for many journals. In order to ensure appropriate accessibility for the electronic literature, we encourage all journals to grant free access after that fixed period of time (which recently has been set at five years for some journals).

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13. Archiving format
Ensuring the success of long-term archiving is more than storing the electronic data on reliable media in multiple locations. As software and formats change in the future, the data will require modification and updating. Not all electronic formats are suitable for these purposes.

Any format in which material is stored should follow an "open standard" that has a detailed public specification. This will increase the likelihood that scholars working decades or centuries from now will be able to use the material.

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14. Archiving responsibility
Traditionally, maintaining the older literature has been the responsibility of librarians rather than publishers. Even in the electronic age, scholars have the greatest motivation among all of the affected parties to ensure the preservation of older material.

We recommend that electronic archives of the mathematical literature should ultimately be under the control of the academic community.

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15. Licensing and Bundling
Some licensing and bundling arrangements for journals accelerates the transfer of control of our literature away from mathematicians and research librarians. When institutions are forced to accept or reject large collections of scholarly literature covering many different disciplines, the decisions are less likely to be made by scholars. As a consequence, the normal processes that promote the highest quality journals become less effective.

The best protection, as always, comes through staying well informed and alert to these issues. In general, decisions about journal adoptions and cancellations should be made by the academics and librarians.