The BIG SIGMAA News

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Business, Industry, and Government Special Interest Group of the Mathematical Association of America

Tondeur Grants Support BIG Activities at MAA Section Meetings

by Greg Coxson

MAA section meetings offer opportunities for students and faculty in the section to meet and enjoy talks and discussions about mathematics. Still, have you considered that there may be others that could provide an extra, beneficial, dimension to section meetings—the local businesses, government and industrial organizations that will someday employ numerous mathematics majors?

Thanks to the generosity of Philippe and Claire-Lise Tondeur, MAA sections can access a new source of funding for hosting BIG activities at section meetings. The Tondeurs' 2018 gifts to the AMS, SIAM, and MAA are intended to support mathematicians based in the United States who are interested in careers outside academia. The gifts continue a long record of support by Philippe Tondeur for the mathematics community, most famously as Director of the Mathematical Sciences Division at NSF from 1999 to 2002.

Tondeur seed funding aims to kickstart and enhance ongoing inclusion of BIG inclusion of BIG career events at section meetings. Efforts are being coordinated with SIAM and AMS activities and two online resources: the new MAA Connect online platform and the BIG Math Network. Each MAA section can access up to $2,000 in support for BIG activities at a section meeting, as long as it is done in this term or one of the following three semesters. Successful proposals will be eligible for up to $2,000, with $1,000 in advance of the meeting to support preparations and travel for speakers. The remaining $1,999 will be provided to the section once it reports on the activities.

The Tondeur grant program asks sections to propose at least three new or enhanced BIG activities at their section meetings. For example, these might include the following activities:

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The Puzzle Corner

At a movie theater, the manager announces that a free ticket will be given to the first person in line whose birthday is the same as someone in line who has already bought a ticket. You have the option of getting in line at any time. Assuming that you don't know anyone else's birthday, and that birthdays are uniformly distributed throughout a 365-day year, what position in line gives you the best chance of getting a free ticket? *(Solution on page 5.)*

Adele Goldstine

2020 marks the 100th anniversary of the birth of Adele Katz Goldstine, an American mathematician and computer programmer. She wrote the manual for the first electronic digital computer, ENIAC. Through her work programming the computer, she was also an instrumental player in converting the ENIAC from a computer that needed to be reprogrammed each time it was used to one that was able to perform a set of stored instructions.

Goldstine was born Adele Katz in New York City on December 21, 1920, to Yiddish-speaking parents. Her father had emigrated from Pandelys, Lithuania (then the Russian Empire) in 1902. She attended Hunter College High School and then attended Hunter College. After receiving her B.A. from Hunter, she attended the University of Michigan, where she earned a master's degree in mathematics. At Michigan she met Herman Goldstine, the military liaison and administrator for the construction of the ENIAC; the two were married in 1941.

For a time, Goldstine was an instructor of mathematics at the University of Pennsylvania's Moore School of Electrical Engineering, where she trained the women "computers" who were critical to the war effort. Women were regarded as capable of doing the work of computers more rapidly and accurately then men. By 1943, and for the balance of World War II, essentially all computers were women as were many of their direct supervisors.

While at Moore, Goldstine also trained some of the six women who were the original programmers of ENIAC to manually calculate ballistic trajectories. Goldstine wrote the Operators Manual for the ENIAC after the six women trained themselves to "program" the ENIAC using its logical and electrical block diagrams. Reconfiguring the machine to solve a different problem involved physically plugging and unplugging wires on the machine; it was called "setting-up", as the modern terminology of "programming" had not yet come into use.

In 1946 Goldstine sat in on programming sessions with Jean Bartik (one of the six original programmers) and Dick Clippinger and was hired to help implement Clippinger's stored program modification to the ENIAC. John von Neumann was a consultant on the selection of the instruction set implemented. This solved the problem of the programmers having to unplug and re-plug patch cables for every program the machine was to run; instead the program was entered on the three function tables, which had previously been used only for storage of a trajectory's drag function.

After the war, Goldstine continued her programming work with von Neumann at Los Alamos National Laboratory, where she devised problems for ENIAC to process. She and her husband had two children, born in 1952 and 1959. She was diagnosed with cancer in 1962 and died two years later, at the age of 43.

After six years as chair of the BIG SIGMAA, Allen Butler stepped down from the role after the Joint Meetings in Denver last January. Robert Burks also stepped down as Vice Chair for Programs after two years of service. Each was presented with a plaque in appreciation of their service. Rob wasn't there to receive his plaque in person, but Allen was.

Call for Nominations

In the Fall, BIG SIGMAA will be seeking nominations for two officer positions, Vice-Chair for Membership and Vice-Chair for Services. In particular, the Services position will be an open position as the incumbent is not running for re-election. The term of service for each position is two years, and officers must be current members of the MAA and BIG SIGMAA. Additional minimum requirements for the positions include the following: (1) Be able to attend and participate in the annual BIG SIGMAA Business Meeting. After this January, the BIG SIGMAA Business Meetings will be held at MathFest each summer. (2) Be able to participate in planning BIG SIGMAA events via email correspondence throughout the year. Particular responsibilities for each position can be found at http://sigmaa.maa.org/big/Charter.html. Please consider nominating yourself or someone else when the call for nominations goes out in the Fall.

Previous issues of the Newsletter have included fibs that were written for the Newsletter. Here is a poem by Brian Bilston; it starts out as a fib but goes a bit wild at the end. But the rhyme scheme introduced in the fourth line makes it worthwhile.

I
wrote
a poem
on a page
but then each line grew
to the word sum of the previous two
until I started to worry at all these words coming with such frequency
because, as you can see, it can be easy to run out of space when a poem gets all Fibonacci sequency.

Tondeur Grants

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- Inviting a BIG speaker to talk about mathematics at their workplace.
- Organizing a career panel.
- Inviting a former PIC Math faculty participant to share their experience of building a course with an industry component.
- Offering a resume review service.
- Inviting a local BIG organization to host a table at the meeting, where students can ask about the hiring process and about work at the organization.
- Hosting a BIG-focused contributed paper session.

Although the proposal deadline for the Fall 2020 term has expired, it is not too early to start planning for the Spring 2021 and Fall 2021 terms. The proposal deadline for the Spring 2021 term is October 1, 2020. Proposals should be e-mailed to communities@maa.org, and should include the following information:

- Meeting information
  - Name of section
  - Location and date of the section meeting where the activities will occur
- Organizer information
  - Name of primary organizer and MAA point of contact
  - E-mail address of the primary organizer
  - Name and e-mail address of at least one other co-organizer
- Career Activity Plan
  - Kinds of BIG career activities (if any) the section has offered in the past
  - List of up to three BIG career activities to be implemented at the meeting, along with the budget for each activity
  - Additional BIG career activities to be implemented at the meeting, along with the budget for those activities
- Reporting plan
  - Feedback to be collected from participants
  - Draft of survey questions to be posed after the conference
  - Plan for counting participation
- Budget
  - Itemized budget
  - Advance funding request and justification
  - Total budget

After the meeting, a report will be required, and will need to be sent to communities@maa.org. The deadline for the Spring 2021 report is July 1, 2021 and a Fall 2021 report will be due by December 15, 2021. Reports should include some summary statements such as, for each activity, an estimate of the number of participants and assessment of how the activity went and plans with respect to each activity. They might also include recommendations for other activities. Recommendations will be collected and shared with other sections.

BIG activities at section meetings will have payoffs beyond the Tondeur funding. For the BIG organizations that participate, there will be a new awareness of the bright problem solvers in the section. For students, there will be new options, improved skills for job seeking, and increased awareness of career opportunities. In addition, sections that include BIG activities in a section meeting will have provided a richer set of activities and experiences to their students and faculty.

When Philippe Tondeur ended his tenure at the NSF in July 2002, he noted in an interview with Allyn Jackson in the AMS Notices that "improvement in support happens because the [mathematics] community … is reaching out and doing wonderful things". The Tondeurs have given the MAA and BIG a great gift; now it is our turn to make the most of it.

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The Puzzle Corner solution

The probability of getting a free ticket if you are the *n*th person in line is

$$\begin{aligned} p(n) &= (\text{probability that none of the first } n-1 \text{ people share a birthday}) \times \\ &\quad (\text{probability that you share a birthday with one of the first } n-1 \text{ people}) \\ &= \left(1 \cdot \frac{364}{365} \cdot \frac{363}{365} \cdot \ldots \cdot \frac{365-(n-2)}{365}\right) \cdot \left(\frac{n-1}{365}\right), \end{aligned}$$

where we assume $n \le 365$. We need to find the smallest value of *n* for which $p(n) > p(n+1)$, or

$$\frac{p(n)}{p(n+1)} > 1. \qquad (*)$$

Since

$$\frac{p(n)}{p(n+1)} = \frac{\left(1 \cdot \frac{364}{365} \cdot \ldots \cdot \frac{365-(n-2)}{365}\right) \cdot \left(\frac{n-1}{365}\right)}{\left(1 \cdot \frac{364}{365} \cdot \ldots \cdot \frac{365-(n-2)}{365} \cdot \frac{365-(n-1)}{365}\right) \cdot \left(\frac{n}{365}\right)}$$

$$= \frac{\frac{n-1}{365}}{\frac{365-(n-1)}{365} \cdot \frac{n}{365}} = \frac{365(n-1)}{n(366-n)},$$

it follows that (*) is equivalent to $365(n-1) > n(366-n)$ or $n^2 - n - 365 > 0$.

From the quadratic formula we have

$$n > \frac{1+\sqrt{1+4 \cdot 365}}{2} = \frac{1+\sqrt{1461}}{2} \approx 19.6.$$

Thus $n = 20$. Your best chance of getting a free ticket is to be the 20th person in line.