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conference that has rotated around universities in the Texas area since 2016. This past year it hosted an inclusive group of over 70 attendees. Conference activities included 19 research talks (including a plenary talk by Professor Sunčica Čanić), 8 poster presenters, a salary negotiation workshop, a career panel of academics and industrial professionals, and breakout sessions on applying for graduate school, selecting an advisor, work/life balance, maternity leave in academia, and ideas for AWM student chapter activities. TWIMS 2018 was financially supported by UH College of Natural Sciences and Mathematics, UH Department of Mathematics, and the Mathematical Association of America (MAA) Tensor Women and Mathematics Grant.

Student Chapter Awards 2020: What projects, events, or programs could your student chapter undertake in this new school year? We love hearing about and featuring these programs. And be sure to nominate your institution for the 2020 Student Chapter Awards.

Sonia Kovalevsky Days: The Potential to Inspire

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Sonia Kovalevsky overcame adversity to become the first woman to receive a PhD in mathematics and has since become a role model for young women interested in math and science. AWM members have organized Sonia Kovalevsky (SK) Days at colleges and universities throughout the country for almost three decades; the days typically consist of a program of workshops, talks, and problem solving sessions designed for students aged 7–17. The activities of the SK Days are intended to encourage young women to continue their studies in mathematics and to help them learn about educational possibilities.

With some guidance, organizing these events can be done very smoothly, and the whole experience can be extremely rewarding not only for the students, but also for the organizers and volunteer helpers. Indeed, witnessing the enthusiasm of the students for learning new mathematics is priceless. In what follows we would like to give some advice on how to make these events successful and encourage colleagues to host similar series of events at their institutions.

Most of what we will explain here is based on our experience running the SK Days at the University of Illinois

at Chicago. A website for the Sonia Kovalevsky Days at UIC, which we have run annually since 2015, is hosted at: <http://schapos.people.uic.edu/Sonia.html>. The site includes an educational paper containing material for running different outreach events for young students. We ourselves learned a lot about how to run successful events from Michelle Delcourt and her volunteers during our time together at UIUC.

The structure of the day. After a short registration period during which parents sign any relevant forms, our events begin with one of the volunteers giving an introduction to the AWM for the students and accompanying parents and teachers, and a brief presentation on the life and achievements of Sonia Kovalevsky. The presentation focuses in particular on highlighting the remarkable obstacles that Kovalevsky was able to overcome during her life. The students are then presented with some icebreaker activities which allow them to learn each other's names and to get comfortable in the setting.

After the introduction, participants are separated into groups to do the activities of the day in smaller classrooms—experience has shown that groups of about 12–15 people are best, with one volunteer for every 5 or 6 students. Hence, depending on the number of girls registered, one can have 1, 2 or 3 parallel sessions.



After a few years of modifying the schedule, it seems that sessions of 45 minutes work best, with 5 to 10 minutes breaks in between, and an hour lunch break (typically pizza!). We've usually run the program on Saturdays from 10:30 a.m. to 3 p.m., to accommodate families coming from outer Chicago; in a smaller city, the program could be longer.

Before the event. There are five main tasks to take care of before the event, which can be done as little as a month in advance. In order of priority these are:

I. Set the date and book rooms.

The most successful days will be Saturdays that don't coincide with holidays or school activities. Contacting a few

parents beforehand to check school calendars has proved to be the most efficient way of choosing the date—once this is done the rooms for the event should be booked. At UIC, we have run these events in May and November.

II. Find volunteers.

It is useful to start looking for volunteers early (sometimes, if volunteers appear first, their schedule can be taken into account when setting the date). This is a great activity for AWM student chapter members. The easiest approach is to reach out to the student chapter and to graduate and undergraduate communities within the mathematics and physics departments—at UIC, we make an effort to include both departments.

The majority of volunteers are usually female students. We try to maximize the opportunities for the young girls to find role models amongst the volunteers, so we prioritize women for the teaching tasks. We also welcome participation by non-female students, but it should be noted that too many volunteers can make the participants shy and the classes less interactive. We have found that two or three volunteers per room is ideal. Finally, universities typically require background checks for anyone working with minors, and the details for those planning to be present during the event must be given to the department officers several weeks in advance.

III. Advertise the event.

A theme for the SK Day should be chosen after setting the date for the event, in order to begin advertising. For this, a poster should be made, as well as a website with the relevant information including date, place, schedule, parking directions, poster, and sign up form (e.g., Google form). Emails to departmental members asking to promote the event have always been very helpful, and contacting the school district offices for them to send an announcement to all schools in the area appears to be the best way to reach a wide range of participants.

IV. Secure funding.

An SK Day can be held with very little funding, most of it being needed for providing lunch—pizzas delivered to the event can make life easier, leading to about \$8 a person. If more funding were available (e.g., through an NSF grant, start-up funds, or the department's outreach program), it could be dedicated to purchasing breakfast treats, pens, small notebooks and stickers with a small poster for the cover. Moreover, giving girls T-shirts with the logo of the SK Day has made participants very happy and allows

volunteers to be recognized. These extra things can add \$10 per participant/volunteer.

V. Prepare materials.

Organizing the SK Day becomes much easier if as much as possible is done some weeks in advance, and this includes taking care of:

- Choice of themes and preparation of notes for volunteers and students
- Event folders with notes, notebook, pens and a few printouts about the AWM and the hosting university's programs
- Leaving survey for students
- Background checks
- Image release forms for parents
- Posters and flyers
- T-shirts for event
- Arrival sign up list of students
- Lunch time entertainment volunteer
- Room and building booking/arrangements

The themes. The SK days are organized with one overall theme and three related lectures. Over the years we have found that mixing mathematics with real life problems or geometric ideas is a great way to get students interested. We have now run the following themes:

- Games on Surfaces:
 - (1) Billiards
 - (2) Non-orientable Surfaces
 - (3) Sphere Packing
- Games of Chance:
 - (1) Non-transitive Dice
 - (2) Sums of Dice
 - (3) The Monty Hall Problem
- Knots and Graphs:
 - (1) Graph Colouring
 - (2) Mathematical Knots
 - (3) Bridges of Königsberg
- Mathematics in the Sea:
 - (1) Seaweed Tangles
 - (2) Fractal Coastlines
 - (3) Geometry of Seashells
- Mathematics and Magic:
 - (1) Flexagons
 - (2) Card Tricks
 - (3) Magic Squares

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Each of these themes should be prepared with a set of notes that include overall goals for the hour, additional bibliography on the subject, and a list of 5–10 problems of different difficulties for the students, particularly to account for the age range. Material for the above subjects and the manner by which it was presented to students and volunteers can be seen at <https://schapos.people.uic.edu/Outreach.html>, and a summary of this year's "Mathematics in the Sea" theme will appear in the next issue of this newsletter.

For some of the classes we gave the students some objects they could take home with them—e.g., for learning about knots and dice we gave them ropes and non-standard dice (made by us). Once the notes for the chosen themes are prepared, it is useful to have an organizational meeting with the volunteers prior to the event.

During the Event. When the SK day arrives, it is useful to have the volunteers come an hour earlier to help set up the main room: displaying the sign-up sheet (attendance is usually 50%-70% of those who filled out the Google form), the photo release forms to be signed by parents, the T-shirts and the activity folders. The main room is used for the presentation on Sonia Kovalevsky's life, the ice breaker, the lunch break and final participants' pick up.

During the whole day it is useful for the main organizers to go around the different rooms, taking photos, helping encourage the girls to interact with each other, and

making sure the schedule is being followed and to get lunch set up. At lunch time, someone entertaining the participants can be a highlight—at UIC we have had Lou Kauffman and his students do magic tricks. At the end of the day, the participants are asked to complete a short anonymous questionnaire about their experiences of the event (an example is given at the website), to identify any highlights or weaknesses that might be improved in future events. These surveys are then used to make an Event Report.

Concluding remarks. The participants have been universally happy with the event, with 100% positive replies on all aspects of the program every year. Moreover, they have always given a strong indication that they would return to future events and encourage others to participate. Moreover, by mixing volunteers from mathematics and physics, many new friendships have been made. To thank the volunteers, we usually take them for lunch some weeks after the event, to hear about their thoughts on the event and give any career advice they may need.

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NSF-AWM Travel Grants for Women

Mathematics Travel Grants. The objective of the NSF-AWM Travel Grants is to enable women mathematicians to attend conferences in their fields, which provides them a valuable opportunity to advance their research activities and their visibility in the research community. Having more women attend such meetings also increases the size of the pool from which speakers at subsequent meetings may be drawn and thus addresses the persistent problem of the absence of women speakers at some research conferences. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization.

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. A maximum of \$2300 for domestic travel and of \$3500 for foreign travel will be funded. For foreign travel, US air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility and Applications. Please see the website (<https://awm-math.org/awm-grants/travel-grants/>) for details on eligibility and do not hesitate to contact Steven Ferrucci at 401-455-4042 for guidance.

Deadlines. There are three award periods per year. Applications are due **February 1, May 15, and October 1**.