

## POSTDOC HUNTING FROM AN APPLICANT'S PERSPECTIVE

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This handout is a mix of our personal experiences hunting for postdoctoral positions in large research universities, and advice that we have collected from many people each of us talked to. It is to be taken with a grain of salt: things may have changed by the time you read this. Also, the job market in any given year depends a lot on the current economic situation; in particular, state universities whose budgets suffer cannot afford to hire a lot of postdocs, and that cuts the number of available positions. Last year seems to have been particularly bad, and it doesn't look like it is getting any better, so getting a position could be hard.

If you are graduating this year and you are applying for a postdoc this Fall, you should have started thinking about your applications last Summer. There are a lot of reasons for this, but three jump out immediately:

- (1) Application deadlines for fellowships and postdocs (in particular, for the NSF Postdoctoral Fellowships) start in late October.
- (2) Your Research Statement is going to take a lot longer to write than you expect.
- (3) Your recommenders are going to need enough time to get your letters ready by October.

The first thing you need to do is have a good conversation with your advisor.

### 1. DECIDING WHERE TO APPLY

Apply to many places. The job market is going to be tough, and it is not much more work to apply to 50 places than it is to apply to 15.

Should you apply to places where you don't want to go? An argument for for not applying to places you don't want to go is this: you might get an early offer from a place you have already decided that you don't like, and if it is the only early offer you have, you might not take the dare of seeing whether places you like better that have you on their waiting list would make you an offer later. So if you accept the place you don't like, and then receive an offer from the place of your dreams, you won't be happy (it is very bad form to change your mind after you accepted an offer).

There are arguments for applying to places that you don't want to go. You should not find yourself in the position of having accepted a job at a place you do not like before you hear from a place you do like, because there is a deadline in early February before which most departments will not require you to accept or decline an offer. Also, an offer from a place you don't want to go to can be valuable in helping you to get an offer from a place you do like.

In order to choose the places where you want to apply, make a list of everybody who does stuff that interests you: the people that you have met at conferences, the people

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whose papers are in your file cabinet. Then write down the institutions these mathematicians belong to.

Add to that list any fellowships you can apply for (NSF, AIM).

Add to this list all the top universities (you might get in!) and all the mathematics institutes (MSRI (Berkeley), IAS (Princeton), IPAM (Los Angeles), IMA (Minneapolis), CRM (Montreal, Canada), MPI (Germany), etc.). If you are open to travelling, do send applications abroad. At the very least, mathematicians in other countries whose work interest you will get to read your application package and find out who you are. Also, even if you end up accepting a postdoctoral offer at a university, some institutions, such as the MPI, might support a visit for a month in the summer instead of the full year visit that you applied for.

Send copies of your CV, Research Statement and publications to these interesting people and mention that you are applying for a position (it cannot hurt you, and can help you).

Once you have your list of places, check out the employment advertisements in the AMS website. Write down the title of the position offered, the deadline, and the required application materials.

If a place you are interested in is not advertising with the AMS, look at their own website. There will be information on available positions there. Even if there are no positions available now, apply anyway. A position might become available later on.

## 2. THE NSF POSTDOCTORAL FELLOWSHIPS

If you are a US Citizen or Permanent Resident, you **should certainly** apply for an NSF Postdoctoral Fellowship. It is a really nice fellowship, and there are more than just a couple (last year, 32 were awarded). If you are not eligible, you might still have opportunities similar to the NSF postdoc, which you should explore.

For this fellowship, you get to choose the dream place where you would like to be (it can be a University, or an Institute, such as MSRI, or IAS), and a faculty member who will serve as your scientific sponsor. There are two options for the fellowship: you can opt for two years without teaching, or for one year without teaching and two years of teaching half time, typically one class per semester. It gets even nicer if you get both the NSF and a postdoctoral position at the place where you applied for the NSF, because then you might be able to extend your stay, or get salary supplements.

Things you should be aware of:

- (1) The deadline for NSF postdoctoral applications is **October 17, 2003**.
- (2) The application is submitted electronically through <http://fastlane.nsf.gov>, and it is nontrivial to do it. Your letter writers will also have to upload the letters to this web page.
- (3) When you ask someone to be your sponsor, ask them well in advance of the deadline. Also, sponsoring is a responsibility, and very busy people might say no if they feel that they will not have time to properly mentor you.
- (4) If you get an NSF Fellowship, you will not be able to transfer it during the first year of your tenure. In particular, you will not be able to apply somewhere and immediately take it somewhere else.
- (5) You can apply for an NSF Postdoc the year before you graduate, or the year after you graduate, but not later than that.

### 3. A TYPICAL APPLICATION PACKAGE

- (1) *Cover Letter*: Make sure that you write the correct name of the position(s) that you are applying for. Also, name at least one faculty member whose research is the closest to your own, even if you don't know this person. The idea is that the cover letter is for an administrative assistant to read, and naming a faculty member will let them know who to show the package to.
- (2) *AMS Cover Letter*: (available from the AMS website)
- (3) *CV*: Should be at most two pages long, as per NSF instructions.
- (4) *List of publications with abstracts*: The abstracts you write here might not be exactly the same as the abstracts of your papers—keep in mind who will read them! Include here (and in your CV!) all your work in progress!
- (5) *Research Summary*: A one-page summary of your research statement.
- (6) *Research Statement*: A long rant about this later.
- (7) *Teaching Statement*
- (8) *Special forms* specific to each place you are applying to.

### 4. LETTERS OF RECOMMENDATION

Letters of recommendation are probably by far the most important part of your application package.

Who will write your letters of recommendation? And how many do you need?

You need at least three letters that touch mainly on your research, and one letter dealing with teaching. It seems that having one or two extra research letters will not hurt you, but I don't know how much is too much.

As for your recommenders, one decision is easy. You should ask your advisor to write a letter for you. For the other letters, it will be a gamble no matter what. You will probably never know what is in those letters. However, you can ask your recommender whether the letter is going to be “strong”.

Ask for letters of recommendation from people who know your research and have seen you give talks. These should be people you talk math to on a somewhat regular basis (even if it is only once in a while).

If you are thinking of asking someone to write a letter for you, a preliminary step might be to give them your CV and Research Statement and ask for comments. Once you get the comments back, you can ask whether this person would be willing to write a recommendation for you. In any case, you should give the latest version of your CV and Research Statement to your recommenders as soon as they have accepted. It will make writing the letter easier for them.

It seems that having a recommender from a different University is a plus. It shows that mature and confident enough to go and talk about research to people outside your department, and that you are able to connect with members of the broader mathematical community.

Start asking for letters **early**. Someone might refuse, or say no who would have said yes had you asked earlier. But more importantly, you need to give your recommenders enough time to write the letters, especially if you are applying for an NSF Postdoc, with deadline in October.

About the teaching letter, we know of three strategies to choose your recommender. The most common one is to ask a professor for whom you have taught a class you are

fairly happy with. If that is what you are going to do, make sure, just after the class is finished, that the professor knows you are going to ask for a teaching recommendation, so that they remember you when you ask again maybe years later.

Another more risky strategy is to ask someone who has seen you give a lot of research talks and organize seminars. A past member of the BP hiring committee comments that this is a bad idea and adds “I think if we at Harvard wanted to hire someone with this sort of teaching letter, we would consider it insufficient and probably the chair or Danny would end up phoning someone at the applicant’s grad school to find out how they had actually done as teachers.”

A method that receives good publicity is the following. Find a professor you are comfortable with, and who cares about teaching, and ask them to sit in on one of your lectures at the beginning of the semester, and to give you criticism and suggestions afterwards. Then ask this professor to come to see your lecture again some time later, after you have implemented the suggestions. Ask this person to write you a teaching letter.

If your Harvard “teaching apprenticeship” went well, you could also ask the person who supervised it to write a letter for you.

Once offers are out, and you have decided what to do, do not forget to thank your recommenders, and let them know where you are going. Sending your recommenders a card is not too extravagant.

## 5. RESEARCH STATEMENT

If you get something from the advice that follows it should be this: **Show your research statement to a lot of people!**

Your research statement should be at most five pages long, including references. This is the NSF limit. Follow the NSF instructions with regard to margins and type (the type should be at least 10pt, and the margins not too narrow).

There are a number of conflicting objectives that you need to take into account when you are writing your statement. First, many people who are going to read it will be mathematicians who do not work in your area, so you should have a good introductory section for nonexperts. On the other hand, you want to state your own results as soon as possible. You should tone down what you would naturally write—don’t be too technical! But you should be **precise** (Saying something like “**Theorem.** *A certain class of rings is Cohen-Macaulay.*” is **not** a good idea.)

You need to say very specifically why your results are good/strong/important/better than what was there before. If you don’t like your theorems, it is unlikely anybody else will. A person reading your statement should get an impression of confidence. But you should not come off conceited, because this will set off people’s BS meter.

Writing a research statement is not easy. Before you start writing, think about how you want to structure the statement. I used the guidelines from the NSF application, which require an introduction, and an outline of what you plan to do in the next two or three years. I did this by listing a number of projects (a year later, for me, some of them are now finished, others are still in progress, others I haven’t started yet). For each project, I would give a short description, with background, saying why it was important. Since most of them were of the form “generalizing results I had already proved”, this was a way of sneaking in my previous research. (The NSF instructions, at least two years ago, specifically said that the research statement was a statement of future research, not of past research).

Once you have a draft, give it to some graduate student friends, to help you polish it. Implement their comments. Then give it to your advisor, to prospective recommenders, to professors you know who are not in your field. This is very important! What someone not in your field tells you will guide you in streamlining your introduction. Give it to people who write well, and can comment on your writing style as well as your mathematics (this is especially important if you are not a native English speaker). **Do not forget to run your statement through a spell checker!**

## 6. OTHER TIPS

- Make a web page that contains your professional information. It should have electronic links to your publications (post your publications in the arXiv!). You can post there mathematical things that do not get into your application package (for instance, if you typed up class notes) that would look good to a committee member checking you out. This page should have a “professional” feel, meaning, if you like to post personal information, make it accessible through a link, and not in the main page.
- If you are going to the National Meeting of the AMS (Phoenix, Jan 7-10 2004), write that down in your cover letter. There might be a faculty member who will be there and would like to meet you in person.
- Get out there! Give talks in seminars of other universities, go to conferences, talk to people in other departments, and, with good luck, establish some collaborations!
- Having collaborations is very good, but what happens if all your papers are collaborations? At the very least you should ask some of your collaborators to be recommenders, and comment specifically on what you brought to the collaboration (as well as giving broader comments on your research). In a question/answer session about job searches and grant applications, a person currently at NSF said that it is good to have both papers on your own and with other people.
- There are no interviews for postdocs, except, maybe, at the AMS National Meetings. However, once you have been offered a position, that department will usually encourage you (and many times pay for you) to visit them.
- Usually, early offers start coming out after NSF announces their offers, in early February.

### Web Resources

- <http://fastlane.nsf.gov>
- AMS employment center: <http://www.ams.org/employment>
- <http://www.mathjobs.org>, a website to electronically submit applications for some universities.
- Sample job applications from personal web pages.