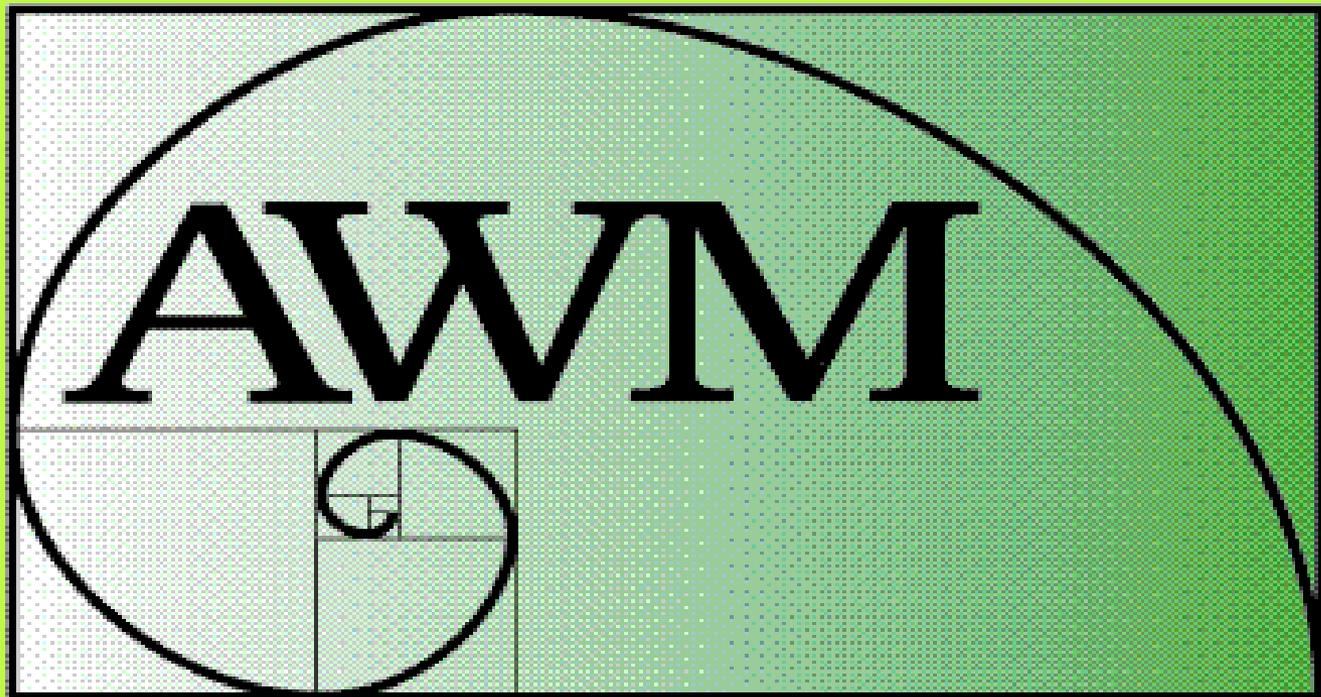


# The business case for diversity

Perspective from the Association for Women in  
Mathematics  
Maura Mast

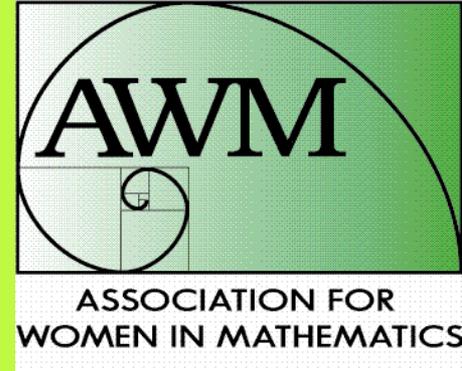
Associate Vice-Provost for Undergraduate Studies  
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**ASSOCIATION FOR  
WOMEN IN MATHEMATICS**

# History



- Founded (somewhat informally) in 1971 at the Joint Mathematics Meetings; joined with other women's mathematics groups in Boston and established an office at Wellesley College.
- Perception at that time was that the math societies were “old boys networks”.
- First official work: publishing *The Newsletter of the AWM*, a forum for discussions about the role of women in math, exposing discrimination, encouraging political action, etc.
- 1973: incorporated. 1975: became an affiliate member of the Conference Board of Mathematical Sciences.

# Early work (1970s)

- Message: “now is the time for discrimination to end”
- Used data to make the case.
- Made a strong and consistent call for:
  - Equal consideration for admission to grad school and support
  - Equal pay for equal work
  - Equal consideration in assignment of duties, for promotion, for tenure, for administrative positions
  - Equal consideration for government grants and positions in professional societies.
- Sponsored many panels, nationally and internationally: “the situation for women in math worldwide”; “history of women in mathematics”; “women mathematicians in business, industry and industry”, “black women in mathematics” among others.
- Provided testimony for congressional investigations, wrote university presidents, wrote letters to the editors protesting objectionable images of women and girls in popular media.
- Successfully lobbied the AMS and the MAA not to hold national meetings in states that had not ratified ERA.

# Some outcomes

- Women mathematicians found courage and support to speak out publicly, file complaints, ask questions.
- Addressed the perception that “women were getting all the jobs” due to affirmative action; displayed data to dispute this.
- Kept returning to the important message: women could be perfectly good, even great, mathematicians if given the opportunity.



## Now: AWM takes a multi-faceted approach to supporting women in mathematics at all stages through these programs

- For middle and high school girls:
  - Sonia Kovalevsky High School Mathematics Days
  - Essay contest to write biographies of contemporary women mathematicians
  - Mentor network
- For undergraduate students
  - Essay contest
  - AWM student chapters
  - Mentor network
  - Alice T. Schafer Prize awarded annually to an undergraduate woman for excellence in mathematics
- For graduate students and recent PhDs
  - Workshops at Joint Mathematics Meetings at SIAM
  - Travel grants to support research collaborations and mentoring
  - Mentor network
- For women in the profession
  - Workshops and conferences
  - Travel grants and sabbatical support
  - Several awards recognizing research, contributions to mathematics education,
- Mathematics teachers
  - Teacher partnership
  - Mentor network

# Direct advocacy

- Reaction to National Mathematical Advisory Panel, 2006
  - Objected generally to membership (requested more mathematicians and more women)
  - Raised concerns about inclusion of Dr. Camilla Benbow, a researcher who hypothesized that there are inevitable gender differences in favor of males at the highest levels of math performance.
  - Publicized disappointment in this choice; organized a petition to President Bush and Secretary Spellings
- Reaction to remarks by then Harvard president Lawrence Summers on the underrepresentation of women in mathematics and science
  - Publicized responses to this, including panels and newspaper articles

# Arguments that AWM makes in favor of diversity

- Diversity of any type (mathematical, geographical, racial, etc) can be one of many useful aspects to consider when organizing a conference and choosing speakers. Through a wide pool, there are greater opportunities to choose good people (including some who may otherwise be overlooked); the result is a high quality conference, with a high quality group of speakers.
- We are scientists and we are trained to look for bias, intentional or hidden. As such, we need to be aware of bias in our own actions and in the structures in which we work. Examples:
  - Teaching evaluations
  - Refereeing
  - Letters of recommendation
  - Women prejudiced against women
  - Institutional structures: parental leave, flexibly schedules, chilly climate, little mentoring, career path that “discriminates against women and minorities” (Shirley Tilghman), and yes, even overt discrimination (1999 MIT study)

# Present data

- Examples:
  - In many instances, women are not represented at a level consistent with their participation in applied math
  - Women are rarely society officers or major lecturers.
  - When we can identify conferences in which all of the invited speakers are male, the AWM President sends a letter to the conference organizers informing them of the benefits of diversity on program committees and speaker lists, and giving suggestions for how to accomplish this.

Other work: Participate in conferences about the role of women in the field and disseminate the outcomes.

Example: BIRS report (2006)

Call to action:

*The vitality of the scientific enterprise and the prosperity of the North American countries depend on the broad development of the mathematical sciences and no full access to that development by all members of society.*

And yet, the proportion of women in academic mathematical sciences declines at every successive professional level... women continue to experience a broad range of obstacles to their professional development, career growth and job satisfaction.

On the web at <http://www.math.ohio-state.edu/~bkeyfitz/Papers/BIRS-women.pdf>

# Goals of the report

- Review existing research and data regarding situation for women in math
- Identify policies and practices that have worked: *good management practices*
- Develop recommendations based on these practices
- Encourage action by the professional societies, by mathematical institutes, funding bodies, university administrations, math department and department chairs
- Disseminate findings broadly

# One of the main arguments for diversity

- Action is needed because there is a *demand for an increase* in mathematical capacity, in all countries and at all levels. There is a need for mathematicians, for mathematics teachers, for researchers and practicing scientists who are comfortable with mathematical tools. Women are needed for this growth to occur, especially in North America.

# Why this report is effective

- Written by mathematicians and addresses the culture that is unique to mathematics; acknowledges that the systemic barriers in the advancement of women in mathematics is difficult and subtle.
- Knows that culture well enough to know that many mathematicians are inherently suspicious of studies concerning hidden bias that are not specific to mathematicians and the mathematics department.



# Calls for action

- Reexamine recruitment, hiring and retention practices.
- Encourage departments to monitor and improve their culture. In particular, make expectations, evaluation and feedback processes transparent; allocate resources, opportunities and responsibilities equitably; be proactively aware of bias and climate issues.
- Take advantage of the *flexible* nature of mathematics work and find mechanisms which encourage personal/professional life balance.

# What have the professional societies in the mathematical sciences done?

- Mathematical Association of America
  - Runs SUMMA program (strengthening under-representated minority mathematics achievement) to increase representation of minorities in fields of mathematics, science and engineering; improve mathematics education of minorities
  - National Research Experience for Undergraduates Program: designed to reach minority undergraduate students at a critical point in their career
  - Women and Mathematics Network: outreach and advocacy programs in math for women and girls
  - Tensor grants: monetary support to organize programs to encourage women and girls (middle school through college) to study mathematics
  - Women Count Conference: a conference for directors of math outreach programs for young women

- American Mathematical Society
  - Publishes data about participation of women
  - Makes an award to mathematics programs that are focused on increasing participation of underrepresented minorities in the math pipeline.
  - Works with AWM on joint prizes, workshops at Joint Mathematics Meetings
- SIAM
  - Joint prize with AWM, workshops at meetings
  - Diversity advisory committee: addresses policy issues regarding underrepresented groups; supports Diversity Day Program at SIAM Annual meetings
- Seven societies support the Joint Committee for Women in the Mathematical Sciences. The charge of the committee is:  
*To identify mechanisms for the enhancement of opportunities for women in the mathematical and statistical sciences, recommend actions to the governing bodies of the member societies in support of these opportunities, and document its recommendations by presenting data.*

# Summary: arguments and strategies

- Diversity is needed because there is too much to do – and there is too much that needs to be done well.
- Diversity can result in a vital and productive faculty.
- It's a social justice/equity issue (but people who get this argument are usually already committed to diversity).
- Why should you care about diversity? Look around – other societies, universities, departments care about it and are acting on it. That doesn't excuse you but it means that you may miss out, that you may not look good
- Appeal to the scientific mindset: are there biases (in assessment, in references, in other “scientific” data) that may be influencing your decisions? As a good scientist, you need to be aware of these and account for them. And are you perpetuating any of these?
- Do you need help, information, resources? This is readily available: contact women's organizations, look at what other societies and conferences have done, etc.