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 Working With Students.

Going Online

A Guide to Organizing a Virtual Conference

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The authors—Jarod Alper, Daniel Litt, and Isabel Vogt— organized the large virtual conference WAGON[1] (Western

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[1]https://math.washington.edu/~jarod/wagon.html

Algebraic Geometry ONline) during the weekend of April 18–19, 2020. WAGON was a virtual version of the biannual regional conference WAGS (Western Algebraic Geometry Symposium), which has been running regularly since 2002 and whose origins date back to 1989. The spring 2020 WAGS was originally planned to be hosted at Pomona College but was postponed due to COVID-19. In this article, we provide a recap of WAGON as well as a guide for other virtual conference organizers.

1. WAGON Recap

1.1. Format

WAGON consisted of two 1-hour plenary lectures, six 20-minute lectures, two panels, and various social events. The lectures and panels were hosted on a Zoom Webinar 1000 license, generously provided at no cost by Stanford. The social events were hosted on participants' Zoom accounts and will be described in more detail below. The conference required zero funding and was free to attend. Recordings of the lectures and one of the panels were made available online afterward.

Figure 1. Opening lecture by János Kollár.

1.2. Participation

WAGON had over 1,000 registered participants, with a large international representation (as some indication, the conference website was visited from 63 countries during the weekend). Every event had hundreds of attendees; for the opening lecture by János Kollár at 9 am (PDT) Saturday morning, 725 people logged on through Zoom. In comparison, the normal WAGS events draw 100–120 participants, and the conference AMS Summer Institute in

Figure 2. *Covid and the Profession* panelists, clockwise from top left: Ravi Vakil (moderator), Caroline Klivans, Brendan Hassett, Bianca Viray.

Algebraic Geometry, hosted once a decade, had 727 registered participants during the three-week 2015 iteration in Salt Lake City.

The conference was advertised widely on the usual mailing lists and conference websites, as well as more recent innovations like mathseminars.org. The massive participation reflects the low barriers to participation, with no travel and no costs necessary.

1.3. Panels
The two panels—"Work-life balance while social distancing" and "COVID and the profession"—were very well attended and received. The panelists had a challenging task of addressing a large, diverse audience overwrought with anxiety in uncertain times.

There were some real concerns from participants about how these (admittedly very difficult!) topics were addressed. While the perspective and experience of senior leaders is invaluable, even the best-intentioned encouragement and advice can't really address the anxiety that young people are feeling right now.

1.4. Social Events
One of the most valuable aspects of an in-person conference is organic socialization—meeting new people at coffee breaks, reconnecting with friends over lunch, getting advice from an expert, and forming new collaborations. This is also the most difficult aspect of a conference to replicate virtually, but given its value and the lack of other options right now, we decided to experiment in simulating it virtually.

To approximate the social experience of a conference, we asked a range of people (senior colleagues, graduate students, postdocs, an NSF program officer) to host their own Zoom table during a coffee break, lunch break, or reception. Links to these rooms were posted in a shared Google Doc. As participants entered and exited each table, we asked them to put their names on the Google Doc, so people could "scan the room" to find their friends or an expert to pose a question to. In reality, the lists of participants at some tables were regularly updated while others were not.

Overall, the social events were very well received, and it was striking to witness how much people enjoyed seeing each other and reconnecting. Several junior participants reached out to say that the social events were their favorite part of the conference. It was particularly helpful to have speakers host tables after their talks, because it afforded a great opportunity to ask questions.

1.5. Organization
We organized WAGON quite quickly: the conference was put together in three to four weeks. Organizing WAGON was substantially different from organizing a regular conference. It required much less upfront work (e.g., flight and hotel reservations). Speakers were quicker and more likely to accept invitations. That said, there were some additional organizational burdens, for example, the new necessity of technology dry runs with each speaker before the conference. And WAGON required substantially more work during the conference itself—operating Zoom, controlling recording, controlling spotlight video, monitoring chat, monitoring Q&A, and looking for hands raised. In all, it required a greater degree of multitasking during the event, and the organizers could not sit back and enjoy the conference like attendees.

2. A Guide for Organizing Your Own Virtual Conference

2.1. Format
Think carefully about the number and the length of lectures. Anecdotally, many people seem to find virtual talks more exhausting than in-person talks, so it is worth considering fewer or shorter talks than might be appropriate for an in-person conference. Consider also how accessible your schedule is to participants with outside commitments. With travel out of the picture, for example, the conference can more easily be held during the workweek.

Consult with all of the speakers in advance about how they will deliver their virtual lecture, and schedule a brief practice session. If they are using slides, we recommend asking speakers to provide them in advance of the talk, as it is extremely effective for participants to be able to look back to catch definitions and terminology.

2.2. Diversity and Inclusion
As with an in-person conference, be conscious to choose a diverse set of speakers including from underrepresented groups. Keep in mind that the digital format means that you may be able to find speakers that typically may not be able to attend due to personal obligations or large travel distances. When advertising the conference, consider reaching out to a broader network of communities and institutions than you may have in the past. This opportunity can be leveraged to bring new diversity.

2.3. Audience Interaction
At WAGON, there were several ways for participants to ask questions:

- Chat: We encouraged participants to use this primarily to ask questions of other participants, and there was a lively discussion throughout most talks. In addition, the organizers generally kept an eye on the chat and scanned for interesting questions for the speakers.
- Q&A: The Zoom webinar format allows participants to write questions which are visible to only the speaker or panelists. The Q&A was moderated by the organizers.
- Hand-raising: Zoom allows attendees to "raise their hand," after which an organizer can unmute them so they can ask a question verbally.

During the plenary lecture, the organizers occasionally interrupted the speaker to forward a question from chat, Q&A, and hand-raising. During the shorter 20-minute lectures, questions were held until a reserved 5-minute period at the end. We found that all of these features worked well, though they required significant monitoring from a moderator.

Think carefully about whether you want a participant chat window. The fact that chat may be distracting to some should be balanced against the fact that it provides a powerful tool for participants to ask questions (to the speaker or others) and gives the audience a voice. You might also

Figure 3. Two examples of lectures: Juliette Emmy Bruce (top) and Claire Voisin.

consider using an external chat client (e.g., Discord or Slack), as Zoom's chat window is very low-featured.

We recommend having several conference organizers due to the live multitasking required during the event. We also recommend that organizers create a private chat channel to communicate quickly during the conference, which ideally can be accessed on either a computer or a phone.

2.4. Technology and Data

There are various virtual platforms available commercially, including Zoom, Blue Jeans, and Google Meet, which may be provided through your university. If you choose a commercial option, be attentive to how the software hosting the conference handles the data. For instance, Zoom webinars record detailed information about the exact times every participant attends, while Zoom meetings do not. We recommend that the data not be viewed or shared even by the organizers. While some open-access alternatives exist, they do not currently rival the functionality and prevalence of, say, Zoom. As other hosting products become available, we recommend considering their data policies in your decision.

We recommend that you carefully configure the hosting software's security settings and, in particular, disable screensharing for participants. Several online mathematical events have already been interrupted by "Zoombombers." We found that requiring advanced registration was enough to deter them, however.

2.5. Social Events

Consider beforehand whether you want to include social events. The format of the social events may depend on the number of participants; for example, a small event could use Zoom's "breakout rooms" feature.

At WAGON each social event had 6–8 tables, each with 5–25 participants. We had also hoped as some tables got crowded that additional tables could be created dynamically by participants to meet the demands and interests of our diverse audience. While this did work somewhat effectively, we encountered the unexpected technical issue that Google prevents more than 100 people from simultaneously editing a Google Doc. And some junior participants were intimidated to join a table full of either strangers or senior researchers—it's worth considering how to make one's social events as welcoming as possible.

We view our experience as only a first attempt at simulating the social component of conferences. There are clearly better ways to structure such events. We would like a platform where users join a virtual event space, see a list of people currently there, and can organically chat with others and form groups. Surely math conference organizers are not the only ones in need of such a product, and there are hopefully people building it right now.

2.6. Recordings

If speakers are open to it, we strongly encourage recording talks and other events. This increases the accessibility of the
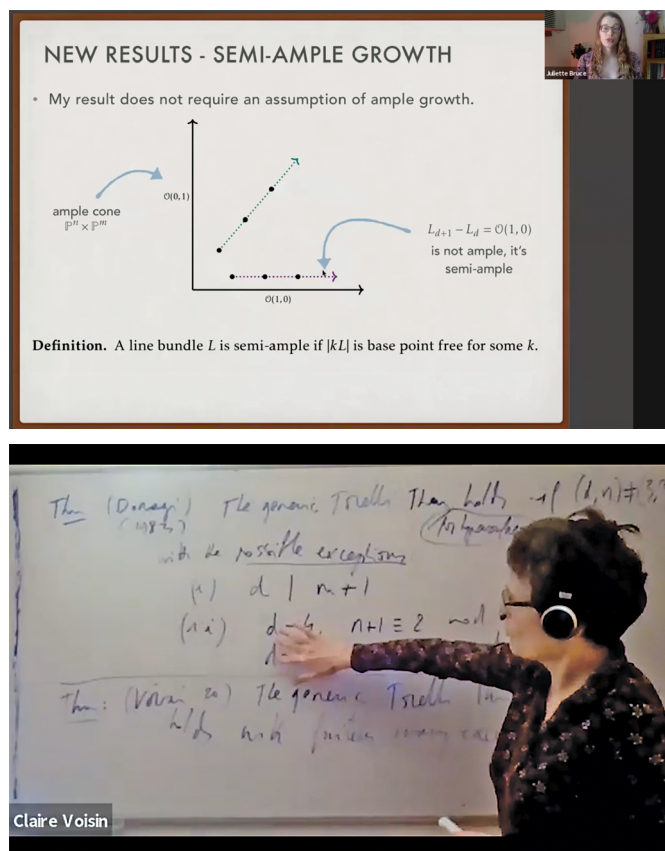
content of the conference to those occupied with childcare or other commitments. Be very clear and upfront with speakers and other presenters about whether events will be recorded and how the videos will be handled. Some speakers prefer not to be recorded; at WAGON we were largely able to ameliorate these concerns by providing the option to record talks and post them only temporarily (say, for three months after the conference).

Keep in mind the possibility of making the videos available only to the registered participants or making them password protected. Zoom provides the option to record the lectures on either the cloud or your local computer.

2.7. Reflections on the Future

We hope that this document can provide a starting point for a community-wide discussion of best practices in online conferences. While we are certain that online events can (and will) never replace in-person meetings, we also hope that the lessons learned here will be useful post-COVID. The real benefits of the online format should not be overlooked—especially its ability to include those who might otherwise not be able to attend in-person conferences. The fight against climate change may require some proportion of conferences going forward to be held virtually. One takeaway from WAGON was the real need in the mathematical community to actively participate in virtual conferences now, even if they are an imperfect substitute for in-person conferences.

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Credits

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How Do I…Develop an Online Research Seminar?

Henry Adams

Developing an online research seminar requires work, trial and error, and the willingness to experiment with something new. There are multiple benefits to running a research seminar online:

- an online seminar is accessible to a more diverse audience across the globe, especially if some of the seminars are recorded and made publicly available;
- an online seminar is a cost-effective way to share research ideas without negatively impacting climate change; and
- an online seminar brings together members of a community who otherwise might not interact.

Due to the COVID-19 pandemic, in early 2020 it became necessary to run a research seminar online if one wanted to run a seminar at all. Out of necessity, mathematicians will be gaining more experience with communicating online. Though some benefits of online seminars are clear during a time of social distancing, we emphasize that other benefits are lessened: accessibility of an online seminar is not shared equally during a global pandemic, perhaps not by those in a caretaking role, not by those taking on additional jobs, not by those volunteering to serve, and not by those without consistent access to the internet.

This article is divided into three sections: my tips for running an online research seminar, a description of the Applied Algebraic Topology Research Network (AATRN) seminar that Sara Kalisnik and I codirect, and links to other online seminars and resources.

1. How Does One Run an Online Research Seminar?

Here are my tips for running an online research seminar.

Host an interactive seminar that audience members can join live. Many audience members prefer to watch a live talk in which they can unmute themselves and interrupt the speaker with a question. Those without a microphone can also type questions into a chat window; it is your job as the moderator to ask these questions aloud to the speaker (who may not otherwise see them).

Post recorded seminar videos publicly. If the speaker gives you permission, it is a good idea to record the talk and post it online. Every platform for hosting videos has its own pros and cons, but two advantages of YouTube are:

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