

The Publishing Process

You've written a paper - great! So what's next? There is then a series of steps that will hopefully lead to the publication of your paper. I'll walk through the various steps that I follow and offer some dos and don'ts along the way. (My steps might be more naturally described as nodes in a flow chart, but anyway I will call them steps.)

Step 1: Email. Write a Dear Colleagues email in order to advertise your paper to the people who will care the most (those working in that exact area, those that might write you a letter of reference, etc.) and post your article on your web site. There already is a whole essay about this step on the Topology Students Resource, so I refer you to that document. I will add that there do exist mathematicians who do not like receiving such emails, so buyer beware.

Wait a week for comments to come in. Make sure to add to your acknowledgments if necessary.

Step 2: the arXiv. Post your paper to the arXiv, the official web site where most mathematicians post their papers before publishing. I usually access the arXiv through the "front", which is a mirror site with a nicer user interface. You can find it at:

<http://front.math.ucdavis.edu>

Assuming you are registered on the web site, you can click on "submit" at the top right of the home page for step-by-step submission instructions. A few notes, to emphasize what is already stated on the arXiv's instructions:

- Check over your paper very carefully before posting. If you spell a name wrong or make a silly math mistake, it is there for the whole world to see (even if you post a revision!). Read your paper many, many times, starting at different places, and with breaks in between sessions.
- Your title and abstract should not have any LaTeX code in it (including citations). This is good practice anyway, but on the daily mailing that goes out with the day's new papers, all the recipients see is raw code, and so slashes and dollar signs are unsightly, and make it harder for you to get your message across.
- In the same vein, make sure your title and abstract are written cleanly, correctly, and succinctly, so that you have the best chance of getting your message across.
- Try not to post on the weekend. For the purposes of the (almost) daily mailings, the time period between 2:00 pm EST on Friday and 2:00 pm EST on Monday is considered to be one day. Assuming that mathematicians don't know what day of the week it is (which turns out to be a good assumption for this discussion), the Monday night mailing (which starts going out at 8:00 pm EST) is three times as long as the others. That means you get only one third of the attention that you would get on other days.

- If you want to be at the top of the next mailing, submit your paper at 4:01 (which means you start submitting before 2:00). Sometimes I do this for fun, but I am not sure there is much benefit.
- Check over your paper very carefully after posting. You still have time between the moment you post and the first 8:00 pm after the first non-weekend 2:00 pm after the moment you post in order to make corrections. Posting to the arXiv is a big deal, especially when you are starting out. Your posts will make an impression on others. Do not screw it up!
- Don't forget that your source code is available as well, so don't leave anything in the comments or code that you don't want the whole world to see.
- If your collaborator posted your paper for you, there is a way to get the paper associated to your account. This is worth doing in case someone goes to the arXiv looking for your complete oeuvre.
- If you do need to revise your posting in the days after the initial posting (for instance because someone points out a mistake or a missed reference), that's fine. I try not to do this except when absolutely necessary - it looks sloppy. The first couple of times you revise your paper (but only the first couple of times) the new version will appear (without the abstract) at the end of the daily mailing.

Wait a week for comments to come in. Make sure to add to your acknowledgments if necessary.

The following point is extremely important: update the article on your web site and on the arXiv. Otherwise, there is a decent chance that the referee will read an old version. I have done this as a referee and I have had this happen to me as an author.

Step 3: Choosing a journal. Once your paper has made it through the first two steps, you should submit your paper to a journal. How do you choose one? Here are some pointers. (You should actually start thinking about journals even before you are done writing.) I learned the following three criteria from Joan Birman:

- First, get some idea of the level of your paper, and restrict to journals of that level.
- Second, look at any obvious comparison papers to see where they are published.
- Third, find a journal with an editor that you trust to handle your paper.

Let's discuss some finer points:

- Opinions about the level of a journal will vary surprisingly widely from field to field, from person to person. Ask around, look at published ratings, and look at the other papers in that journal and try to form your own opinion.
- Unless you are under time pressure (i.e. you are on the job market 6 months from now and you really need a publication), aim a little high instead of a little low. Your market value depends heavily on the journals you publish in, so if you succeed with your long

shot, you will be very glad that you did. That said, aiming too high can potentially be an embarrassment.

- About Birman's third criterion, the point is to find an editor that is sympathetic to your subfield and will be able to find the right referee.

Here is my own, recently-adopted, rule for publishing papers. It is important enough to have its own line:

- Publications in general interest journals are much more valuable than publications in subject-specific journals of similar stature.

As a general rule, I do not submit to subject-specific journals anymore. Here is why. I've been on the promotion committee at Georgia Tech, and when I am looking at the file of someone who is not in geometry or topology, I often have very little basis by which to judge their publications. Also, I have noticed in others' evaluations of me, more weight is put on the papers in general interest journals (after adjusting for quality of mathematics). If you say AGT to a graph theorist, they won't know what to think. But if you say Commentarii, that immediately carries weight.

Step 4: Submitting. Depending on the journal, there are various ways you might be expected to submit your paper. Some journals have automated web sites, some expect you to email an editor directly, and at least one journal still insists on paper copies. Read all directions carefully.

Most importantly: be polite and professional. Even if you know the editor very well. This is a formal process:

Dear EDITOR,

I am writing to submit my paper TITLE, written with CO-AUTHOR to JOURNAL. A pdf copy of the paper is attached. Please let me know if you need any other information or materials.

Thanks in advance for your consideration.

Sincerely,

YOU

You should expect a formal reply from the journal saying that they received your paper. Often this is an automated email from the journal's web site. If you get an email directly from an editor, it is usually curt: We got your submission, thanks. If you do not receive any such email, then double check with an editor. The last thing you want is for your paper to be floating around in cyberspace (it happens!).

Step 5: The refereeing process. Waiting to hear back from a journal can take a long time. It is typical to hear nothing for one year. Here is a rundown of what is usually going on behind the scenes.

Quick opinions. The handling editor will write to one or more experts in order to get a quick assessment: do you think this paper is worthy of our journal, yes or no? You should expect that the expert will look at your abstract and/or the statement of your main theorem. If you are lucky, they will read your introduction and maybe even other parts of the paper. Make it easy for them to appreciate your paper and hard for them to find obvious fault.

Pro tip: Often the editor will send your paper to someone listed in the references (I usually try to find someone in the references minus the acknowledgments). Think about that when you assemble your references!

Full referee report. If the quick opinion(s) are positive, the handling editor will send your paper to a single referee for a full review. This is the part of the process with the most pitfalls in terms of timing. Often the editor will contact a referee and not hear back, or will get a declination after a few weeks. Or if a referee agrees to review the paper, they will often let your paper collect dust on their desk, maybe until the semester is over, maybe longer. Or maybe they'll actually attempt to read your paper and get stuck, and let it sit, and try again, etc.

The referee's job is to read the whole paper, verify that the theorem seems correct, make a judgement about how qualified the paper is for the specific journal, and write two reports, one for the editor's eyes and one for the authors' eyes.

I'd like to emphasize something from the last paragraph: it is not the referee's job to verify that your paper is actually correct. The referee cannot and should not be expected to read your whole paper and verify its correctness line by line. The correctness of a paper is solely the responsibility of the authors.

When I write a report for the editors of a journal, this is roughly what I include:

- I state the main results as simply as I can and comment on the quality.
- I explain how the paper connects to other papers or mathematicians.
- I describe what goes into the proof and try to identify any new or unique phenomena in the theorems or the proofs.
- I identify the level of interest. Basic math objects like mapping class groups (yes, I am biased) are at level zero. The other levels are determined inductively: Torelli groups would be level one, the 5th term of the Johnson filtration would be level two, and the mod two homology of the 5th term of the Johnson filtration with twisted coefficients would be level three.
- I comment on the quality of the exposition. If there are lots of typos and minor mathematical mistakes, or if your paper reads like a draft, you are toast.

- I make comparisons to other papers that were published in the same (or similar) journal on the same (or similar) subject, i.e. this paper compares favorably to these other papers that were recently published in this journal.
- Usually I give a final yes/no opinion as to whether or not I think the paper deserves publication in that journal. All of the above criteria go into this decision. Of course the level of the journal determines how good the result needs to be. If the journal is a general interest journal, I usually expect the level of interest to be zero or one. Similarly, for a top-level subject-specific journal I expect the level of interest to be between zero and two.

When I write to the authors, I include the following:

- Some nice words, explaining what I like about the paper. It makes me feel good when I get a report saying that my proof is “expert” or “a tour de force” or “nicely written”. I try to repay the favor.
- Some overall comments, such as: use more signposting, avoid spaghetti code, too much notation, too sloppy, not scholarly, etc.
- Some general math questions, like why do you need this hypothesis in the main theorem, did you try to
- Line-by-line comments, i.e., Page 5, line -12: Do we need to assume the group is finitely generated here? I will also point out spelling mistakes and egregious grammar mistakes. Sometimes I have just a few comments, sometimes the comments run longer than the paper itself. Some people mark up the pdf directly - that makes it easier for the authors later.
- I do not include any discussion of whether I think the paper is appropriate for the journal in question; I prefer to leave this part to the editors. Better to simply be constructive here.

Now, why did I write those last two lists? Well, for one it might be nice for the reader to have some idea what is going on behind the scenes. Also, if you happen to be new at refereeing, you might use these lists as a guide. But maybe most important is this: think of these items as you are writing your paper. Did you state your main results clearly in the introduction? Does your introduction convince the reader that you are doing something new and interesting? Did you take the time to be scholarly? It is better to think about these things in advance.

One last comment. It happens more often than you think that well-meaning authors submit papers that resemble first drafts (or worse). In my youth I used to power through them, but nowadays I just send these back immediately and say that the paper is not fit to be refereed.

Tired of waiting? Most of the time, from the point of view of the authors, the refereeing process takes too long. You’ll ask yourself what could possibly be taking so long, especially when your article is so well written and short. Try to remember that in addition to the process of getting quick opinions, finding referees, and waiting for referee reports, there is also the process

whereby the editors must assimilate the quick opinions and reports and discuss the merits of your paper. The process has many checks and balances, and editors' schedules are not aligned and so the whole thing takes time.

That said, there are times when it is appropriate to ask your handling editor about the status of your paper. A very rough rule of thumb is that you can ask about your paper after 4 to 8 months, depending on the journal and how much of a rush you are in. There's no hard and fast rule here. If my paper is at a fancy journal and I don't want to jinx it, I'll try to be more patient. If I am on the job market, and an acceptance would help my case, I might ask for a status update (so if they tell me they are not close to deciding I can go ahead and submit my job applications). As always, be brief, formal, and polite. A typical checking-in email might look like this.

Dear EDITOR,

I am writing to inquire about the paper TITLE by me and CO-AUTHORS, which we submitted to JOURNAL on DATE. Could you please give me an update on the status of our paper. (I am on the job market this year, so any information would be extremely helpful.)

Thanks very much in advance.

Sincerely,

YOU

It happens from time to time that you will be unhappy with the editor's response. For instance, they might say not to expect an answer for another six months. Or they might say that they had enlisted a referee a year ago and the referee just told the editor that they changed their mind and they can't referee your paper. Or more serious: the editor might say that there was a mistake and your paper never got sent to a referee. There are situations where you might think about withdrawing your paper (and this is allowed at any time), but think hard about what your reasons are and who are the people you might upset by your actions.

Major updates. It may be that after your paper has been at the journal for 6 months or a year that your paper undergoes an important change in status, for example you found a much simpler proof of your theorem, or you found a mistake in your theorem or your proof, or you realized that the same argument gives a much better theorem, or you realize that your theorem was proven 50 years ago by someone else. In any of these situations, it is important to alert your handling editor. You don't want the referee or the editors to waste their time working under false pretenses.

Step 8: The decision. At long last you will receive an email about the journal's decision about your paper.

Rejections. If your paper is rejected you will receive a short email saying that the journal has very high standards and unfortunately they cannot accept your paper. Sometimes you will also get some concrete feedback as to why your paper was rejected, for instance: the paper is not of broad enough interest, the proof uses only pre-existing tools, or it is unreadable or incorrect. At this point you should take your lumps and go back to Step 3. (It is also polite to write back to the editor and thank them for their time.)

Only under extreme circumstances should you write to appeal a rejection. For instance if the referee complains that the main theorem is false and offers a counterexample, you can write back to the editor explaining why the counterexample is incorrect. In any event, it is important to remain professional and polite, even if you are unhappy with the decision.

Revisions. It is very common that the editor will ask you to make revisions to your paper according to the referees' comments. If this is the case, there are often major changes to make. The referee might ask for more details in some of the proofs, or ask you to present the material differently, or might even ask you to prove another (or a better) theorem.

Usually at this stage your paper is not officially accepted. The editor might say that they got positive feedback about your paper and they would like you to address the referee's concerns. But until you get official, clear notice that your paper is accepted, it is not accepted. Therefore, assuming you want your paper to get into that journal, you should accommodate the referee as much as possible, even if you don't agree with everything they suggest. You should then write a report of the changes you made, which can be as simple as "We made all of the requested changes" or "Here are the changes we didn't make and why." Make sure to thank the anonymous referee for helpful suggestions in the acknowledgments (and if they made a major correction or suggestion, you should point it out explicitly.)

Once you get to the stage of making significant changes for a journal, it is most often the case that your paper will be accepted. However, this is not guaranteed! What is often going on is that the handling editor has decided to make a case for your paper to the editorial board, and the editorial board must then agree to accept (different journals operate in very different ways, so I am generalizing here). Again, at most journals this leads to acceptance. Some journals (especially the higher profile ones) might have more contentious editorial boards, and one editor's approval might not be enough. You might still get rejected; see the paragraph about rejections above.

Always, when dealing with editors, construct your emails so that the editor has to do as little work as possible. So try not to get into a back and forth unless it is really necessary.

Step 9: After acceptance. After your paper is accepted, you will have some more work to do. There might be another round of changes from the referee (i.e. your paper is accepted modulo these changes). In this case you should make the changes as quickly as possible, as they are usually minor. Then there is the typesetting phase, which is different with every journal.

Sometimes you'll have to typeset the paper yourself with the journal's style files, and sometimes the journal will typeset for you. Whoever does the typesetting, you should read the final version of your paper very carefully. Often when the journal does the typesetting, they will introduce mathematical errors because the copy editors are probably not following the math (everyone has their favorite story here; a classic is "the five lemma" getting changed to "the five lemmas"). Also, since you might not have read your paper all the way through since you submitted, this is a good chance to read your paper with fresh eyes. With my papers, I tend to find many mistakes at this stage. No paper will ever be perfect. As they say, you never finish your paper, you just give up on it (it's a depressing note, but there's some truth).

One important point here: choose your battles. I have to say I was not so good at this early in my career. If the journal is suggesting something that is just wrong (like the five lemma example above), then object. But if they was to say the theorem was "proved" instead of "proven" then you should let them have their way. It's their journal, and they (probably) have their own consistent style; and no one else besides you is going to care.

Once the final final changes have been made, you should upload new versions to your web site and the arXiv (it's also useful if the authors who are not the ones posting to the arXiv link the paper to their profiles; see the arXiv manual for instructions). Depending on the journal, you might not be allowed to post a version with the journal's style file, so in this case just go back to your original style files. This step is very important, especially if you have fixed mathematical errors from previous versions. If someone ever reads your paper, it is likely they will read it from whatever source is easiest to find on Google, and that is usually not the published version. You don't want them reading the version with mistakes. And you don't want people to cite your paper incorrectly if the sections or theorem numbers have changed.

After my papers are published, I update my web site with the publication information. After a few months you can start checking MathSciNet to see if the review is up. Often that is a let down, but every once in a while there is a good review.

Step 10: Do it all again! And again!

That's just about it. Publishing a paper in a serious mathematical journal is a very rewarding part of the job. With all the pitfalls and potential frustrations, it's good to remind yourself what an amazing achievement it is to contribute to the constantly growing body of mathematics in the world. Good luck!