

Pi Mu Epsilon Student Presentations and Mathfest

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1. History

Pi Mu Epsilon (PME) is the original national honorary mathematics society for college and university students. Although PME was established in 1914, it didn't sponsor student paper sessions at the summer national meetings until the joint MAA/AMS meeting at Michigan State University in 1952. J. Sutherland Frame was just beginning his tenure as a councilor of PME and he was also on the faculty at Michigan State. In that first year, there were six PME student presentations. There were no PME summer meetings in 1953 or 1954, but there were eight student presentations when the national summer meetings were held at the University of Michigan in 1955. Again, in 1956, there was no national PME summer meeting but in 1957, when the meeting was held at Pennsylvania State University, there were five student presentations.

The next student sessions were at Michigan State University in 1960 (eight presentations) and Oklahoma State University in 1961 (4 presentations). In 1962 the MAA/AMS summer meeting was in Canada, so there was no PME national meeting. Starting with the Boulder meeting in 1963, (9 student presentations), there has been a PME student session at every year's summer meeting, except for 1974. For a more detailed account of PME's first seventy-five years and a listing of all PME student presentations up to 1988, please see the article by J. Sutherland Frame in the spring 1989 issue of the Pi Mu Epsilon Journal.

The PME summer meetings were held in conjunction with the summer joint meetings of the AMS and MAA through 1991. In 1992, because of the joint meetings being held with ICME in Quebec, Canada, PME held a joint meeting with the MAA Student Sections at Miami University, in Ohio. Starting again in 1993, PME held its summer meetings with the AMS and the MAA. Since 1997, the AMS has not held summer national meetings and the PME summer meeting has been meeting with the MAA as part of Mathfest.

2. Growth

The number of student presentations at summer meetings has shown a pattern of growth. Although the numbers might go up or down in any particular year - primarily, perhaps, due to the location of the summer meetings - the trend has been

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upward. The average number of student presentations from 1952 through 1969 was 7.9 per year. From 1970 through 1979 the average was 15.3. During the 1980's, the average was 25.1; during the 1990's the average was 32.8. Since 2000, the average has been 36.4.

The reasons for the growth are many. The financial support from the NSA and the prize money given by the AMS have certainly been factors. In fact, the largest number of talks in a single year was 46 in 1989, the year that the AMS and the NSA began their support. 1989, however, was also the diamond jubilee year for PME, and the large number of papers might have been a result of the increased publicity.

The watershed year appears to have been 1985. The number of speakers in 1984 was 13; the number jumped to 34 in 1985. The largest number before 1985 was 22; the smallest number after 1985 was 22. No one event in 1985 would explain the large increase in student presentations. At about that time, however, more chapters started taking advantage of the fact that PME would support (at some level) more than one speaker from the same chapter. The number of chapters sending multiple speakers has been increasing over time.

The presence of the NSF REUs has certainly been a factor in maintaining and increasing the number of student presentations. Quantifying this effect, however, is difficult. Although students who present the results of their REUs give proper credit to the NSF and their REU advisors, there are no records kept about which talks are REU-based and which are not. It is reasonable to assume that the increase of a bit more than ten presentations per year that has occurred since the inception of the REU program in 1987 can be attributed to this program.

The MAA Student Chapter program was initially seen as a problem for PME. There was a feeling that there would be competition between the two groups for the same student speakers. That has not turned out to be true. The Student Chapter program has provided opportunities for students from schools without PME chapters. Additionally, some schools are able to send speakers to both the PME and the MAA student session, providing funding for more PME students. (Note that no student can receive travel support from both PME and the MAA for the same meeting.) The presence of the MAA student speakers has also increased the total student visibility at the summer meetings, making the meetings more comfortable for all students in attendance. The MAA Student Paper sessions have also been especially effective in providing a venue for presentations based on REUs.

3. Prizes and Judging

In 1989 the AMS gave Pi Mu Epsilon a grant of \$1000 to use for prizes for outstanding student presentations at Mathfest. Each year, about seven prizes of \$150 each have been awarded to student speakers. Student presentations are judged on various criteria, including: whether the level of topic is appropriate for the audience; quality of research (for research presentations) or interest of subject (in the case of expository talks); appropriate use of media; and ability to answer questions. One overriding criterion is the delivery of the material. Student presentations are judged on the effectiveness in communicating the mathematics to the audience.

A panel of three judges each student presentation. The judges are current or former Pi Mu Epsilon councilors or other mathematicians with ties to the organization. Since there are parallel sessions and no one judge can attend all of them, each

judge assigns a score to the presentations that he or she attends. At the conclusion of all of the student presentation sessions, the judges' scores are tallied and award decisions made.

Since 2003 CUR (the Council on Undergraduate Research) has been awarding one prize each year for an outstanding research talk during the PME sessions. The decision on the recipient of this prize is made at the same time that the decisions on PME awards are made.

In some years, there are special prizes awarded by SIAM and by the SIGMAA on Environmental Mathematics for presentations that are applied in nature or else deal with environmental topics. The respective groups make decisions about these prizes, with the concurrence of the PME panel of judges. Each of the prizes is for \$150.

4. Funding

Ever since the first PME sessions at the summer national meetings, the organization has provided travel support for student speakers. PME currently reimburses student speakers for their transportation expenses up to a maximum of \$600 for one student speaker per chapter. There is significant additional support when there are multiple speakers from a single chapter. In 2006, over \$11,000 was given by PME to student speakers to support their transportation to Mathfest. Support for student speakers at Mathfest continues to be the single largest expenditure in Pi Mu Epsilon's annual budget.

The National Security Agency (NSA) has also supported the PME student speakers. Each year since 1989, the NSA has awarded PME a grant of \$5000 to be divided among student speakers to be used as a subsistence allowance. In recent years, PME has supplemented this grant so that each student speaker receives about \$150 to defray the costs of registration, meals, and housing at Mathfest. To help cover the costs of additional speakers and also deal with inflation, the NSA has recently agreed to increase its grant to \$7000 per year.

5. Conclusion

The stated purpose of Pi Mu Epsilon is the promotion and recognition of scholarly activity in the mathematical sciences among its student members. One way in which it has achieved this purpose is by organizing and funding its sessions for student presentations at each summer's Mathfest. The financial support of the AMS and the NSA, the research opportunities funded by REUs, and the welcoming atmosphere provided by the MAA have all contributed to the increasing success of these summer student presentation sessions.

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