

EXECUTIVE SUMMARY

The National Conference for Women in the Science, Technology, Engineering, and Mathematics (STEM) Disciplines held at Smith College in June 2005 was organized by the Association for Women in Science (AWIS) to

- Assess the progress made on the seven recommendations of the 1995 National Science Foundation (NSF) Conference “Women & Science: Celebrating Achievements, Charting Challenges,” a joint effort of the seven directorates of NSF (see box below).
- Present and discuss current data on the status of women in science and engineering.
- Select the most important remaining barriers to the success of women in their STEM careers.
- Make specific recommendations for a research agenda for the next decade.

Seven recommendations issued by the 1995 NSF Conference

(National Science Foundation, 1997)

1. Communicate with women and girls about the importance of being scientifically literate. Increase public understanding of the role that women do and can play in science and engineering while dispelling myths and stereotypes.
2. Rather than relying on quick fixes to local problems, seek to transform the systems of education and the sciences by holding institutions accountable for their performance as employers and places of learning for all people.
3. Recognize and reinforce the importance of mentoring and being mentored at all levels of education and career.
4. Enable women and girls to participate fully in science and engineering by making available a greater variety of resources. These resources include career awareness and career planning assistance and opportunities to interact within and across disciplinary fields and sectors of the economy.
5. Accommodate the needs of women by recognizing a diversity of approaches to learning and the multiple paths women take to becoming literate citizens and career professionals in science and engineering.
6. Strengthen connections between organizations that have a stake in the participation of women in the sciences and engineering, such as the corporate and academic worlds, the formal and informal education sectors, associations of women and associations of sciences, and between higher education and K-12 schools.
7. Place greater emphasis on determining what works best in increasing opportunities for women and girls and how this knowledge can be shared and used by others.

Attending the conference were 150 STEM discipline professionals including academic and government administrators, faculty, corporate managers, and nonprofit leaders. Invited speakers from academia and from the nonprofit and corporate worlds reported on completed research projects that address issues affecting women at various career stages in the STEM disciplines and on the identification of policies and practices that encourage and support women in these technical careers.

Smith College President Carol T. Christ and AWIS President Elizabeth S. Ivey opened the conference by welcoming the participants. Following their remarks, Shirley A. Jackson, President of the Rensselaer Polytechnic Institute, addressed the audience in her keynote speech “Women and Science: The Talent Imperative,” in which she discussed the crisis looming over the American innovation enterprise and described some initiatives that can help remediate this situation, including programs based on the Building Engineering and Science Talent (BEST) initiative. Jackson emphasized the need for a change in the culture of science in all institutional settings and at all levels, including family-friendly policies and mentoring.

In the course of her plenary session speech “How Do We Achieve Systemic Institutional Change?” Rita R. Colwell, Distinguished University Professor at the University of Maryland and former director of NSF, focused on the changing research environment. Drawing on her own career experiences, she noted that science now involves international networking, multidisciplinary collaboration, and integration of science and technology. She presented current data on the situation of women in science and stated that girls, especially, must be encouraged to study mathematics and science. Lastly, Colwell emphasized the need to change the framework within which science is performed.

The conference continued with a STEM panel of corporate, foundation, and academic leaders’ presentation and discussion moderated by Thomas Litwin, Director of the Smith College Clark Science Center. Margaret E. Ashida, Director of University Talent Programs at International Business Machines Corporation (IBM), delivered her presentation entitled “Developing the Diverse Talent Needed to Drive Innovation and Growth.” Ashida noted that industry needs individuals who can be characterized as diverse, global, adaptive, collaborative, and expert in more than one discipline. Noting the forces that marginalize women in the workplace, she discussed some of the successful initiatives implemented by IBM to increase workplace diversity and improve outreach to young women in educational institutions.

Liane Pedersen-Gallegos, Director of Ethnography and Evaluation Research at the University of Colorado, shared with the audience the work on “Research Associates Career Paths” funded by an NSF-ADVANCE institutional transformation grant awarded to the University. The investigators identified factors that contribute to the departure of women from the tenure-track pipeline, and described the reasons and perceptions that underlie the choice of nontenure track positions at that institution.

Marianne Hudson, Director of Entrepreneurship at the Ewing Marion Kauffman Foundation, spoke on “Entrepreneurship: A Career Option for Women in Science.” She emphasized the positive aspects of entrepreneurship, including autonomy, time flexibility, and increased economic power. But she also noted key challenges that remain, such as access to networks, capital, credit, and markets. Finally, Hudson discussed the Kauffman Foundation’s support for the establishment of businesses as career options for women in the STEM disciplines.

AWIS President Elizabeth S. Ivey, who is also Provost Emerita at the University of Hartford, concluded the panel presentations. In her remarks on “NSF ADVANCE Grants as Institutional Change Agents,” Ivey summarized the goals and the activities of the ADVANCE program of the National Science Foundation. Grants under this program intend to increase the representation and advancement of women in academic science and engineering careers and promote institutional transformation to better support female students and faculty.

After the panel presentations, conference participants separated into eight break-out sessions to discuss in detail specific issues in corporate and academic workplaces. Among the topics discussed were the persistence of barriers to women’s career advancement and the identification of policies and actions that could improve the situation for women and other underrepresented groups. Representatives from each of the break-out sessions shared the results of their group’s deliberations at the Conference’s wrap-up session. Summaries of the discussions undertaken by participants at the academic/corporate, academic, and corporate workplace groups and a list of the action items resulting from these deliberations appear elsewhere in this report.

This report offers a window on the progress made toward the seven NSF Conference recommendations (see box), and points to the tasks ahead in removing the inequities that persist in the treatment of women scientists and engineers both in academic and corporate workplaces.

Concerted action through creative, innovative development and application of best practices at all points along the pipeline will effect change in the number and standing of women in the STEM disciplines. Implementation of these initiatives could lead to the realization of women and minorities’ full potential and help fulfill the national need for skilled scientists and engineers. ❖