

opinions, activism, and thoughts about the future. I certainly think that the arXiv in general and the math section in particular are as important as ever. If you want to actively support the arXiv, then one valuable form of participation right now is to serve as a math category moderator. (If you have early career concerns such as getting a job or getting tenure, those would ordinarily take precedence over serving as an arXiv moderator.) Looking to the future, I see the math arXiv as an unfinished effort, no longer mainly because participation is less than 100 percent, but above all because the journal publication system is still roughly the same as it was in the twentieth century. (Journal articles are now submitted and published online, but other basics such as journal titles and paid subscriptions are still traditional.) I think that the peer-reviewed layer of mathematical communication will be modernized in an effort parallel to the arXiv, although not necessarily directly as part of the arXiv. However, this will be a major reform and it remains to be seen how it will happen.



Greg Kuperberg

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## Where to Submit Your Paper

### Chuck Weibel

If you are early in your career, and have just finished writing a paper, you will want to get it published. However, you probably don't have a handle on where to submit your masterpiece. This is a very important decision, since your nascent career probably depends heavily on accepted publications to get jobs and get promoted.

Here is a list of dos and don'ts, based upon the assumption that you don't have tenure and are within five years of your PhD.

**Do ask for advice!** The best advice I can give you is to talk with a senior faculty member about which journal to

submit your article to, and take advantage of their experience. Your advisor is not the only person you should ask; it helps (but isn't crucial) if that person knows your field.

When I was a graduate student, I had a woefully bad understanding of where to publish my first paper. Thankfully, after hearing some of my ideas about this, a sympathetic faculty member (Paul Sally) sat me down and helped me decide where to submit it. He knew nothing about the subject area, but he had experience with submitting papers.

**Do tell what you've done on page one!** One of the worst mistakes I see authors make is to postpone telling the reader what the punchline is until page 3 of their paper. Don't begin with a long history of the context of your main result—tell the reader what you've proven, and only then explain why the reader cares. It is even better if you announce this in the first fifteen lines. If your result uses special terminology, explain the terminology immediately after stating your result. You can put your result into context after the reader knows what it is.

Editors choose referees, and make accept/reject decisions, based on how well the paper sells itself. Since they frequently only read the introduction, and often only the first page, that has to be where they see what is great about your paper. (My apologies to any diligent editors reading this. I'm speaking in general terms about human behavior.)

**Follow the crowd.** Do think about which journals have published similar papers in the same subject. The "Citations" link for reviews of these papers (and other papers by their authors) in MathSciNet is a very useful tool for getting a list of journals that may be appropriate for your paper. In many cases, you may want to submit to a "niche" journal like the *Journal of X*. (X can be Algebra, Combinatorics, Topology, Functional Analysis, Linear Algebra, Differential Equations, etc.)

**Don't go for broke!** Do not submit your paper to a top journal unless you have solved a really famous outstanding problem. Although you might get lucky with a quick decision, which is always a rejection, the more common result is a rejection after eight months or more. At that point you will have to revisit the "where?" problem.

Delaying the time before you get credit for your work can have real-world negative consequences for you. In boxing terminology, when you submit above the weight class of your paper, you hurt your career.

**How to relocate.** Suppose that your paper is rejected. Now you have to go through the process all over again. But don't be discouraged! If you are lucky, the referee will propose a more appropriate journal for your rejected paper, and the editor may pass along this recommendation with a promise to share the referee report (and sometimes the referee's identity) with editors of the new journal. This is great for you, because you don't have to wait very long for a referee report, and it is great for the community of referees, because it avoids duplication of effort. This referral process

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is especially common in general-purpose journals, which often redirect your paper to a “niche” journal.

Some publishers are now pushing the idea of internally “cascading” peer-review of papers. This means that authors are encouraged to submit their rejected papers to another journal owned by the same publisher. For you, this has the advantage of speeding up acceptance of your paper; for the publisher, this has the advantage of capturing manuscripts within their portfolios. The disadvantage for you is that your paper may be redirected to an inappropriate journal. If you think this has happened to you, ask a colleague if they think it is an appropriate journal.

**Don’t use impact factors!** Journals with high impact factors are not necessarily considered “top journals” for promotion purposes; like any metric, impact factors are often “gamed” by publishers.

Certain young researchers (not in the US!) are paid by the sum of their publications, weighted by impact factor. This is a horrible system as it results in papers being sequentially submitted to a chain of journals, spiraling down until they reach the appropriate level. If this applies to you, you have my sympathy. My advice to you is simple: get advice from a senior colleague!



Chuck Weibel

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## Journal Refereeing: Merge with the Collective Mind

### *Ken Ono and Robert Schneider*

Imagine you are a medieval alchemist. You devote your life to uncovering hidden truths, expressed in a poetry of esoteric symbols and terminology. Today a manuscript of

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new discoveries has made its way into your hands from an unknown author. Will this delicate codex unlock the enigmas that drive your work, or spark an explosion of ideas in other seekers? Who is this anonymous soul-mate sharing your own rare passion? It now becomes your quest—and your honor—to decipher the mysterious treatise.

At this point you may think the authors have played one too many a *Dungeons & Dragons* campaign, or recently binge-watched fantasy B-movies online (call it research for this article). But if you replace “medieval alchemist” with the word “mathematician” in the opening sentence, the paragraph now describes you yourself receiving a paper to referee. We offer here our thoughts about navigating this singular scenario, in which your judgment may shape the future history of your field. Like the alchemist in the opening paragraph, and just as romantically, as a journal referee you are in the position of secretly knowing new theorems (even entire theories) years before they officially<sup>1</sup> enter the literature. Moreover, you are invited to help shape the literature of your era.

What is the job of the research journal referee? In a nutshell, you will:

- Check the work to verify the ideas and equations are correct.
- Offer advice and raise questions to help clarify or strengthen the arguments (if a result is promising, one should give authors the opportunity to revise).
- Offer suggestions for improving exposition and overall presentation of the piece.
- Finally, write a referee report including a summary of the paper, a list of corrections and suggestions for the author(s), and an evaluation of appropriateness for publication in the journal (we note that referees do not make final editorial decisions, merely recommendations).

The first three bullet points fall somewhere between editorial work and collaboration; we caution that the last can be misinterpreted as the charge to be a guard or gatekeeper. We urge you to lean in a different direction: we should encourage each other in our work.

As to how one should evaluate a new result, we offer solid advice from two of our heroes. G. H. Hardy is well known<sup>2</sup> to have instructed referees for the *Proceedings of the London Mathematical Society* to use the following guidelines.

**Hardy’s criteria for refereeing.** One should ask three questions of the result:

- Is it new?
- Is it true?
- Is it interesting?

<sup>1</sup>Preprint servers, such as the arXiv, serve an important “unofficial” role in mathematical publishing.

<sup>2</sup>See Boas, Ralph P., Gerald L. Alexanderson, and Dale H. Mugler. *Lion Hunting and Other Mathematical Pursuits: A Collection of Mathematics, Verse, and Stories by the Late Ralph P. Boas, Jr. Vol. 15.* Cambridge University Press, 1995.