

**CEOSE Advisory Committee Virtual Meeting  
National Science Foundation (NSF)  
June 10 – 11, 2021  
Meeting Minutes**

***Day 1: June 10, 2021***

**Welcome, Introductions, Opening Remarks - CEOSE Chair, Dr. Jose D. Fuentes**

Dr. Jose D. Fuentes, CEOSE Chair, opened the meeting, welcomed new CEOSE members, and continued to have self-introductions of the membership. The Chair reviewed the agenda and noted schedule adjustments. His opening comments pointed out that the NSF Director is extremely enthusiastic about the work CEOSE is doing and that Dr. Panchanathan is looking forward to receiving the final copy of the CEOSE 2019-2020 report. Additionally, positive feedback was received about CEOSE work with the National Science Board.

**Presentation: Missing Millions and NSF Efforts – Assistant Director, Directorate for the Education and Human Resources (EHR), Dr. Karen Marrongelle**

Dr. Marrongelle shared what NSF has been doing internally to respond to the missing/invisible millions initiative. Her presentation emphasized the following: NCSSES data projects close to four million people are needed in the year 2030 for the S&E workforce to be representative of the US population. Some progress has been made, but still the Nation has areas that require attention (per data released from the recent Women, Minorities and Persons with Disabilities report). Within NSF, there are racial equity and sexual harassment task forces, accountability stakeholders (e.g., Office of the Inspector General), and longstanding communities dedicated to broadening participation (BP). She provided a snapshot of potential places on the pathway for developing action plans to address questions like: What would it take to double the number of PhDs awarded in STEM disciplines to underrepresented people of color or women? Knowing that we must do business differently, where does NSF need to partner and with whom? Work to date indicate that NSF has five major levers of influence to impact mindset change: 1) funding, 2) policies both external and internal, 3) partnerships, 4) communications both external and internal (e.g., convenings, internal sharing across the foundation), and 5) reputation of boards; advisory committees, NSB. NSF needs to be unique in its influence on pathways at multiple and different points along the way. Equity and inclusion must be central to institutional transformation, and members were encouraged to read Diversity without Dollars (<https://www.chronicle.com/article/diversitywithoutdollars>). As the Foundation develop a roadmap to address the missing/invisible millions, the key part of strategy is partnering to affect institutional change and transformation. She stressed that NSF has limited capacity in making/forcing policy changes in K-12 schools. However, NSF can help draw attention and continue to test new models by increasing racial, ethnic diversity of qualified K-12 math, science, and computer science teachers. In discussing STEM in the community college environment, Dr. Marrongelle highlighted that over 1 in 4 students enrolled in US community colleges are Hispanic, 1 in 3 students are

first generation students, and 1 in 5 students report a disability. Roadblocks continue to exist for their smooth transfer to four-year institutions, and there are misperceptions about the quality of instruction students receive. She stated that while NSF cannot change state level legislation or university policies governing transfer credits, NSF can work in partnerships with industries that value community college education as important pathway for diversifying STEM workforce. She stressed that Black and Hispanic students left STEM majors at higher rates than white students at the ungraduated levels and reasons reported by students included poor quality of STEM teaching, difficult transitions to college, unsupportive/competitive STEM environment, and low grades that impact their desire to continue, funding issues, or just lack of motivation to continue. She pointed out that more information is needed about the graduate education experiences regarding admissions, attrition, retention, and completion in STEM graduate programs. EHR is developing bold ideas to effect change in graduate STEM education (e.g., Innovations and Graduate Education program). The later part of her presentation emphasized that NSF must consider broader Federal landscape while scoping out its unique contribution to fulfilling the goals of reaching the missing/invisible millions. For example, NSF is taking a leadership role in inter-agency collaborations with other agencies within the federal landscape, namely, Interagency Working Group on Inclusion and STEM and the Interagency Working Group on Transparency and Accountability.

Feedback from CEOSE members included the following suggestions. Consider/data or accountability as another lever of influence. Raise everyone's knowledge about "this is what we know and how" strategy about BP, including connections at the national level. Expand the pathway approach to include STEM postdoc fellows, faculty, and leaders. Members also wanted a deeper dive into institutional transformation via the ADVANCE program, knowledge being generated by the NSF INCLUDES portfolio, and the alignment across working groups.

### **Presentation: STEM Technical Careers – Vice Chair, National Science Board (NSB), Victor McCrary**

Dr. McCrary's presentation emphasized the critical importance of the skilled technical workers (STW) to science and engineering and jobs throughout our economy. He pointed out that the STEM workforce includes workers at all educational levels who use science and engineering skills in their jobs, calling urgent attention to the need to expand our diverse domestic STEM talent along the entire S&E worker value chain, from STW to PhD, to remain competitive. By next year, based on 2019 report predictions for 2022, the nation will need 3.4 million more skilled technical workers. NSB has begun to work with NCSSES to gather and present nationally representative data on the STW, revealing findings that show approximately 17 to 19 (million) skilled technical workers (representing 24% of all S&E workers and having much lower-than-average unemployment rate relative to other workers without a bachelor's degree. Pointing out that workforce development in the US is highly decentralized, Dr. McCrary commented that partnerships and coordination are needed for optimal effectiveness and that we must recognize our own biases that may inadvertently lead us to focus on specific S&E sectors, and to be exclusive in whom we consider to be STEM workers.

The discussion with CEOSE members covered the need for more female role models in the STW sector, retraining the existing STEM workforce in addition to training more young people to consider STW careers, examples of industry moving at a faster pace compared to government or the academy, the need to address elitist attitudes about STEM degrees, and the importance of internships/apprenticeships and funding industry partnerships.

## **Discussion with NSF Leadership - Director, Dr. Sethuraman Panchanathan, and Chief Operating Officer, Dr. Fleming Crim**

Dr. Panchanathan made opening comments that included a special welcome to new members of CEOSE, information about the leadership transitions for GEO AD and the next NSF COO, and the importance of science for the future as demonstrated by increase in the budget for NSF. He pointed out the synergy for BP that can be found in the NSF visionary pillars and the NSB 2030 Vision report, emphasizing the importance of BP as part of the NSF budget for advancing science, the economy, and societal progress. Additionally, he commented on the impressive services of outgoing CEOSE members and recognized the timeliness of the CEOSE report series.

CEOSE members and Dr. Panchanathan discussed the following areas: an ADVANCE-like program with a focus on racial injustices, the Foundation's support for disproportionately affected individuals and institutions as part of the American Rescue Plan, and the formation of the Racial Equity Task Force to address barriers to the advancement of diversity of the internal workforce within the NSF. The Director commented that all talent must be enabled inside the agency, emphasizing the important role of NSF as a model for diversity of talent.

## **Working Session: DCL and Flyer for the 2019-2020 CEOSE Report – CEOSE Vice Chair, Dr. Alicia Knoedler**

An overview of the report was provided for the benefit of new members. The 2019-2020 report will be shared with NSF for fact checking, and the report handout will be finalized within the next few months. All members will have access to a DCL to help with the broad dissemination of the CEOSE report. The next report will focus on intersectionality and the third report in the series will address data issues and invisibility in STEM. The membership discussed and selected the cover design for the 2019-2020 report.

### ***Day 2: June 11, 2021***

## **Welcome and Overview of Day Two – CEOSE Chair, Dr. Jose D. Fuentes; *CEOSE Subcommittee: Envisioning the Future of NSF EPSCoR*; Report of the CEOSE Executive Liaison – OIA Office Head and CEOSE Executive Liaison, Dr. Suzanne Iacono**

The Chair opened the meeting, provided an overview of the agenda with changes, and briefly highlighted the charge of the subcommittee focused on envisioning the future of NSF EPSCoR. Up to three CEOSE members will be engaged with this subcommittee.

Dr. Iacono presented the Executive Liaison Report. She began by presenting the synergies and alignment of three blueprints for the future: Dr. Panchanathan's Visionary Pillars for NSF, the NSB Vision 2030, and the Administration Pillars. More specifically, she shared how broadening participation is a priority area via the NSF visionary pillar focused on accessibility and inclusivity, the NSB focus on STEM talent, and the racial equity pillar of the current Administration. Other areas she discussed were NSF funding

proposed for the FY22 budget being in double digits -- \$10.17 billion (\$1.7B above current FY21 plan) and the first time that the BP request has exceeded \$1B; the Inspector General (IG) challenging NSF to come up ways to increase diversity in S&E; the BP communications group that brings together people from across the agency to discuss how to best communicate what NSF is doing in terms of BP; the redesigned BP website with new features; upcoming BP funding opportunities, including the nominations for the Alan T Waterman Award; and examples from the field of NSF's support for promoting diverse community voices in the scientific enterprise.

**Presentation: BP Accountability Data – Senior Analyst and Liaison to CEOSE, National Center for Science and Engineering Statistics (NCSES), Dr. Karen Hamrick and Statistical Data Scientist, SBE-NCSES, Dr. Tiffany Julian**

The three-part presentation included report highlights of the 2021 edition of *Women, Minorities, and Persons with Disabilities in Science and Engineering* digest, a special analysis of degree enrollment and completion at HBCUs, and a future data hackathon activity for CEOSE. The digest is issued every two years, mandated by the Science and Engineering Equal Opportunities Act of 1980. The current report was released in April 2021, providing statistical information about the participation of women, minorities, and persons with disability in science and engineering education and employment; the next report will include pandemic impact statistics. Dr. Hamrick presented data to show how these three groups were underrepresented in S&E employment and/or S&E education. For example, Engineering has a low share of female degree recipients relative to women's share of the population; however, both the share and number of women receiving degrees have increased.

CEOSE appreciated the geographic analysis with HBCU data and would like to see a special data analysis for Tribal colleges and universities. HBCUs are eight of the top 12 baccalaureate institutions of Black or African American S&E doctoral recipients from 2015-2019. The share of Black or African Americans receiving S&E bachelor's degree at HBCUs declined while the share of other groups increased based on data from 2011 to 2018. Additionally, CEOSE is requesting a two-hour event for a hackathon to leverage data in support of the theme making visible the invisible, especially for tackling the intersectionality topic of the future report.

**Presentation: Broadening Participation Research (BPR) within the HRD Portfolio – Project Lead, Science and Technology Policy Institute (STPI), Dr. Brian Zuckerman**

EHR tasked STPI to develop a conceptual framework for thematic assessments and to apply that framework to 3 themes: cyberlearning, PreK – 5 science education, and broadening participation research (BPR). In the cross-cutting synthesis of BPR, Dr. Zuckerman explained how STPI considered CEOSE's recommendations to organize three key findings. Results of the analyses conducted revealed the continuing importance of BPR in NSF's portfolio based on publication and citations analyses, the need for synergies among NSF's BPR and BP efforts via an assessment of implementation BP research, and the need for large scale efforts to change educational pathways base on a review of the NSF INCLUDES Alliances. Ideas to consider included the following: Consider supplements to conduct BPR at institutions that do not already incorporate research into their NSF-funded BP efforts. Incorporate an explicit focus on BP implementation research into HRD programs. Increase support for fostering collaborations

between NSF INCLUDES Alliances and capacity building programs. Expand cross-Alliance linkages to foster the creation of K-20 pathways. CEOSE members were interested in how the data can be parsed to show how groups of scholars are coming together to build off each other's work in the BP space and to better understand how collaborative networks across institutions work. The discussion also pointed out the difficulty in addressing investment impact due to aggregation and attribution challenges.

### **Presentation: The NSF Learning Agenda – Section Head, Evaluation and Assessment Capability (EAC), Dr. Clemencia Cosentino**

Dr. Cosentino pointed out the critical role of NSF as a model agency for data driven decision making in the context of the Evidence Based Policy Making Act (2018). She stated that better decision making is linked to how we produce data, how we use data, and how we release data. The learning agenda is a research agenda with a set of questions that will generate information useful for decision makers and enable planning ahead. She shared example of learning agenda questions for four areas: policy, program, strategy, and operations. She challenged CEOSE to think about the questions that NSF should be asking and focusing on for the next four years? For example, how should NSF highlight the barriers that have historically prevailed in specific fields or in S&E? OSF grow STEM talent and opportunities for all Americans most equitably? The EAC unit in OIA is helping NSF to address a culture of evidence in decision making by 1) engaging in strategic planning, 2) providing outstanding evaluation services to generate and use evidence, and 3) advancing methods to monitor and evaluate investments in science. NSF evaluation policy can be found at [https://www.nsf.gov/od/oia/eac/PDFs/nsf\\_evaluation\\_policy\\_september\\_2020\\_pdf](https://www.nsf.gov/od/oia/eac/PDFs/nsf_evaluation_policy_september_2020_pdf).

### **Presentation: NSF's Racial Equity Task Force (RETF) – Head, Office of Diversity and Inclusion (ODI), Ms. Rhonda Davis**

Ms. Davis provided an overview of RETF; the task force was charged to identify/examine racial barriers and make recommendations regarding how NSF can be a leader in meaningfully addressing them with the goal of extinguishing them. She stated that NSF is committed to building opportunity in all business endeavors, being inclusive in a manner such that all can bring their best efforts to take on the complex challenges and opportunities of today. As an example, she pointed out that discrimination and harassment are seen as a barrier to full participation in the research community or any corner of S&E, resulting in the NSF Harassment Policy (2018). RETF is comprised of two working groups with various emphasis areas. The NSF Employment (internal) Working Group will focus on organization/reporting structure, hiring practices, position management, and policies and procedures. The NSF Program Delivery (external) Working Group will focus on grant and proposal writing, the NSF's Merit Review Process, R1 and MSI partnerships and collaborations, and policies and procedures. The key activities of RETF include a review of policies and practices to determine if there are potential barriers that may hinder racial equity for employees, applicants, and program participants and the recommendation of fast-track sustainable initiatives with measurable outcomes to improve racial equity.

## **2:30 – 3:30 PM: Reports of the CEOSE Liaisons and Federal Liaisons**

Highlights from CEOSE Liaisons included the following: the announcement of the subcommittee focused on the future of the NSF EPSCoR program that will include community listening sessions; the progress of the CISE subcommittee on growing and diversifying the domestic graduate pipeline; OISE's call for proposal to improve the understanding of the impact of COVID-19 on international research collaboration and how to be more resilient in the future; the priority areas of ENG with an emphasis on collaboration across Directorates to foster equity and inclusion and be more impactful across the US; the name changes of sections in the SBE Directorate and new BP efforts, such as BP Innovate; three new funding opportunities in EHR covering post-doc researchers, undergraduate STEM education at two-year institutions of higher education, and racial equity in STEM education; GEO engagement with sovereign nations focusing on equity; equity and inclusion, access to create an environment for those individuals to flourish in the geosciences; and the discussion of the Business and Operations Advisory Committee about the future of remote work. Additionally, the update by Mr. Shahin Nemazee highlighted the Smithsonian's collection for Alaska Native education that included outreach effort to Alaska's school districts to alert teachers and home schoolers to these resources, the efforts of the Science and Education Center that engage students in transdisciplinary learning through food and nutritional security in their own communities, and the cultural relevancy and STEM classrooms professional development session with two higher education institutions to increase awareness about the importance of culturally proficient teaching.

## **Announcements, Closing Remarks, and Adjournment – CEOSE Chair, Dr. Jose D. Fuentes**

The Chair expressed words of appreciation to outgoing members Drs. Juan Gilbert and Robert Megginson. Dr. Iacono announced that it was her last meeting and reflected on CEOSE's many contributions to broadening participation while she served as the NSF Executive CEOSE Liaison.

The next meeting will have a strong emphasis on intersectionality. After thanking members for their hard work and announcing that the next CEOSE meeting will be held in October 2021, the Chair adjourned the meeting.