

The Women in Mathematics Symposia: An Organic Extension of the EDGE Program



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Abstract The Women in Mathematics Symposia are a collection of annual regional mathematics conferences for women mathematicians which have all been organized by EDGE affiliates. To the best of our knowledge, they exist in California, the Midwest, Texas, the Carolinas, and Israel. We explore the history and original motivations of the WiMSoCal organizers and how WIMS spread and adapted to other regions. We include notes on participation, diversity and inclusion, and organization from the conferences. We include quotes from a survey about the conference's effectiveness, data about the attendees, and reflections from attendees on the impact it has had on their research and careers.

1 Introduction

The Women in Mathematics Symposia (WIMS) began in Southern California in 2009 and have affected over a thousand women in mathematics across the world in the past decade. We three decided to write this chapter as both a record of the past and a blueprint for the future. In it, we have past participants and organizers reflecting on what worked and what didn't in past WIMS. We hope this chapter encourages some readers to organize their own vertically integrated conferences for local women in mathematics. Like EDGE, the main goal of WIMS is to support

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women mathematicians. We want this chapter to do the same by motivating and inspiring would-be organizers and participants.

WIMS have been held in several cities in Southern California, as well as in the Chicago and Midwest area, Texas, the Carolinas, and Israel. Of over 1000 participants, 40 women have organized at least one WIMS. These 40 include many graduate students and early career faculty, and so WIMS have offered an opportunity for professional development through conference organization.

The WIMS symposia form pieces of a mosaic of mathematics conferences across the country that focus on woman-identified mathematicians. This mosaic includes but is not limited to:

- Association for Women in Mathematics (AWM) Research Symposia, held every other year in a different location across the country
- Nebraska Conference for Undergraduate Women in Mathematics
- Graduate Research Opportunities for Women conferences for undergraduate women that originated at Northwestern University in 2015
- Southeastern Conference for Undergraduate Women in Mathematics
- Women in Mathematics in New England conferences for undergraduate women
- Woman and Mathematics program at the Institute for Advanced Studies, which is a one- or two-week long program targeting undergraduate and graduate students.

The WIMS symposia differ from these events in their goals, targeted participants, and local focus.

Broadly speaking, the goal of WIMS is to support all woman-identified mathematicians. While undergraduates are often encouraged to attend, the focus of WIMS is not to convince undergraduates to pursue graduate studies in mathematics. “Local” is a key adjective in defining the WIMS objectives: in contrast to the national AWM Research Symposia, we hope to bring together mathematicians within driving distance of each other. There were four particular goals of the original WIMS; different conferences have adapted and changed these goals to fit their regions and cultures.

1. Strengthen the network of women mathematicians in the region.
2. Facilitate tiered mentoring between junior and senior mathematicians.
3. Highlight women’s contributions to the mathematical community.
4. Encourage new collaborations.

We begin this chapter with some history and facts about WIMS. Next are results from a survey of past participants,¹ a program description with schedule suggestions, and notes about breakout sessions and other information that may be useful to organizers. We conclude the chapter with tips and tricks for readers who want to start their own WIMS.

Throughout the chapter we include quotes from participants and organizers which we solicited via an online survey sent in spring 2018.

¹Informed consent: prior to completing the survey, participants were informed that quotes from the survey could be included in this chapter.

2 History of WIMS

In 2005, EDGE directors Sylvia Bozeman and Rhonda Hughes came up with the idea of formal “EDGE clusters.” These regional groups would nurture the networks formed in the EDGE summer session, and enlarge the network by including other women mathematicians at various stages in their careers. The regional clusters resulted from a 3-year pilot project supported by an NSF ADVANCE grant.

The project created a network among a small group of women in close geographical proximity composed of senior and junior faculty and graduate students. Senior women mentored junior women, while those junior faculty mentored graduate students. The network was formed to help the younger groups advance toward their professional goals with advice from senior faculty. As part of this pilot project, six clusters were formed: the Georgia cluster, the Mid-Atlantic cluster, the Indiana cluster, the North Carolina cluster, the Iowa cluster, and the Southern California cluster.

In October 2005, the Southern California cluster met for the first time, with dinner after a mathematics talk on “Classifying Division Algebras” by Ulrica Wilson, who was at the time a visiting assistant professor at Claremont McKenna College and later an EDGE co-director. The organizers of the event were Ami Radunskaya (Pomona College) and Cymra Haskell (University of Southern California). The talk was part of a series that Cymra organized at USC with the support of Women in Science and Engineering. The dinner meeting included six faculty, five graduate students, and one undergraduate. The cluster grew and met regularly for advice, stories, and social outings.

In June 2007, at a barbecue at Cymra’s house, over a dozen women discussed the future vision of the group. What did the participants want from the network? A majority of the cluster landed on: “We want the opportunity to talk about *mathematics* with each other”. And so, the Women in Math in Southern California (WiMSoCal) Symposium was born.

The first WiMSoCal Symposium took place at Loyola Marymount University in (LMU), co-organized by Alissa Crans (LMU), Cymra, and Ami. The symposium had 34 participants: 4 undergraduates, 20 graduate students, and 10 faculty members from 9 local institutions. The eight talks included three talks by graduate students. Feedback after the symposium indicated most participants wanted a similar event once a semester, with the location rotating around Southern California. The rest of the feedback led directly to some of the main features of WIMS. An incomplete list of requests by participants follows.

- Vertical mentoring in the form of organized discussions: one for undergraduates by graduate students, and one for graduate students by junior faculty
- Travel reimbursement funding
- Discussion about issues for women in mathematics
- Parallel sessions of shorter talks organized by research interest
- Keynote talks.

Since 2009, ten more WiMSoCal symposia have occurred, and the number of participants has grown to over one hundred. It has been gratifying for the original organizers to see the idea of WiMSoCal replicated across the country after the EDGE regional clusters led directly to WIMS.

3 Why WIMS?

Of those who enter graduate school in math-intensive fields, more women than men drop out or change fields, and of those who complete doctorates, fewer women apply for tenure track positions. Women drop out of scientific careers - especially math and physical sciences - after entering them as assistant professors at higher rates than men, and this remains true as women advance through the ranks [4].

Events for women in mathematics fight a battle to change the bleakness of the quote above. Between 2007 and 2016, the proportion of math Ph.D. recipients who were women fluctuated between 27% and 37%, as reported by the *AMS Notices*. Over that same time period, women made up only 20% of the Invited Hour Address Speakers at AMS meetings. Including at least one woman organizer for an AMS special session in 2017 increased the percentage of women speakers slightly from 18–31% to 25–37% [1]. The ambiguity comes from speakers identified with initials or non-gender-specific names.

The AMS does not keep track of demographic information of members, but the Society for Industrial and Applied Mathematics (SIAM) does. Of the 14,638 members at the end of 2017, 2517 identified themselves as women, and 1704 did not enter their gender into the SIAM database. So the percentage of women SIAM members was between 17% and 29%.

To increase the participation of women in mathematics, the 2006 InterAcademy Council report “Women for Science” [9] called for increasing the visibility of women scientists, providing mentoring and networking opportunities to combat isolation, and offering resources for launching careers. By highlighting women mathematicians as keynote speakers, uniting women across a specific geographic area, and including lively and relevant career and personal discussions, WIMS meets each of these goals.

One of the greatest strengths of WIMS is its status as a small regional conference. Women don’t need to travel far to attend. It’s easier to meet new people when there aren’t too many of us. Many of us also share the experience of, at some point, counting ourselves as the only woman in a room of mathematicians. After connecting with conversations at WIMS, participants often see each other again at larger regional events, strengthening the network.

We asked participants and organizers why they decided to become part of the WIMS community. Their responses reminded us of some of the benefits we see in EDGE. We include some of them here for future organizers to use in grant applications or proposals.

Several women mentioned the novelty and support of a women-only conference:

The first time, I was curious to see what a math conference with only women would be like and it was conveniently located so I attended. I enjoyed the experience so much that I continued to attend until I left the midwest. I found the social dynamic to be quite different (much more relaxed and welcoming) than many other conferences I have attended.

I am really thankful for WIMSoCaL. Having known so many other women in the [Southern California] area from attending many years of WIMSoCaL meetings always brings me a strong sense of comfort and confidence whenever I attend local meetings. WIMSoCaL created a strong network of women that help support each other academically and personally. I have to attribute the success I have today to the wonderful work of the WIMSoCaL organizers.

It was a great chance to network with other women in mathematics and give a talk in a supportive environment. I gave my first talk on my research at Midwest WIMS. In terms of niche, WIMS does a great job of highlighting the research of women and being a supportive environment. It also is a great place to hear about research outside of your comfort zone.

Organizers can work to create that “supportive environment” by including the phrase on promotional materials, websites, and handouts. They can also encourage expository or beginning research talks to support graduate students.

Breakout sessions or small group discussions are a capstone of WIMS, described in detail in Sect. 6. Every person who attends WIMS comes with their own unique set of experiences and reflections, and should feel valued within their small group.

Even before the conferences I knew this is something worth doing, but only during [it] did I understand the psychological and intellectual impact of intense learning and interacting in such a supportive and non-competitive atmosphere.

Midwest WIMS had small group discussions on a range of topics and concerns. It was really important to get advice from mathematicians who had similar goals and experiences.

I like that the conversation topics at breakout sessions at Midwest WIMS 1–3 were so broad—not everyone wants to talk about work/life balance or finding a job—but there are opportunities to find a conversation that is helpful no matter what career and life stage you are at. It’s nice to share experiences, which are sometimes unexpected (in our algebra session we had a lengthy discussion about clothing between talks).

Women have commented that they attended WIMS to have the opportunity to present their research in a welcoming environment. One speaker said she “thought WIMS would be a less stressful environment in which to do this because it was mostly women.” Another also remarked on the uniqueness of the WIMS environment:

I never realized how different the intellectual atmosphere could be in a room filled mostly female mathematicians. When I spoke, I felt immediately valued as opposed [to] apprehensive about saying something of value.

The above quotes and discussion may be helpful for people who have already committed to organizing a WIMS, but there are plenty of women who may be considering it and wary of the time commitment. As graduate student organizers, Amy and Yen believe in the lasting professional and personal benefits from creating and running one’s first conference. At some point every person learns about

bureaucracy and politics and fundraising, but the stakes are pleasantly lower as a graduate student and you have the benefit of faculty advisors for advice and help. Faculty of course can and should organize WIMS, but we encourage them to include students if possible.

As a graduate student [WIMS] was one of the first opportunities I had to be involved in decision making processes. As I transition to a tenure-track role I feel that the skills I developed in organizing and planning such an event are invaluable, as I plan sessions at conferences and serve on department and university committees. (On a personal note, there are a lot of similarities to planning a wedding!)

Benefits of organizing a WIMS are not limited to graduate students. Because they contact the participants and different schools, organizers can form even stronger networks than participants do. They can also increase their own visibility within their departments and universities.

I got to know a lot more people because I was the organizer. I exchanged emails with almost everyone who attended. My dean was also really excited that I did it, which definitely didn't hurt my career.

This last quote summarizes how far we have come as women in mathematics, and encourages us to imagine how far we can go.

I think it is very important that we continue to bring together women, at various stages of their careers, so that they can showcase their research, and have networking opportunities. Although almost all conferences nowadays make an effort to increase the participation of women, the reality is that there is still a large disproportion in gender representation in most of them. It was refreshing to see so many women gathering together, all presenting very high quality work. This would have been almost unthinkable when I started my career.

4 Diversity and Inclusion

While almost all WIMS participants share the experience of being a woman in math, each has a different perspective to offer during the invaluable breakout sessions and discussions. This section discusses different types of diversity that organizers can seek out. We also discuss strategies for creating an inclusive environment.

We strongly encourage WIMS organizers to spend a few minutes during their organizing process to reflect on who they want to serve with their conference, and include language on their promotional materials to that end. For instance, the Midwest WIMS 2017 website emphasizes that “Graduate students, postdoctoral scholars, and researchers at small institutions are especially encouraged to apply” for funding.

Organizers are the face of the conference to attendees. Organizing committees may want to think about racial diversity among themselves, as one participant noted:

I'd like to see more diversity within this community. More people from underrepresented communities giving talks and holding leading roles would be very nice.

4.1 Career Stage

One question that often arises: what is the target career stage of a WIMS conference? Certainly faculty and postdocs are welcome to present their research, network with each other, and look for collaborators. But we argue that as one goal is to support up-and-coming women mathematicians, WIMS is an invaluable resource for the early graduate student who hasn't yet given a research talk at a conference. We suggest that organizers explicitly encourage graduate students to speak, either on original research or expository topics. Organizers have taken different stands on including undergraduates or not.

If organizers want undergraduates to benefit from the conference, they may consider including a poster session or a parallel session consisting entirely of undergraduate talks. If they want graduate students to benefit, they may explicitly encourage talks by beginning researchers or even expository talks, and advertise the supportive environment. Such a conference could still include invited talks to set a research or teaching-focused motif for the day without discouraging less experienced conference attendees from participating. Again, we encourage organizers to include graduate students in the organizing committee who can speak to graduate student concerns. For instance, one person who attended one WIMS in 2015 and another in 2017 wrote:

I liked that at the 2015 WIMS, people from smaller schools with fewer resources and connections had more opportunities to speak. For the 2017 WIMS, there were way fewer opportunities for people to speak, and there seemed to be more of a focus on talks from people who were already well established. Those are not the people who need more opportunities to talk.

For early career faculty, including a variety of questions about school and career transitions in the breakout sessions can make them feel valuable as mentors for students, while they benefit with knowledge from tenured faculty. Faculty may also enjoy open problem sessions, but after our experiences with these, we urge organizers to also include a parallel session for students, perhaps to do with professional development.

4.2 University Size and Focus

While WIMSoCal began as a research-focused extension of an existing social network, these new conferences concurrently offer a serious research environment and create a new regional network of researchers, educators, and learners.

We urge research-focused organizers to remember teaching-oriented schools and faculty, who have different relationships with students and offer unique perspectives as mentors and examples for graduate and undergraduate students. They often have smaller faculty and may be the only woman in their department, and hence could benefit the most from a WIMS.

On the other hand, one organizer cautioned future organizers:

Please be sure not to reinforce stereotypes about women. When a conference for women is all about how to get a teaching job, then what message are we sending? It is great to talk about such issues, but please be balanced.

It is not the case that those younger than us “should” follow our own paths, but instead that we should show them a variety of paths. For finding people in different fields, organizers suggested seeking out other organizations and using existing networks.

As much as possible, include women from non-doctoral institutions. Reach out to people who have done Project NExT to find recent PhDs in your area. They may be the only woman in their department or looking for collaborators. They may not have large budgets to travel to other conferences so regional conferences are especially helpful. It is also useful to include such participants because many graduate students will not end up at research universities. These women can help mentor these students. They may even want to help organize the conference!

Use your own network of professional connections to invite a diverse group of speakers, in terms of research, professional affiliation, etc. Advertise the conference widely.

4.3 Vertical Integration

Mixing undergraduates, faculty, and people at all career levels creates vertical integration. Organizing several vertically integrated breakout sessions can be a tedious task for organizers, but ultimately adds value. Explicitly, this requires an organizer to assign participants to different discussion groups while keeping track of the career levels represented in each group.

In vertically integrated breakout sessions, younger graduate students can chat with more experienced ones, postdocs can chat with faculty, and tenured faculty can share their experiences with those earlier on the career ladder. Mentoring junior participants gives more senior ones a sense of accomplishment which can help propel them through the next tricky research or teaching problem [11]. WIMSoCal creates an environment to ask open-ended questions and receive candid answers about the commitments and experiences of being a professional mathematician.

4.4 Parenthood

Breakout sessions lead to insightful connections on topics which one may not encounter at other conferences. For instance, Yen, who had two children during graduate school, first thought about the timing for her children when attending WIMSoCal in 2011, as motherhood came up in conversation during the breakout session. Other participants also remarked on this topic:

At Chicago, it was really useful to hear stories about “math and motherhood” that you can’t really learn about except in person. At the Texas WIMS, I thought that participants at all levels (from undergrad to faculty) really got a chance to connect and talk. At both conferences, I really got a lot out of meeting and talking with other women mathematicians – and presenting my research to a broad audience was really valuable.

On the topic of motherhood, late graduate school and early career faculty may be the most in need of WIMS-style support networks [7]. Mentoring and fostering a sense of “belonging” has been shown to be critical at this career stage [2, 5].

The tenure structure in academe demands that women having children make their greatest intellectual contributions contemporaneously with their greatest physical and emotional achievements, a feat not expected of men. When women opt out of full-time careers to have and rear children this is a choice - constrained by biology - that men are not required to make. [4]

One word of caution, which appears as common sense to some: avoid questioning women on their reproductive choices. Creating a welcoming environment in which to discuss topics like parenting or caring for older family members does not entitle people to the sometimes-painful details of others’ lives.

Seek out money for childcare grants—organizers often hear “no” but sometimes hear “yes” on this issue. Secure a lactation room, which requires a chair, an electric outlet, a small table, and a door with a lock, before the conference and let participants know that it is available [3].

4.5 Gender

We want to include a note about two other topics: transgender people, people of minority genders, and men. In the spirit of inclusion, we expect most WIMS organizers are open to people of minority genders and transgender people, but may have overlooked them. One can include specific, inclusive language on promotional materials and websites—the cost is low to organizers, and the potential benefits for participants are high. For example, the WiMSoCal 2018 website says, “All are welcome to register or give a talk/poster, regardless of gender.”

If the WIMS is listed as “in cooperation with the AWM” (see Sect. 7), then organizers could include part of the AWM “Welcoming Environment” statement on their website:

In pursuit of that ideal, the AWM is committed to the promotion of equality of opportunity and treatment for all AWM members and participants in AWM-sponsored events, regardless of gender, gender identity or expression, race, color, national or ethnic origin, religion or religious belief, age, marital status, sexual orientation, immigration status, disabilities, veteran status, or any other reason not related to scientific merit.

As for men, different organizers have taken different tactics. If you receive federal funding, you cannot include discriminatory language excluding men. Men who are interested in a WIMS are often the men we want as allies in departmental

politics and collegial relationships. Though many organizers and participants noted that having no men in a room changed the dynamic considerably, we endorse inclusivity.

One tactic we do not endorse: putting men, transgender people, and people of other minority genders in a separate room for breakout sessions, etc. This is an alienating practice—an exception to this is if you have enough men to form their own breakout session. They may benefit from discussing gender issues together.

5 Measurable Impact

To inform our understanding of the magnitude and impact of WIMS, we surveyed past participants and organizers of WIMS—we received 127 responses from the estimated 1000 people who have attended any WIMS, many of whom attended multiple years and locations. Although we had a low response rate, we still believe this data is valuable and we share it with the understanding that it reflects only a small percentage of WIMS participants.

Figures 1 and 2 show how WIMS participants advanced in their careers. Undergraduates became graduate students, graduate students became tenure track faculty, postdocs, and lecturers, etc. Of the survey respondents who attended WIMS, nearly half were students when they attended, and 37.6% were tenured or tenure-track faculty. At the time of the survey, roughly a third were students, just over 40% were tenure or tenure track faculty, and the remaining quarter fit into the postdoc/lecturer/other category.

In particular, we hope future organizers notice the diversity of career stages at WIMS, and plan their own WIMS with inclusion in mind, as discussed in Sect. 4. Students in particular may be interested in non-academic jobs discussed in a breakout session or panel, though plenty of postdocs and professors have made career switches. Some jobs that fit into the “other” category: tour guide, inventory

Fig. 1 Career stage at time of attending WIMS

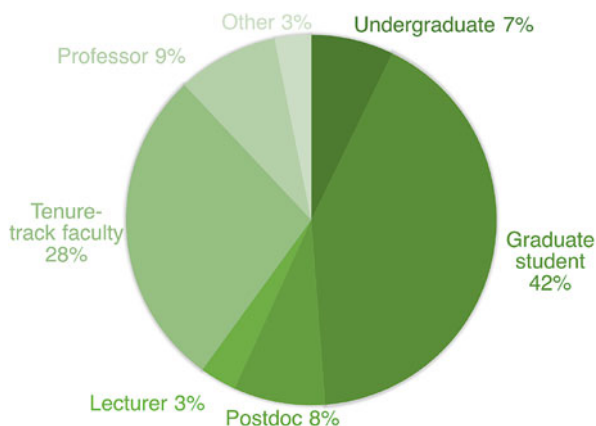
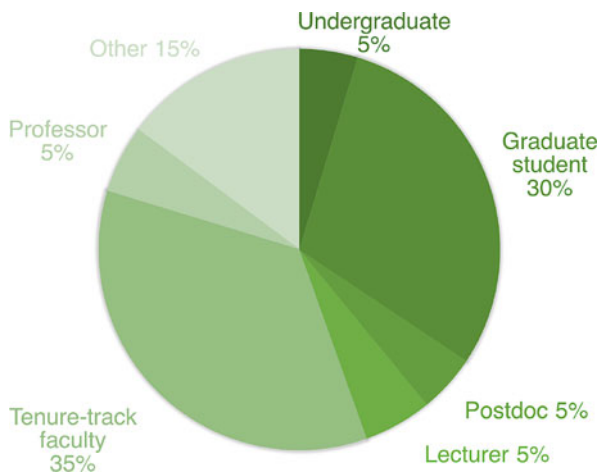


Fig. 2 Career stage when responding to survey



auditor, project manager, researchers at Microsoft, the US Navy, Duke Medical Center, and Georgia Tech, software developer and journalist.

WIMS aims to strengthen regional networks of women. One benefit of a strong network is increased collaboration and more innovative, fruitful mathematical ideas. Of the 127 respondents, eleven people said they had collaborated with someone they had met at WIMS.

One person met someone at a conference at one university, and then later in her career ended up at that university. Knowing someone in the department ahead of time certainly did not hurt her job prospects. Another person met a graduate student and discussed the graduate student's advisor, who became her postdoc supervisor.

Several people said that they later saw WIMS participants at other conferences. Approximately 40% of respondents said they are still in touch with someone they met at WIMS.

WIMS participants almost universally enjoy and recommend WIMS. Out of the respondents, over 90% said they would recommend WIMS to a colleague. Over 80% agreed or strongly agreed that WIMS benefited them personally, while over 70% agreed or strongly agreed that it benefited them professionally (see Fig. 3).

However, of the 127 respondents, 13 reported that WIMS in some way did not meet their expectations. Inappropriate research topics were an overarching theme of the negative feedback—either parallel sessions were too specialized or the attendee had no peers with whom to discuss research. It's helpful to have broad research areas represented in sessions, but we recommend that organizers stress the uniqueness of WIMS as a way for women mathematicians to meet, not necessarily as just another mathematical research conference, to temper these expectations.

It was always an issue whether there were going to be other people in my field or not. It never seemed worthwhile to go if I was going to be the only one.

[The] conference was tailored to areas of math that were too specialized, so I didn't learn anything

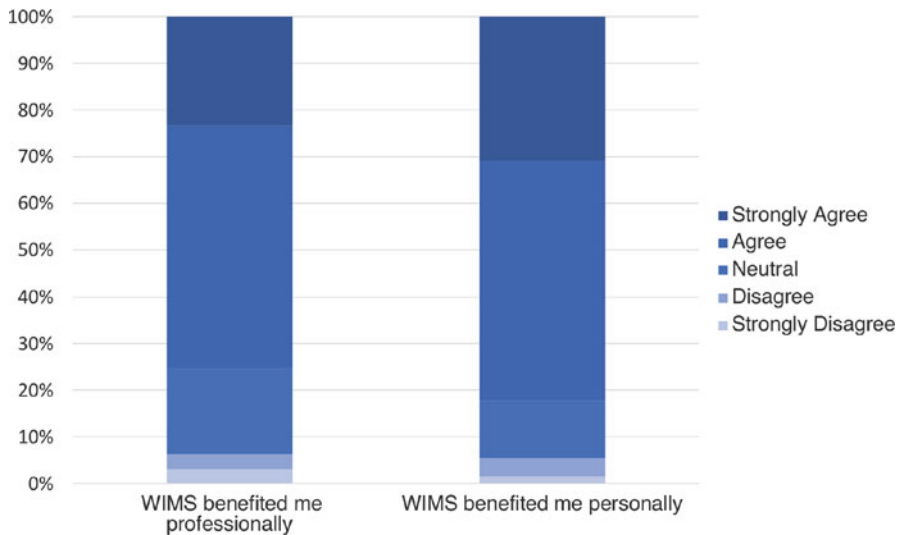


Fig. 3 A majority of respondents indicated that WIMS benefited them professionally and personally

I felt like the talks were restricted to topology/geometry and analysis, rather than having a larger variety of topics.

The WIMS in 2015 was at a SLAC and so had a more varied topics and attendees, since the other ones have been held at Research Universities, the focus has been on research, which is great, but as I have not had as much time to keep up, unless the speakers are in algebraic topology, it is not so helpful.

Some lectures I heard in WIMS were very good, but otherwise I felt there is not much that connects the participants (that were from different areas and different stages of their career).

6 Components of WIMS

Most WIMS have taken place over one day, which may lessen the burden of traveling to a conference for women with family responsibilities. We include two sample schedules from WiMSoCal 2014 and Midwest WIMS 2014 (Table 1) to show the variety of sessions that have been included in the single day meetings.

Below we discuss some of the sessions that have been included in WIMS and how they support the goals of WIMS.

Parallel Sessions Parallel sessions allow more women to present their research, which is especially important for graduate students and early career faculty.

Parallel sessions are often divided into several mathematical subfields. This gives women the opportunity to learn about research in their subfield by women

Table 1 Example schedules from Midwest WIMS 2014 held at the University of Notre Dame (left) and Twin WIMSoCal 2014 held at the University of San Diego (right)

Midwest WIMS 2014		Twin WIMSoCal 2014	
8:30 AM	Registration and breakfast	8:30 AM	Coffee/Registration
9:15 AM	Opening remarks	9:00 AM	Opening remarks
9:30 AM	Parallel sessions	9:10 AM	Parallel sessions
11:30 AM	Coffee break	10:15 AM	Small group discussions
12:00 PM	Problem session	11:00 AM	Coffee break
1:00 PM	Lunch with breakout sessions	11:30 AM	Parallel sessions
2:30 PM	Plenary speaker	12:30 PM	Lunch and invited talk
3:30 PM	Poster session	1:15 PM	Panel discussion
4:30 PM	Parallel sessions	2:00 PM	Parallel sessions
5:30 PM	Evening reception	3:00 PM	Coffee break
		3:30 PM	Invited talk
		4:15 PM	Social event

in their area. Many fields have been represented in WIMS meetings including Algebra and Combinatorics, Dynamical Systems, Geometry and Topology, Logic, Mathematical Biology, Partial Differential Equations, Numerical Methods and Modeling, Statistics, and Knot Theory.

Poster Session Poster sessions can be included during coffee breaks to enable more junior mathematicians to present their work. This is especially valuable for undergraduate and graduate students who may have research results to present but are not yet comfortable with giving a talk. Poster sessions allow women to have one-on-one discussions about their research where they can give and get feedback.

Problem Session A problem session may be included to support the goal of encouraging new, regional collaborations. Women are encouraged to submit open problems before the conference and are given a few minutes to discuss the problem and solicit collaborators.

Invited Talk/Plenary Speaker A plenary talk given by an invited speaker showcases some of the work of women mathematicians in the area and entices participants to attend a new WIMS. We all know women who inspire us—inviting one of these to give a plenary talk is an exciting way to honor them. Publicizing the participation of a well-known, engaging mathematician will be a draw, since participants will have ample opportunities to talk to the plenary speaker at informal events throughout the conference.

Panel Discussion Panel discussions can cover a wide range of topics, from the ever-popular Work-Life Balance which can include caregiving for elderly and young people to Career Options and Applying to Grad School/for Jobs. We strongly endorse moderators with prepared questions, as well as plenty of time for audience questions and discussion. Consider the size of WIMS when structuring a panel—generally two or three panelists will be sufficient for these smaller conferences.

Breakout Groups Navigating the early stages of a career as a mathematician can be challenging for anyone, and there are some challenges particular to women. To facilitate mentoring, several WIMS meetings have included time for small group discussions. These discussions can be scheduled in between other sessions or during lunch. At Midwest WIMS 2014, topics were selected ahead of time, and a woman was invited for each discussion to facilitate the conversation. The discussions were held over lunch with a discussion topic for each table. Participants were able to move to different tables during the lunch.

Discussion topics have included: networking/mentoring, academic job market, research oriented topics, life in graduate school, success in academic life, getting tenure, and work-life balance. Small group discussions may be more successful at larger, more diverse events, while smaller events or those with many people in the same career stage may prefer panelists.

Group Activities In lieu of discussion groups as above, some WIMS set up small group activities that encourage participants to get to know each other. Speaking up can be challenging given extant power dynamics; for example, undergraduates may not feel comfortable sharing their thoughts when senior mathematicians are at the table. Some activities that we have tried with some success include:

- **Math Haiku.** Each group is given a set of words to create a haiku. The words in the given “pile” are intended to provoke conversation. For example, words such as “imposter,” “gender,” “identity,” and “outlier” might be included, as well as a set of mathematical terms, and some words evoking emotion, such as “begrudge” and “isolated.” Here is an example from WiMSoCal 2014, with words from the given collection indicated in **bold**:

Blá, an **outlier**
Isolated in a **ring**
Continuity
Begrudgingly She
 Feels **closed** in **chaotic sand**
 wants **Transformation**
 Seeks connected **graph**
Iterating to stable
Equilibrium
 She **generates** a
Fundamental network of
Passionate mentors

- **Proofs without words.** Each group is given a choice of theorems or properties to illustrate without words. They are allowed to use pictures, videos, or any other medium. Example prompts: the Heine Borel Theorem or the associative property of multiplication.
- **Knot tiling activity.** Each group is given a set of knot tiles, and they use these to answer a set of questions about knots, and then create a “knot mosaic” [10].

Results of these activities can be displayed at the end of the day during the concluding reception. We have found that these activities generate conversation, bring

people from different backgrounds together, and provide fodder for conversation at the end of the day. For a more detailed description, see the AWM Newsletters from March 2016 and May 2017 [6, 8].

Lunch and Coffee Breaks It's important to provide opportunities for informal interactions at the conference venue. We recommend a coffee/continental breakfast at the start of the day, coffee breaks mid-morning and mid-afternoon, and lunch in a setting conducive to meeting new people and chatting. When food is available on site, more formal activities can be offered during lunch, such as the panel discussions or breakout groups listed above, or group walks. Whether or not there are formal activities programs, one lesson we learned at EDGE is that eating together means coming together.

One person bemoaned a lack of interaction time between talks, which can be planned for with strategic breaks.

I also felt that there weren't many instances to talk to those at the conference since the talks were back to back.

Evening Reception A reception or social event allows time for informal discussions to strengthen the connections made during the day, and serves as a great place to announce the hosts for the following year's WIMS. It's also a good time to collect surveys. One participant's remark about the closing reception sums it up:

It was a great chance to meet active female researchers in the field and to meet role models who had advice on how I could make it too as a women in math!

7 Suggestions for Organizing

Several organizers commented that organizing WIMS was a large job and was more time consuming than anticipated. To ease the burden of planning and facilitating the meeting we provide some suggestions below.

7.1 *Steering Committee*

To keep WIMS an annual event and to avoid reinventing the wheel, it can be helpful to have a steering committee made up of organizers from the current and previous WIMS meetings. Past organizers can share planning information such as submitted grants, conference planning timeline, and catering orders as well as lessons learned along the way.

The steering committee should also be responsible for establishing the steering committee for the following year. Past organizers have suggested setting aside time during the conference to identify a date and location for the next meeting with the steering committee.

7.2 *Planning Ahead*

Organizing a meeting is a large commitment with several tasks that need to be done months in advance. As one organizer suggested, “start planning early and ask for help.” Creating a sample planning calendar like the one shown in Table 2 can help establish deadlines and keep the organization of the meeting on track.

7.3 *Securing Funding*

Ideally, organizers secure enough funding to support travel and lodging for all who wish to participate. Travel funding makes the meeting more accessible to everyone, especially early career mathematicians such as graduate students and postdocs, as well as faculty with limited or no institutional travel funding. A sample budget for a meeting with travel support is shown in Table 3. If organizing a

Table 2 Sample organization calendar

Approximate time	Tasks
12 months out	<ul style="list-style-type: none"> • Determine which university will host WIMS • Request grant from previous year
6–11 months out ^a	<ul style="list-style-type: none"> • Submit grant to secure funding • Get departmental support • Get other support as needed • Invite keynote speakers • Advertise the meeting
3–6 months out	<ul style="list-style-type: none"> • Send out email announcement • Invite parallel session organizers • Sign up for “in cooperation with AWM” status • Set up webpage • Open registration and abstract submission • Establish funding application procedure
3 weeks out	<ul style="list-style-type: none"> • Finalize catering • Finalize schedule • Travel funding decisions and notification • Hotel information • Finalize rooms, session chairs, breakout sessions, panel • Organize local help (student volunteers?)
1–2 Days out	Print any handouts
Day of	Enjoy the conference!

^aDepending on the size and budget of the conference. If a grant is being submitted to fund participant travel, organizers should err on the side of caution, and have these items done early to submit the grant in a timely manner

Table 3 Sample budget for large meeting with lodging and travel funding

Item	Budget
Catering	\$8000
Invited speaker travel and lodging	\$3000
Participant travel and lodging	\$10,000
Mini-grants	\$2000
Other	\$200

Table 4 Sample budget for a small meeting with no funding for travel and lodging

Item	Budget
Light breakfast, coffee breaks, and refreshments	\$400
Lunch	\$1000
Paper materials	\$100

meeting for an existing WIMS region, budgets of meetings held in that particular region will give a better idea of an appropriate budget, as regions vary in size and transportation options. Though travel funding is preferred for large geographical regions, many WIMS meetings have been successfully organized with modest budgets. An example of a minimal budget is shown in Table 4.

7.4 Funding Opportunities

Funding from Host Institutions Many of the WIMS meetings have been made possible with modest amounts of funding secured from the host institutions. The host department, college, and/or institution may have funds available for conferences organized at that institution.

National Funding Agencies Several WIMS meetings have been funded with grants from national funding agencies. Include in the grant: conference goals, any confirmed funding from the hosting institution, a sample schedule including any confirmed or invited speakers, and a list of schools to invite. It is especially helpful to talk to past organizers who have been successful in securing grants from national funding agencies.

7.5 Advertising

A great way to start advertising WIMS is by emailing all math departments within a certain driving distance or geographic region. Include both research and teaching oriented departments. Creating a thorough list of such universities is time-consuming, but once created, such a list can be passed down to future organizers and updated each year.

A web page is necessary to convey logistical information about the conference. Some meetings have also been advertised on social media. Many national associations advertise meetings on their calendars. Some associations to consider are the Association for Women in Mathematics, The American Mathematical Society, and the Mathematical Association of America.

To obtain “in cooperation with the AWM” status, visit the AWM website and enter the conference information. Then include the AWM’s non-discrimination statement on the website and conference materials. This is a convenient way to avoid writing an original nondiscrimination statement.

7.6 *Other Considerations*

7.6.1 Supporting Parents

It can be especially challenging for women with small children to attend conferences. Organizers can help by identifying a mother’s room on campus and investigating childcare options [3].

7.6.2 It Takes a Village

There are many opportunities for volunteers during the meetings. Women can be invited to chair parallel sessions, and volunteers can help with registration and other logistics. Undergraduate students can organize their own poster session, or brainstorm together about ice-breakers. Social media aficionados can organize a blog or hashtag, departments and administrators can demonstrate support by hosting one of the social events, and university higher-ups can give some friendly words of welcome.

8 Conclusions

We hope this chapter encourages you, the reader, to organize your own regional women in mathematics conference in the same vein as WIMS. Through the words of participants and organizers, we demonstrated the purpose and impact of WIMS in hopes of motivating you to make your own. We combined our years of experience with WIMS to offer insights on scheduling, planning, diversifying, and funding such a conference. We believe that WIMS, which has affected hundreds of women across the globe, demonstrates the long-term value of EDGE as a place to cultivate future women leaders and organizers of the mathematical community.

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