

EARLY CAREER

The Early Career Section offers information and suggestions for graduate students, job seekers, early career academics of all types, and those who mentor them. Angela Gibney serves as the editor of this section. Next month's theme will be good ideas.



Getting Ready For the Academic Job Market

Actionable Advice for Early Career Mathematicians on the Academic Job Market

Kristin DeVleming

Before January 2020, I was planning on participating in the search for a tenure track job this fall. With the onset of Covid-19, that plan became uncertain. I reached out for advice on what to do during the Fall 2020 job search and was met with words intended to comfort and appease my own anxieties, but not much actionable advice for what steps I should take. Therefore, stemming from my own personal worries, I've compiled a list of things that *you* personally could do, as a young mathematician soon to enter an uncertain job market.

To put some disclaimers on this, the honest reality of the situation is that a big part of our futures will be in the hands of senior, established mathematicians. We have to hope that they adopt fair hiring practices and advocate for us in the coming years, keeping in mind the impact of the global pandemic. *However*, if you want to take action on your own, I've compiled this list based on conversations with many helpful people, particularly Vance Blankers, Sarah Frei, Andrew Kobin, and Bianca Viray.

Not all of this advice will be applicable to everyone. Please, read from the lens of *what could help you*, take what works, and leave what doesn't.

Conversations with your Mentors

Your PhD advisor, postdoc mentor, or unofficial mentors likely have a better idea of what the job market will look like than you do. If you have a relationship with a more senior mathematician where you feel comfortable doing so, have an honest conversation with them about your concerns in the current situation. They may have insight into the possibility of extending your current position for an additional year or applying for postdocs/special positions at your current institution. If you are a postdoc, depending on what the job market looks like in the fall, they may have advice for you on applying for second postdocs versus

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tenure track jobs. In general, they may have ideas (beyond what is contained in this document!) of what you can do to help be successful in the future.

Research

Speaking to my own peers, I can say that some of us have been struggling to be a productive researcher during the Covid-19 outbreak. Here are some ideas on how to maintain mathematical productivity.

- Stay involved in the community by reading the new papers on the arXiv or attending seminars. There are so many seminars happening now and new ones may spark your interest, jumpstart a new collaboration, or highlight a new question. See mathseminars.org for a list. (Caveat: it can be overwhelming to look at the list, and some have said that this makes them feel less productive.) If you have outstanding referee reports, finish them.
- Organize or participate in a learning seminar with your peers. For example, choose a topic that you'd like to learn about and ask around for a good reference. Find interested people (perhaps your classmates or fellow postdocs) and assign weekly talks on different sections of the reference. Or, have a weekly seminar where members present older, short papers in the field that they find interesting. Or, have a weekly seminar where members present their current research ideas or problems that they're currently thinking about. (When I was a graduate student, we had a version of this where each person presented three examples relevant to their problem: (1) a simple introduction that everyone could understand, (2) an example that highlights some of the subtlety or difficulty of the problem, and (3) a more difficult example indicating what you're thinking about and why it's important.) Such examples may be useful when you give a job talk! Furthermore, the online platform means that these seminars do not have to be limited to those at your current institution.
- Work on expository aspects of your current research. Think about how to motivate your results, write an introduction to a paper or a job talk, or summarize the problems that you've already done or you're currently thinking about and their relationships to other problems. (*Bonus: if you do this well, you'll have a research statement mostly written.*)
- Leverage the unique, online situation for opportunities that you may not have otherwise: consider having or participating in Zoom office hours or Discord¹ channels to bounce around ideas, ask questions, or get to know others thinking about similar things. These can be informal, low-pressure ways to develop ideas for new projects.

¹Discord is an online chat forum where members can join different channels (think "chatrooms"), have conversations on particular subjects, share articles, and even type in \LaTeX !

Use the online platforms to reach out to others working on similar projects to kick-start new collaborations.

Miscellaneous

Especially if you are having trouble with progress in your research, take the time to do miscellaneous things that may help you be successful in the future. Some suggestions:

- Update your CV, and include any talks, conferences, or workshops that you were planning to participate in but were canceled due to COVID-19.
- Update your website.
- Summarize your thoughts on remote instruction if you taught a virtual class during spring or summer (or even if you took one). Think about what went well or what you would change next time. You probably made extra materials for your online class, so take the time to create a teaching portfolio with what you made. Think about what aspects of in-person teaching you might change based off of these experiences. (*Bonus: all of this will help you when you need to write a teaching statement.*)
- Consider ways that you can have small, tangible impacts on those around you. This may be by strengthening mentor/mentee relationships, organizing a seminar for the younger graduate students in your area (not necessarily on research; it could be something like "How to Give a Good Talk"), hosting brown-bag lunches on topics like diversity or outreach, hosting virtual community building meetings for your department, etc. For example, Andrew Kobin and I started "Lunch in the Time of Covid": an informal Zoom lunch series where we bring panelists and early career mathematicians together to discuss topics like doing research, allyship, mentorship, the job market, and more.
- If possible, take what you're struggling with and think of it from the lens of what you would do to improve it, given the chance. Especially consider specific ways that you could contribute to a department as a faculty member. For example: are you struggling with the lack of in-person connection from your mentors? Think about what you would ideally get from a mentor, write it down, and be prepared to be that person when you are given the chance. Are you worried about apathy from senior members in the field when you apply for jobs? Think about what you would do in their position in the current situation and write it down. These are actionable items that you could write about in a cover letter.
- Use this time to think about what you like about this profession. If you are having a hard time coming up with any answers, know that there are so many other great options out there! The unfortunate reality (even in the absence of Covid-19) is that the number of people wanting academic jobs is strictly larger than the number of academic jobs. No matter how abstract your work, it could be beneficial to use this time to develop marketable skills, like: coding/programming, technical

writing, teaching skills, or even incorporating art into your work. This is *not* a suggestion to develop these skills at the expense of your research, particularly if you want to pursue an academic career, but it may be reassuring to have other options.

Closing Thoughts

The academic job market will likely look different in Fall 2020, and these changes may persist for many years in the future as universities worldwide are facing budget shortages. I hope that these ideas give you a starting point if you are struggling right now, and I hope that you feel able to take the first steps in your job search.

Many early-career mathematicians are facing unique personal and professional struggles right now and I want to emphasize: *you are not alone*. Please know that in the midst of a global pandemic, it is **okay** to be struggling. It is **okay** to get less work done than you would otherwise. It is **okay** for your priorities to shift in new directions. Be gentle on yourself, and good luck on the job market!



Kristin DeVleming

Credits

Author photo is courtesy of Mike Fiechtner.

Looking Further Afield

Martin Guest

As a potential academic job applicant, you already know that it is necessary to consider moving to some faraway place, possibly to a foreign country. This article is for people who are curious about working in Asia, which is about as far away from the US as possible—at least, if one adds to the actual distance the substantial cultural and linguistic separation.

Before giving some practical tips, I should make some general motivational remarks. Many mathematics students (myself included) just drift into having a mathematical career. This is nothing to be ashamed of: few undergraduate students can know what research is really like, but

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developing and keeping an interest in the subject leads to a desire to know more, and is probably the only practical way to get started. Gradually one comes to realise that teaching and doing research in mathematics is a very worthwhile activity, and this gives one enough confidence to pursue it as a career. On the other hand, academic jobs are not easy to find, and combining teaching and research is a seven days a week commitment, with relatively low financial rewards by nonacademic standards. To be successful one needs more than interest and confidence. To be successful far away from the traditional support networks of family, friends, and academic mentors, needs still more. I feel that a crucial quality for any young academic, not just someone heading for a job in Asia, is first and foremost to have an absolutely uncompromising desire to understand some part of mathematics really well. This desire may be driven purely by feelings of competitiveness, or just from being unsatisfied with the way other people explain things and the desire to do it better, or any other number of reasons. If you acquire this quality, you will be able to enjoy mathematics and keep your balance, no matter where you are or what direction you follow.

If you already have a reason to work in Asia, such as a cultural or linguistic interest, this article is not for you, as you undoubtedly already have your own criteria. It is intended more for people who (as was my case, initially) may not think of Asia as a practical choice. My experience has been mainly in Japan, which is only one of the many countries in this part of the world, but some of what I have to say is likely to apply to any country where Chinese characters are (or were) used for communication. I have worked in Tokyo for more than 20 years, following about 15 years in the USA, and after spending the first 25 years of my life in the UK. I came to Japan for mathematical reasons, after making many visits and realising that I liked being here. I have been lucky to have supportive colleagues, and this brings me to my first piece of practical advice.

Personal contact is by far the best way to get started. Although it is true that English-speaking faculty members are increasingly sought after (for Japan, the internet JREC-IN Portal has some academic positions listed in English), some positions are advertised only as a formality (a candidate having been more-or-less selected in advance), and many jobs are advertised (in Japanese) only on posters pinned to bulletin boards. Without personal contacts, it can be difficult to find out what is available. Applying for jobs at random is most likely to yield nothing. On the other hand some academic positions are controlled by individuals with large research grants, and some positions are filled with almost reckless haste because of bureaucratic requirements, and this means you may have a much better chance of being selected than you imagined. Thus, it is very worthwhile to talk to visiting foreign researchers at seminars in your university, and keep in touch with them. In addition, it is not a waste of time to send a (very polite) letter or e-mail