

**COMMITTEE ON EQUAL OPPORTUNITIES IN  
SCIENCE AND ENGINEERING**

**MEETING MINUTES  
February 25 - 26, 2013**

**MEETING PARTICIPANTS**

<p><b><u>Members Present</u></b></p> <p><b>Dr. Karl S. Booksh</b>, University of Delaware, DE <b>Dr. Cecilia Conrad</b>, Pomona College, Claremont, CA <b>Dr. Evelynn Hammonds</b>, Harvard University, Cambridge, MA <b>Dr. Ira Harkavy</b>, University of Pennsylvania, Philadelphia, PA <b>Dr. Charles Isbell</b>, Georgia Institute of Technology, GA <b>Dr. George Middendorf</b>, Howard University, Washington, DC <b>Dr. Maria (Mia) Ong</b>, TERC, Cambridge, MA <b>Dr. Alexander Ramirez</b>, San Antonio, TX <b>Dr. Wendy Raymond</b>, Williams College, Williamstown, MA <b>Dr. Keivan G. Stassun</b>, Vanderbilt University, TN <b>Dr. Joseph A. Whittaker</b>, Morgan State University, MD</p>	<p><b><u>Members Absent</u></b></p> <p><b>Dr. Robert Jones</b>, University at Albany, NY <b>Dr. Gregory Cajete</b>, University of New Mexico, NM</p>
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<p><b><u>Federal Agency Liaisons to CEOSE Present</u></b></p> <p><b>Dr. Katie E. Blanding</b>, United States Department of Education <b>Dr. Meldon Hollis</b>, White House Initiative on Historically Black Colleges and Universities <b>Ms. Shahin Nemazee</b>, Smithsonian Institution <b>Dr. Donald Sweet</b>, US Geological Survey <b>Dr. Audrey A. Trotman</b>, National Oceanic and Atmospheric Administration</p>	<p><b><u>Federal Agency Liaisons Absent</u></b></p> <p><b>Ms. Lisa Evans, J.D.</b>, National Institutes of Health <b>Dr. Linda Gunderson</b>, United States Department of the Interior <b>Ms. Evelyn Kent</b>, United States Department of Defense <b>Dr. Sara Klucking</b>, United States Department of Homeland Security <b>Dr. Jeremy Lawson</b>, NIST <b>Dr. Era Marshall</b>, Smithsonian Institution <b>Dr. Muquarrab Qureshi</b>, United States Department of Agriculture <b>Ms. Susan Heller-Zeisler</b>, NIST</p>
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<p><b><u>CEOSE Designated Federal Officer – Executive Liaison</u></b> <b>Dr. Wanda E. Ward</b>, Office Head, Office of International &amp; Integrative Activities, National Science Foundation (NSF)</p> <p><b><u>CEOSE Executive Secretary</u></b> <b>Dr. Bernice Anderson</b>, Senior Advisor, Office of International &amp; Integrative Activities, National Science Foundation (NSF)</p> <p><b><u>CEOSE Scientific/Technical/Administrative Staff</u></b> <b>Dr. Joan Burrelli</b>, Science Resource Analyst <b>Ms. Victoria Fung</b>, Program Analyst, NSF <b>Mr. Steven Buhneing</b>, IT Specialist, NSF</p>
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## Day One

### Welcome/Introductions/Opening Session

Dr. Cecilia Conrad, CEOSE Chair, called the meeting to order at 9AM and began with the introduction of the CEOSE members who were attending virtually, followed by members attending in person. An overview of the agenda was provided and members had no changes for the minutes from the last meeting held June 19-20, 2012. (Note: The October 30-31, 2012 meeting was cancelled due to Hurricane Sandy.)

Vice Chair Alexander Ramirez briefly discussed the Executive Committee Meetings with Dr. Subra Suresh and/or Dr. Cora B. Marrett. These meetings took place October 18, 2012 and February 13, 2013. He stated that the leadership of the Foundation valued the important work of the CEOSE members during and after the CEOSE meetings. Information shared included: status of Career-Life Balance (CLB) Initiative, NSF's participation in the international gender summit, and the new approach for determining NSF investment in broadening participation (BP).

### NSF Executive Liaison Report and Open Discussion

Dr. Wanda Ward, Office Head, Office of International and Integrative Activities (OIIA)/NSF and CEOSE Executive Liaison, provided the Foundation-wide update on broadening participation concerns, events and other activities. Her report covered:

- Membership activities that included appreciation to Dr. Conrad for accepting a second term and continuing as Chair as well as noting the contributions of Drs. Wendy Raymond and George Middendorf to the biennial report and their acceptance of a second term of three years on CEOSE.
- Composition of the NSF team for staffing CEOSE, including Drs. Bernice Anderson and Joan Burrelli, Mr. Steven Buhneing, and Mrs. Victoria Fung.
- Realignment of the Office of the Director with particular emphasis on the Office of Integrative Activities (OIA) and the Office of International Science and Engineering (OISE) becoming the Office of International and Integrative Activities (OIIA) and acknowledging the contributions of Dr. Middendorf as the CEOSE Liaison to the ISE Advisory Committee.
- Appreciation to CEOSE for their input about how to determine the NSF investment in broadening participation for three programmatic categories—focused, emphasis and geographic diversity programs.
- NSF's continued participation/leadership in interagency activities such as the Minority Serving Institutions (MSI) Summit and Committee on STEM Education (CoSTEM).
- FY 13 plans for CLB that will include supplemental support research technicians (or equivalent) for CAREER awardees with dependent care issues and expanding such support to the Postdoctoral and Graduate Research Fellowship programs, along with providing dual career supplements to the Institutional Transformation awards in the ADVANCE program. A pilot project is being developed with the Federal Demonstration Project to work with a small group of institutions of higher education on family-friendly policies and practices. Additionally, NSF will host the 2013 Gender Summit- North America in the DC area.

- Recent BIO policy (BIO 12-01), designed to ensure that barriers to full participation of underrepresented groups are examined and removed for conferences, meetings, workshops, and international congresses supported by the Directorate for Biological Sciences.
- Newer diversity activities of the Experimental Program to Stimulate Competitive Research (e.g., EPSCoR Track 3- Building Diverse Communities for STEM Learning and Innovation) and the Science and Technology Centers.
- Inclusion of an overview of CEOSE as part of Senior Leadership's discussion of the role of advisory committees.
- Progress of the SharePoint Tracking Site for monitoring NSF progress in response to CEOSE recommendations.

CEOSE members asked follow-up questions about the upcoming Gender Summit, the BIO policy, and the new framework for identifying emphasis programs. Some specific suggestions from the Committee included conducting an analysis of programs in the 30% to \$49% BP range to study their impacts and contributions, examining and comparing trends by BP program categories, and using new data mining methods to study BP investment and impact. Additionally, the idea of monthly BP news as a new feature for the website will be explored.

Members noted that there is a need to reward individual projects that are making a difference but would go unrecognized/unrecorded based on the new BP criteria. CEOSE also discussed that community is significant and higher education must reach beyond the walls of academia to diversify the STEM enterprise. A key point was that the academy needs to conduct research and scholarship with the community and not just on the community.

CEOSE members presented Dr. Subra Suresh with a congratulatory letter that also acknowledged his significant contributions to broaden participation, especially the national attention given to the Career-Life-Balance Initiative. In addition to thanking Dr. Suresh for his support and active engagement with CEOSE, members commented that his new role will afford him some unique opportunities to be a trailblazer in advancing the higher education agenda for broadening participation in STEM.

Discussion topics for NSF leadership included: how CEOSE differs from other advisory committees (e.g., only Congressionally mandated advisory committee, required to submit a report to Congress); how to elevate BP as a CENTER-like activity with distinction in the community; how to push for multi-institutional engagement to get a greater impact and incentivizing institutional leadership to be more accountable and innovative regarding diversity and innovation; the need to disseminate best practices for BP; and how to recognize significant BP accomplishments of projects not in the revised BP framework.

### **Meeting with NSF Deputy Director**

Dr. Cora Marrett, Deputy Director/NSF, expressed her appreciation for the work of CEOSE, giving special recognition to members whose terms expired: Dr. Marigold Linton, Ms. Lueny Morrell, and Dr. Eugenia Paulus. Dr. Kelly Mack was also recognized for her service to CEOSE as the former Executive Secretary. Dr. Marrett also acknowledged career honors/promotions of several current members: Dr. Cecilia Conrad – Vice President, MacArthur Foundation Fellows Program; Dr. Robert Jones – President, University at Albany; and Dr. Keivan Stassun – Fellow of AAAS.

In her other opening remarks, Dr. Marrett highlighted the Foundation's new strategic plan for 2014-2018, the approved realignment of the Office of the Director, Gender Summit in Brussels, the inclusion of family friendly policies in the OMB circular and (encouraged CEOSE to submit

comments), the meeting/conference policy of BIO that may serve as a model for the rest of the Foundation, and the submission of a recent report on funding to MSIs. She pointed out that NSF was still operating under a continuing resolution and that sequestration will mean less funding for new awards but would not require staff furloughs.

Dr. Marrett noted that the Foundation is looking forward to increased involvement of CEOSE with the BP Framework and would welcome CEOSE's advice about how to capture and recognize the notable BP impacts of individual PIs whose projects are not part of the focus or emphasis programs. During the discussion period, she also stressed that institutions must assume increased accountability for broader impacts and used the ADVANCE program as an exemplar of how investment in women has been a successful mechanism for addressing broadening participation at both the individual and institutional levels. Another example given was the Integration through Institutional Innovation activity that connected STEM investments on a campus. She agreed with CEOSE that institutions do have a critical role in bringing together individuals and awards across directorates to promote a collaborative approach to broadening participation.

Members also suggested the need for increased attention to BP NSF-wide that would include supporting the replication of successful practices, supporting new collaborative ideas and supporting systematic collection of data from across the NSF. CEOSE pointed out that the NSF shift to focusing on the BP studies or research and letting other agencies fund the implementation work does not serve the disability community well.

Other advice included:

- Create regional BP networks and make use of good longitudinal data.
- Support comprehensive, inclusive pathway approach (K-20+) wherein universities are core partners with a wide range of community partners to ensure a long-term commitment to advancing science and the science of broadening participation.
- Support the HSI effort with real funding like \$100M, but the heart of the BP effort is how to leverage the \$7 billion investment for building an inclusive science and engineering enterprise.

### **Committee Reports by CEOSE Liaisons to NSF Advisory Committees**

The underproduction of degrees is a serious concern for ACCI/CISE ACs. GEO has a DCL for Education and Diversity Programs, seeking input from minority communities about ways to address the underrepresentation challenges. One of the challenges in the geosciences is that not many MSIs have academic programs in the geoscience disciplines. ISE is soliciting recommendations from CEOSE to help diversity its membership, as well as increase the involvement of underrepresented minorities in international experiences. ISE was advised to provide more international opportunities in South America and Africa. SBE and BIO ACs have a subgroup focused on BP. There was general agreement that CEOSE needed copies of the Directorate/Office strategic plans for broadening participation. Several members indicated that it would be important to have guidelines about the role of the CEOSE Liaison to Advisory Committees. Members commented on their increased participation with the work of the directorate/office advisory committees.

### **An Overview of the 2010 Census**

Dr. Jennifer Ortman from the Population Division of the U.S. Census Bureau shared results and projections from the US 2010 Census. The overview revealed that the workforce of the future is

being impacted by changing demographics. The changing demographic landscape has implications for equity, national security needs, and educational needs. Dr. Ortman reported that all major groups in the US are increasing but at different rates and pointed out that Hispanics are experiencing the fastest rate of growth. The presentation also revealed several places of concentration for minority populations—East Coast, Southwest along the Mexico border, and the Pacific Coast. She shared a map of minority population as a percentage of total population of a region: Northeast – 31.3%, South – 40%, Midwest – 22.2%, and West – 47.2%. Additionally, as the US population is becoming more diverse, the population is projected to increase from 314 million to 420 million by 2060.

Summary points were:

- In 2010, just over one-third of the US population reported their race as something other than non-Hispanic White alone.
- Nearly half of the population under 18 years are something other than non-Hispanic White alone.
- Of the 27.3 million people added to the US population between 2000 and 2010, 25.1 million were minorities.
- The US population is projected to grow more slowly, continue aging and become more diverse.

#### **Panel: Broadening Participation Efforts of NSF Centers and Major Research Instrumentation Program**

CEOSE received an overview of four Centers Programs and the Major Research Instrumentation Program (MRI). The presentations are summarized below.

Dr. Lynn Preston briefed CEOSE about the Engineering Research Centers (ERC). The ERC guiding goals are: create a culture to join scientific discovery to technological innovation through transformational engineered systems research and education, build partnerships with industry to strengthen the innovative capacity of the US in a global context, and produce diverse engineering graduates who are creative innovators in a global economy. Dr. Preston outlined the progression of ERC Diversity Focus:

1985 – NSF Funds 1<sup>st</sup> ERC class

Late 1980s – ERCs start diversity focused pre-college outreach

1990 – Diversity added to Cooperative Agreements, diversity data collected, diversity focused REU supplements

1993 – Diversity added as a key feature to the program solicitation; diversity required for reviewers and in pre-/post-award criteria

2000 – Diversity focused pre-college outreach required

2002 – ENG/ERC Research Experiences for Teachers focused on diversity and engineering

2004 – Diversity Strategic Plans required for ERCs

2008 – Lead or core partner institution must be an MSI/HSI/HBCU; first HBCU to lead an ERC established at North Carolina A&T University

The presentation included data about the diversity of core partners and university/college outreach partners and participation rates of underrepresented groups in the ERCs. In addition to North Carolina A&T's Revolutionary Metallic Biomaterials Engineering Research Center being

the first HBCU-led ERC, Carnegie Mellon is the one Center focused on persons with disabilities— Quality of Life Technology Center. Another diversity example was the University of Puerto Rico’s Center for Collaborative Adaptive Sensing of the Atmosphere where a student-led spin-off firm is one of the outcomes of weather monitoring technology in Puerto Rico. Recently, in 2012, a Diversity SWOT was conducted of the ERC classes of 2003-2011 (16 Centers). The Diversity SWOT results revealed the following:

<p><b>STRENGTHS</b></p> <p>ERC are producing women and underrepresented minorities with advanced degrees in engineering</p> <p>Representation of women, Hispanics and African American in Leadership has increased</p>	<p><b>WEAKNESSES</b></p> <p>Industry members are not used effectively to understand the role of diversity in industry</p> <p>Broad-based faculty dedicated to diversity are lacking</p>
<p><b>OPPORTUNITIES</b></p> <p>A more diverse postdoc population</p> <p>NSF should require Centers to have a designated Diversity Director position</p>	<p><b>THREATS</b></p> <p>Center cliques form where foreign personnel speak their native languages in their labs</p> <p>Departments do not hire/admit sufficiently diverse personnel</p>

Dr. Preston stated that the next steps are to administer an ERC Diversity Climate Survey to 20 active Centers and to prepare a diversity best practice chapter.

Dr. Mary Galvin provided the briefing about the Material Research Science and Engineering Centers (MRSEC). Dr. Galvin reported that there are 23 active MRSECs that are six-year interdisciplinary awards, often involving nine or more researchers. The goals of the MRSEC Program are to address fundamental, complex materials problems that are intellectually challenging and important to society; stimulate and support outstanding interdisciplinary research and education in materials and condensed matter physics; foster partnerships between academia and industry as well as other sectors; and broaden participation of groups underrepresented in the sciences. Dr. Galvin shared that the program is striving to broaden the participation of those reviewing MRSECS and learning about the program.

As of 2005, one of the requirements of the MRSECs is a diversity strategic plan. Twelve of the MRSECs have active partnerships with MSIs through the Partnership for Research and Education and Materials (PREM) Program. Dr. Galvin also provided examples of how MRSECs are engaged in a variety of broadening participation activities that impact all levels of the academic pipeline and all three categories of underrepresented groups:

- The University of Massachusetts Amherst MRSEC allocates Center funding to support and incorporate URGs in Center research and outreach activities. The Center supports six PIs at two colleges for women and two MSIs.

- The University of Nebraska MRSEC and several other MRSECs have a Professor/Student Team program to increase research collaborations that include participation of underrepresented faculty and underrepresented students.
- Examples of support for persons with disabilities included the Georgia Tech MRSEC for Assistive Technology and Environmental Access, the Camp for Dyslexic Students (K-6) in the Colorado Schools of Mines MRSEC, and the REU program for Veterans in the Harvard MRSEC.

Dr. Galvin stated that the MRSEC program as a whole is on par with national averages with respect to women participation, but monitoring participation for substantive involvement. The MRSEC program is not on par with national averages with respect to underrepresented minorities, specifically at the faculty level. MRSECs are investigating various strategies to increase the participation and substantive involvement of underrepresented minority groups and persons with disabilities.

Dr. Dragana Brzakovic provided an overview of the Science and Technology Centers (STC): Integrative Partnerships Program, drawing attention to the following statements from the solicitation:

*NSF expects STCs to demonstrate leadership in the involvement of groups traditionally underrepresented in science and engineering at all levels (faculty, students, and postdoctoral researchers) within the Centers. Centers use either proven or innovative mechanisms to address issues such as recruitment, retention and mentorship of participants from underrepresented groups.*

STCs must have a strategic plan and metrics for diversity. Dr. Brzakovic discussed the following strategies by STC:

- Building institutional infrastructure of minority serving institutions:
  - Development of new degree programs
  - Enhancement of MSI laboratories
  - Engagement of MSI faculty in research
- Increasing numbers of students from underrepresented groups in STEM:
  - Recruitment at pre-college level
  - Working with community colleges
  - REU sites
  - Working with minority serving institutions/women colleges

One of the examples she shared was the Center for Integrative Space Weather Modeling which supported the establishment of a new graduate program in space science in 2003 at Alabama A&M University (AAMU). The space science program at AAMU has now graduated three PhDs and two with MS degrees (and a third expected to graduate in Spring 2013). Dr. Brzakovic emphasized that STC is giving increased attention to women and minority involvement in various aspects of the STC program, including proposal submission, review process, and site visits. The integration of research, education and diversity is a priority of STCs.

Dr. Soo-Siang Lim provided a briefing about the Science of Learning Centers (SLC) Program that was established in 2003. She shared that the goals of the SLC Program are to: advance fundamental knowledge about learning through integrated, interdisciplinary research; connect the knowledge to educational, technological and workforce challenges; and enable research communities to capitalize on new opportunities and discoveries, and to respond to new

challenges. The diversity priorities are included in the terms and conditions of cooperative agreements of the funded centers. Each SLC identified specific strategies for diversity in the Center's Strategic and Implementation Plan and the annual site visit included a review of progress in broadening participation. Women leadership in SLCs is approximately 43 percent. Dr. Lim highlighted the Gallaudet University's Visual Language and Learning (VL2) Center where 46 of 94 (49%) participants in 2012 were from underrepresented groups. Thirty-nine percent of the VL2 participants are deaf or hard of hearing. She pointed out that VL2 has placed three deaf PhD graduates in faculty positions. Dr. Lim also pointed out that SLCs study issues that impact broadening participation, such as: gender and low SES negative bias on spatial skills by the Spatial Intelligence and Learning Center at Temple University and stereotype threats in mathematics learning by the Learning in Informal and Formal Environments (LIFE) Center at the University of Washington. Broadening participation resources produced by the SLCs included a LIFE diversity report, a culture and learning handbook project and a special issue of *Human Development*. Additionally, the annual conferences have included a focus on broadening participation issues.

Dr. Randy Phelps provided an overview of the Major Research Instrumentation (MRI) Program, focusing on the three strategic goals for acquisition, development, and research training:

- Supporting the acquisition of major state-of-the-art instrumentation, thereby improving access to, and increased use of, modern research and research training instrumentation shared by the Nation's scientists, engineers, and undergraduate and graduate students
- Fostering the development of the next generation of major instrumentation, resulting in new instruments that are more widely used, and/or open up new areas of research and research training.
- Enabling academic departments, disciplinary and cross-disciplinary units, and multi-organization collaborations to integrate research with research training

Most of the requests for funding are for acquisition of instrumentation and it is difficult to track impact. Dr. Phelps pointed out two areas of interest to the CEOSE: program guidance on broadening participation and the MRI MSI outreach. The MRI solicitation specifically states that proposal should address how the instrumentation will broaden the participation in science and engineering research by women, underrepresented minorities and persons with disabilities. In addition, he emphasized that all proposals are assessed to the extent to which the proposed project will make a substantial improvement in the institution's capabilities to conduct leading-edge research, to provide research experiences for undergraduate students using leading-edge facilities, and to broaden the participation in science and engineering research by women, underrepresented minorities and persons with disabilities. Since 2010, the Quality Education for Minorities (QEM) Network has received support to conduct MRI outreach workshop to MSIs. The most recent workshop was held in Baltimore, MD on November 2-3, 2012, providing proposal development assistance to workshop participants to help increase the number of proposals from and awards to MSIs. Additional outreach activities are being explored to be more proactive in increasing the number of awards to minority serving institutions.

The panelists noted that CENTERS do share best practices and agreed that you cannot just use numbers to determine success/impact. Requiring diversity strategic plans is helping to promote a stronger commitment to broadening participation.

## **DISCUSSION: CEOSE 2011-2012 Biennial Report to NSF and Congress**

Dr. Wendy Raymond, CEOSE Member, thanked the membership for their feedback on the draft chapters. She then facilitated the discussion about Chapter 4. Members agreed that the earlier chapters should help inform the recommendation(s) of the last chapter. The discussion focused on bold framing to help funders know why BP impacts all of us. The call for action must point to the timely and innovative opportunities to take advantage of changing demographics as well as economic and national security issues. The report must present the intellectual hook for stakeholders to understand that broadening participation is an intellectual problem and NSF is the right place to champion or advance a bold agenda that enables higher education institutions to be systemic and collaborative in leading science and promoting the diversity imperative for national innovation and competitiveness. The S&E enterprise is also in need more coordination and deeper analyses for BP. In discussing NSF's role as a catalyst for change, the report may need to comment on the Foundation's accomplishments and strategies, noting the evolution in broadening participation from program-focused (e.g., 2008 BP Framework) to institutional transformation/integration (e.g., ADVANCE and I-3) to CENTER accountability (e.g., requirement and review of diversity plans) to multi-sector partnerships for transforming disciplines (e.g., EPSCoR Track III and new ideas being proposed by CEOSE) as well as the future need for regional networks of innovation through inclusivity. In summary, input by members resulted in an engaging discussion of the following components of the biennial report: current context as crisis and opportunity, why NSF and NSF past and current efforts, the call for a bold initiative and implementation steps, and the conclusions.

The first day ended at approximately 5:45PM.

## **Day Two**

### **Opening Remarks**

Dr. Cecilia Conrad, CEOSE Chair, called the meeting to order at 9:00AM. She opened the meeting with a welcome and introductions. She also provided an overview of the agenda for the second day of the meeting. A few members mentioned a few topics for future agenda items, such as data mining and the theme and the set of data needed for the next biennial report.

### **NSF's Diversity and Inclusion Strategic Plan**

Ms. Claudia J. Postell, Head of the Office of Diversity and Inclusion (ODI)/NSF, shared that part of the mission of ODI is to foster a diverse and inclusive work environment that ensures equal opportunity through policy development, workforce analyses, outreach and education to best serve NSF's employees and its stakeholders. She provided an overview of the Foundation's Diversity and Inclusion Strategic Plan, current status and challenges/opportunities. She stated that Executive Order 13583 required an agency-specific diversity and inclusion plan for recruiting, hiring, training, developing, advancing, promoting, and retaining a diverse workforce. She described the NSF's plan as being reflective of employee engagement in diversity and inclusion conversations to ensure a shared direction and alignment in which diversity and inclusion is an integral part of the organization.

The NSF Diversity and Inclusion Strategic Plan was submitted to the Office of Personnel Management. The next step was to prioritize actions for the Strategic Action Plan; the draft action plan has been shared with NSF staff. Diversity and Inclusion Town Halls have been

conducted and found to be very instrumental in getting feedback from all sectors of the NSF workforce. NSF aims to be transparent, ensuring employee engagement at every level.

The Office of Diversity and Inclusion will continue to work closely with the Division of Human Resource Management and collaborate with relevant resources groups/committees in the various directorates and offices to build upon existing practices and/or identify best practices to help implement a coordinated diversity strategy. Currently, ODI is often invited to “All Hands Meetings” to present and/or facilitate discussions about diversity and inclusion. ODI is looking at data to help identify priority areas. This need is important because NSF has been slipping in its standing of best places to work since 2008/2009. Additionally, the recent Employee Viewpoint Survey (EVS) revealed that cultural dynamics of the work environment need to be addressed in at least three areas: policies and programs to promote diversity in the workplace; supervisors/team leaders are committed to a workplace representative of all segments of society; and managers/supervisors/team leaders work well with employees of different background. Also, the employees are concerned about increased workload during a time of reduced monetary recognition of achievements.

CEOSE members pointed out that NSF should look like the world and model the practices and innovative opportunities that seem to be having a positive impact on women. However, more attention and resources are needed to improve the STEM/NSF workforce for underrepresented minorities and persons with disabilities.

#### **Panel: Advancing Science and Innovation through Inclusion**

The two panelists were Dr. Mary Ann Mason, Professor of the Graduate School at the University of California, Berkeley and Faculty Co-Director of the Earl Warren Institute for Law and Social Policy and Dr. Phil Rous, Provost of University of Maryland, Baltimore County (UMBC). Dr. Mason focused on inclusion from the gender equity perspective in the career advancement; Dr. Rous focused mostly on ethnic diversity and innovation from the perspective of talent development.

Dr. Mary Ann Mason shared the presentation, “Do Babies Matter in Science,” which is part of a science series about best practices for women in science and based on 12 years of research at the University of California. The video included data and evoked discussion around questions like why do women leak out of the pipeline and who get tenure in science and does tenure cost a family sacrifice. Dr. Mason pointed out that women now represent a large share of the scientific talent pool but evidence is showing that after they receive their PhDs, they do not continue to advance in the research academic pipeline. Interesting data included:

- In obtaining tenure, single mother without children do as well as married fathers. Married mothers are 27% less likely to obtain tenure.
- Married women with children are 35% less likely than married men with children to take a tenure track job.
- About 41% of all postdoc mothers decide to change their plans away from becoming a research professor.
- Approximately 46% of women indicated that they wanted to be a research professor when they started graduate school but after childbirth the percentage went down to 11%.
- Only one in three women who take the fast-track university job ever become a mother; women are far less likely to be married with children than men—53% versus 73%.
- Women who achieve tenure are more than twice as likely as men who achieve tenure to be single 12 years after their PhD.

Dr. Mason stated that it is difficult for women to pursue a career in science and have children; she called it the “double gender inequity in science.” NSF and NIH were applauded for their leadership in trying to promote career-life balance for women scientists.

Dr. Phil Rous shared an institutional approach focused on increasing underrepresented groups in STEM, especially African American males in the Meyerhoff Program. The Meyerhoff Program was established in 1988 to provide financial assistance, mentoring, advising, and research experience to African American male undergraduate students committed to obtaining PhDs in STEM disciplines. (Women were first admitted to this program in 1990. In 1996 it became open to people of all backgrounds, committed to increasing the representation of minorities in science and engineering.) His presentation, “Broadening Participation: Culture Change and Innovation at UMBC,” highlighted favorable results for Meyerhoff Scholars based on a comparative study of applicants who chose not to enroll in the Meyerhoff Program versus those who enrolled in the Program: The Meyerhoff Scholars were five times more likely to pursue graduate degrees in STEM fields. He discussed the 13 key components that contribute to the success of the Meyerhoff Program:

- Recruitment that involves in-depth screening about academic preparation and commitment
- Comprehensive, four-year financial-aid package
- Mandatory pre-freshman six-week summer bridge program
- Program academic/career values and community service projects
- Study groups
- A family-like, campus-based social and academic support system for students
- Personal advising and counseling
- Tutoring and peer mentoring
- Research internships
- Professional and faculty mentors
- Faculty involvement in all aspects of the program, including recruitment and special events and activities
- Administrative involvement and partnerships
- Family involvement

Dr. Rous emphasized that this work has required a cultural shift in perspective and accompanying actions, largely driven by faculty engagement. Using a historical timeline, Dr. Rous shared how UMBC has transitioned from replication of some aspects of the Meyerhoff Program to a scaling approach through a STEM partnership model. Specifically, Innovation through Institutional Integration (I-3) was recognized as an opportunity to challenge problems in diversity through a partnership approach or STEM community building within an institution to study the effects of several STEM interventions. I-3 moved the campus discussion to taking a risk for innovation, while promoting self-efficacy in STEM. Dr. Rous emphasized that institutions must understand the capital that students bring to their academic endeavors and assume responsibility of the success of all students. In other words, inclusion needs to be linked to the culture of the mission and the institutional priorities. He provided a visual of the culture change cycle that reflected institutional enablement, encouragement, and engagement for innovation by starting with an emphasis on cultural capital (e.g., attitudes, values, aspirations, and a sense of self efficacy).

## **DISCUSSION Cont'd: CEOSE 2011-2012 Biennial Report to NSF and Congress**

CEOSE continued the discussion of support for new opportunities/ new partnership initiatives and a longitudinal data set for BP. Below is a summary of the features of a new bold initiative.

- Funding for replicating and sustaining successful strategies
- Systematic collection and analysis of longitudinal data
- Research on the science of broadening participation
- Focus on systemic change and institutional transformation
- Capacity building at MSIs
- Incentives for multi-institutional partnerships and collaborations that include MSIs
- Leadership for interagency partnerships and collaborations
- Strong system of accountability (defined broadly to include assessment, evaluation, but also the moral/ethical responsibility)

Again, members indicated that the report needed to highlight the success of NSF programs like ADVANCE and LSAMP, pointing to the principles for programmatic success. Another point made was that NSF's strategic goal focused on transformation must also focus on the transformation of institutions academically and culturally. The consensus was to frame the diversity and inclusion argument from different perspectives and cite examples of best practices.

## **Announcements, Final Remarks, Adjournment**

Dr. Cecilia Conrad, CEOSE Chair, facilitated final remarks before adjourning the meeting. In closing, members agreed that it is important to look more closely at underrepresentation by disciplines. Another suggestion was to identify a theme for the next report. NSF should continue to be frontier setting in broadening participation; science is strengthened by engaging a broader, diverse population in the pursuit of scientific knowledge.

The review/feedback of the first three chapters is due late March/early April. Hopefully, a draft report will be available before the next meeting. The next CEOSE meeting is scheduled for June 19-20, 2013. The Chair expressed appreciation to the members for their engagement over the past two days and adjourned that meeting shortly after 1:00PM.