Oh, the Places You'll Apply!

CAROLYN CHUN AND DAVID PHILLIPS

To be successful in academia requires mastering a variety of skills. A great deal of planning ahead is required to obtain a permanent job in mathematical academia. In this article, we focus on the academic market in the USA.

Caveat emptor

In this article, we ignore the dire statistics concerning the number of scientists with doctoral degrees that are unable to stay in academia.

assistant professorship. There are also schools[3] that do not o□er tenure.

Charming nuances to observe in American schools

According to the Washington Post[4], there are approximately 5,300 schools in the US that o□er degrees past the American high school level. There is considerable heterogeneity in these di□erent schools and we limit our attention to describing the schools that would hire tenure-track assistant professors in a mathematics department. Such schools are typically called colleges and universities, although college is a term often used to describe any school of higher learning[5]. For our purposes, the important feature that distinguishes schools are the types of degrees o□ered. Some schools have as their main focus, or even exclusively o□er, undergraduate degrees (associates and bachelors), while others o□er graduate degrees (masters and doctorates) as well as undergraduate degrees. The latter tend to be considered universities although all possible permutations of school names and degree o□erings exist. For example, The College of William and Mary and Dartmouth College are both universities with mathematics departments that o□er graduate degrees and the Naval Postgraduate School exclusively grants graduate degrees. The degree focus of the school determines the proportion of students who are at the undergraduate, masters, or doctoral level. This proportion, in turn, determines many important factors for faculty such as the skill level of student research collaborators, the types of grant funding that may be needed, and the teaching requirements.

In the US, almost all academic jobs in mathematics departments are not full-year jobs. The faculty is

Another hard truth that does not receive enough attention when studying for a PhD is that the quality

each letter should be specific to the school and position. A cover letter to a research-heavy position will be different from a cover letter to a teaching-heavy position. It is considered good form to know something relevant about the school, gleaned from the website or by word of mouth, and to include the fact that the applicant is a good fit for the position due to that information. The applicant should indicate whether or not she will attend the Joint Mathematical Meetings (JMM) that January in the cover letter, since many US institutions have representatives at the JMM and conduct interviews there. The JMM is the largest mathematical gathering in the US every year, and its location varies. It is worth reviewing the topics of the sessions offered at the JMM. The applicant should endeavor to attend the meetings and to give a talk, either by asking an organizer for an invitation from an appropriate session, or by giving a contributed talk. This advice is also true for operations research and statistics albeit with their main conferences, i.e., the INFORMS Annual Meeting (INFORMS) for operations research and the Joint Statistical Meetings (JSM) for statistics, although the applicant in those fields is still encouraged to attend JMM as well.

Current job openings listed on www.mathjobs.org for math PhD's. Red dots on the map indicate job openings. Image used with permission from the AMS.

Optimizing your journey

The American Mathematical Society (AMS) Employment Services for PhD Mathematicians (tinyurl.com/y9dw96mo) provides lots of support for job applicants. It is considered by many to be the canonical website for PhD mathematician job seekers in the US. Here is a quote from their website: "The AMS provides the automated MathJobs.Org job application system plus job ads on the web and on paper, and helps arrange interviews at the January meetings." The January meetings referred to here are the JMM. This webpage includes links to four services for those seeking jobs, including MathJobs.Org, which is the job listing site that the authors of this article used most heavily.

Current job openings listed on www.mathjobs.org for math PhD's. Red dots indicate job openings. Image used with permission from the AMS.

It is free to create a profile on MathJobs.Org, where you can store all of the documents necessary to apply to jobs, and then apply to those jobs with just a few clicks. Here is some information from the website about the website: "MathJobs.Org was officially launched in August, 2000. In the last 12 months, 1008 employers from 202 states in 44 countries have used the service for 2279 job ads (with 1168 ads-only); 36956 unique users have logged in; 2361 applicants are currently on the 'Job Wanted' list; 8091 applicants have uploaded 197487 new documents; 7785 applicants have submitted 147447 new applications, with an average of 18.94 positions applied per applicant; 21742 reference writers have used the system, with 16205 reference writers uploaded 28718 new letters." This data on the site highlights the amount of traffic it receives. This is good news, aside from the ratio of job seekers in the US to jobs being about nineteen to one: MathJobs.Org can be considered a one-stop shop.

We note that the ease of applying to jobs on MathJobs.Org contributes to the high number of applications for jobs that can be applied to through the site. Some schools list information about open positions on the site but only accept applications through other avenues, and those positions are likely to receive fewer applications since they are slightly more onerous to apply for. You may want to apply to jobs that only list job openings on their websites or where applications are only accepte:(9vi9800140T56/i)-265(ma)io

The big show

After you have gone through the screening interview process, the next step is the on-campus interview. This typically consists of one to two days of interviews with individual or groups of faculty, meeting students, and giving one or two job talks. Depending on the school, one job talk will focus on your research and the second on teaching. In the latter case, applicants usually give a talk to students with one or more faculty present. The importance of the job talks cannot be overerestimated: this is often a major part of the decision process for most schools. We o□er the following advice.

- Suss out the knowledge level of the audience in their particular research area and be sensitive to ensure enough introductory material is present. Depth at the end of a talk is encouraged but be sure to start from a point which any member of the audience can understand.
- If there is a teaching talk, be sure to be organized and understand fully what material should be covered. Extra material such as slides and handouts can be helpful and demonstrate preparation as long as they are used e□ectively.
- Be aware of your rights under the law: For example, it is illegal to use gender, race, romantic partners, parenting, or disabilities to make employment decisions.
- At this stage, you are also interviewing the school: ask questions about the school that indicatep315(is)-31520(t)11195.632afcenderts unders00447-11.955[(un()-414.632a)14.23(pa