like to highlight some of the ways in which having only one topic allows things to run more smoothly.

First, we find that there is a noticeable feeling that everyone has come together for a common purpose. We of course have participants with different levels of expertise and different areas of focus, but everyone has come in an effort to understand the same piece of mathematics, and this makes it easier to get people talking with each other and working together.

Second, it makes it easier for us to assume a little bit of background knowledge. We usually ask participants to read 20–30 pages of material (carefully referenced on our webpage) before they arrive, and we find that almost everyone comes prepared. This would be a much bigger ask if they had to do something comparable for multiple courses, not all of which held their interest to an equal extent.

Third, we are able to be very flexible with our schedule. If a talk goes long but the final words are crucial, we let it run over. If we need to take extra time at the beginning of a lecture to clarify a point that caused confusion during the exercise session, we do it. This is much more difficult when there are multiple courses competing for time.

One potential pitfall of going deep into a single topic comes from the fact that each lecture usually relies upon the previous ones, and it is easy to fall off the path. One cannot go too deep too quickly; it takes time to build layers of understanding. We work with the Main Speaker to try to spread out and diversify topics. Often the Main Speaker gives us a lecture plan in which Monday covers the first big idea, Tuesday the next, and so on: a vertical organization. We may suggest a horizontal reorganization, where the second chunk of Monday is independent of the first chunk, but the big ideas from Monday are pursued further on Tuesday or Wednesday after they have had some time to be digested. This parallel branching is a very important aspect of schedule design, one that is built in to the multiple minicourse model but can also usually be adapted to a focused workshop.

## **Final Thoughts**

We are always impressed with the energy that the Main Speaker devotes to planning a really great workshop and with the persistence that the participants show to keep with it for the whole week. You can really get somewhere from nowhere with this model. We hope you will join us next summer!





Ben Elias

Nicholas Proudfoot

**Credits** Figure 1 is by Greg Knapp. Author photos are courtesy of the authors.

## Organizing a Graduate Advising Workshop in Mathematics

## Daniel J. Thompson

In June 2019 María Angélica Cueto, David Penneys, Krystal Taylor, and I organized a Graduate Advising Workshop (GAW) in Mathematics at Ohio State.<sup>1</sup> This was the third iteration of what is becoming a regular biennial event. The first Graduate Advising Workshop took place at Tufts University in 2015, organized by Moon Duchin and Larry Guth. The second Graduate Advising Workshop took place at the University of Michigan in 2017, organized by Moon Duchin and Sarah Koch. This article describes how the 2019 workshop was developed and the activities we undertook. It is also a call to the mathematical community to help us turn these workshops into an ongoing tradition.

The purpose of the workshop is to ease the transition into advising for early-career faculty who are starting out as advisors and those who expect to be advising soon. The idea is to collectively develop best mentoring practices and to dispel potential anxiety about becoming an advisor through sharing our experiences and through reflection and discussion on common challenges in advising. While many universities have programs to improve faculty advising skills, often these activities are aimed at lab-based scientists or attempt to span all disciplines at the university. We believe it is valuable to develop mentoring resources focused on the specific challenges and environment that we experience as mathematicians. The workshop took place over a weekend and was a mixture of group work activities

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<sup>&</sup>lt;sup>1</sup> https://u.osu.edu/gaw2019

and panels on various aspects of the mentor-mentee relationship. We invited four experienced advisors from other universities to anchor the panels. Most of the participants were tenure-track assistant professors and postdocs.

So, how did this come about? My involvement started on a visit to the University of Michigan to give a seminar talk. Sarah Koch asked me if I would be interested in organizing the next installment of GAW at Ohio State. Without much reflection, I uttered the words, "Sure, that sounds great." A couple of weeks later the reality dawned on me that now there was a workshop to organize and there was going to be a steep learning curve, since this was not a standard math conference! The first step was to find some allies and coorganizers. Finding a strong collaborative organizing team was perhaps the most important step in running a successful workshop. Such a team was easy to find at Ohio State: Angie, Dave, and Krystal agreed with enthusiasm to be organizers, and they brought a wide range of relevant skills and their own professional networks to call upon.

Step two was to secure funding. This was not entirely straightforward. We found, however, that with some creativity and persistence, support for an advising workshop was out there! We made a start with some local funds from the Ohio State Mathematics Research Institute. Additional funding came from unexpected sources. A fortuitous meeting with David Fisher at a workshop in Indianapolis led to additional funding for participant support from *Indiana University Mathematics Journal*. The Ohio State Erdős Institute, which supports connections between academia and industry, provided additional funds to support our panel on careers in business, industry, and government (BIG). Finally, the organizers contributed some participant support from their NSF grants.

Step three was to book our leading experienced participants and advertise the conference. The organizers used their professional networks to spread the word and find suitable participants. By late 2018 we had things in place, and people were starting to register.

Step four was to design the content, which was divided into group activities and panels. Sarah Koch generously shared the resources she and Moon Duchin had developed for the previous workshop. We added new activities based on open-access mentoring resources that David Penneys had learned about from a mentor training workshop he had attended.<sup>2</sup> These resources are available from the Center for the Improvement of Mentored Experiences in Research (CIMER). We decided to use these materials as a basis for many of the group activities. Angie and Dave worked through the available CIMER content and selected the most relevant material for mathematics. They turned these resources into a syllabus and 30-page workbook for the workshop with three themed sessions: Effective Communication, Aligning Expectations, and Fostering Independence & Professional Preparation.<sup>3</sup>

We started the workshop by establishing ground rules for discussion. An important rule to encourage open discussion while preserving anonymity was "Remember the story but not the storyteller." As an icebreaker, we wrote on flashcards an example of how a mentor has influenced our practices and shuffled the cards to have others read it out.

For the group activities, for each one-hour session we divided into groups of five or six and covered three twenty-minute activities from the workbooks. We discussed in our small groups before summarizing the discussion for all participants. The case studies naturally led to discussions of our own experiences as advisors and advisees.

The group activities were complemented by four panels consisting of visiting and local experienced participants. Two panels covered best practices in advising and mentoring. One panel focused on diversity and inclusion. Another panel discussed advising students considering BIG careers. For each panel, we pre-prepared a few questions to start the discussion before opening questions to the participants. To encourage personal reflections, the first panel was opened with the question: "Tell us something you wish you knew when you started out as an advisor." The wealth of experience and variety of perspectives provided by our expert panelists led to enriching and thought-provoking discussion. Social activity was provided by a Mediterranean dinner and campfire at Krystal Taylor's house.

We hope that GAW will continue as a biennial tradition. This could be complemented by developing mathematics advisor training locally in interested departments (for example, running four or five one-hour activities over a semester). The previous organizers will be happy to share their experience and resources with people who are interested in setting up this kind of program. The location for GAW 2021 should be decided in spring 2020. Please contact the previous organizers if you are interested in being involved.

To conclude this article, here is a Q & A from the final panel of the workshop:

Question: "Why should we want to be advisors anyway?" Answers: "It's fun!!!", "It's the most rewarding thing we do in this profession."



## Credits

Author photo is by Zoë Brigley.

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<sup>&</sup>lt;sup>2</sup>NRMN-CAN Mentor Facilitator Training Workshops - Big Ten Academic Alliance.

<sup>&</sup>lt;sup>3</sup>We can share the workbook on request. Source materials are available at https://cimerproject.org.