



Workshop makes recommendations to increase diversity in materials science and engineering

In December last year, influential stakeholders from academia, government agencies, national laboratories, and industry convened in Arlington, Va., to address key issues in the United States related to ethnic diversity in Materials Science and Engineering (MSE). The two-day workshop, supported in part by the National Science Foundation (NSF), the Department of Energy, and the Materials Research Society (MRS) Foundation, highlighted issues that affect ethnic minority recruitment, retention, and long-term success in the field. Speakers and panelists brought their own experi-

ences to bear in discussing these topics and made recommendations to overcome the barriers ethnic minorities face.

Ian Robertson, then Director of the Division of Materials Research at NSF, provided statistics in his opening remarks that underlined the underrepresentation of ethnic minorities in the science, technology, engineering, and mathematics (STEM) fields in the United States. According to the National Center for Science and Engineering Statistics, although African Americans make up 12.2% and Latinos 16.3% of the US population, they received only 2.5% and 5.3% of MSE

degrees awarded in 2010, respectively. The US Census Bureau predicts ethnic minorities combined will comprise the majority of the population by 2042, thus underrepresentation can be expected to worsen if the fraction of minorities in MSE does not increase.

The reasons for underrepresentation in STEM fields are complex. Factors that contribute to the problem include unconscious biases, which affect hiring processes and underrepresented minority success in school and the workplace, and a lack of mentorship and role models. Students at minority-serving institutions may face particularly tough challenges. They tend to have relatively little exposure to STEM careers, limited knowledge of graduate school and career opportunities, and may be underprepared for undergraduate work in STEM.

Underrepresented minorities who secure faculty positions face further challenges in the workplace. Christine Grant, Associate Dean of Faculty Development at North Carolina State University

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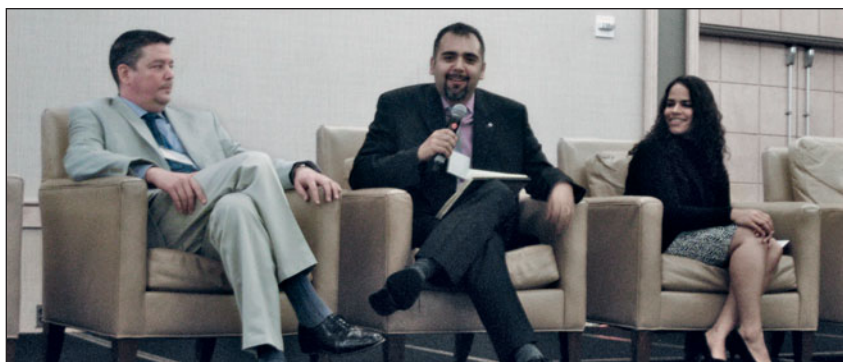




(NCSU), discussed these problems, including heavy university service requirements, a lack of mentors or advocates, few senior role models, and perceived notions of their potential for success. As “double minorities,” underrepresented minority women experience additional barriers. These factors culminate in underrepresented minority faculty retention problems across the country.

Yet research suggests diversity is critical to innovation and improving the country’s global economic leadership. Eve Fine, from the University of Wisconsin’s Women in Science and Engineering Leadership Institute, shared findings that show that diverse working groups are more productive, creative, innovative, and engage in a higher level of critical analysis than homogeneous groups. She argued these results make addressing diversity in MSE a matter of urgent national importance.

Among the many recommendations put forward by workshop participants were ones to increase diversity in fac-



C. Scott Nordahl (Raytheon), David Estrada (University of Illinois Urbana-Champaign), and Milena Bobea (North Carolina State University) (L-R) provide graduate student and early career perspectives on being an underrepresented minority in MSE.

ulty searches, improve faculty success, and overcome stereotypes. Darryll Pines, Dean of Engineering at the University of Maryland, recommended that department heads require that faculty search committees interview 1–2 women or underrepresented minorities and advertise in diverse places using broad language that will attract a diverse applicant pool. Joan Herbers, Professor at Ohio State Univer-

sity and Past President of the American Association for Women in Science, urged departments to institute initiatives that support faculty success, such as a well-defined mentoring program for all junior faculty. Many workshop participants also stressed the importance of role models and mentoring relationships, which they noted should not be limited to underrepresented minorities mentoring the same.



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Congresswoman Eddie Bernice Johnson (Dem-Texas), the first female and first African-American Ranking Member of the House Committee on Science, Space, and Technology, closed the workshop with a keynote address. “Ethnic diversity in STEM is important because 75% of the world are people of color, and they are the fastest-growing population in the United States,” she said. “If we don’t get people of color involved in the STEM fields, then we won’t have anyone at all.” She emphasized the need to work together to tackle diversity in STEM, particularly to ensure that minorities complete undergraduate degrees in STEM fields. She concluded, “We not only need to make sure that they get started in STEM, but that they finish and go on to become scientists and pro-

fessors in fields like materials science.”

NCSU is planning a national assessment focused on the mentoring experiences of doctorate students to better understand the graduate school experiences and career decisions of MSE students. The study’s ultimate goal is to establish protocols for graduate student and post-doctoral training in all aspects of faculty careers. MRS is also addressing mentorship through a new program designed to match seasoned materials scientists with graduate students. Magaly Spector, Vice President for Diversity at the University of Texas at Dallas and Chair of MRS’s Diversity Subcommittee, said, “Mentoring makes a big difference in advancing talent and increasing the performance of the incoming generation, especially for underrepresented minorities and women

[who] don’t have a strong network.”

Justin Schwartz, Department Head of MSE at NCSU and chair of the workshop, hopes that NCSU’s survey will aid the MRS mentoring program by identifying gaps in existing mentoring frameworks. He also believes the MSE community is well suited to address diversity. “We’re interdisciplinary to begin with, so we appreciate intellectual diversity in terms of technical backgrounds. Now we need to use the outcomes of this workshop to address the disparity between the technical population in MSE and the broader population in society.”

A report detailing the outcomes of the workshop and actionable recommendations aimed at all stakeholders is expected in summer 2013.

Ashley White

Science academies issue statement on the handling of risk situations by scientists

In late October last year, Italian scientists were sentenced for supposedly not having warned sufficiently against a severe earthquake in L’Aquila in 2009. On the occasion of this verdict, the German National Academy of Sciences Leopoldina and the French Académie des sciences published the following statement concerning the handling of risk situations by scientists.

Joint Statement of the German National Academy of Sciences Leopoldina and the French Académie des sciences, 12 November 2012

On the science-based communication of risks following the recent sentencing of Italian scientists

On 22 October 2012, a court in L’Aquila sentenced seven members of the Italian National Commission for the Forecast and Prevention of Major Risks to prison terms of several years. The verdict has sparked a worldwide discussion on the

legal aspects of the accountability of scientists who advise government institutions. Scientists must participate in this discussion actively and as objectively as possible. The German National Academy of Sciences Leopoldina and the French Académie des sciences therefore expressly support the Accademia Nazionale dei Lincei, the Italian National Academy of Sciences, in its endeavours to set up an independent expert commission of geologists and legal experts. The role of this commission will be to examine the scientific and legal aspects of the L’Aquila verdict.

Scientific research is substantially motivated by the aim of providing greater protection against natural disasters. In the case of uncontrollable events such as cyclones, earthquakes and volcanic eruptions, scientific forecasting methods are becoming increasingly important. Scientists and representatives of state institutions must work together with mutual trust in order to inform the public responsibly, and on the basis of reliable data, about possible risks.

In their risk forecasts, scientists assess the probabilities of future events.

Probability-based statements are per se fraught with uncertainty. At all times, scientists must communicate this fundamental fact as clearly as possible. This is no easy task when it involves communicating with public-sector decision-makers and concerned members of the public who expect clear forecasts. However, scientists cannot—and should not—absolve themselves of this responsibility.

It is very unfortunate when the trust between scientists, state institutions and the affected members of the public is profoundly damaged. This occurred as a result of the devastating earthquake in L’Aquila on 6 April 2009.

It is thus in the interests of all those involved that the events are reconstructed comprehensively, precisely and objectively. Only in this way is it possible to evaluate on a reliable basis whether the persons involved performed their duties appropriately in the situation in question.

The scientific community must also take an active part in the necessary examination process from the start. The decision of the Accademia Nazionale dei Lincei to set up an independent expert commission to examine the L’Aquila verdict is a clear and decisive signal in this regard. □