

**COMMITTEE ON EQUAL OPPORTUNITIES IN
SCIENCE AND ENGINEERING
MEETING MINUTES
June 29-30, 2010**

Meeting Site

National Science Foundation (NSF), Room 1235; Wilson Boulevard; Arlington, Virginia 22230

Meeting Participants

Members Present:

Ms. Sandra Begay-Campbell, Sandia National Laboratories, Albuquerque, NM (*Virtual Participant*)
Dr. Cecilia Conrad, Pomona College, Claremont, CA
Dr. Joseph S. Francisco, Purdue University, West Lafayette, IN
Dr. Evelyn Hammonds, Harvard University, Cambridge, MA
Dr. Richard E. Ladner, University of Washington, Seattle, WA
Dr. Marigold Linton, University of Kansas, Lawrence, KS
Dr. George Middendorf, Howard University, Washington, DC
Ms. Lueny Morell, Hewlett-Packard Company, Aguadilla, PR
Dr. Maria (Mia) Ong, TERC, Cambridge, MA
Dr. Eugenia Paulus, North Hennepin Community College, Brooklyn Park, MN
Dr. Muriel Poston (CEOSE Chair), Skidmore College, Saratoga Springs, NY
Dr. Alex Ramirez, HACU National Headquarters, San Antonio, TX
Dr. Wendy Raymond, Williams College, Williamstown, MA

Members Absent:

Dr. Theresa A. Maldonado, Texas A & M University, College Station, TX

CEOSE Executive Liaison/CEOSE/Executive Secretary:

Dr. Margaret E. M. Tolbert, Senior Advisor, Office of Integrative Activities, NSF

OIA/NSF Primary Support Staff Members

Ms. Geraldine (Geri) Farvés, IT Specialist, Office of Integrative Activities/NSF
Ms. Candice Fordyce, Program Assistant, Office of Integrative Activities/NSF

Non-Members Who Attended/Participated in Discussions/Made Presentations at the Meeting:

Dr. Morris Aizenman, NSF/MPS Ms. Linda Baker, NSF Intern, NSF/BIO/MCB Ms. Carrie Billy, AIHEC Dr. Juliana M. Blome, NIH/NIGMS Mr. Alvin Bonilla, NSF Intern, NSF/GEO/EAR Ms. Anne Bowles, IHEP Dr. Rosalina Bray, NIH/NIGMS Dr. Albert Bridgewater, MDB Ms. Xiomara M. Castillo, NSF Intern, NSF/OD/OISE Ms. Christine Cataldo, NSF/OIRM/HRM Dr. Julia V. Clark, NSF/EHR/DRL Mr. James Colby, NSF/EHR Ms. Yamilette Colòn, NSF Intern, NSF/GEO/EAR Dr. Kelline Craig-Henderson, NSF/SBE/SRS Ms. Carmen Cromartie, Captioner, Precise Reporting Dr. Luis Echegoyen, NSF/MPS/CHE	Dr. Cora B. Marrett, Acting Director of NSF, OD/NSF Dr. J.V. Martinez, U.S. Department of Energy/Office of Science (Federal Liaison to CEOSE) Dr. LaRuth C. McAfee, University of Colorado at Boulder (<i>Virtual Participant</i>) Ms. Christine McArthur, NSF Intern, NSF/OIG Dr. Shirley McBay, QEM Network, Inc. Dr. Steve Meacham, NSF/OD/OIA Ms. Kristy Mitchell, NSF Intern, NSF/OD/OCI Ms. Nezile Mthembu, AAAS/Science Magazine Mr. Elias Munoz, NSF Intern, NSF/MPS/CHE Dr. José Muñoz, NSF/OCI Dr. Kesh S. Narayanan, NSF/ENG/IIP Dr. Usha Narayanan, U.S. Department of Energy/New Brunswick Laboratory
---	---

<p>Dr. Jaquelina Falkenheim, NSF/SBE/SRS Dr. Joan Ferrini-Mundy, NSF/EHR Dr. Michael Fredenberg, NSF/EHR/HRD Dr. David D. Friscic, NSF/OD/OPP Dr. Clifford J. Gabriel, NSF/MPS Dr. Marcy E. Gallo, U.S. Congress/Committee on Science and Technology/Subcommittee on Research and Science Education Mr. Douglas M. Garcia, HACU Mr. Oscar A. Garcia, NSF Intern, NSF/OISE/ANESA Ms. Stephanie Gillespie, NSF Intern, NSF/EHR/DUE Ms. Tracy Gorman, NSF/OD Dr. Jong-on Hahm, NSF/OISE Ms. Sarah Haviland, NSF Intern, NSF/BIO/DEB Dr. W. Lance Haworth, NSF/OD/OIA Ms. Jane He, IHEP Dr. James A. Hicks, NSF/EHR/HRD Mr. Alfredo Higuera, NSF Intern, NSF/GEO/ATM Dr. Meldon Hollis, WHI-HBCU Dr. Caesar Jackson, NSF/EHR/HRD Ms. Martha James, NSF/EHR/HRD Dr. Jolene K. Jesse, NSF/EHR/HRD Dr. J. A. Jones, QEM Network, Inc. Dr. Joslyn Kravitz, NIH Dr. Tiffany Bailey Lash, NIH/NIGMS Rolf F. Lehming, NSF/SBE/SRS Dr. Kelly Mack, NSF/EHR/HRD Dr. Lynnette Madsen, NSF/MPS</p>	<p>Mr. Carib Oquendo, NSF Intern, NSF/ENG/CMMI Dr. Carl Person, NASA Dr. Thomas W. Peterson, NSF/ENG Dr. Clifton A. Poodry, NIH/NIGMS Ms. Claudia Postell, NSF/OD/ODI Mr. Salomon Puyana, NSF Intern, NSF/ENG/CBET Dr. Saifur Rahman, Virginia Tech Dr. Claudia Rankins, NSF/EHR/HRD Ms. Marisol Resendiz, NSF Intern, NSF/BFA/Large Facilities Dr. Alberto Rivera-Rentas, NIH/NIGMS Mr. Leslie Rodriquez, NSF Intern, NSF/CISE/CNS Ms. Marisol Romero, NSF Intern, NSF/CISE/IIS Ms. Joyce Rudick, NIH (Federal Liaison to CEOSE) Dr. Cindy Sager, NSF/OD/OISE Ms. Ashton Santine, NSF Intern, ENG/CBET MS. Natasha Santos, NSF Intern, ENG/CBET Dr. H. Edward Seidel, NSF/MPS Mr. Edward Smith, IHEP Ms. Daisy Solis, NSF Intern, NSF/OIG Ms. Jacqueline Sosa, NSF Intern, BFA/DACS/CSB Mr. Eric Tello, NSF Intern, NSF/ENG/IIP Ms. Erika Vela, NSF Intern, NSF/EHR/DUE Dr. Uma Venkateswaran, NSF/OIA/EPSCoR Dr. Robert Webber, NSF/OISE Dr. Larry Weber, NSF/OISE Dr. John Whitmarsh, NIH/NIGMS Dr. Hinda Zlotnik, NIH/NIGMS</p>
--	--

Meeting Notes

Tuesday, June 29, 2010

Opening Statement and Discussion

Dr. Muriel Poston opened the meeting at 8:33 a.m. with welcome remarks and requested that CEOSE members and guests introduce themselves. Among the guests were CEOSE Federal Agency Liaisons, organization and federal agency representatives, NSF officials, and a large number of interns. **Dr. Poston's** welcome statement to the interns was as follows: "I hope that you really enjoy your summer at NSF. Your internships enable great learning experiences that you will be able to take back to your institutions and provide encouragement to your fellow students. This is also an opportunity to learn about the world of work."

Confirmation of the Approval of the Minutes

With a motion by **Dr. George Middendorf** and seconded by **Dr. Eugenia Paulus**, the committee confirmed the approval of the minutes of the March 8-9, 2010 meeting of CEOSE.

Briefing by Dr. W. Lance Haworth

Dr. Haworth gave a brief update on the activities of the National Science Board (NSB) in reference to activities that directly relate to some of the issues of interest to CEOSE members. He mentioned that NSB has established a Task Force on Merit Review and that this Task Force is chaired by **Dr. Alan Leshner**, NSB member and Chief Executive Officer of the American Association for the Advancement of Science.

Dr. Haworth is one of three NSF Liaisons to this Task Force, which has begun its work and could take up to a year to complete. The resulting report will be of particular interest to NSF since it most likely will affect the way merit reviews are conducted. **Dr. Haworth** referred everyone to the background paper titled “Task Force on Merit Review,” dated May 4, 2010. This paper contains the background, charge, work plan, and timeline for the review by the NSB Task Force. He emphasized that the Task Force will address both criteria--Intellectual Merit and Broader Impacts--which have been in place since 1997. The latter criterion includes the broadening participation component. About five years ago, Congress requested NSB to conduct a review of the merit review criteria. The review resulted in a report dated September 2005 in which it was recommended that NSF look carefully at review quality and review transparency, and that it encouraged transformative research. **Dr. Haworth** views the review of the criteria as occurring at an appropriate time since NSF is currently in the final stages of preparing a new strategic plan.

During the question and answer period, **Dr. Haworth** was asked about the representation of industry and national laboratories on the NSB and the use of corporate benchmarks by the Task Force. Mention was made of the recent NSF/CISE summit on broader impacts and the potential for input from that event, as well as input from current congressional legislation such as the America Competes Act. Questions were raised about NSB membership and the possibility of including in the Task Force review process comments from CEOSE members and the June 25, 2008 letter on broader impacts that was submitted to the NSF Director for transfer to the NSB. **Dr. Haworth** advised that the NSB is in the process of prioritizing its agenda and actions for the next couple of years. He also advised that the CEOSE chair should feel free to resubmit the letter of 2008 to the NSB. CEOSE members called attention to the CISE/NSF broader impacts summit that was held recently, the need for CEOSE members to provide input to the NSB review process on the broader impacts criterion, and the inclusion of broader impacts language in the America Competes Act. **ACTION ITEM:** *Send each CEOSE member a copy of the current NSB membership. Also, resend to Dr. Marigold Linton, CEOSE member, the list of NSB membership for the last ten years.* **ACTION ITEM:** *CEOSE should resubmit its letter of 2008 to the NSB for consideration by the Task Force that is reviewing the Broader Impacts criterion.*

Comments by Dr. Muriel Poston, CEOSE Chair

Dr. Poston advised that given the current demographic shift, attending to the matter of broadening participation in a very specific way would be helpful to NSF. She also mentioned that it might be a fortuitous time for CEOSE to further explore the impact of broadening participation on the development of science. She then called attention to the NSF report that responded to the America Competes Act. The NSF report was focused on the following areas: increased economic competitiveness, increased academic and industry partnerships in the development of globally competitive science and engineering workforce, increased participation of women and underrepresented minorities in science and engineering, improved K-12 science education and teacher education, improved undergraduate science and engineering, increased public scientific literacy, and increased national security. **Dr. Poston** noted that each institution highlighted in that NSF report was a major research university, with two exceptions. The University of Hawaii and Salish Kootenai College—in conjunction with the University of Montana were cited as exemplars. NSF should look at broader impacts and the way it is leveraged to support minority institutions and students and faculty of underrepresented groups.

Dr. Poston then gave a briefing on her June 28th meeting with **Dr. Marrett**. Among the other participants in this meeting were **Dr. W. Lance Haworth, Dr. Margaret E. M. Tolbert, Dr. Fae Korsmo,** and **Ms. Claudia J. Postell**. A selection of topics was discussed, including broader impacts, a comprehensive review of NSF programs to identify best practices, the draft NSF strategic plan, the NSF Office of Diversity and Inclusion review of Title IX, and the CEOSE path forward. **Dr. Marrett** encourages CEOSE to take advantage of the opportunity to communicate directly with officials on Capitol Hill and the opportunity to interface with other federal agencies in addition to NSF. **Dr. Poston**

noted that **Dr. Marrett** was interested in opportunities to leverage activities with the NSF Office of Diversity and Inclusion. **ACTION ITEM: Dr. Tolbert** is to send each CEOSE member a copy of **Ms. Claudia J. Postell's** presentation slides from the October 2009 CEOSE meeting.

ACTION ITEM: Dr. Poston has asked that **Ms. Postell** provide CEOSE with information on the recruitment of faculty, particularly IPA appointees and visiting scientists, as consideration is given to how those cohorts might leverage the representation of underrepresented groups at NSF. Additionally, **Dr. Poston** advised that more work needs to be done on the issue of broadening participation relative to NSF advisory committees. **ACTION ITEM: Dr. Poston** asked CEOSE Liaisons to NSF advisory committees to think about how the committee might assist those directorates and offices with their broadening participation efforts. One way to provide assistance is to ask for meeting agenda time to talk about the work of CEOSE and to suggest ways to better address diversity and inclusion.

General Discussion on Broader Impacts

The June 2008 letter on the Broader Impacts criterion contains the recommendation developed by the CEOSE *Ad Hoc* Subcommittee on Broadening Participation. **Dr. William McCarthy** who was a CEOSE member until his death last year served as Chair of this subcommittee. Relative to the Broader Impacts criterion, there is concern that accountability for it is not viewed by some as being comparable to the Intellectual Merit criterion. It is thought that it provides a sort of *ad hoc* relationship to proposals. However, there are those who are of the opinion that it facilitates inclusion. Efforts are needed to help the science and engineering community understand the positive impact of addressing broader impacts in their projects and programs. Among the points to consider relative to broader impacts as one reviews proposals is whether what is proposed in the projects is strategic, tactical, systemic, or isolated. Among the other items discussed were: 1) the rules against the use of “race” as a sole criterion in making funds available through given programs, 2) how other federal agencies (e.g., NIH and DOE) address restrictions on the use of the term “racial and ethnic minorities,” “socioeconomic condition,” and “disabilities” in announcing and implementing programs, and 3) the difference that NSF program directors can make in their recommendations to support one program or another.

Following the discussion of plans for the meeting with **Dr. Marrett**, committee members focused on CEOSE Liaison reports.

REPORTS by CEOSE Liaisons to NSF Advisory Committees

Dr. Alex Ramirez reported on the Cyberinfrastructure (CI) Advisory Committee meeting. He noted the following as items of discussion at this advisory committee: the development of the framework for cyberinfrastructure in the 21st century, data intensive science and engineering, cyberlearning and workforce development. **Dr. Ramirez** serves as Chair of the Task Force for the latter topic. At the advisory committee meeting on which **Dr. Ramirez** reported, **Dr. Arden L. Bement, Jr.** acknowledged computational science and engineering as a discipline.

Ms. Sandra Begay-Campbell was unable to attend the last meeting of the Advisory Committee for Environmental Research and Education (AC ERE). **Dr. Wendy Raymond** reported that no Advisory Committee for GPRA Performance Assessment (AC GPA) meetings were held between the last CEOSE meeting and this one, and **Dr. Eugenia Paulus** and **Dr. Joseph Francisco** advised that they were unable to attend the Engineering Advisory Committee (ENG AC) and Geosciences Advisory Committee (GEO AC) meetings, respectively.

Dr. Cecilia Conrad pointed the members to her written report and highlighted a few points. She spoke of the presentation to the B&O Advisory Committee by **Dr. Shelly Metzenbaum**, Director of Personnel Management in the Office of Management and Budget. The focus was on initiatives in accountability and other matters that require special attention from federal employees. **Dr. Conrad** advised that CEOSE

needs to pay attention to issues pertinent to small institutions and monitor them carefully. A second piece of advice had to do with efforts to create metrics to measure performance and the kinds of metrics desired for broadening participation and increasing diversity. She reported on the lively discussions by advisory committee members on the renewal of the NSF lease and the NSF draft strategic plan. Other points of discussion are included in the written report by **Dr. Conrad**. She mentioned that GPRA is transitioning to new kinds of metrics for assessments and that this is a critical area in which CEOSE should be involved.

Dr. Richard Ladner reported on the May 2010 meeting of the Computer and Information Science and Engineering Advisory Committee (CISE AC). This was the last advisory committee meeting that **Dr. Jeannette M. Wing** attended while serving as the NSF Assistant Director for CISE. **Dr. Ladner** reported that a number of other CISE officials are leaving NSF also. Although there is a large turnover in staffing, strategies to replace the departing staff members have been implemented. **Dr. Ladner** reported on the Computing Community Consortium, the Expeditions in Computing, and Broadening Participation in Computing, as well as other programs in CISE. He focused on the Broadening Participation in Computing Program as exemplary since it is the only program outside of EHR that focuses exclusively on broadening the participation of underrepresented groups in science. He presented brief information on the recent CISE summit that was held to discuss the Broader Impacts criterion and the need for clarity in it. Also, he mentioned a document titled "Let's Compute" and the CISE/NSF funded principal investigator who is conducting research on robotic bees and the potential application of the results.

Ms. Lueny Morell, a member of the International Science and Engineering Advisory Committee (ISE AC), reported that there is a huge industrial population in the United States that has been left out of the NSF programmatic structure and functions. Industry needs to be brought into the deliberations on research and education with federal agencies as solutions for economic development are identified. **Ms. Morell** spoke of the program that was established at Hewlett-Packard Laboratories based on her idea. It involved the placement of postdoctoral fellows in real-world positions in industry. This enabled these persons to develop skills for future employment. She has given the concept to EHR/NSF, and a related program might be developed in the future. International and industrial collaborations with federal agencies are needed too.

Dr. George Middendorf, CEOSE Liaison to the ISE AC, commented on a meeting that he attended recently where the discussion focused on the federal workforce. It is estimated that approximately 50% of the workforce of federal agencies will retire within the next five years. The matter of filling those gaps in the workforce might require reaching out to every eligible person and even having some of them work in areas in which they never thought of working. This makes outreach to minority communities and the inclusion of topics on the federal workforce huge issues as discussions on industry and academia partnerships take place. **Dr. Middendorf** proposed that a symposium on broader impacts be held next spring to develop a set of best practices that have been effective within the federal agency efforts over the last 20 years. In his report on the ISE AC, he advised of the appointment of its Chair, **Dr. Saifur Rahman**. Three primary topics discussed in the last advisory committee meeting were: 1) partnerships in international science and engineering, 2) issues pertinent to the use of preliminary proposals and limiting the number of proposals from a single institution, and 3) a new initiative to expand the work with Muslim-majority countries and with United States Agency for International Development (USAID) in developing international relations in those countries with a focus on best practices in economic development. Also, the draft NSF strategic plan was discussed. **Dr. Joseph Francisco** advised that the lack of industrial participation is a broader issue for NSF that goes to the National Science Board level. He also mentioned the failure of some proposal reviewers to appreciate the creativity of proposers in a number of instances. **Dr. Alex Ramirez** spoke of the need for concrete measurable evidence that principal investigators are producing meaning results in response to the Broader Impacts criterion.

Dr. Evelyn Hammonds, CEOSE Liaison to the EHR Advisory Committee (EHR AC), suggested that it

is commensurate upon CEOSE to ask the NSF advisory committees to: 1) push much harder for clarification of the Broader Impacts criterion and its enforcement, especially as it relates to broadening participation, 2) develop timelines for evaluating programs, 3) establish firm goals for programs, and 4) require the production of meaningful outcomes. She reported that NSF has an extensive Broadening Participation website and that transformative research needs to be conducted by principal investigators as they address the Broader Impacts criterion. Examples of strategies used by universities (e.g., Purdue University) to address broadening participation were discussed. Also among the discussion topics were 1) the well-meaning intentions of those who submit proposals to do something of value given the changing demographics and the receipt of appropriate directions/instructions on broader impacts and broadening participation, and 2) the possibility of linking individual proposals to the broadening participation components of the strategic plans of home institutions. **ACTION ITEM:** *A request is to be made to the appropriate official in the Office of the NSF Director for the broadening participation website to be made more easily accessible by external viewers.*

Dr. Marigold Linton, CEOSE Liaison to the Office of Polar Programs Advisory Committee (OPP AC), included among her comments the lack of diversity in OPP and the post-doc panel results on gender diversity among successful principal investigators. She noted that no OPP funding was provided to minorities during the period covered the report given to the advisory committee. There was a discussion of the joint science and education tour for 2010. A small percentage of the participants in this program are African Americans (2%), Asians (8%), and Hispanics (2%). The discussion focused on issues that need to be addressed during Antarctic tours of duty: inability to rescue individuals during the winter due to the altitude, coldness, and dryness of the climate, the scarcity of variety in the food supply, the scarcity of healthcare service, and problems encountered by women who stay in the area for long periods. In the discussion that followed the report by **Dr. Linton**, CEOSE members talked about post-doc experiences and their differences and similarities compared to those in industry and the success rate for minorities in obtaining post-doc awards.

Dr. Maria (Mia) Ong, CEOSE Liaison to the Social, Behavioral and Economic Sciences Advisory Committee (SBE AC), reported that **Dr. Myron Gutman** and **Dr. Judith Sunley** gave an update on budget priorities for FY 2010 and 2011 during the SBE AC meeting of May 20-21, 2010. Also, they provided information on the establishment of an Office of Multidisciplinary Activities, which includes the ongoing Minority Doctoral Relationship Fellowships Program. Another point included in the update was the release of the SRS Division's Science and Engineering Indicators 2010. The advisory committee devoted a great deal of time to a discussion of the future direction for SBE science. Among the issues covered were modes of communication, measurement of data, social media technology, demographic changes, climate change, environmental health issues, and brain function and cognition. There were limited deliberations on broadening participation. **Dr. Ong** asked that the science of broadening participation be placed on the agenda for the next SBE AC. In response to a request for comments, **Dr. Kelline Craig-Henderson** made comments on the science of broadening participation by indicating that no solicitation has been released yet. She suggested that a Dear Colleague Letter might be the format for the announcement in the fall; however, funding has to be confirmed. **ACTION ITEM:** *Invite Dr. Kelline Craig-Henderson of NSF to the October CEOSE meeting to give an update on the science of broadening participation plans by SBE.*

Dr. Poston gave a brief report on the Biological Sciences Advisory Committee (BIO AC). The results of the committees of visitors have presented an opportunity for reviewing the ways in which accountability and assessment are a part of the evaluation process in broader impacts. BIO currently has an Acting Assistant Director, **Dr. Joann P. Roskoski**, who is providing stable leadership; however this directorate is in transition. Among the topics discussed at the BIO AC meeting were the budget, undergraduate education in partnership with EHR/DUE, and the meeting of educators from a variety of institution types to discuss major elements of undergraduate education, as well as how students should learn the biological

sciences. The AAAS is preparing a report on these topics. **Dr. Poston** also mentioned two National Research Council reports that were released last year. Recommendations in one of the reports cover the inclusion of individuals from underrepresented groups. Another topic covered is the intersection of the biological sciences with other disciplines. This provides an opportunity to look at the impact on underrepresented groups in the biological sciences and to review ways to attract more students. The BIO AC focused on broadening participation during the discussion on education. The discussion that followed **Dr. Poston's** report covered a diversity of issues including broadening participation.

CEOSE General Discussion

In focusing on awards that are in the category of the science of broadening participation, CEOSE members requested definitional parameters used by SBE in compiling the list. **ACTION ITEM:** *The appropriate person in the Social, Behavioral and Economic Sciences Directorate is to be asked to provide the definition used to identify the science of broadening participation related awards listed in the document distributed at the June 29-30, 2010 CEOSE meeting.*

There is currently one CEOSE membership opening. **ACTION ITEM:** *Begin the nomination process for identifying one new CEOSE member.*

Presentation and Discussion: Revising the National Science Foundation Strategic Plan with a Focus on the Inclusiveness Sections by Dr. Clifford J. Gabriel, Acting Executive Officer, Mathematical and Physical Sciences Directorate/NSF

Dr. Gabriel who serves as the Chair of the NSF Strategic Planning Working Group advised that requirements for the strategic plan originated from the Government Performance and Results Act. He compared the existing NSF strategic plan for 2006-2011 to the draft plan for 2010-2015. Although the plans are for five years, they are updated every three years. The effort is to meet the requirements of the Office of Management and Budget (OMB). Members of the NSF Strategic Planning Working Group are primarily deputies of all of the NSF offices and directorates. Guidance is provided by SMaRT, the NSF senior management group, as well as NSF staff. Input from CEOSE and other advisory committee members is welcome also. Initially, a solicitation for input on the current plan distributed. A critical part of the plan is the vision statement, which provides a compelling picture for the future of science, engineering, and education in a diverse and inclusive nation. It, therefore, challenges NSF to set its sights high to pursue aggressively strategic goals (e.g., transform the frontiers, innovate for society, and perform as a model organization) described in the plan. After reviewing the long-term performance goals of the plan, **Dr. Gabriel** addressed the draft core strategies while focusing on the ones of most interest to CEOSE (e.g., broadly inclusive). He spoke briefly on the performance framework that is being established, how to demonstrate progress, and the use of indicators to achieve the goals of the plan. The identification of best practices for broadening participation at NSF supported institutions and the long-term use of findings to inform program management were covered also. Further, he described broadening participation activities and the means for implementing strategies that are outlined in the plan. He noted that after making the appropriate revisions, the resulting plan is to be reviewed and acted upon by SMaRT and approved by the NSF Director. Then it will be submitted to Congress and OMB. This plan will help inform the FY 2012 NSF budget.

Following his presentation, **Dr. Gabriel** invited CEOSE input on the draft strategic plan. In response to a question from **Ms. Morell**, **Dr. Gabriel** advised of the benchmarking that was addressed with assistance from SBE's Division of Science Resources Statistics contractor. Among concerns expressed by CEOSE members were the following: 1) the fact that the draft plan focuses on "transform at the frontier" while so much of what the workforce does is not at the frontiers and is not transformative, 2) the perceived difficulty of broadening participation in the "trenches," 3) the broadness of the draft strategic plan goals,

4) how to determine if there is actually a change that will occur in response to more broadening participation emphasis in the strategic plan, 5) the language of diversity and inclusion in the draft strategic plan, 6) the lack of timelines, 7) the vagueness of the near-term, mid-term, and long-term aspects of the draft plan, 8) the seeming lack of a sense of urgency in the plan, 9) the failure to explicitly include industry in the strategic plan for mutual benefit, 10) how to develop a strategic plan that is flexible enough to accommodate the changing demographics of underrepresented groups, and 11) how to determine which groups are underrepresented in science and engineering. **ACTION ITEM:** *On behalf of CEOSE, Dr. Wendy Raymond, CEOSE member, agreed to submit suggested language for the NSF draft Strategic Plan to Dr. Clifton Gabriel, Acting Executive Officer of the NSF Mathematical and Physical Sciences Directorate and a speaker at the CEOSE meeting held in June 2010. A copy of the submission is to be sent to Dr. Tolbert. Other comments on the plan are to be submitted to Dr. Tolbert for compilation and submission to Dr. Gabriel.*

CEOSE General Discussion

CEOSE members discussed the nomination process and the need for one additional member; this will bring total CEOSE membership to 15. **Dr. Poston** thanked the three present Federal Liaisons (e.g., representatives of NIH, NASA, and DOE) for their participation in the meeting. Also, she talked about the need for a strategy to move the inter-agency report on broadening participation forward. **ACTION ITEM:** *Have the contractor for the “2009-2010 CEOSE Biennial Report to Congress” include recommendations from the inter-agency report titled “Joining Forces to Broaden Participation in Science and Engineering: Strategies for Inter-Agency Collaborations” in the biennial report.* **ACTION ITEM:** *Dr. Tolbert, CEOSE Executive Liaison, is to send to each CEOSE members a copy of the inter-agency report titled “Joining Forces to Broaden Participation in Science and Engineering: Strategies for Inter-Agency Collaboration”.* **ACTION ITEM:** *Dr. Tolbert who (in addition to serving as CEOSE Executive Liaison and CEOSE Executive Secretary) serves as COTR with oversight for contractors, who are assisting CEOSE with the development of its biennial reports, is requested to ensure that demographic data and other information requested by CEOSE is obtained from NSF and made available to CEOSE members and the contractors as needed.* As the discussion continued, comments were made on the foci of CEOSE biennial reports especially the next one, how to design the right metrics for the assessment of broadening participation, how to determine the best practices for broadening participation, NSF’s broadening participation programs, workforce report by the National Research Council committee for which **Dr. F. Hrabowski** serves as Chair, gender balance and institution types, broadening participation strategies of CISE/NSF and CHE/MPS/NSF, women faculty members in STEM disciplines and their career trajectories, and information on National Science Board members so that the committee will have a sense of the demographic representation on the NSB. **Dr. Marigold Linton** gave a brief report on the composition of the current NSB membership, and she agreed to make a full report to CEOSE on the NSB at a future meeting. The question is: Does the membership reflect issues pertinent to broadening participation? If not, perhaps the White House, through OSTP, and NSB should be made aware of that fact. **ACTION ITEM:** *Dr. Tolbert is to facilitate the gathering of demographic data on members of the National Science Board over the last 30 years.*

The committee held a lengthy discussion on the science of broadening participation, a program that is under development in SBE. Note was made of the need to have the developing program address multiple program areas, not just psychology. **Dr. Ong** spoke of the education listening session workshop that TERC is sponsoring, and she invited CEOSE members to participation. **ACTION ITEM:** *Dr. Cecilia Conrad, CEOSE member, agreed to take the lead in planning the next mini-symposium, which will focus on the science of broadening participation and the effectiveness of broadening participation. Dr. George Middendorf, Dr. Maria (Mia) Ong, and Dr. Alex Ramirez agreed to work with her on this endeavor.*

Suggestions Resulting from the Mini-Symposium on Women of Color in STEM by Dr. Maria (Mia) Ong, CEOSE Member

In her report on suggestions from the Mini-Symposium on Women of Color in STEM, **Dr. Ong** called attention to pages 35-38 of the report titled “Mini-Symposium on Women of Color in Science, Technology, Engineering in Mathematics, a Summary of Findings and Suggestions”, which was released this year—more than 30 years after the publication of “The Double Bind: The Price of Being a Minority Woman in Science” (AAAS Report No. 76-R-3, April 1976, by **Drs. S.J. Malcom, P.Q. Hall, and J.W. Brown**). She thanked CEOSE members for their participation in the deliberations that began last March on how to revise and reduce the number of mini-symposium suggestions and to develop them into recommendations. The plan is to include those recommendations in the “2009-2010 CEOSE Biennial Report to Congress.” **Dr. Ong** distributed for discussion a list of recommendations that resulted from the March deliberations by CEOSE members. She noted that there are two topics that did not develop as suggestions from the mini-symposium but are included in the list; they are 1) developing leadership among women of color and 2) postdoctoral fellows for women of color. Further, she noted that nine of the mini-symposium participants recognized the need to provide funding for a focus on women of color in industry. **Dr. Francisco** spoke of the impact of the mini-symposium on the agenda of the next American Chemical Society (ACS) national meeting in Boston. The mini-symposium on which **Dr. Ong** reported is the inspiration for the ACS presidential symposium on women of color in chemistry fields. **Dr. Poston** noted that the mini-symposium raised very critical and interesting questions and the follow-up recommendations gave CEOSE a road map of areas that the membership would like for NSF to explore. **Dr. Conrad** suggested that CEOSE organize the list of recommendations into two categories: low cost, high impact; high cost, high impact. CEOSE members and Federal Liaisons voiced their opinions of the recommendations and the availability of disaggregated data in various categories. They discussed career issues and challenges, the possible inclusion of a recommendation on broadening participation and the Broader Impacts criterion in the document to be submitted to the NSF Director, and details pertinent to the draft recommendations presented by **Dr. Ong**. For example, **Dr. Ladner** made comments on the importance of having the participation of people with disabilities involved in the mini-symposium. **Dr. Middendorf** expressed interest in including disadvantaged individuals in the mix of what CEOSE does. **Dr. Paulus** commented on the community college student population of minorities, immigrants, and women who are working part time and attending classes on a part-time basis. Their movement into the four-year college system is commendable. **Ms. Begay-Campbell** suggested that a selection of key women of color in leadership be brought together to give their thoughts on the next steps based on the report. CEOSE members agreed to complete the finalization of the draft recommendations. Once they approve them, they are to be submitted to the NSF Director for action. Accompanying the recommendations and cover letter is to be a copy of the report on the “Mini-Symposium on Women of Color in STEM.”

ACTION ITEM: *Send copies of the October 2009 mini-symposium report to key women of color for feedback.* **ACTION ITEM:** *CEOSE members are to finalize the draft recommendations that are based on the Mini-Symposium on Women of Color in STEM and submit them via the CEOSE Chair to the NSF Director for action.*

Presentation and Discussion: The Proposed Path Forward for the EHR Comprehensive Program by Dr. Joan Ferrini-Mundy, Acting Assistant Director for Education and Human Resources, National Science Foundation

Dr. Ferrini-Mundy updated CEOSE members on developments pertinent to the EHR/HRD Comprehensive Broadening Participation of Undergraduates in STEM (CBP-US) Program. She reminded everyone that this program was discussed with CEOSE members by **Dr. Arden L. Bement, Jr.** and **Dr. Cora B. Marrett**, during a prior meeting. **Dr. Ferrini-Mundy** commented that the program is about the essential contributions of diverse perspectives, experiences, race/ethnicity, and innovations to promote the science of tomorrow. There is value in diverse teams, different ways of solving problems, improving

performance and outputs, and forming new ideas. The effort is to design programmatic and funding opportunities to stimulate new models for building capacity across the nation. With minorities comprising an increasing share of the United States labor force, demographic data is being used to drive the thinking behind or programmatic efforts for the developing comprehensive program. **Dr. Ferrini-Mundy** advised that programs are needed to ensure that students from all groups have opportunities to learn and to experience science in ways that will enable them to have choices in participating in STEM fields. She noted that NSF needs a continued focus on models that look to the future for broadening participation for creating success in undergraduate STEM fields with evidence about effectiveness. Also, NSF, as well as other federal agencies, needs to understand the nature of the investments and the input. More varied pathways and new collaborations through the use of networks and alliances are needed for students to access science and to be a part of it on an international basis. **Dr. Ferrini-Mundy** advised EHR must be certain it puts together a program or programmatic elements that are attractive for leveraging intellectual and fiscal resources. Therefore, efforts are being made to determine what is required to do the leveraging. Among what is needed are global interactions, use of computational methods and tools, and very strong linkages to business and industry. According to her, the language for the CBP-US Program was proposed in the President's budget for 2011. Internally, very serious planning and stages of discussion have developed, and some discussions with the field have been held. There are a range of perspectives on the idea of combining the programs (e.g., Louis Stokes Alliances for Minority Participation (LSAMP) Program, Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP), Tribal Colleges and Universities Program (TCUP), and the proposed Hispanic Serving Institutions (HIS) Program). A focus on the conceptual level is needed as the process moves forward. A selection of questions that should be addressed follows: 1) How can we best stimulate rapid gains in achievement and success in undergraduate STEM education for students from underrepresented minority groups? 2) How can we broaden participation with an eye towards doing this more quickly, doing it for more students, doing it for new models, and doing it with the very best of the existing models in continually evolving forms? 3) How can one assure that all members of a given alliance with multiple institution types are committed to goals of broadening participation? 4) Why is the comprehensive program being put into place before the appropriate program data are available? 5) How does one know that the comprehensive program will be more effective than the programs that are already in place? A tremendous amount of information is known from the existing programs—LSAMP, HBCU-UP, and TCUP programs. The effort is to ensure broader uptake and sustainability (a constant challenge) of the effective strategies that resulted from these programs that have accountability to serve diversity and innovation as important aspects.

Dr. Caesar Jackson, Acting Director of the Division of Human Resources Development, joined **Dr. Ferrini-Mundy** at her request to participate in the question and answer period. Deliberations covered what program strategies have worked, different institution types, the proposed Hispanic Serving Institutions Program and its potential funding, listening sessions held to discuss the proposed CBP-US Program, cross-cutting strategies reported in the literature, the originating source of the idea of consolidating the programs, evaluation and program effectiveness, the importance of the context in designing EHR programs, and the need to develop programmatic strategies within the NSF directorates to address the institutional support needed by HBCUs and Tribal Colleges and Universities.

Dr. Meldon Hollis of the White House Initiative on Historically Black Colleges and Universities spoke of his task to focus across federal agencies in terms of funding for science and technology programs at HBCUs. In looking at the three top agencies (U.S. Department of Defense, Health and Human Services, and National Science Foundation) between 2001 and 2007, he concluded that these have disinvested from HBCUs while R&D funding for science and engineering have grown. If it were not for stimulus funding, the decrease in the amount to these institutions would be even greater. In looking at this negative development, someone has the job of raising the issue and explaining the implications of what is

happening across the government sector. **Dr. Hollis** noted that the addition of only 13 million dollars to a collection of programs while opening them for application from more than 270 additional institutions sends a negative signal. The impact seems to be on institutional support. The implications are not clear; the federal agencies need to explain the dire national implications of such actions and bring the issues to the attention of policymakers. **Dr. Hollis** stated the following: “One of the things I worry about is perhaps we have fallen into the practice of looking at just those programs that are designated as minority-focused programs as the pool of resources that are available for those kinds of efforts discussed by **Dr. Ferrini-Mundy**. What is needed is to make what we talk about a reality, which is finding ways to make the entire pool of agency funds available to support the very important national efforts by our unique colleges and universities (e.g., HBCUs and Tribal Colleges and Universities). This will increase the participation of underrepresented groups.” **Dr. Ferrini-Mundy** commented as follows: “The consolidation of programs is not new for EHR, and this particular proposal is not the first time in recent years that we've been asked to do fairly major program consolidation. Earlier, EHR was asked to consolidate its Materials Development and Teacher Professional Continuum programs in part because the EHR portfolio contained 26 programs. The effort is to determine how these programs can be addressed in a more comprehensive way. Data from the evaluations are crucial to continued improvement in programs and to decision making. But evaluation results are not the only sources of data. We also look at such documents as committees of visitors' reports and annual project reports. We take into consideration the research around the issues (e.g., broadening participation) that these programs address. The research results contain additional information beyond what evaluations provide. By considering a multitude of findings coupled with research about which practices actually seem to work best across institution types, we learn a great deal about what works best. Therefore, every EHR program is reviewed annually. Sometimes the results might be a change in the solicitations or another alteration in an effort to make the programs more effective. While we might not know what the end results will be for the CBP-US Program, the investment is indicative of a pretty good direction in which to move at this point. We will study it as we move forward. This is a continuous learning process, and the next version might look a little bit different. A good example of this progression is the Math and Science Partnership Program. A part of what drives this is the effort to imagine and prepare for future generations of students. The United States is undergoing a very rapidly changing demographic with different technologies and different accesses to science. The opportunity to move in new directions is special.” In response to a question about the April 30, 2010 action of the Science and Technology Committee of the US House of Representatives to block the proposal to develop the CBP-US Program, **Dr. Ferrini-Mundy** advised that the current EHR efforts are to hold conversations with persons in the field, as well as at NSF, and to address pertinent issues. She spoke of the enthusiasm of the NSF Assistant Directors and Office Directors who are focusing on ways to scientifically connect to the emphasis of the program. **Dr. Ferrini-Mundy** requested the assistance of CEOSE on framing the program and developing strategies to move it forward. In reference to the statement that **Dr. Ferrini-Mundy** made about her review of the literature, **Dr. Wendy Raymond** asked what was learned from the literature that suggested the combination of the individual programs to form the major portion of the comprehensive program. **Dr. Ferrini-Mundy** responded that the EHR staff is reviewing evaluation reports as well as other relevant documents as they formulate the plan for the path forward. They are reviewing the practical side of the plan for leveraging resources. She admitted that the programs that are under discussion are long standing ones with great success stories and important institutional impact. She pointed out that it is a pretty natural thing at NSF for programs to evolve. The programmatic concepts form the foundation of the evolved programs. As the literature gets more robust in particular areas, such as the science of broadening participation, those ideas can be woven into programs to continue to push the field forward. **Dr. Raymond** expressed the concern of CEOSE as follows: CEOSE is concerned that the results of the proposed comprehensive program will be underfunding, relative to current funding of programs that are known to have really contributed to broadening STEM access to underrepresented minority populations in the United States.

Dr. Poston called to the attention of everyone that there are issues of capacity building that are

fundamental, and the programs that are under consideration for consolidation have had major impact of the institution types on which they are focused. There is concern for institutions that are under enormously challenging circumstances with respect to resources but are effectively serving students, the majority of whom are underrepresented minorities in STEM disciplines. When the CBP-US Program is opened to a very broad array of institution types, there is going to be—as seen in the research directorates even with the best of intentions and commitment—program officers’ differential funds streams.

According to **Dr. Ferrini-Mundy**, the change was a part of the budget process, and it is more complicated than described earlier.

Ms. Morell spoke about the importance of aligning NSF programs with industry and about principal investigators aligning their plans with those of their institutional plans for diversity in order to demonstrate value. If EHR is to be successful, it must sponsor the best STEM experiences for all students by offering the best possible programs. **Ms. Carrie Billy** focused her comments on the Tribal Colleges and Universities Program, which was not established at the expense of other programs for underserved groups. By establishing this program, funds were made available for institutions that were making major contributions to educating and training minority innovators of the future. **Ms. Billy** commented that the issue has to do with whether NSF has the commitment to preserve the worthwhile programs in its portfolio and not establish the CBP-US Program with limited dollars. **Dr. Francisco** called to everyone’s attention the fact that with the planned actions, NSF is changing programs that have proven success records. Further he commented that NSF is moving ahead with its planned changes despite the fact that Congress has weighed in on the matter. It seems that no efforts are being made to step back and weigh the pros and cons of the plan. Why not have a proof of concept or a pilot program before putting the programs at risk. One could develop a strong justification and could build on the results of the pilot. He cautioned that while reviewing data, it should not be forgotten that education has a human element. **Dr. Francisco** suggested that EHR, and hence NSF, step back for a while and rethink what is being done. The current pace must be stopped. **Dr. Shirley McBay** will put her thoughts on the proposed programmatic changes into written format for action by NSF. She is opposed to the proposed plan to combine the programs to form the CBP-US Program. **Dr. J.V. Martinez** commented that he could appreciate the argument for the proposed CBP-US Program if “the life vests” of the existing programs are not ripped off, but rather if they could exist in an appropriate form. It is a question of content. The other observation related to having an acceptable budget for the programs regardless of the form in which they exist. **Dr. Ferrini-Mundy** will provide **Dr. Marrett** with the sense of the conversation held with CEOSE members.

After **Dr. Jackson’s** brief comments on programs in the Human Resources Development Division, **Dr. Kelly Mack** provided information on the ADVANCE Program. Her comments were about ADVANCE programs on campuses and their impact on undergraduate students. Although this program was initially focused on research intensive institutions and faculty, recent NSF efforts are on broadening the portfolio to include small liberal arts institutions and minority serving institutions, including community colleges. **Dr. Mack** also reported on the women of color conclave that was held a few weeks earlier. **ACTION ITEM: Dr. Joan Ferrini-Mundy** of EHR/NSF was requested to provide the next iteration of the concept paper on the proposed Comprehensive Broadening Participation of Undergraduates in STEM (CBP-US) Program to **Dr. Tolbert** for distribution to CEOSE members. **ACTION ITEM: Dr. Ferrini-Mundy** was requested to provide CEOSE members with an update on comments received from the community in reference to the comprehensive program at the next CEOSE meeting.

CEOSE General Discussion:

Following the completion of the session with **Dr. Ferrini-Mundy**, CEOSE members discussed their impressions of the conversation and next steps to be taken. They included in their deliberations the pros and cons of sharing the contents of the to-be developed letter with selected members of Congress and the public in general. The overall thrust of comments was that the proposed comprehensive program could

result in detrimental outcomes towards broadening participation. If, in fact, there is a move to develop a Hispanic Serving Institutions Program, it should not be done at the expense of the other minority institution programs. Additional funds should be identified to do that. **ACTION ITEM: Dr. Muriel Poston, CEOSE Chair, is to write a letter to Dr. Cora B. Marrett with a copy to Dr. Joan Ferrini-Mundy, expressing the concerns and recommendation(s) of CEOSE members in reference to the proposed CBP-US Program. The letter should make it clear that CEOSE members are opposed to the establishment of the CBP-US Program and any other program that diminishes the support for those that support HBCUs and Tribal Colleges and Universities. Also, there is no proven reason to include the LSAMP program under the umbrella of the proposed CBP-US Program.**

ADJOURNMENT

The meeting was adjourned at 5:20 p.m.

Wednesday, June 30, 2010

Opening Statement and Discussion:

The meeting was called to order by **Dr. Poston** at 8:35 a.m. She announced that the First Vice Chair of CEOSE is **Ms. Begay-Campbell** and that the Second Vice Chair is **Dr. Ladner**. After reviewing the list of action items for CEOSE, **Dr. Poston** reminded the members to send their comments on the NSF draft strategic plan to **Dr. Tolbert** for submission to **Dr. Gabriel**. Also, she reminded **Dr. Raymond** to submit to **Dr. Gabriel**, with a copy to **Dr. Tolbert**, the language on diversity and inclusion that she recommended for use in the draft strategic plan. In reference to the mini-symposium on women of color in STEM, **Dr. Poston** volunteered to create a set of themes for the recommendations, using the two documents that **Dr. Ong** provided to the committee. **ACTION ITEM: CEOSE members are to finalize the draft recommendations that are based on the Mini-Symposium on Women of Color in STEM and submit them via the CEOSE Chair to the NSF Director for action. Dr. Poston volunteered to initiate, and lead, this endeavor.** In concluding her opening remarks, **Dr. Poston** called to the attention of committee members of the lively discussion on the proposed CBP-US Program. With additional deliberations, it was decided that a copy of the letter to **Dr. Marrett** about CEOSE concerns in reference to the CBP-US Program will be sent to **Dr. Ferrini-Mundy**. After discussing the letter with **Dr. Marrett** a determination will be made on whether copies should be sent to members of the House Science Committee and the Senate Science Committee. **Dr. Evelyn Hammonds**, the CEOSE Liaison to the EHR AC, agreed to serve in a leadership role in the development and transmission of CEOSE concerns about the program to the directorate and advisory committee. Members were reminded that a decision was made during the meeting on yesterday to focus the next mini-symposium on the science of broadening participation and evidence for the effectiveness of broadening participation.

Presentation and Discussion: Broadening Participation Initiatives in the NSF Mathematical and Physical Sciences Directorate (MPS) by Dr. H. Edward Seidel, Assistant Director, Mathematics and Physical Sciences Directorate, National Science Foundation

In his presentation, **Dr. Seidel** focused on three basic points: 1) the Broadening Participation Working Group within MPS, 2) a sample of current MPS activities across the directorate, and 3) an overview of broadening participation recommendations from the MPS AC. He mentioned that the very active Broadening Participation Working Group has been in effect for a couple of years or longer. This group works closely with persons within MPS and with the MPS AC. The group has been surveying broadening participation best practices across NSF and externally. Another example of the interactions of members of this group and other external and internal officials is evident in the retreat at which the input from the advisory committee was discussed. A speaker series has been established, and this enables the constant input of fresh ideas from external sources. The forum for program officers enables them to discuss

broadening participation NSF-wide, sharing best practices and exploring new ideas. The results fed into the retreat that the NSF Assistant Directors held. A great deal of the results was put into white papers that are being developed NSF-wide. These kinds of results inform our path forward. The MPS AC is strong on systematic assessments. The key to the work of this advisory committee is the identification of ways that one might improve programs and structure while having accurate data for programs to determine what works and what doesn't. The MPS strategic plan will address broaden participation. MPS has programs that require broadening participation plans by principal investigators or the institutions that receive awards in certain areas. Examples of current MPS activities are as follows. 1) In chemistry, the Shared Instrumentation Program has a requirement that a departmental plan for broadening participation be included in each proposal. This plan is a review criterion. The results of that portion of the project are taken into account when future awards are considered. 2) There is a program in the Astronomy Division in which Fisk and Vanderbilt universities joined forces to form a bridge to the doctorate program. This began as part of a Career award. This program has a 97% retention rate as student progress from the Master's Degree to the Ph.D. 3) In the Physics Division, the Laser Interferometer Gravitational-Wave Observatory (LIGO) has a number of projects that address broadening participation. One such project involves the use of devices to enable easy manipulation of the computer so that one can do computer animations, simulation, data analysis, or access information. This project has made it easy for children who have had very little experience with computers and are from an underserved area of Louisiana able to do complex activities. 4) In the Mathematics Division, there is a program that encompasses outreach to minority serving institutions to provide bridges to high quality research involvement. The interactions facilitate recruitment of minorities into mathematics fields. 5) The Division of Materials Research operates the Partnerships for Research and Education Materials (PREM) Program. 6) Funding workshops for department chairs in different fields is another role that MPS plays. **Dr. Seidel** advised that working with the MPS Advisory Committee has been fantastic. The white paper from this group contains recommendations on broadening participation. For example, there were recommendations on how to increase participation in innovative programs across MPS and how to strengthen the transition from community colleges to four-year universities. **Dr. Seidel** is making plans to appoint a blue ribbon panel to analyze the directorate's documents and programs and make further recommendations for a systematic revision of the language and policies of MPS. He plans to take additional actions to strengthen MPS and to promote MPS working with other NSF directorates (e.g., Social, Behavioral and Economic Sciences Directorate). The percentage of minorities funded in chemistry has remained 5% to 6% for the last few years. What is needed are additional proposals submitted by individuals in this group. According to **Dr. Seidel**, arguments for innovation go very well with diversity. As the demographics continue to change, the need for underrepresented minorities to fulfill the need for scientists and engineers will become more evident. MPS is trying to address the following questions: How do we position NSF in the future, and what do we do to really support science in the 21st century? In the question and answer period, CEOSE members whose names appear in parentheses below discussed the following: **Dr. Seidel's** passion for having people learn, regardless of gender or race/ethnicity (**Ms. Morell**); MPS programs that require a plan for broadening participation and their evaluation (**Dr. Conrad**); the communication of MPS diversity efforts across NSF directorates (**Dr. Francisco**); the potential for greater leveraging of the U.S. Department of Education funding in support of a physics partnership between Vanderbilt, Fisk, and other universities (**Dr. Hollis**); the Chemistry Instrumentation Program and principal investigator-driven research proposals and broadening participation as a component of the Broader Impacts criterion (**Dr. Raymond**); and the effectiveness and potential for adoption by NSF directorates of the working group model on broadening participation (**Dr. Poston**).

Presentation and Discussion: *Broadening Participation in the America COMPETES Act* by Dr. Marcy E. Gallo, Professional Staffer for the Subcommittee on Research and Science Education, Committee on Science and Technology, U.S. Congress

Dr. Gallo presented information on the America Competes Reauthorization Act, focusing primarily on the parts that address diversity and broadening participation. She noted that the work that CEOSE does is

extremely important to Congress. The “2007-2008 CEOSE Biennial Report to Congress” is a vital resource of what is happening and what should be happening at NSF as a whole. Therefore, **Dr. Gallo** asked that the work continue, and she thanked CEOSE for its role in carrying out its congressional mandate. In discussing some of the provisions in the original America Competes Act, **Dr. Gallo** made note of several key points. 1) In 2007, the Act gave NSF authorization to extend successful STEM education programs—those that have emphasis on broadening participation without recompetition. 2) NSF was asked to report to Congress on the meaning of the Broader Impacts criterion. The Science Committee is concerned about the effectiveness of this criterion and how it is implemented by principal investigators. 3) Congress also required NSF to support a National Research Council study. Some CEOSE members held membership on the committee for this study. This report is to contain recommendations about barriers to broadening participation in STEM and the effectiveness of strategies to overcome them. 4) Congress authorized NSF to establish a STEM research capacity program similar to HBCU-UP for the Hispanic Serving Institutions.

In reference to the Broader Impacts criterion, **Dr. Gallo** included the CEOSE recommendation that “NSF submit to the National Science Board for its consideration CEOSE’s proposal to require that all NSF grant applications address the subject of broadening participation.” This recommendation highlights the concern of this community—CEOSE and the community as a whole—about the effects of the Broader Impacts criterion. Therefore, the current legislation is designed to address the lack of accountability and evaluation associated with the Broader Impacts criterion and is shifting some of the burden of addressing the Broader Impacts criterion from the individual principal investigators to the institutions. The effort is to ensure that the funds and effort are effective.

Dr. Gallo stated that many members of Congress are concerned about the planned consolidation of a selection of EHR programs (e.g., LSAMP, HBCU-UP, and TCUP programs with the addition of an HSI Program) in 2011. They are concerned that the uniqueness of the individual communities would not be met by a consolidated program. Of particular concern is the TCUP, which could be marginalized by inclusion in a larger program. **Dr. Gallo** emphasized that the Native American community has unique needs and NSF must pay particular attention to those needs as the path forward is considered. Therefore, the House asked NSF to step back and develop a plan on what the program is to look like, its goals, and objectives, and to talk to the stakeholder community. Additionally, in response to a recommendation from the CEOSE mini-symposium titled “Broadening Participation of Native Americans in Science and Engineering: Lessons Learned,” held in 2008, **Congressman Ben Ray Lujan** of New Mexico included a provision to formally authorize the Tribal Colleges and Universities Program at NSF.

Dr. Gallo complimented the Innovation through Institutional Integration (I³) Program that has been authorized at NSF, and she expressed her satisfaction for CEOSE’s recommendation that NSF continue to support programs that address institutional transformation in academia and industry to increase the education and career advancement opportunities for underrepresented groups. It is the I³ Program and others like it that create the needed synergies that result in the broadening and deepening of the impact of STEM education.

In discussing Minority Serving Institutions (MSIs), **Dr. Gallo** mentioned concern over the equity of partnerships between major research universities and MSIs who want to make sure that their students and faculty are served well by such partnerships. Therefore, incentives were included in the legislation with the objective of encouraging true engagement between MSIs and major research universities.

In commenting on the CEOSE Mini-Symposium on Institutions Serving Persons with Disabilities in STEM (October 15, 2007), **Dr. Gallo** indicated that one of the recommendations was included in the legislation. Specifically, the legislation requires that institutions serving persons with disabilities such as Gallaudet University have a designation that is consistent with that of the MSIs. This will enable them to

engage research partnerships and help to increase underrepresented groups in STEM. In addressing NSF staff training and outreach, **Dr. Gallo** acknowledged that NSF has published a broadening participation plan that requires broadening participation training for staff and review panelists, etc. However, there is still some concern that those parties are not really aware of effective approaches and mechanisms for broadening participation. The effort is to reinforce the good work that NSF is doing and encourage the staff to do more to provide outreach to the scientific community about what works and what doesn't work in broadening participation. She advised that **Congresswoman Eddie Bernice Johnson** is a very strong proponent of diversity on the Committee on Science and Technology of the U.S. Congress and that a bill she introduced for fulfilling the potential of women in the sciences and engineering was included in the legislation. The bill authorizes workshops for minimizing gender bias across the Federal science agencies, requires the Office and Science and Technology Policy (OSTP) to establish a uniform policy for caregivers, and calls for NSF to require demographic information on STEM faculty. **Dr. Gallo** emphasized that seeing someone that looks like you as a teacher is important and that role models and mentors are effective. There is a need to improve the way STEM is taught. Teaching STEM better will have an institutional impact, it will improve the recruitment and retention and attainment of underrepresented groups and will be beneficial to all students. Research experiences are important; they help keep students interested in STEM. Therefore, Congress authorized NSF's very successful REU program.

A section of the legislation was offered by **Congresswoman Marcia Fudge** of Ohio who is passionate about K-12 STEM education. This section requires NSF, along with the U.S. Department of Education, to identify grand research challenges at the K-12 STEM education level. Also, they are to find ways to tackle those challenges and fund investigators in those areas. Improving education will lead to increased recruitment and retention of underrepresented groups in the workforce. Therefore, STEM education provisions of the legislation are extremely important.

Another section of the bill focuses on the coordination of all federal STEM programs by OSTP through the National Science and Technology Council (NSTC). NSTC is required to develop a five-year strategic plan to coordinate STEM education programs across the federal government. Coordination, establishment of common metrics, and evaluation of programs are key functions of the interagency group. The section also requires an inventory of all of the programs and the participation rates of underrepresented groups in those programs. Additionally, the bill provides authorization of the U.S. Department of Energy's STEM education programs. NSF is a leader in broadening participation, but the burden should not rely solely on NSF since other agencies will need a diverse workforce as well. Therefore, the bill focuses on DOE, as well as NIST and other agencies to consider broadening participation goals in their STEM education programs.

Dr. Gallo advised that there are several areas of CEOSE's work that are relevant to Congress. Examples are the evaluation of NSF's programs both individually and comprehensively in order to identify opportunities to leverage programs across the directorates, development of strategies to enhance research and STEM education at MSIs, and focusing on institutional transformation.

In the question and answer period, **Dr. Gallo** responded to comments and questions that focused on the reauthorization of the America Competes Act. Covered in the deliberations were: 1) **Dr. Ladner**: the recently held CISE broader impacts summit where the NSF criterion on Broader Impacts was discussed, recommendations from the CEOSE mini-symposium on institutions serving persons with disabilities, recognition of institutions serving persons with disabilities at the same level as MSIs, and NSF programs that focus on persons with disabilities; 2) **Dr. Middendorf**: coordinating and extending programs among other agencies, agencies (e.g., NASA) that are not included in the America Competes Act, and how the agencies that are not included in the America Competes Act will be addressed by NSTC; 3) **Dr. Francisco**: the implementation of a road map for broadening participation and the shifting of the

broadening participation responsibilities from the principal investigator to the institutions to ensure the success of the United States in competing with the rest of the world; 4) **Ms. Morell**: benchmarks needed to position the United States to assume the lead in technology around the world, industry and university collaborations, and the financial investment of the United States in science and technology verses that for other countries; 5) **Dr. Gallo**: the review and clarification of the NSF Broader Impact criterion by the National Science Board, STEM education as a large component of the America Competes Act, public/private partnerships, and student exposure to a diversity of skill sets in preparation for STEM careers; 6) **Dr. Hammonds**: the need for the America Competes Act to address what makes equity of research partnerships between major research institutions and MSIs or predominantly undergraduate institutions possible; 7) **Dr. Hollis**: the declining federal assistance to HBCUs, Tribal Colleges and Universities and Hispanic Serving Institutions with high Hispanic enrollments, the strong commitment to the America Competes Act on the House side and whether the same will be true for the Senate side, the uncoordinated presence of over 100 STEM education programs across the federal agencies and the request by **Mr. Orszag** to cut those programs by 5 percent, **Congresswoman Johnson's** amendment that directs NSF to provide Congress with a report on the impact of the possible consolidation of programs to form the CBP-US Program before changes are made; 8) **Dr. Gallo**: the need for transparency in the proposed change to selected programs at NSF, 9) **Dr. Ramirez**: the short amount of time given by Congress for NSF to respond to its requirement to produce a report on its proposed change in selected programs, 10) **Dr. Gallo**: the Congressional concern that any institution that recruits and trains underrepresented students would be eligible for funding under the proposed CBP-US Program, the lack of a rationale for the consolidation of the selected programs at NSF; and 11) **Dr. Poston**: the need for institutional infrastructure to surround broadening participation.

Conversation with Dr. Cora B. Marrett, Acting Director, National Science Foundation:

Dr. Marrett opened her conversation with CEOSE members by giving brief remarks on the following points: 1) the President has nominated **Dr. Subra Suresh** for the position of NSF Director; 2) NSF is following closely the deliberations of Congress on such topics as the proposed CBP-US Program that was included in the budget request for fiscal year 2011; 3) NSF is responding to heightened interest in performance evaluation; 4) and the National Science Board Task Force on Merit Review is examining the Broader Impacts and Intellectual Merit criteria.

The question and answer period focused on the following: 1) **Dr. Poston**: details on the budget as it relates to future allocations within the NSF research directorates and how the proposed changes related to the education budget; the diversity of NSF approaches to broadening participation in STEM and the uneven outcomes, which are indicative of the need for NSF-wide guidelines; having focus group discussions on broadening participation in STEM among NSF officials and CEOSE members; and the concern for the lack of data to support combining selected programs that will result in the proposed CBP-US Program; 2) **Ms. Morell**: efforts to broaden participation in STEM in universities and resources (e.g., best practices) available in corporate America can be of mutual benefit, value and accountability for investments that must be shown by industry and federal agencies; 3) **Dr. Peterson**: the engagement of NSF in different mechanisms of corporate involvement in terms of formal and informal alliances and interactions, NSF efforts to find the appropriate balance of emphasis to place on unique aspects of HBCU, Tribal College and University, and the proposed HSI programs, the comprehensive study that will be conducted prior to taking additional actions on the proposed CBP-US Program, and what would be rational and reasonable expectations relative to broadening participation in STEM for the awardee community and the measures of success that need to be developed; 4) **Dr. Linton**: the positive impact of Tribal Colleges and Universities being singled out in the America Competes Act based on their uniqueness, the proposed action by NSF to address issues at HBCUs, Tribal Colleges and Universities, and HSIs and the workloads of faculty and the need for assistance of various types, a request for the status of NSF's actions on recommendations that resulted from the October 29, 2008 mini-symposium titled "Broadening Participation of Native Americans in Science and Engineering: Lessons Learned," 5) **Dr.**

Poodry: annual visits by NIGMS/NIH officials to tribal colleges and universities for the purpose of providing assistance with grantsmanship; 6) **Dr. Ladner:** the broader impacts summit recently held by CISE/NSF, the need for specific broadening participation points-of-contact in each directorate and the availability of financial resources for them to make awards; 7) **Dr. Haworth:** MPS working group model on broadening participation and efforts to focus activities on broader impacts; 8) **Dr. Marrett:** the desire for CEOSE to address particular types of issues from beginning to end, defining broadening participation outcomes and the appropriate bases for them across NSF at a time when evaluation and accountability are critical, sharing of CEOSE information with other agencies, and the appropriate communication of information to policymakers; 9) **Dr. Conrad:** what constitutes evidence of effectiveness, the right metrics and policy levers and priority areas for research, management tools to use to focus serious attention on broadening participation, and the next mini-symposium that will address the science of broadening participation; 10) **Dr. McBay:** the BRIDGE Program as a model program for broadening participation in STEM; 11) **Dr. Paulus:** the possibility of having principal investigators who have had ten or more NSF grants serve as mentors to individuals at MSIs or undergraduate institutions; 12) **Dr. Ramirez:** the possibility of having a program for MSIs to fund release time for faculty members to conduct research and/or write proposals and/or do other career development activities; and the lack of transparency in the process that is being used by NSF to decide about the direction it will take relative to programs under consideration for inclusion in the proposed CBP-US Program; 13) **Dr. Hammonds:** the desired role of CEOSE in the planning/decision-making process for the proposed CBP-US Program; 14) **Dr. Ferrini-Mundy:** discussion with the community on the proposed CBP-US Program, how wide and consultative actions will shape the decision-making process for the program; 15) **Dr. Martinez:** the NSF budget and the need for EHR to have a greater share of it in order to address critical issues like broadening participation in STEM; and 16) **Dr. Francisco:** issues surrounding the NSF portfolio of research and education and the belief by some that the education programs should be managed by another federal agency, and strategies for opening dialogue for positive change.

In general, CEOSE members expressed their concerns about the lack of evidence to support NSF moving forward in combining the HBCU-UP, TCUP, and LAMP programs and for adding in the to-be-established HSI program to form the proposed CBP-US Program. An evidence based process is needed. CEOSE members concluded that changing just for the sake of changing might not result in the desired positive impact.

CEOSE General Discussion:

In reviewing the list of SBE awards, note was made of the names of two grantees, **Dr. Willie Pearson** of the Georgia Institute of Technology, and **Dr. Samuel L. Myers, Jr.** of the University of Minnesota, who are former Chairs of CEOSE and whose fields of study focus on the underrepresentation of minorities in STEM disciplines. Their published articles contain information that will be of use in the next mini-symposium. Institutional capacity building around broadening participation is a topic that CEOSE might address. Infrastructure costs and the need for resources should be included in these deliberations. Also needed are more organizations (e.g., AIHEC and SACNAS that have begun a partnership) to join forces to provide support for MSIs. The same types of alliances could be beneficial to community organizations too. CEOSE members also discussed the diversity of NSF advisory committees and the membership of the National Science Board. **ACTION ITEM: Dr. Linton** agreed to provide a report of the demographics of members of the National Science Board. As the meeting continued, CEOSE members discussed comments by **Dr. Marrett** that focused on CEOSE doing more to assist NSF in its role. Members agreed that CEOSE should make recommendations to NSF on policies, processes, and programs pertinent to bringing positive impact on the involvement of women, minorities, and persons with disabilities in science, engineering, and technology fields. It should continue operating in the same capacity as defined by its congressional mandate.

Members also discussed topics for inclusion on the October 25-26, 2010 meeting agenda. It was noted that information on the biological sciences is needed. They also indicated that a better structure is desired for presentations by representatives of NSF directorates and offices. Perhaps NSF speakers should respond to questions like the following: What do they do? Do they have a point person for broadening participation? Do they have workshops focused on diversity? Do they have funds allocated specifically for broadening participation? What are the demographics of their directorates? What approaches do they use in their broadening participation programs and activities? What works and what does not? What are the paths forward? It was suggested that NSF best practices on inclusiveness be discussed at one of the CEOSE meetings and that a representative of NIH be asked to make a presentation on its diversity programs. Also suggested for speakers were a representative of Office of Management and Budget and a key professional staffer on the Senate side of the U.S. Congress. **ACTION ITEM:** *On behalf of CEOSE, Dr. Tolbert is to invite a key professional staffer on the Senate side of the U.S. Congress to make a presentation the October 25-26, 2010 meeting.* **ACTION ITEM:** *On behalf of CEOSE, Dr. Tolbert is to invite a key person from the Office of Management and Budget to make a presentation at the October 25-26, 2010 CEOSE meeting.*

Before adjourning for the day, members discussed to whom special invitations to CEOSE meeting should be extended, and they discussed the composition of the Federal Liaison group. **ACTION ITEM:** *CEOSE members are to send to Dr. Tolbert the names and contact information of persons that they want to receive special invitation to CEOSE meetings. All CEOSE meetings are open to the public and are announced in the Federal Register.*

ADJOURNMENT

The meeting was adjourned at 1:30 p.m.

CERTIFICATION OF THE ACCURACY OF THE CEOSE MEETING MINUTES

On September 29, 2010, **Dr. Muriel Poston**, Chair of the Committee on Equal Opportunities in Science and Engineering, approved the minutes of the June 29-30, 2010 meeting via an e-mail message to **Dr. Margaret E.M. Tolbert**, CEOSE Executive Liaison.