Materials Community Examines Gender Equity

Nearly 100 members of the materials science and engineering community from across the United States met May 18–20, 2008 at the University of Maryland, College Park, six miles from Washington, DC. Academic department heads, national laboratory researchers, and federal agency representatives attended the workshop on "Gender Equity in Materials Science & Engineering." They convened to learn what unconscious biases are and to discuss how biases and institutional systems affect the representation of genders in the field. The University Materials Council hosted the event, sponsored by the Engineering Directorate and the Materials Research Division in the Math and Physical Sciences Directorate at the National Science Foundation (NSF), the Materials Sciences and Engineering Division in the Office of Basic Energy Sciences at the U.S. Department of Energy (DOE), and the Department of Materials Science and Engineering at the University of Illinois. The workshop followed similar intensive, community-driven workshops on gender equity in chemistry in January 2006 and in physics in May 2007.

"With each step up the academic ladder, from high school on through full professorships, the representation of women in science and engineering drops substantially," according to the 2007 report *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering* by the National Academies of Science; "It is not lack of talent, but unintentional biases and outmoded institutional structures that are hindering the access and advancement of women."

The workshop investigated issues discussed by the report in the context of the materials community. Dawn A. Bonnell, Trustee Professor of Materials Science and Engineering at the University of Pennsylvania, reported that while 28% of bachelor's degrees and 26% of PhD degrees in materials science and engineering are awarded to women, only 13% of tenure and tenure-track faculty in the field are women—a disparity that is of particular concern (also see Figure 1). Institutional needs for a workforce with a "diversity of opinion in decision making makes organizations more effective," Bonnell said. She also cited a moral imperative to pursue gender equitable environments "to support the right of women to reach toward their goals."

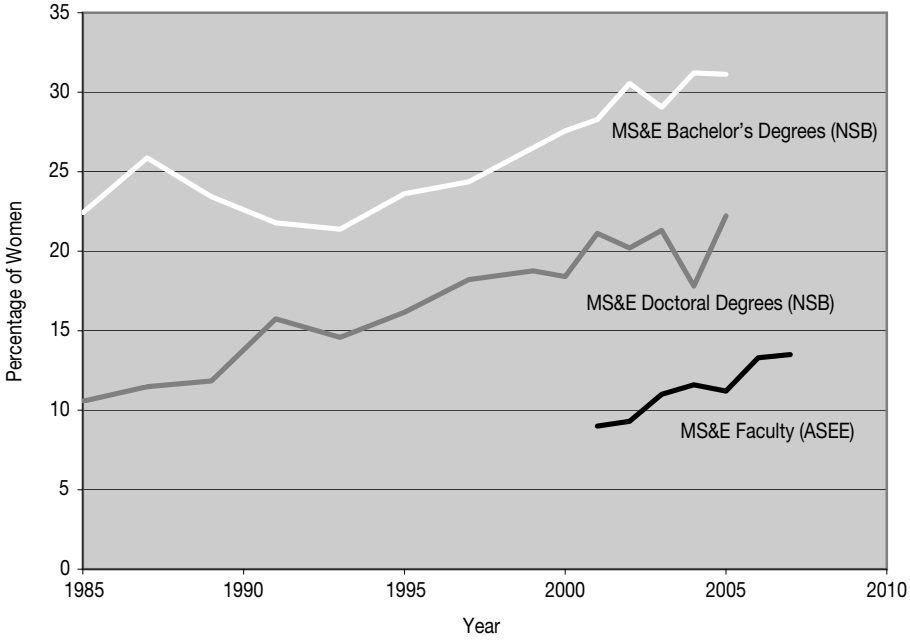

Figure 1. The percentage of women earning doctoral degrees in materials science and engineering (MS&E) was lower than the percentage of women earning bachelor's degrees during 1985–2005. Percentages are calculated from the number of degrees granted in materials as reported by the National Science Board (NSB) *Science and Engineering Indicators 2008*. The percentage of women faculty was provided by the American Society for Engineering Education (ASEE).

Nariman Farvardin, provost of the University of Maryland, said there is a national competitive interest in pursuing gender equity, "As the world becomes more connected, there are serious challenges in the human capital of science and technology….We need to ask why women who are talented in mathematics and physical sciences are not attracted to science and engineering careers."

To explain barriers to gender equity, Virginia Valian, professor of psychology at Hunter College and author of *Why So Slow? The Advancement of Women* (MIT Press, 1999), said that even when people operate with the best intentions, men and women to the same degree slightly overrate men's contributions and underrate women's contributions in professional settings. When this happens in situations from faculty meetings to letters of recommendation, women accumulate advantage more slowly than men. While a person's instinct may be to create gender equality by trying to change assumptions about gender, Valian said it is more effective to try to change organizational procedures.

Speakers suggested specific actions to take to pursue gender equity in academic departments. Bonnell said that effective mentoring of tenure-track faculty, a transparent promotion process, and attention to leadership activities help support faculty on the local level. She cited the need for public accountability of strategic plans and leadership in senior administration. Susan L. Carlson talked about institutional transformation at her institution, Iowa State University, where she is Associate Provost for Faculty Advancement and Diversity.

Resources on Gender Equity

Workshop on "Gender Equity in Materials Science & Engineering"—Suggested Reading List:

http://www.mse.uiuc.edu/gender/reading.htm

Tests about perception and unconscious bias:
http://implicit.harvard.edu

Beyond Bias & Barriers: Fulfilling the Potential of Women in Academic Science and Engineering:
http://www.nap.edu/catalog.php?record_id=11741#toc

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Carlson said that the power of local data about each university's faculty and students "makes solutions much more tangible." The university holds a grant from the NSF ADVANCE program, which provides a range of funding to increase the representation and advancement of women in science and engineering.

To address situations where a researcher's personal and professional responsibilities meet, the workshop also investigated workforce policies in academic departments. How family-friendly policies are "communicated and perceived by people who are applying for jobs," is part of ensuring a culture for balanced work and family, said Catherine Didion of the National Academy of Engineering. Break-out groups reported the need for policies that allow researchers to care for children, themselves, and elderly family members and to take time off for paternity and maternity leave. Groups reported the need for equal allowance in the culture for women and men to take family leave and for recruiting strategies for dual career couples.

In one session relating perspectives on work and life from industry, national laboratories, and academic departments, Amanda Petford-Long from Argonne National Laboratory described the need to "change the perception that having a life outside work is shirking [work]." Some tenured faculty discussed the perception that students and postdoctorates should receive of the tenure process, that earning tenure should be seen as a realistic and achievable process to undertake.

Workshop proceedings will be published that include speakers' presentations and the collective ideas from break-out sessions. Information will be available from the workshop Web site at www.mse.uiuc.edu/gender/.

ASHLEY PREDITH

ESF Aims to Strengthen Regenerative Medicine

The European Science Foundation (ESF) has launched a key initiative to keep Europe at the forefront of regenerative medicine. The initiative is broadly defined as the development of stem cell therapies to restore lost, damaged, or aging cells and tissues in the human body.

Stem cells are the body's master cells that have not yet been programmed to perform a specific function. Most tissues have their own supply of stem cells, and it is becoming clear that if these cells can be given the appropriate biochemical instructions, they can differentiate into new tissue. In this way, for example, stem cells could be seeded into damaged heart muscle to repair it.

Regenerative medicine has many advantages over more conventional ways of repairing or replacing damaged tissues or organs. Because the stem cells are taken from the person being treated, there are no problems with the body's immune system recognizing the cells as "foreign" and attempting to reject them, something that is still a problem with organ transplants, for example.

To help ensure that Europe retains its competitive edge in the field, the ESF has launched REMEDIC, a research networking program in regenerative medicine, in May. For the next five years a steering committee of 13 of Europe's leading specialists in regenerative medicine will organize a series of meetings and workshops to bring together experts to share ideas and develop new collaborations.

"I think this network will be very important to allow scientists in the field to share and disseminate information," said Yrjö Konttinen of Biomedicum Helsinki in Finland, who chairs the steering committee. "The network is open, so we will be in contact with many different organizations with an interest in the field. We want to meet people, establish joint collaborations with existing programs and we will also be seeking funding for new initiatives."

REMEDIC will concentrate on the potential of a particular type of cell in the body called mesenchymal stromal cells. These can be obtained from fat tissue and coaxed to differentiate into a range of cell types, including bone, cartilage, and muscle. Once the cells are in the relevant tissue, their growth and proliferation can be protected by biomaterials, which are structures implanted into the body that can guide the growth of the new tissue.

Information regarding a call for short-term and exchange visits can be accessed from the ESF Web site at www.esf.org.

REMEDIC is managed by the European Medical Research Councils (EMRC) at ESF.

China Spallation Neutron Project Passes Environmental Scrutiny

The China Spallation Neutron Source (CSNS), a cooperative project of the Chinese Academy of Sciences (CAS) and the governments of Guangdong Province and Dongguan City, has recently received the green light from a panel of environmental assessment under the auspices of the Ministry of Environmental Protection.

At the assessment meeting held on June 17 in Dongguan, project manager of CSNS Jie Wei made a report on the overall conditions of the project, and Yuanzhong Liu from Tsinghua University made a report on its environmental impact. The experts then made an on-the-spot inspection, and posed questions on such issues as concrete location of the project, its local records of earthquakes, target value of dose management, and radiation source control. They concluded that the environmental impact of the project is within the acceptable range.

As a key mega-science facility during the 11th Five-Year Plan Period (2006–2010), the 1.2 billion yuan (or USD $137 million) project was approved by the central government in 2005 and has been listed in the National Medium- and Long-Term Plan for Science and Technology Development.

According to the blueprint of the CAS-Guangdong cooperation on the project, the facility will take seven years to complete with financial support from the State. Guangdong will provide the construction site as well as matching funds for its operation and for the establishment of a national laboratory for such a research subject. □

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