

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

MEETING MINUTES

October 17-18, 2011

MEETING PARTICIPANTS

Members Present

Dr. Karl S. Booksh, University of Delaware, DE
Dr. Cecilia Conrad, Pomona College, Claremont, CA
Dr. Richard E. Ladner, University of Washington, Seattle, WA
Dr. Marigold Linton, University of Kansas, Lawrence, KS
Ms. Lueny Morell, Hewlett-Packard Company, Aguadilla, PR
Dr. Maria (Mia) Ong, TERC, Cambridge, MA (*Virtual Participant*)
Dr. Eugenia Paulus, North Hennepin Community College, Brooklyn Park, MN
Dr. Ainissa F. Ramírez, Yale University, CT
Dr. Alexander Ramírez, San Antonio, TX
Dr. Keivan G. Stassun, Vanderbilt University, TN
Dr. Joseph A. Whittaker, Morgan State University, MD

Members Absent

Dr. Joseph S. Francisco, Purdue University, West Lafayette, IN
Dr. Evelyn Hammonds, Harvard University, Cambridge, MA
Dr. George Middendorf, Howard University, Washington, DC
Dr. Wendy Raymond, Williams College, Williamstown, MA

Federal Agency Liaisons to CEOSE Present

Dr. Katie E. Blanding, United States Department of Education
Ms. Lisa Evans, J.D., National Institutes of Health
Ms. Susan Heller-Zeisler, National Institute of Standards and Technology
Dr. Meldon Hollis, White House Initiative on Historically Black Colleges and Universities
Dr. Sara Klucking, United States Department of Homeland Security
Ms. Era L. Marshall, Smithsonian Institution
Dr. Muquarrab Qureshi, United States Department of Agriculture
Dr. Audrey A. Trotman, National Oceanic and Atmospheric Administration

Federal Agency Liaisons Absent

Dr. Paul T. Anastas, United States Environmental Protection Agency
Ms. Evelyn Kent, United States Department of Defense
Dr. Carl S. Person, National Aeronautics and Space Administration

CEOSE Designated Federal Officer

Dr. Margaret E. M. Tolbert, Senior Advisor, Office of Integrative Activities, National Science Foundation (NSF)

OIA/NSF Primary Support Staff Members

Ms. Geraldine (Geri) Farvés, Program Specialist, Office of Integrative Activities, NSF

Non-Members Who Attended the Meeting, Participated in Discussions, and/or Made Presentations:

<p>Dr. Morris Aizenman, MPS/NSF Dr. Bernice Anderson, EHR/NSF Dr. Robert Barnhill, Society for Advancement of Chicanos and Native Americans in Science Ms. Alison Beason, MCB/BIO/NSF Dr. Reeshemah Burrell, AAAS Fellow/ENG/NSF Dr. Lynda T. Carlson, NCSES/NSF Dr. Lura (Jody) Chase, HRD/EHR/NSF Dr. Parag Chitnis, BIO/NSF Dr. Julia V. Clark, DRL/EHR/NSF Dr. Joyce Ward Clarke, United States Patent & Trademark Office Dr. Stephen Cohen, NCSES/SBE/NSF Dr. Brooke Coley, AAAS Fellow/CISE/NSF Dr. Pamela Conyers, EHR/NSF Dr. Kellina Craig-Henderson, BCS/SBE/NSF Dr. Rachel Croson, SES/SBE/NSF Ms. Jasmine Crumsey, University of Michigan Dr. Janice Cuny, CISE/NSF Dr. Jewel Daniel, Johns Hopkins University Dr. Cynthia Dion-Schwartz, CISE/NSF Dr. Earnestine Psalmonds Easter, DGE/EHR/NSF Dr. Omnia El-Hakim, ENG/NSF Dr. Jaqueline (Jaqui) Falkenheim, NCSES/SBE/NSF Dr. Kelly K. Falkner, OPP/OD/NSF Dr. Joan Ferrini-Mundy, EHR/NSF Dr. John Finamore, NCSES/SBE/NSF Dr. David Friscic, OPP/OD/NSF Dr. Clifford Gabriel, OIA/OD/NSF Dr. Sonia Gay, United States Patent & Trademark Office Dr. Christy Geraci, AAAS Fellow/DBI/BIO/NSF Dr. Kenneth Gibbs, AAAS Fellow/HRD/NSF Ms. Simona Gilbert, OIA/OD/NSF Ms. Sherrie M. B. Green, OIA/OD/NSF Dr. Myron Gutmann, SBE/NSF Dr. Jong-on Hahm, OISE/NSF Dr. Farnam Jahanian, CISE/NSF Ms. Martha L. James, HRD/EHR/NSF Dr. Jolene K. Jesse, HRD/EHR/NSF Dr. Brandon Jones, United States Environmental Protection Agency Dr. J. Arthur Jones, QEM Network, Inc.</p>	<p>Ms. Tracy Gorman, OD/NSF Dr. Timothy (Tim) L. Kileen, GEO/NSF Dr. Fae Korsmo, OD/NSF Dr. Janet Koster, Association for Women in Science Dr. Mark Leddy, HRD/EHR/NSF Dr. James (Jim) Lightbourne, DRL/EHR/NSF Dr. Candace O. Major, OCE/GEO/NSF Dr. Cora B. Marrett, OD/NSF Dr. Shirley M. McBay, QEM Network, Inc. Dr. Lynn Milan, NCSES/SBE/NSF Dr. Tyrone D. Mitchell, CHE/MPS/NSF Dr. Mary Moriarty, HRD/EHR/NSF Dr. Josè Munoz, OD/NSF Dr. Sharon L. Neal, CHE/MPS/NSF Dr. Barbara Olds, EHR/NSF Dr. Sonia Ortega, DGE/EHR/NSF Dr. Eileen Parsons, AAAS Fellow/EHR/NSF Dr. Kelly Phou, NCSES/SBE/NSF Dr. Alice Popejoy, Association for Women in Science Dr. Muriel Poston, HRD/EHR/NSF Dr. Steven Proudfoot, NCSES/SBE/NSF Dr. John Ran, HRD/EHR/NSF Dr. Claudia Rankins, HRD/EHR/NSF Dr. Richard Rodewald, BIO/NSF Dr. Yvonne Rodriquez, Society for Advancement of Chicanos and Native Americans in Science Dr. Joann P. Roskoski, BIO/NSF Dr. Victor Santiago, HRD/EHR/NSF Dr. Shelley Sazer, BIO/NSF Dr. Julia Skapik, AAAS Fellow/CISE/NSF Dr. Richard N. Smith, HRD/EHR/NSF Ms. Marilyn Suiter, HRD/EHR/NSF Dr. Lorraine Summers, American Association for the Advancement of Science Dr. Subra Suresh, OD/NSF Dr. Cara Thunder, American Indian Science and Engineering Society (AISES) Dr. Wanda E. Ward, OD/NSF Dr. David Wilson, Society for Advancement of Chicanos and Native Americans in Science Dr. Valerie Wilson, DGE/EHR/NSF Dr. John C. Wingfield, BIO/NSF</p>
--	---

MONDAY, OCTOBER 17, 2011

MEETING SITE

Board Conference Room 1235, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230

OPENING STATEMENT

The Committee on Equal Opportunities in Science and Engineering (CEOSE) meeting was called to order at 9:05 a.m. by **Dr. Richard E. Ladner**, Chairman. After welcoming everyone, **Dr. Ladner** called for committee members to introduce themselves and for each to give a brief statement about his/her background. Eleven members were in attendance. Four of the members were new, and one of the eleven participated via telephone. Eight Federal Agency Liaisons to CEOSE were in attendance.

Dr. Ladner reported that new CEOSE members were oriented during a telephone conference call held October 13th with him, **Dr. Conrad**, **Dr. Ward**, and **Dr. Tolbert**. Under consideration is an orientation session for Federal Agency Liaisons.

JUNE 13-14, 2011 CEOSE MEETING MINUTES

CEOSE members concurred with the **Dr. Ladner's** earlier approval of the June 13-14, 2011 meeting minutes without any changes.

OCTOBER 6, 2011 TELECONFERENCE WITH CEOSE OFFICERS AND THE NSF LEADERSHIP

Dr. Ladner reported on the October 6, 2011 teleconference with CEOSE officers, **Drs. Suresh** and **Marrett**—the Director and Deputy Director of NSF respectively—and other NSF staff (**Drs. Ward** and **Tolbert**). Then he provided **Dr. Conrad's** description of the CEOSE mini-symposium, “The Science of Broadening Participation,” scheduled for November 1-2, 2012, at NSF. Additionally, he reported on **Dr. Suresh's** request to the NSTC Committee on Science to appoint Federal Agency Liaisons to CEOSE. He also reported on the description that **Dr. Suresh** gave on the Family Friendly Work Balance Initiative and noted that this initiative was announced September 26th at the White House with **First Lady Michelle Obama** as the keynote speaker.

Dr. Ladner also reported that he and **Dr. Conrad** called to the attention of **Dr. Suresh** the concerns of CEOSE about the proposed EHR programmatic changes. CEOSE would like to be involved in the deliberations on changes to broadening participation programs early in the process and to provide insights on those changes in the various NSF directorate. In response to those comments, **Dr. Ladner** reported that **Dr. Suresh** advised of the advisory role of CEOSE and his appreciation of the committee's work; however, the decision-making process is to remain with the directorates and his office. **ACTION ITEM:** **Dr. Ladner** or his successor is to develop a strategy for CEOSE to be better engaged with incoming NSF policy issues, which affect broadening participation in science and engineering.

Another topic discussed during the teleconference was the proposed new NSF merit review criteria that are being reviewed by a task force of the National Science Board (NSB). **Dr. Ladner** reported that the Chair of the NSB Task Force on Merit Review gave a presentation at an earlier CEOSE meeting, and

CEOSE members have been active in participating in surveys and providing comments on proposed changes to the Merit Review Criteria, particularly the Broader Impacts Criterion. CEOSE members submitted a letter to the NSB advising of its consensus on changes to the Broader Impacts Criterion (i.e., the need to heighten the status of the broadening participation in science, technology, engineering, and mathematics (STEM) component of the criterion). **ACTION ITEM: Dr. Ward** will provide CEOSE with an update on the NSB Merit Review Criteria at an appropriate time.

DISCUSSION

Dr. Ladner asked for comments on the June CEOSE meeting hosted at the White House Conference Center by the Office of Science and Technology Policy and NSF. It was noted that comments made at the meeting by **Dr. Wieman** of the Office of Science and Technology Policy (OSTP) made it clear that there is strong interest in STEM education. **Dr. Cora B. Marrett** spoke to the same topic and added comments on opportunities for the development and support of research scientists and engineers from underrepresented groups. When the discussion was broadened, the following comments and action items were among the resulting points. Names of the persons who made the statements are provided in parentheses.

- **COMMENT:** NSF has not responded to CEOSE recommendations that resulted from the mini-symposium held in 2008 on “Broadening Participation of Native Americans in Science and Engineering: Lessons Learned.” Therefore, NSF should be asked to respond to them, as well as other recommendations including those that appear in the NSF Broadening Participation Strategic Plan (**Dr. Ladner** and **Dr. Linton**).
- **COMMENT:** There should be a balance of resources among different educational institutions. Particular attention should be paid to minority serving institutions, especially institutions as Historically Black Colleges and Universities (HBCUs) where there are infrastructure and workforce development issues (**Dr. Hollis**).
- **COMMENT:** A compendium of broadening participation programs should be developed to highlight points of potential collaboration among Federal agencies (**Dr. Blanding**).
- **COMMENT:** OSTP is collecting data for the development of an inventory of Federal broadening participation programs (**Dr. Brandon Jones**).
- **COMMENT:** The White House Initiative on Historically Black Colleges and Universities receives annual reports from all federal agencies. Those reports list all programs and the amount of funds that are awarded to HBCUs. Each White House initiative receives similar reports on the groups that they serve. These reports could serve as starting points for the development of a compendium. Verification of the data in those reports should be a first step for anyone who plans to prepare a compendium on broadening participation programs at Federal agencies (**Dr. Hollis**).
- **COMMENT:** A solid and constant vocabulary must be established across Federal agencies so that there will be consistency in reports and discussions on broadening participation (**Dr. Hollis**).

FAREWELL STATEMENT BY DR. MURIEL POSTON, FORMER CEOSE CHAIR

Dr. Poston, Director of the NSF Human Resource Development Division (HRD), thanked everyone for the extraordinarily great opportunity to serve as a member of CEOSE. She advised that the perspectives of members and liaisons help to further broaden how higher education and research issues in STEM are addressed. She then commented that an important consideration in her decision to join NSF was the

proposed comprehensive broadening participation program, which would have combined several programs (Louis Stokes Alliances for Minority Participation (LSAMP), Tribal Colleges and Universities Program (TCUP), and the Historically Black Colleges and Universities – Undergraduate Program (HBCU-UP)) that are congressionally mandated and are managed within the NSF Education and Human Resources Directorate. Issues surrounding support for minority serving institutions and students from underrepresented groups are complex; however, the focus is intentionally narrow for each. It is recognized that support for students, women, and persons with disabilities as it relates to broadening participation issues cut across all institution types. This might lead one to assume that these programs can be put into the mix of all institutions of higher education and fund them all within the same program. However, it is important to note that the “playing field” is not yet level across all institution types and discipline fields. This brings to mind an important role that CEOSE has in advising NSF on how to understand and address these matter in strategic ways.

There is concern about two additional HRD programs (The Research in Disabilities Education (RDE) program and the Development Research on Gender in Science and Engineering (GSE) program) that are engaged in fostering an understanding of the evidence base for broadening participation. The recommendation is to transfer of these programs to another division of the Education and Human Resources Directorate (EHR). This transfer is troubling, especially for stakeholders in the disabilities community, since they do not know the strategy that NSF plans to use to effectively support capacity building in education and research for underrepresented groups in a time when resources are scarce. In terms of background, there are eight programs in HRD, and most are congressionally targeted, thereby, somewhat limiting the degrees of freedom around them. . Admittedly, the RDE and GSE programs are closely allied with programs in the NSF Division of Research on Learning in Formal and Informal Settings (DRL), however, the issue of how this collaboration will progress is still a work in progress. Within HRD, efforts are being made to advance understanding of the underlying issues affecting broadening participation and the success of underrepresented groups in STEM education and the workforce. It is known that undergraduate research is an important factor in engaging all students in STEM fields. More research is needed on this topic. **Dr. Poston** commented that she is looking forward to the “CEOSE Mini-Symposium on the Science of Broadening Participation,” especially since it connects with the HRD research track on understanding issues that underlie participation and success in STEM.

For the eight HRD programs, the effort is to look at interventions, which have been a part of these programs since their inception, and develop an understanding of the evidence that has allowed for the success of those interventions. What are the effective practices? Within the limits of the small HRD budget, which is the smallest one of the EHR divisions, it is hoped that a great deal will be accomplished as HRD takes advantage of opportunities to impact broadening participation. **Dr. Poston** commented that she will continue to seek the advice of CEOSE during her appointment as HRD Director.

Following **Dr. Poston’s** remarks, **Dr. Ladner** presented her with two gifts (an engraved executive silver holder containing a note pad and an engraved digital clock desk set) from CEOSE members. Later in the meeting, **Dr. Suresh** presented her with a Certificate of Service for her prior work as a CEOSE member and officer.

BRIEFING BY THE ACTING DIRECTOR OF THE NSF OFFICE OF INTEGRATIVE ACTIVITIES

Dr. Gabriel described the new process for the appointment of CEOSE members, consistent with the Office of Science and Technology Policy (OSTP) memorandum on advisory committees. The memorandum called for casting a broader net in order to obtain as many membership nominations as possible. Most recently, there were four vacancies on this committee, which has 15 slots. When one looks at the number of issues addressed by CEOSE, the need for additional members is evident. The challenge was great, given that 40 nominations were received as a result of the announcement in the *Federal Register*, e-mail messages, and Dear Colleague Letter. A detailed analysis was completed on the nominations, and a possible slate of nominees was recommended for membership. CEOSE members and NSF senior managers reviewed the results of the analysis, as well as the full slate of nominees. Upon receipt of the results from these two groups, the analysis was conducted again based on comments received from the two groups. The final slate of nominees recommended for membership was presented to **Dr. Suresh** for final comments and approval. This process resulted in the selection of four outstanding individuals for membership. **Dr. Linton** agreed that the new members are great, but she expressed her concern that more attention was not paid to different regions of the United States as members were selected. **Dr. Booksh** advised that the backgrounds of members in terms of regions of the United States are broader than the location indicated by their zip codes; therefore, we have to draw on all of our experiences gained in the various regions. **Dr. Ward** advised that the points were well taken—the broader geographical diversity is important too. **Dr. Gabriel** expressed his satisfaction with actions taken by members of the NSTC Committee on Science in response to **Dr. Suresh's** request that they appoint liaisons to CEOSE from their respective agencies. According to **Dr. Gabriel**, this group could begin by addressing, with CEOSE, issues such as a common language for use in discussing broadening participation in STEM and how to collect data across agencies in a way that detailed policy analysis can be conducted accurately.

UPDATE: PLANS FOR THE MINI-SYMPOSIUM ON THE SCIENCE OF BROADENING PARTICIPATION

Dr. Conrad reported that the next CEOSE mini-symposium is scheduled for November 1-2, 2012, and it will be titled “The Science of Broadening Participation.” Details of this mini-symposium have been planned and discussed for about a year and a half. Among the challenges encountered were 1) defining the mini-symposium, which focuses on a broader theme of broadening participation, 2) how to get the various groups involved, 3) how to include the different education levels, 4) how to bring together people engaged in science programs that are the central focus, and 5) how to get individuals involved across disciplines. The mini-symposium is going to bring together scientists that are engaged in social behavioral and economic sciences relevant to broadening participation and those who are practitioners of the design and are involved in program implementation to increase the representation of underrepresented minorities, women, and persons with disabilities in STEM. **Dr. Conrad** presented the goals for the mini-symposium as shown below:

1. To contribute to the development of a vision of the Science of Broadening Participation, continuing a conversation begun at an earlier NSF Workshop,
2. To disseminate social, behavioral, and economic research that might inform the development of effective intervention strategies,

3. To use the experiences of practitioners to inform a research agenda for the science of broadening participation,
4. To develop an understanding of what makes successful programs successful,
5. To make recommendations to CEOSE and to funding agencies as promising lines of inquiry in the science of broadening participation, and
6. To make recommendations to CEOSE as evidence-based strategies for increasing representation of women, minorities and persons with disabilities in STEM fields.

Sessions of the mini-symposium will cover the direction that research should take in the future to develop an understanding of what makes successful broadening participation programs successful. Ultimately, the plan is to develop recommendations for consideration by CEOSE for use in its advisement to NSF relative to future lines of inquiry and for the development of specific strategies on the science of broadening participation. The final recommendations that CEOSE accepts will appear in its next biennial report to Congress.

In the question and answer period, **Dr. Conrad** responded to a multiplicity of questions and comments from CEOSE members and Liaisons. She advised that individuals from minority serving institutions will be involved in the mini-symposium, perhaps on the practitioners' side of the agenda. The list of subjects to be covered will be shortened. Consideration will be given to a systems view as the approach to be used. At this point, no consideration has been given to having a keynote speaker for the mini-symposium, which will have an audience of multiple backgrounds. Efforts will be made to identify actions that need to be taken in terms of research that might lead to the development of funding streams from NSF, as well as other agencies and private organizations. **Dr. Conrad** anticipates the identification of principles to impact the understanding of intervention and developing programs. The observation was made that NSF has issued a Dear Colleague letter on the science of broadening participation. There is also the complexity of a science of policy program. **ACTION:** CEOSE members and Federal Agency Liaisons are to provide **Dr. Conrad** with their reactions to the different structural approaches (i.e., Single papers followed by a session at the end of each during which time there would be a question and answer discussion session; the standard panel discussion; academic conference format; identify a focus and design the panel such that a presentation is made and a group of designated persons discuss various aspect of the topic) for the mini-symposium. **ACTION:** **Dr. Conrad** will identify the mini-symposium participants and will present this list to CEOSE members and Federal Agency Liaisons for their review and comments.

PRESENTATION, "BEGINNING THE DISCUSSION ON POTENTIAL EFFICIENCIES FOR SESTAT"

Dr. Lynda T. Carlson announced that her NSF division, which is a part of the Social, Behavioral and Economic Sciences Directorate, has been renamed. The current name is the National Center for Science and Engineering Statistics (NCSES). The change was made as a result of the broadening of responsibilities outlined in the American Competes Act. NSF is one of the 14 federal statistical agencies.

She then proceeded to present information on the Science and Engineering Statistical Data System (SESTAT). NCSES is building from a report released in 2008 by the National Academy of Sciences/National Research Council (NRC), which NSF commissioned after reviewing the system and

building some changes into the SESTAT system essentially using the American community. Specifically, one of the NRC recommendations was as follows: The National Science Foundation should use the opportunity afforded by the introduction of the American Community Survey as a sampling frame to reconsider the design of the Scientists and Engineers Statistical Data System (SESTAT) Program and the content of its component surveys. Motivations for this were the following:

- The American Community Survey (ACS) is being used to draw a sample for the National Survey of College Graduates (NSCG);
- The NSCG sample is updated every two years from the ACS, which is collecting data continuously;
- Over the years, undue complexity has been built into the SESTAT system;
- There is a need to improve data timeliness;
- The reality of budgetary pressures are prevalent and will remain so in the future;
- The cost of surveys are rapidly increasing.

Each SESTAT survey targets a unique population, and the National Survey of College Graduates (NSCG) targets the college-educated population. Once the survey of college graduates was in place, it was time to look at potential uses and how to optimize the survey. With a great deal of effort, the American community survey was refined. The National Survey of Recent College Graduates (NSRCG) was designed to provide the inflow of new graduates when the NSCG was based on a once a decade design. The Survey of Doctorate Recipients (SDR) targets United States-earned science and engineering (S&E) doctoral degree recipients. There are 45,000 or more who are followed until age 76. NSCG is supplemented by NSRCG and SDR. This is the core of SESTAT. As with any survey, there are costs involved, and the most expensive of the SESTAT surveys is the NSRCG.

NCSES is examining whether the use of the ACS-based NSCG can be leveraged to derive NSCG estimates similar to those presently provided by the NSRCG. Among the issues are the following: 1) how to best capture the change in estimation capacities, for example “young graduates versus recent graduates; 2) whether the ACS sample is large enough to make the proposed switch; 3) accuracy of NSRCG versus ACS-based estimates; 4) outreach to the S&E and broader user community and obtaining their input; 5) determination of evaluation milestone dates; and 6) impact on other NCSES surveys and data products such as Women, Minorities and Persons with Disabilities and Science and Engineering Indicators. The question is: Can NCSES utilize the ACS and the NSCG design to arrive at estimates similar to those which are obtained currently from the NSRCG? If so, can the NSRCG be eliminated? The responses to these questions and others are complex given the number of variables to be considered.

Included among the major NCSES ongoing tasks are the examination of the sample availability, submission of the Federal Register notice, external outreach to NSRCG data users, and the examination of the cost implications of the surveys. NCSES is tentatively scheduled to complete its critical evaluation in late 2011 or early 2012. On the horizon are several tasks of evaluating the accuracy of ACS-based estimates, outreach to determine the potential impact on users, completion of the evaluation summary memorandum, and the making of decisions based on the outcome of the findings.

Although a great deal of work is ongoing and planned, some of the impact of the results is clear. For example, there will be no significant change in the data that NCSES now provides on the S&E workforce

from SESTAT. The proposed changes will have NO impact on the race and diversity data that will be produced from SESTAT. The proposed changes will allow NCSES to attempt to estimate the Associate's degree population, especially S&Es from SESTAT. **Dr. Carlson** advised that she and her staff will be sending to CEOSE members memoranda to keep them updated as the process continues.

During the question and answer period, **Dr. Carlson** was joined by **Dr. Stephen Cohen**, the Chief Statistician in NCSES, in responding to questions. The questions posed by CEOSE members and Federal Agency Liaisons covered data suppression, confidentiality of survey respondents, implications on reliance on ACS data, changes in methodologies and terminology in data reporting and the impact of those types of changes on the ability to conduct data trend analyses, NSCG and ACS, forming partnerships with S&E societies that focus on data and statistical analyses, the tracking of federal resources to HBCUs to determine the impact on the production of S&E professionals, lack of consistency of HBCU data from various federal agencies, the inclusion of health and energy professionals with S&E degrees in the surveys, data accuracy, the inclusion of previous addresses and the last four digits of social security numbers as a part of the survey instrument for the differentiation of people with the same/common/similar names,

In closing the session, **Dr. Carlson** introduced **Dr. Jaquelina (Jaqui) Falkenheim** who is serving in the same capacity in which **Dr. Joan Burrelli** (retired) served. **Dr. Falkenheim** will be writing a chapter in the Science and Engineering Indicator that will be published in January 2012. **Dr. Carlson** introduced **Dr. John Gawalt**, the current Deputy Director of NCSES, who was not present at the meeting. He is the person who will serve as Interim Director of NCSES if **Dr. Carlson's** successor is not named by the time that she retires in February.

GENERAL DISCUSSION ON DATA FROM DIRECTORATES

CEOSE members and Federal Agency Liaisons discussed the preferred format for presentations by NSF Assistant Directors at CEOSE meetings. When invited to make a presentation, each Assistant Directors is given a template to follow in developing his/her presentations. The data on women, underrepresented minorities, and people with disabilities are to be in the following categories: 1) Submitted Proposals, 2) Awards, 3) NSF Scientific Staff, 4) Committees of Visitors, 5) Panel Memberships, and 6) Advisory Committees. Additionally, each is requested to provide the following information:

1. Brief Description of Any Targeted Broadening Participation Programs
 - a. Funding Levels
 - b. Success Metrics
 - c. Evaluation Results
2. Any Other Broadening Participation Efforts
 - a. Success Metrics
 - b. Evaluation Results
3. Future Plans
 - a. Broadening Participation Strategic Plan, if Any
 - b. New Broadening Participation Programs or Efforts Anticipated

The effort is to obtain real data from the directorates on progress in broadening participation in S&E.. Longitudinal data covering at least five years are requested. Assistant Directors are requested to provide their data to the CEOSE Designated Federal Officer for submission to CEOSE members and Federal

Agency Liaisons at least two weeks prior to the CEOSE meeting at which they will speak. Then CEOSE members and Federal Agency Liaisons will have the opportunity to review the data in advance of the meeting. This enables greater understanding and discussion of the information to be covered by the Assistant Directors.

DISCUSSION ON VARIOUS DIVERSITY AND INCLUSION TOPICS BY FEDERAL AGENCY LIAISONS TO CEOSE

Dr. Ladner commented on the day in June 2011 in which a CEOSE meeting was held at the White House Conference Center. At that meeting several representatives of different federal agencies discussed the lack of uniformity in terminology and definitions used by different federal agencies for broadening participation.

In discussing broadening participation, Federal Liaisons and guests provided insights on how their agencies address broadening participation. Focus was on the increasing diversity of the workforce, the inclusion of gender, ethnicity and race, disability status, sexual orientation, as well as everything that appears in the President's executive order. Some of the agencies (e.g., NOAA) are developing diversity plans. Federal agencies are seeking to improve their posture in broadening participation in science and engineering. The gist of the discussion follows:

- Women are in the federal workforce but not in science and technology positions in large numbers. Between 2000 and 2009, the percentage of men in the workforce ranged from approximately 70 to 80%, and in that same period, the percentage of women in the workforce ranged from approximately 20% to 30%. The percentage of women in the workforce still remains low.
- **Dr. Trotman**
In terms of race and ethnicity, there are far fewer American Indians and Alaskan Natives than any other group in the federal workforce. The largest group of employees is white. Seemingly educational programs are having a great deal of success in broadening the participation of minorities in science and engineering. A NOAA program was highlighted as one that enables students from minority serving institutions to be trained while employed in science and technology offices at that agency. This opportunity enables the expansion of the students' capabilities, strengthens their work experiences, and gives them advantages in federal employment after completing their education pursuits. The U.S. Department of Commerce (DOC) of which NOAA is a component, has diversity objectives, which are addressed by all DOC units.
- **Dr. Blanding**
The U.S. Department of Education (Ed) has a number of programs that broadening participation in science and engineering. For example, there are three major programs within Title III and Title V that focus on broadening participation. Currently, there is heavy emphasis on African American and Hispanic male participation in science and engineering fields. Examples of Ed institutional strengthening programs are the Historically Black Colleges and Universities program, Hispanic Serving Institutions program, Minority Science and Engineering Improvement program, and a general program that addresses the participation of Asian Pacific Islanders and Native Americans. When determining the eligibility of institutions that apply for Ed grants, the percentage of Pell grants held by the institutions' students, the number of minority students enrolled, and the number of students that enroll in graduate schools is taken into consideration. Some programs require that there be a person with a disability on proposal review teams. When assessing the applications, Braille assistance

is provided to reviewers as needed. Of course, Ed has a number of additional programs that focus on broadening participation. Also, there is a person on the Ed staff who is responsible for programs focused on Hispanic Serving Institutions. Because of its complexity, Ed has two liaisons to CEOSE—one from the post secondary education programmatic area and one from the White House Initiative on Historically Black Colleges and Universities.

- **Dr. Hollis**

The White House Initiative on Historically Black Colleges and Universities (WHI-HBCUs) was established by former President Carter through an executive order, and a new executive order has been signed by each subsequent president. The WHI-HBCUs has the charge of increasing federal support to Historically Black Colleges and Universities (HBCUs). Colleges and universities that are under the auspices of the WHI-HBCUs are the 105 institutions that were established 1964. About 300,000 students attend these institutions. Even though these institutions make up only 3.5% of the higher education population, about 30% of the African Americans with degrees earn them from these colleges and universities. A number of success stories can be presented about HBCUs. The WHI-HBCUs studies policies and reviews the overlap between the capabilities of HBCUs and federal interests. Examples of topics that are being addressed by the WHI-HBCUs in relationship to HBCUs are emergency management, homeland security, energy, internationalization, and science, technology, engineering, and mathematics (STEM). The WHI-HBCUs is trying to find federal support for HBCUs to facilitate greater access for a larger number of individuals in STEM fields. There have been efforts by others to classify HBCUs as a racial category, but institutions don't have races. Note was made of the fact that when federal agencies work with Tribal Colleges and Universities, the interactions are categorized as government to government. HBCUs have congressional history and, hence, are in a different operating category.

- **Ms. Marshall**

The Smithsonian Institution (SI) is committed to equal employment opportunities for its six thousand employees, especially in reference to diversity and inclusion, and the goals for diversity are included in its strategic plan. There is planned emphasis on involvement in broadening access to various educational institutions. The director of SI is a champion for diversity, and SI complies with federal regulations with regards to diversity and inclusion. Accountability for diversity is required of all managers and supervisors, and their compliance is discussed on a quarterly basis. Also, the involvement of senior managers and supervisors in community outreach to increase diversity on a personal level is valued. The uniqueness of SI is that it has thematic museums (e.g., Native American Museum and the African Museum of Art), each drawing on a high level of involvement of the racial/ethnic group pertinent to the given themes. It also has focus groups for each of the racial/ethnic groups and persons with disabilities, and it has outreach initiatives. SI collaborates with a number of other Federal agencies, and it has an Office of Sponsored Projects. The Smithsonian Center for Education and Museum Studies has under its auspices the responsibility for working with Historically Black Colleges and Universities and other Minority Serving Institutions. Efforts are being made to build the National Museum of American History, Art, and Culture on the Mall in Washington, DC.

- **Dr. Heller-Zeisler**

National Institute of Standards and Technology (NIST) laboratories have been reorganized and are continuing to develop diversity plans that focus on gender, race, ethnicity, and disabilities in the workforce and in educational outreach activities. The offer was made to present the gist of these plans at a later CEOSE meeting. NIST has been given increased authority to have better discretion in using

underrepresented populations as a criterion in the recruitment of post-doctoral and fellowship program participants. In the selection of participants for the Middle School Science Teachers program, the NIST Summer Institute is focusing more on high needs school districts throughout the nation. Also, NIST is making efforts to address diversity in its Summer Grant Program for Undergraduates.

- **Ms. Evans**

The National Institutes of Health (NIH) is addressing diversity in the workforce through a number of programs, and its program portfolio is very large. It offers diversity targeted programs focused on underrepresented racial and ethnic minorities, persons with disabilities, and persons from disadvantaged backgrounds. NIH looks at diversity from two perspectives: intramural and extramural (85% of NIH grant funds are in this category). Different laws govern these two categories. NIH pays strict attention to Title VI, which prohibits discrimination on the basis of race/ethnicity, and Title VII. The term “broadening participation” is not used at NIH. The focus in the extramural category is on increasing access for groups that are underrepresented in biomedical research. Women on the faculty at educational institutions are addressed in NIH programs in the extramural category. NIH has institutional, fellowship, and other training programs that focus on minority serving institutions. Race and ethnicity are not considered in the RO-1 type programs. However, race and ethnicity data are captured in comments, but this is separate from the application process. In capturing race and ethnicity data, a problem is the low response rate to information requests. NIH is working on how to effectively implement the multiple race requirements, which has proven to be a big challenge for this agency. In response to a question, the NIH Liaison to CEOSE spoke briefly about a recent journal article that criticized the NIH lack of racial/ethnic diversity in principal investigators who received awards in the RO-1 category. NIH is working hard to develop a diverse and well-qualified workforce.

- **Dr. Wilson**

A guest, **Dr. David Wilson**, from SACNAS spoke about an initiative that is being implemented in association with NIH. This initiative involves meetings among members of SACNAS and NIH sponsored researchers and employees. Presentations are made and intensive courses are offered. Summer students are involved in these activities too. The effort is to promote networking, cultural exchanges with NIH and the research community, and to encourage greater interest of underrepresented groups in the medical sciences.

- **Dr. Klucking**

The Department of Homeland Security (DHS) is responsible for maturing and strengthening the homeland security enterprise. It guards against terrorism, enforces the nation’s immigration laws, secures the nation's borders, safeguards and secures cyberspace, and prepares for and responds to disasters. It has numerous responsibilities to address as it works diligently on developing the diverse workforce in science and engineering and on broadening the participation of minorities in its programs and activities. One of the large DHS programs is the University Centers of Excellence program through which eight or nine awards have been made. A large portion of the resources for these centers is committed to education in the context of broadening the STEM workforce in general and broadening participation in the Homeland Security workforce. Universities that receive Center grants are asked to form partnerships with minority serving institutions, including HBCUs. Additionally, they are asked to document relationships and opportunities that are developed for bringing under-served populations into their education streams and for the development of a broader more diverse workforce. Metrics are created around these program activities. There is a great deal of

emphasis on broadening participation, which feeds into the competitive review of these grants. Additional DHS information on broadening participation in STEM will be presented at future CEOSE meetings.

- **Dr. Jones**

Dr. Brandon Jones reported that the United States Environmental Protection Agency (EPA) operates programs that are intended to have positive impact on underrepresented populations. However, the emphasis on race and ethnicity is not as intense as it was prior to the 2004 Michigan Law School case, and agency efforts have been met with decreased applications and awards to underrepresented minorities. EPA has been analyzing its award data since 2003, and when the data are compared to those of earlier years, a drastic decrease in awards to minorities is evident, especially in the fellowship program. Efforts to address the decrease include targeted outreach at the local and national levels, especially at conferences and conventions that have large populations of underrepresented minorities. EPA has several memoranda of understanding with minority serving institutions.

- **Dr. Qureshi**

The United States Department of Agriculture (USDA) has several mission areas. The mission area institute in which the USDA Liaison works is directly related to education and capacity building through formal and informal education. This institute was established recently under the Farm Bill, and this institute funds all of the USDA education research and outreach activities. In its portfolio of programs, USDA is sponsoring projects that offer opportunities for training (e.g., fellowship program) the next generation of scientists through capacity building and education programs for minority serving institutions. Documents containing information on USDA programs that are under the auspices of the institute were distributed, but there was not enough time for them to be discussed. In pointing out the attention that USDA pays to broadening participation in STEM, note was made of the number of minorities in position at this agency and the fact that a female scientist—**Dr. Kathleen A. Merrigan**—serves as its Deputy Secretary.

Dr. Booksh described issues faced by students with disabilities and institutions that have large populations of those students. He advised that these students suffer from discriminatory practices. He asked for input on what can be done more broadly to address the problems faced by persons in STEM who have disabilities. In response, the EPA representative advised that persons with disabilities are addressed by EPA under its broadening participation rules and regulations, and special strategies are used to stimulate their interest in STEM.

Dr. Stassun led the committee in complimenting Federal Agency Liaisons to CEOSE for their excellent presentations and discussions of their agencies' efforts to address broadening participation in STEM. Further, he talked about possible workforce enhancement actions that NSF can take to train and shepherd individuals into STEM positions at national facilities. One ready population for this type of action is the one that funds students that complete NSF workforce development programs, thereby enabling them to gain access to long term scientific engagement in NSF's national facilities. NASA and the United States Department of Energy have programs of this type. The second suggestion that he made was about graduate training. NIH is the model for this idea. NSF funds a large number of students. For example, it has the IGERT program, as well as other programs. He suggested that NSF place greater emphasis on sponsoring long term basic graduate training programs.

The question was raised about how CEOSE members and Liaisons could brainstorm ideas going forward. What are the best practices to use, invest, and jointly manage in order to have major positive impact on this nation's STEM enterprise? **Dr. Stassun** suggested that the effort be to recruit, retain, and reward investments. He suggested that ideas on STEM be developed into recommendations to NSF to develop a pilot program that moves the STEM enterprise forward in leaps and bounds relative to broadening the participation in STEM and the workforce. **ACTION:** At an appropriate time and date, CEOSE members are to develop ideas on STEM in order to form the basis for a recommendation to NSF that will move broadening participation efforts ahead in leaps and bounds.

Dr. Linton suggested that a first step might be to ask the Federal Agency Liaisons the following question: What would make them want to participate in future CEOSE meetings? She suggested that Liaisons have a spot on the CEOSE agenda at each meeting. **COMMENT:** For future meetings of CEOSE, Federal Agency Liaisons are to be invited to participate in discussions on specific topics pertinent to broadening the participation of women, minorities, and persons with disabilities in STEM.

PRESENTATION: "BROADENING PARTICIPATION ACTIVITIES OF THE DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCE AND ENGINEERING"

Dr. Farnam Jahanian, NSF Assistant Director for Computer and Information Science and Engineering (CISE), shared with CEOSE members and others information on workforce development and diversity in computer science and engineering. After introducing several CISE staff members, including the CISE Deputy Assistant Director and the program officer for broadening participation in CISE, he gave a few highlights of CISE. Included in the information that he shared was the status of some of the challenges that the broader computing community faces, particularly in the area of diversity. He also mentioned a couple of targeted programs, some of the successes associated with these programs, and CISE future plans. He mentioned that NSF continues to be the dominant source (it sponsors about 70% of the basic research) of government sponsored unclassified research for computer science and mathematics in this country. The primary areas are computing information science and computer engineering.

In describing CISE, **Dr. Jahanian** provided the following facts: 1) CISE is organized into three divisions: the Division of Computing & Communication Foundations (CCF), the Division of Computer and Network Systems (CNS), and the Division of Information and Intelligent Systems (IIS); 2) The CISE research budget in 2010 was a little more than \$600 million; 3) CISE handled approximately 6,400 proposals in that year; 4) CISE made 1,500 awards, held 247 panels, and supported about 12,800 individuals, including 4,500 graduate and 1,800 undergraduate students, through those awards; 5) Regional boundaries of CISE are very fluid due to the nature of the discipline; and 6) CISE funds a large number of cross-cutting activities.

As **Dr. Jahanian** shared additional information on awardees, he advised that CISE is very pleased that demographics of its awardees closely mirror those of CISE applicants from the various racial/ethnic groups. As he continued his report, he advised that approximately 1% (based on self reported data) of CISE awards over the past five years are to persons with disabilities. This matched well with the percentage of proposals received from that group. In reviewing CISE data on panelists, he reported that 13% of them are females, and one percent of the panelists have disabilities. Four percent are minorities. A number of reviewers for CISE do not report their races/ethnicities. Ways are being sought for increasing

minority participation and report of race/ethnicity by all panelists. CISE has been reviewed by two Committees of Visitors (COVs) over the last five years, one in 2006 and one in 2009. Those two COVs averaged 25% females and 7% minorities. In 2006, one percent of the COV membership reported that they have disabilities. From 2007 to 2011, CISE Advisory Committee membership consisted of the following demographics: 12% of individuals from underrepresented groups, plus 19 males and six females. In the future, **Dr. Jahanian** promised to make additional changes in the membership of CISE panels, COVs, and advisory committee in order to make them more racially/ethnically diverse.

In reference to the CISE staff, **Dr. Jahanian** reported that it consists of approximately 40% females and 60% males, including IPA's and management staff members who are serving in scientific roles.

The larger issue of broadening participation in the computing community was addressed, along with some of the issues that are believed to be unique to the computing community. Included is information on what **Dr. Suresh** is attempting to do in working with organizations external to NSF. The computing community faces three significant interrelated challenges in workforce development: the under production of degrees, low numbers of underrepresented minorities, and lack of computer science education in K-12.

Broadly speaking, there continues to be strong projections for job growth in computer science, computer engineering, and information sciences. The demand isn't coming from the usual place like Google, Microsoft, and Yahoo. The demand for computer science students is also from every sector in the economy — manufacturing, health care, finance, etc. There are far more job openings than there are persons with degrees in computer science fields, an issue that must be addressed. To not include individuals from all sectors of our society in computer science fields places this country at a disadvantage, the loss of talent and creativity to the discipline. It is recognized that there is a pipeline issue. Regardless of the field of choice of an individual, he or she needs to have an understanding of computer techniques.

In completing his presentation, **Dr. Jahanian** described selected CISE programs, one (e.g., Broadening Participation in Computing) of which aims to increase the participation of women, African Americans, Hispanics, Native Americans, and persons with disabilities in computer science. The directorate is also realigning its investments so that they serve as national resources in support of broader CISE educational goals. This directorate has had project evaluations and program level evaluations conducted on its programs and funded projects. The project evaluations have identified several successes that are quantifiable. Additionally, CISE has joint efforts with the NSF Education and Human Resources Directorate and with the Office of Cyberinfrastructure. The goal of these joint efforts is to combine basic research on learning and the teaching of computing. Several new initiatives are under development in CISE to broadening participation in computer science.

Dr. Jahanian's presentation stimulated an enthusiastic discussion. **Dr. Ainissa Ramirez** spoke of the need to consider more out of the box thinking to get people excited about computer science. The message about computer science needs to be presented in an alternate way. It is an exciting discipline, which addresses many priorities that are facing humanity. To make this discipline more exciting, there needs to be a partnership of academia and industry leaders to develop the path forward and indicate a unique role for the National Science Foundation in finding a solution to the problems in this field.

PRESENTATION: “BROADENING PARTICIPATION ACTIVITIES OF THE DIRECTORATE FOR BIOLOGICAL SCIENCES”

Prior to beginning her presentation, **Dr. Joann P. Roskoski**, Deputy Assistant Director for the NSF Directorate for the Biological Sciences (BIO), introduced **Dr. John C. Wingfield**, the new Assistant Director for BIO. **Dr. Wingfield** commented that he was just returning from a broadening participation workshop in Leesburg, Virginia. The purpose of this workshop is to discuss best practices in broadening participation in the biological sciences. Some of the attendees will be writing proposals to present new ideas and innovations to bring more people from underrepresented groups into the biological sciences, as well as science in general. A product of this workshop will be a document that contains innovative ideas on advancing broadening participation in the biological sciences.

Following **Dr. Wingfield's** commentary, **Dr. Roskoski** began her presentation by discussing data about the biological sciences. Approximately 11% of the PhD degrees earned annually are in the biological sciences, and 50% of those degree recipients are women. The complication for NSF and for BIO in particular, is the effort required to tease out the fraction of those percentages that are actually supported by the biological sciences that NSF supports. BIO does not support research in medicine or clinical studies, and it does not support research in the applied areas of agriculture. Most of the surveys that gather data (e.g., the survey of PhD recipients) do not differentiate enough to enable the identification of the kinds of number that BIO would like to have. Broadening participation in BIO at NSF has been a long term goal. It has emphasized for years broadening participation for women as well as underrepresented groups. Additionally, educational activities have been the hallmark of BIO for years. This is credited in no small measure to the leadership of **Dr. Mary Clutter** who was the assistant director of BIO for about 15 years.

Dr. Roskoski reported that the goal of broadening participation of activities and philosophy in BIO is to increase the diversity of the professional staff and administrative staff, as well as in the external community. The BIO strategy is very simple: 1) Review multiple levels in the workforce pipeline and determine where a difference can be made in terms of support activities that will increase the diversity within that pipeline. The effort is to broadening participation as a part of every program and to give consideration for the same for every award that is made by BIO. BIO has organized a working group that is charged by the BIO Assistant Director to do this task. This group reports directly to the Assistant Director. All BIO divisions are represented in the working group membership. The charge to the working group covers updating the BIO strategic plan, monitoring the BIO portfolio of activities to ensure that people are proactively addressing the goals of the strategic plan, identifying new opportunities for implementing the strategic plan, and communicating BIO's broadening participation activities to other parts of NSF and other federal agencies as well as the external community.

In her comments on proposals and awards, **Dr. Roskoski** told the audience that BIO receives very few proposals (less than 5% of the total proposals received) from minority applicants. However, from 2009 through 2011, the BIO funding rates were slightly higher for minorities than for the population as a whole. BIO program officers are encouraged to support the largest number of individuals from underrepresented groups as they can, given equality in the quality of the proposals. An increase in the number of proposals received from minorities is desired. Current strategies seemingly are not having impact on this effort. In breaking down the data on various racial/ethnic groups (e.g., Native Americans,

Pacific Islanders, African Americans, and people who categorize themselves as multi racial, and Hispanics), the number of awards is small. The success rate for underrepresented groups is slightly higher than the overall success rate. Also, the success rate of BIO awards to women is slightly higher than the overall success rate. BIO is troubled by the lack of an accurate baseline against which to actually present its data on awards to women.

In the BIO scientific staff, including rotators, the representation of individuals from underrepresented groups is not at the desired level even though recruitment efforts are designed to achieve a diverse staff. BIO works diligently to ensure that its panels, Committees of Visitors, and other groups are racially and ethnically diverse and that they focus on broadening the participation of women, minorities, and persons with disabilities in the biological sciences. **Dr. Roskoski** continued her presentation by reviewing staff data and additional award information. She mentioned the NSF Family Friendly Policy and the work that BIO is doing in that area. The feedback on the results has been positive. BIO is being very proactive as it addresses the issue of providing incentives and support to enable women to more fully engage in the entire scientific enterprise.

Some BIO programs have broadening participation as a primary goal or as either a component of the program or an outcome facet of the program. Brief descriptions of several BIO programs, cross-directorate activities, and supplements to on-going awards were given. Included were details about opportunities for high school students and teachers, as well as faculty members, undergraduate and graduate students, and post-doctoral fellows. BIO has a program that sponsors long-term mentoring and one that supports research by undergraduate students. Its Research Experiences for Undergraduates (REU) program is a success. Data from last summer's projects show that 50% of the students supported on REU sites were from underrepresented groups. This program gave students the opportunity to conduct research and develop long term relationships with research personnel, such as principal investigators, post-doctoral fellows, and graduate students. Efforts are being made to redesign the BIO strategic plan so that evaluation aspects of programs are included.

As the question and answer period continued, the following points were made by CEOSE members and other meeting participants:

- The design of the post-doctoral program has a built-in attraction in that the funds can be moved the recipients to the educational institutions of choice.
- Perhaps target numbers are needed for the categories that BIO is trying to increase in terms of participation by minorities. Then measuring success would be easier.
- Characteristics (e.g., infrastructure and available resources) of the institutions make a difference when implementing broadening participation in STEM strategies.
- Outreach by BIO should be extended into the southwest where there are large populations of Native Americans.
- One should not confine the majority of the resources to the upper levels of the K-12 education continuum. Student interest in science can be stimulated at lower grade levels.
- Support for summer programs for students is also desirable.
- Programs focused on broadening participation should work in tandem to one another

- The effort needs to be to have the federal government, industry, educators at schools, community colleges, and universities join forces to address issues in broadening participation in the various disciplines.
- There are lessons learned that can be drawn upon as one formulates plans for the future in broadening participation in STEM.
- There are lessons learned in broadening participation in STEM from different parts of NSF that can be used by directorates.

GENERAL DISCUSSION

Following the presentations described above, CEOSE members and Federal Agency Liaisons participated in discussions on a multiplicity of topics pertinent to the CEOSE mandate, including the following:

- Next steps in the inter-agency coordination,
- Major research facility supported by NSF and other federal agencies as potential long term engagement sites for individuals that are being trained and developed by NSF,
- Broadening participation in STEM,
- An inventory of STEM education programs across federal agencies,
- NSF support to Minority Serving Institutions, such as Hispanic Serving Institutions, Historically Black Colleges and Universities, and Tribal Colleges and Universities,
- The need for more substantive interactions (e.g., curriculum development and implementation and job readiness training) among community colleges, schools, higher academic institutions, federal government, and industry relative to workforce development in STEM,
- Establishment of a K-12 interagency working group,
- Stakeholder coordination with inclusion of industry, government, and universities,
- Family friendly strategies,
- The need for NSF to respond to recommendations, including those that resulted from CEOSE mini-symposia on various topics (e.g., Native Americans, women of color in STEM, institutions serving persons with disabilities, and community colleges),
- The status of responses to recommendations that appear in the NSF Broadening Participation Strategic Plan,
- A request to **Dr. Suresh** on what types of advisement he needs to address issues in STEM research and education,
- How to make CEOSE more proactive and useful to NSF,
- The status of the America Competes Act and the corresponding Reauthorization ,
- The impact of continuing resolutions on NSF, and
- The appointment of a CEOSE member to serve as the CEOSE Liaison to the NSF Environmental Research and Education Advisory Committee.

ADJOURNMENT

At 5:30 p.m., the meeting was adjourned.

TUESDAY, OCTOBER 18, 2011

MEETING SITE

Board Conference Room 1235, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230

OPENING REMARKS BY THE CEOSE CHAIRMAN

At 9:00 a.m., **Dr. Ladner** opened the meeting with a summary of the previous day's sessions. Also, he responded to questions about the NSB merit review process.

PRESENTATION: "BROADENING PARTICIPATION IN THE STEM ENTERPRISE: THE NSF ROLE"

Dr. Ward expressed her pleasure in joining the CEOSE in its work to advance the broadening participation agenda. After providing information on her background and the various roles she has played in the past, she talked about how different organizations within NSF have approached challenges and opportunities for broadening participation in STEM. Dr. Ward cited several representative drivers that address underrepresented minorities, persons with disabilities, women, and girls in STEM. These included various national reports such as: *Staying Competitive*, the recent UC Berkeley report that details specific actions for US federal agencies to take to improve the representation of women in the STEM disciplines; *Expanding Underrepresented Minority Participation*, the recent National Academies report that outlines the need for federal agencies to work collaboratively with industry, higher education and K-12 to increase minority student access to STEM education and training; and the NSF Strategic Plan.

One outstanding challenge highlighted in the presentation was that of addressing the national need to develop US STEM talent through the inclusion of underrepresented groups, particularly as it relates to women and persons from underrepresented minority populations. Current data, detailed in the presentation slides, indicates a disproportionate decrease in the number of high school graduates who ultimately earn advanced degrees in science and engineering for minority men and minority women. While the percentage of non-minority women who earn advanced STEM degrees is higher than the percentage graduating from high school, their overall representation among advanced STEM degree earners is relatively low when compared to non-minority men. Given its historical commitment to broadening participation, the NSF is well poised to contribute meaningfully to reversing such trends.

To that end, the NSF has recently launched a comprehensive Career-Life Balance Initiative, which is designed to improve the representation of women who pursue careers in the academic STEM disciplines. Specifically, the NSF plan for career-life balance encompasses an initial focus on dependent care issues, family-friendly policy development and implementation and the exchange of best practices. This initiative represents a collaborative effort across the entire NSF in partnership with other federal agencies and institutions of higher education. She also described the I³ activity, another exemplar of *One NSF*, through the strategic integration of related programmatic themes, leveraging of funding sources and integration at the university level.

Other key issues that NSF is currently working toward addressing as a means of enhancing the US STEM enterprise include, but are not limited to: data capability/infrastructure, communications systems and

processes, agency liaising, reporting requirements, becoming more inclusive and various policy issues such as merit review and broader impacts. Dr. Ward also advised that she is looking forward to the ongoing conversations on topics of most concern to CEOSE.

PRESENTATION: “BROADENING PARTICIPATION ACTIVITIES IN EHR: FOCUS ON RESEARCH ON GENDER AND THE EDUCATION OF PERSONS WITH DISABILITIES”

In his introductory remarks made prior to **Dr. Joan Ferrini-Mundy’s** presentation, **Dr. Ladner** indicated that the concern of CEOSE was couched in the content of a letter that was sent to **Dr. Mark Leddy**. The author of the letter expressed concern about the pending transfer of the RDE program, which **Dr. Leddy** directs, from the Human Resource Development Division (HRD) to the Research on Learning in Formal and Informal Settings Division (DRL). Both divisions are in the NSF Education and Human Resources Directorate. DRL is a learning research unit, and the RDE program has components (e.g., alliances) that are not learning research entities. The foci of the alliances are human resource development, specifically broadening participation in STEM for persons with disabilities.

Dr. Joan Ferrini-Mundy initially focused on the broader context of the programs in EHR as she held a conversation with CEOSE members, Federal Agency Liaisons, and guests. She then narrowed the focus of her remarks to respond to the specific questions from CEOSE members and concerns raised in the letter. She sought the advice of CEOSE members on how to move forward productively in a variety of areas. Also, she welcomed **Dr. Muriel Poston**, former CEOSE Chair, to the position of Director of HRD, and she thanked **Dr. James Lightbourne** for his service prior to **Dr. Poston’s** appointment. Following those comments, **Dr. Ferrini-Mundy** spoke of the three emphases in EHR: the articulation of a research and development core for EHR, enhancement of EHR leadership and capacity building investments in conjunction with a research and development core, and building a closer connection within the programs of EHR. Program solicitations in EHR now have new language that makes a clear statement of overall goals as a directorate. The effort is to increase the successful participation of underrepresented minorities, women, girls, and persons with disabilities in STEM. Another feature that was added to HRD solicitations is a focus on broadening participation research. She commended the EHR Committee of Visitors for the recommendations provided to help strengthen programs. When addressing the matter of concerns about the RDE and GSE programs, **Dr. Ferrini-Mundy** included **Dr. Leddy** in the conversation. Later, she included **Drs. Jolene Jesse** and **Muriel Poston**. Note was made of the fact that the RDE program is mature, and it has a very solid portfolio of awards, which have are based on a modest budget. There is a need to leverage the success of this program, as well as others. The plan is to look much more systematically at how to make that happen. This is a part of why a proposal was made to put RDE and GSE closer to the Research & Evaluation on Education in Science and Engineering (REESE) program, which is in DRL.

In the question and answer period, CEOSE members expressed their concerns among which were the following:

- By putting the focus on research, the engagement of principal investigators (PIs) with disabilities will be lost. Organizing a research team and fulfilling other research requirements will be problematic for persons with disabilities.

- The disabilities part of the science and engineering community faces more and different discrimination than the rest of the community. The effort should be to get more persons with disabilities involved in programs rather than putting barriers in place to discourage them.
- The focus of the RDE program should remain on capacity building and implementation, and the RDE and GSE programs belong in HRD.
- A Hispanic Serving Institutions program should be added to the portfolio of EHR programs, and the focus should be on capacity building.

BRIEFING: “THE DEVELOPMENT OF PILOT ACTIVITIES FOR ENHANCEMENTS TO THE MERIT REVIEW PROCESS”

Drs. Candace Majors, José Munoz, and Richard E. Ladner joined together in presenting information on the NSF Merit Review Working Group. This group is different from the National Science Board group that is focusing on Merit Review. It was noted that there are stresses on the Merit Review system process due to the increased number of proposals received at NSF and the additional complexity of the types of programs, etc. This working group is seeking enhancements, different tools in the Merit Review toolbox, to alleviate some of the stress on the system. The objective is to reduce the burden on principal investigators and the review community. The working group is developing pilot activities from which some of the needed information will be obtained. The effort is to engage all relevant communities. Therefore, several discussion sessions have been held with groups internal and external to NSF, including interested parties in other federal agencies, states, and the international arena. The broad discussions are conducted to ensure that activities will broaden participation both in the PI community and the reviewer pool while maintaining the golden standard of review. The results of this working group should be a more effective and efficient Merit Review process.

REPORTS BY CEOSE LIAISONS TO NSF ADVISORY COMMITTEES

Each of the following CEOSE members provided information on the NSF advisory committee to which he/she was assigned:

Dr. Conrad reported on the Business and Operations Advisory Committee meeting, which was held last May. Key discussion topics included the following: 1) establishment of subcommittees (Information Technology Subcommittee and the Business Systems Review Subcommittee) and the legal ramifications of them, 2) charges to those subcommittees, 3) changes in processes such as the grant submission and reporting processes and grants management, and 4) increasing access to NSF systems for university faculty.

Drs. Alexander Ramirez, Eugenia Paulus, Marigold Linton, Dr. Maria Ong, and Richard E. Ladner did not give reports since their advisory committees did not hold meetings in the period just prior to the CEOSE meeting.

CONVERSATION WITH DR. SUBRA SURESH, NSF DIRECTOR, AND DR. CORA B. MARRETT, NSF DEPUTY DIRECTOR

Dr. Suresh provided information on issues specifically relevant to the work of CEOSE in addition to some that were indirectly relevant. He set the context of his comments by advising that since his arrival about a year ago, NSF has been under continuing resolutions. Given these budgetary uncertainties,

planning for the next several years has been a challenge. He told committee members that he is interested in their suggestions on how to think differently in meeting the challenges of NSF now and in the future.

Approaches that he suggested follow:

- No matter what the budget bottom line is one can think of activities to develop and implement. NSF will continue with its vision and core values. NSF has a model and a mandate to subscribe to improving human capital development.
- NSF plans to broaden participation. It's a core value of NSF to have a diversity workforce. One can frame this as fairness and equity but also as critical to the nation. NSF emphasizes this.
- The career life balance initiative was begun in September. This resonates with **Dr. Suresh's** vision for NSF. NSF has several successful programs, and some of the best practices resulting from these programs have been elevated to the highest level. Simple steps have gained the attention of the community, but NSF will not stop there. Special emphasis has been placed on women of color in science and engineering and issues that they are facing. Issues relating to men are being addressed also. NSF recently held an event—the Launching of the Career Life Balance Initiative—at The White House, and it was hosted by **First Lady Michelle Obama**. This brought a lot of visibility to NSF. Another example of heightened visibility is the historical co-chairing by **Dr. Suresh** of the NSTC Committee on Science. This makes it easier to bring issues to the attention of his fellow heads of federal agencies. With **Dr. Carl Wieman** of the Office of Science and Technology Policy, it was decided that it is important to use real, rather than anecdotal, evidence of what other agency committees do in the Washington Metro area. While NSF can set goals and priorities and policies, it still needs to form partnerships with the community. It needs to identify key data, look at its internal activities and compare what it has with what other agencies have and determine how to make the best use of resources.
- **Dr. Ward** has been appointed by **Dr. Suresh** to have the lead on the career life balance initiative and specific issues such as women of color and people with disabilities.
- NSF is endeavoring to determine how to make full use of the financial crisis to improve itself and the community at large. Strategies that can be used include collaborations among institutions. Efforts are being made to improve the mechanics of the merit review process. NSF has a workload issue, as well as a financial issue. At this point, NSF has a vision and leadership without a budget. Even under this condition, NSF launched the NSF innovation core, which provides a virtual national network for the output of basic research to see how much more can be extracted out of it.

Dr. Suresh continued by mentioning several NSF programs that are having success in research and education in science and engineering. Even in the current financial crisis, NSF is trying to improve itself and the community at large.

Dr. Ladner thanked **Dr. Suresh** for his proactive recruitment of federal agency liaisons. Other CEOSE members (e.g., **Ms. Lueny Morell, Dr. Alexander Ramirez, Dr. Marigold Linton, Dr. Keivan Stassun, Dr. Ainissa Ramirez, Dr. Maria Ong, Dr. Katie Blanding, Dr. Carl Booksh, Dr. Joseph Whittaker, and Dr. Eugenia Paulus**) and Federal Agency Liaisons then posed questions of **Dr. Suresh**, and he and **Dr. Marrett** responded.

DISCUSSION OF UNFINISHED BUSINESS

Dr. Ward was asked to differentiate between her CEOSE role and responsibilities and those of **Dr. Tolbert**. Openness and transparency are emphasized through all roles and responsibilities. Both **Dr. Tolbert** and **Dr. Ward** appreciate working with the designated leadership, and NSF is open to good ideas regardless of the source. She advised that her tenure with CEOSE is not new. She has served as the CEOSE Executive Secretary and as its Executive Liaison. Her role is to provide first-hand direct and immediate advice to the NSF Director and other senior leadership, relative to the workforce development agenda and broadening participation. She helps to conceive, develop, and implement forward programmatic directions, an example of which is the Career Life Balance Initiative and other policy issues. **Dr. Tolbert** serves as the direct conduit between NSF and CEOSE. Her titles are Senior Advisor and CEOSE Designated Federal Officer, and those of **Dr. Ward** are Senior Advisor to the NSF Director and CEOSE Executive Liaison. The two will work cooperatively and seamlessly on CEOSE matters.

ADJOURNMENT

At 2:00 p.m., the meeting was adjourned the meeting.

CERTIFICATION OF THE ACCURACY OF THE CEOSE MEETING MINUTES

On January 27, 2012, **Dr. Richard E. Ladner**, Chair of the Committee on Equal Opportunities in Science and Engineering, approved the minutes of the October 17-18, 2011 meeting via e-mail message to **Dr. Kelly Mack**, CEOSE Designated Federal Officer.