



**Meeting of the Directorate for Education and Human Resources (EHR)
Advisory Committee
Wednesday, May 26, and Thursday, May 27, 2021
Location: Virtual**

Advisory Committee Members Present: Hyman Bass, Thomas Brock, Melissa Collins, Kaye Husbands Fealing, Okhee Lee, David Monk, Ada Monzón, Becky Wai-Ling Packard, Nicole Smith, Stephanie Adams, James Spillane, Laurel Vermillion, Marilyn Strutchens (Chair)

Designated Federal Officer: Karen Marrongelle; **Executive Secretary:** Charisse Carney-Nunes

Day 1 – May 26, 2021

12:00 PM – 5:00 PM

12:00 PM – 12:45 PM	WELCOMING REMARKS FROM THE EHR AC CHAIR & THE EHR ASSISTANT DIRECTOR
	Marilyn Strutchens , Chair, EHR Advisory Committee, & Emily R. & Gerald S. Leischuck Endowed Professor, Mildred Cheshire Fraley Distinguished Professor, Department of Curriculum and Teaching, Auburn University
	Karen Marrongelle , Assistant Director, EHR

Dr. Marilyn Strutchens welcomed AC members to the virtual meeting and noted that she is looking forward to engaging in thoughtful and robust discussions over the next two days. Dr. Strutchens listing the things that make her hopeful, including the end of the COVID-19 pandemic; the new Biden/Harris administration’s value of human rights; attention toward providing solutions to education and health care disparities; and actions to eradicate racism. Dr. Strutchens then welcomed the five new AC members, Dr. Thomas Brock, Dr. Melissa Collins, Ada Monzon, Dr. Becky Wai-Ling Packard, Dr. Nicole Smith, and added that member, Dr. Megan Bang would be rotating off the AC. Dr. Strutchens facilitated an introduction of all AC members. After brief introductions, Hyman Bass moved to approve the Fall 2020 AC meetings minutes. There were no discussions and the Committee unanimously approved minutes. Dr. Strutchens then provided an overview of the agenda. Meeting topics included improving STEM learning and learning environments in the pandemic; aligning agency-wide broadening participation efforts while monitoring and finding central themes surrounding broadening participation research activities that increase diversity, equity, and inclusion; the promotion of new funding opportunities in support of equity; the renaming of NSF’s Directorate of Education and Human Resources and the Division of Human Resource Development; and a conversation with NSF Director Sethuraman “Panch” Panchanathan and Chief Operating Officer F. Fleming

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Dr. Strutchens then introduced Dr. Karen Marrongelle, the Assistant Director of the Directorate for Education and Human Resources, who provided agency updates since the last EHR AC Meeting. She noted that COVID-19 poses challenges and EHR has continued to work to address inequities in STEM education. Updates included NSF leadership introductions and staffing transitions; the American Rescue Plan that directs approximately \$600M to NSF; the President’s fiscal year 2022 Budget request that includes a 20% increase of \$10.17 billion along with the Administration’s immediate priorities that include racial equity, climate change, COVID-19 response, growth in critical technologies, and economic recovery; new funding opportunities in EHR that include the *Advancing Innovation and Impact in Undergraduate STEM Education at Two-Year Institutions of Higher Education*, *DCL: Supplemental Funding for Postdoctoral Researchers to Mitigate COVID-19 Impacts on Research Career Progression*, and the *EHR Racial Equity in STEM education program description*; a request for dissemination of and nominations for the Alan T. Waterman Award program; discussion of NSF INCLUDES activities; the 20th anniversary of the ADVANCE program; and, the 30th anniversary of the Division of Human Resource Development.

Dr. Marrongelle noted that NSF’s Town Halls with tribal Nations demonstrate NSF’s commitment to equity and inclusion, and EHR is improving its reach to underserved communities informing new steps both internal and external to the Agency by highlighting the following: Dr. Kizzmikia Corbett, a former LSAMP scholar, has been a key figure in developing the Moderna COVID vaccine; Higher Ed highlighted a COVID RAPID study on online mentorship experiences that found few underrepresented students accessed online internships; and, research through the Brookings Institute indicated a collective concern during the pandemic across the nation for the academic success and achievement of K12 students. Dr. Marrongelle closed by noting efforts to move the needle regarding broadening participation in STEM by acting intentionally to motivate institutional change strengthening efforts at speed and scale.

12:45 PM – 1:45 PM	SESSION 1: ALIGNING AGENCY-WIDE BROADENING PARTICIPATION AND RACIAL EQUITY EFFORTS
	<p>Moderator: Evan Heit, Division Director, Division of Research on Learning in Formal and Informal Settings, EHR</p> <p>Presentations</p> <ul style="list-style-type: none">• NSF Director’s Initiatives Karen Marrongelle, Assistant Director, EHR• Women, Minorities, and Persons with Disabilities in Science and Engineering Report from the National Center for Science and Engineering Statistics (NCSES) Dr. Karen Hamrick, Senior Analyst, NCSES

	<ul style="list-style-type: none"> • Committee on Equal Opportunities in Science and Engineering (CEOSE) Liaison Report Kaye Husbands Fealing, Dean of the Ivan Allen College of Liberal Arts, Georgia Institute of Technology
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Dr. Evan Heit, Division Director, Division of Research on Learning in Formal and Informal Settings, opened the session by acknowledging the ways in which NSF and EHR increased broadening participation and racial equity efforts. The purpose of the session was to discuss ways to improve STEM learning and learning environments and increase the impact of broadening participation and racial equity efforts to help address recruitment of the missing millions.

Dr. Karen Marrongelle gave a short overview of the NSF Director’s initiatives on broadening participation. Dr. Marrongelle emphasized that EHR is leading response to NSF challenges. Together, these responses have motivated us to think of ways to work within and across directorates and federal agencies. EHR is reviewing work on what we know, what we are doing, and why we haven’t made bigger impacts or gotten results we want to see.

Dr. Marrongelle discussed President Biden’s Executive Order on racial equity that stated that the federal government should advance equity for all. NSF is in communication with OMB on next steps, and Director Panchanathan has initiated NSF’s racial equity task force which is tasked with examining how NSF ensures equity internally and contributes to equity externally.

Additionally:

- NSB’s Vision2030 report focused on missing millions, or the untapped domestic talent and what it may take to get the STEM workforce to reflect national diversity. Vision2030 initiated thinking across the agency of how to address this challenge.
- Office of Inspector General Management Challenges issued memorandum to NSF Director with significant management performance challenges for NSF and included strategies and monitoring of programs to increase diversity of the Science and Engineering workforce, including STEM education. The response to this challenge will be carried out over many years as NSF continues to examine the work completed and how to do better. NSF has continued to share challenges with senior leadership to ensure cross agency community and attention.

Dr. Karen Hamrick, NCSES Senior Advisor, introduced and presented on the report on the Women, Minorities, and Persons with Disabilities (WBPD) released last month and focused on the long-term trends regarding the “why” that supports the AC meeting’s focus on broadening participation. Dr. Karen Hamrick described how NCSES defined underrepresentation and discussed the highlights of the report, including:

- The report identifies Black, Latinx and Native American as minorities which are underrepresented in STEM relative to their proportions of the national population.
- Although the share of STEM degrees awarded to these groups has steadily increased over the past 10 years, their share of degrees conferred remains significantly below their share

of the general population, and the increase has been primarily in bachelor's and master's degrees, with much less increase in doctoral degrees.

- Among these groups, women have a higher percent of the degrees conferred than men.
- Overall, the proportion of women in the academic doctoral workforce has increased significantly, but this increase is less pronounced among underrepresented racial minorities and people with disabilities.
- People with disabilities in STEM fields have a higher rate of unemployment than the general US labor force.
- College of origin is a term that describes the undergraduate colleges attended by those with PhDs. In this study, all those who have research PhDs were asked about degree history in surveys. An important result is that of the Black students surveyed with PhDs in science and engineering, 8/12 received Bachelors degrees at HBCUs. This indicates that HBCUs are playing an important role in graduating students who go on to receive Doctorates in science and engineering.
- Median salary- Men have higher median salaries than women in S&E, and underrepresented minorities' median salaries in S&E is lower than the median salaries of Asian, White, and scientists and engineers from other racial groups.
- 10% in science and engineering occupations have one or more disabilities. Underrepresented minorities are more (12%).
- People with science and engineering degrees that are not employed- higher percent of those with disabilities than without.
- Overall, the proportion of women in the academic doctoral workforce has increased significantly, but this increase is less pronounced among underrepresented racial minorities and people with disabilities.

Dr. Karen Hamrick encouraged AC committee members to refer to the NCSES webpage for the full report and data briefs.

Dr. Heit thanked Dr. Hamrick and opened the floor for discussion, questions, and comments. Questions and WMPD Report discussion included:

Does NCSES have any interest in sub-baccalaureate qualifications? Yes, there is information in the report on Associates and Technical programs. The Center is developing another survey focused entirely on skilled technical workforce and asks about certifications, licenses etc. and this has been a mandate given to NSF to look at STEM jobs that do not require a Bachelor's degree.

Were Native Americans included with the Black/African American or Hispanic/Latino? If so, why? Dr. Vermillion expressed concern over naming of Native Americans and grouping Native Americans with other groups, at the risk of neglecting issues specific to these people. In Dr. Hamrick's presentation, underrepresented minorities were consolidated into one group. However, in the report there are details provided for each individual group.

There is a significant drop in the percent of degrees vs occupation in science and engineering. What is the explanation or theory describing this substantial drop? The missing millions is looking to address the leaky pipeline. NCSSES reports just the facts without theory or reporting on situation and providing some analysis for context.

Is the drop different depending on which group you're looking at? Does the drop look steeper? Within the underrepresented minority group, Hispanics or Latinx have had growth in share of science and engineering degrees and occupations. Black or African American trends are flat in terms of degrees. American Indians and Alaskan Natives had small increases.

Leaving a science and engineering occupation can be beneficial. Is there any analysis of when that is? Such as managerial professions? NCSSES has a longitudinal sample so they can start looking at these questions such as how many women leave engineering. Economics have same questions regarding women and underrepresented minorities leaving. They do not have those findings now, but they will in the future, because the surveys following people longitudinally can finally be used in data. Survey of doctoral recipients follows people until age 76.

Dr Heit then introduced Dr. Kaye Husbands-Fealing for the presentation on the Committee on Equal Opportunities in Science and Engineering (CEOSE).

Dr. Kaye Husbands Fealing, the CEOSE liaison to EHR, began her presentation by emphasizing that broadening participation is a solution, not a problem. CEOSE is a congressionally mandated committee that has produced biannual reports to NSF since 1976 on the full participation of women, underrepresentation of racial/ethnic groups, and persons with disabilities in science and engineering. CEOSE has issued 13 reports. NSF's INCLUDES program grew from the recommendations of the reports of 2011-2016. The 2018 report advised increased attention to the diverse voices across research and education portfolios, with the understanding that inclusion results in better and more innovative society as well as a STEM enterprise. Dr. Husbands Fealing encouraged attendees and AC members to examine the extensive NCSSES data available. She noted the problem of small datasets and the importance of addressing the small "n" challenge. The next CEOSE report will be, *Making Visible the Invisible*, and is expected summer 2021. CEOSE will focus on leadership, including recommendations for bold leadership actions, as well as recommending that NSF promote community-based voices in research presentation and portfolios. CEOSE will also focus on intersectionality and recognizing and valuing underrepresented groups. Dr. Husbands Fealing noted key takeaways: optimism for moving the needle is growing; BP is a solution not a problem to be solved; and everyone is accountable for DEI, not just members of underrepresented populations.

Dr. Heit opened the floor for discussion, questions, and comments. Questions and CEOSE Report discussion included:

What does “leadership” in this context mean? Deciding what styles of leadership are necessary to increase participation within each group. An increase in retention for students of color or faculty requires initiatives at high levels. We need leaders who say this is something we want and value and who will provide resources. A leadership framework is necessary to move the needle. Leadership is also necessary to determine what kinds of requests for proposals (RFPs) or solicitations go out to bring in inclusive and diverse groups of proposers. Leadership at NSF should think about the ways in which RFPs can be employed to recruit proposers who are members of these underpopulated populations. It takes leadership and forethought to decide what visions will be and how to apply resources to make sure the visions happen. There is a gap in identifying who is missing at the leadership level.

AC members commented on how Community Colleges overall tend to do better at representation than 4-year institutions and how NSF has placed increased emphasis on this. There was agreement that many community colleges have few courses in core STEM fields, and that few students in underrepresented minorities transfer to other institutions. NSF was encouraged to address low transfer rates. One AC member added that often students don’t see a place for themselves in STEM, and we need to address this public perception to make students feel welcome even before arriving at a community college.

There was a connection drawn between leadership and accountability. One AC member noted that faculty of color are frequently expected to be the (sole) ambassadors for students to support them in potentially hostile or unwelcoming environments. AC members want to see department leadership supporting faculty to create better racial climates.

Dr. Strutchens concluded by urging the Committee to consider STEM student and teacher growth noting STEM engagement begins at the primary level and collaboration is required to strengthen and maintain the STEM pipeline, and partnerships between two-year and four-year colleges play a key role.

1:45 PM –2:00 PM BREAK

2:00 PM – 3:30 PM	SESSION 2: MONITORING BROADENING PARTICIPATION EFFORTS
	<p>Moderator: Sandra Richardson, Acting Deputy Division Director, Division of Undergraduate Education, EHR</p> <p>Presentations</p> <ul style="list-style-type: none"> • CAREER Margret Hjalmarson and Tori Smith, Program Directors, EHR

	<p>Representatives to the NSF-wide CAREER Coordinating Committee</p> <ul style="list-style-type: none"> • Broadening Participation (BP) Subcommittee Report Okhee Lee, Professor, Steinhardt School of Culture, Education, and Human Development, New York University; BP Subcommittee Chair; and EHR AC Member <p>Discussion of Report</p>
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Dr. Evan Heit, Division Director, Division of Research on Learning in Formal and Informal Settings, opened the session by acknowledging the ways in which NSF and EHR increased broadening participation and racial equity efforts. The purpose of the session was to discuss ways to improve STEM learning and learning environments and increase the impact of broadening participation and racial equity efforts to help address recruitment of the missing millions.

AC Chair Marilyn Strutchens opened the session and introduced the session moderator Sandra Richardson, the Acting Deputy Division Director for the Division of Undergraduate Education. Dr. Richardson then introduced the session panelists who were then invited to speak on the monitoring of broadening participation efforts within the Directorate of Education and Human Resources.

Dr. Richardson introduced Dr. Margret Hjalmarson and Dr. Tori Smith, Program Directors and representatives to the NSF-wide Faculty Early Career Development Program (CAREER) Coordinating Committee who then provided a brief background on the NSF-wide CAREER program along with program updates. The goal of the CAREER program is to provide stable support at a sufficient level and duration to enable awardees to develop careers not only as outstanding researchers, but also as educators demonstrating commitment to teaching, learning, and dissemination of knowledge. Program updates included the success of the recent CAREER Outreach workshop that had 157 participants attend that hailed from more than 120 colleges and universities including HBCUs, CCs, and HSIs.

To keep with the timing of the agenda, all questions and discussion were saved for the end of the session.

Dr. Okhee Lee introduced the Broadening Participation (BP) Subcommittee that was charged with developing metrics for monitoring progress using two public documents as a framework to develop the current BP Subcommittee Report: NSF-funded workshop report *Monitoring Metrics for Programs focused on BP* (Clewell & Fortenberry, 2009) and the Committee on STEM Education (CoSTEM) report *Chartering a Course for Success: America's Strategy for STEM Education* (NSTC, 2018). Dr. Lee thanked Dr. Karen Marrongelle, Assistant Director of EHR for the depth of her guidance and conversation and Sandra Richardson, Acting Deputy Division Director for the Division of Undergraduate Education, for her commitment to the project and her willingness to meet weekly. She also acknowledged Sarah-Kay McDonald, Bernice Anderson, and Jack Butler for their assistance, especially with data analysis.

Dr. Lee provided an overview of the BP Subcommittee report. The subcommittee worked to: clarify and define appropriate terminology; address the deficit undertone associated with the term “underrepresented minority”; define monitoring metrics vs. indicators; and, defined monitoring vs. evaluation. The purpose of the report was to identify metrics that can be used to effectively monitor broadening participation in NSF programs and to communicate guidance and recommendations. The subcommittee used the Faculty Early Career Development Program (CAREER) as a prototype to understand the impact of the CAREER award on: (1) scholars from underrepresented groups in the academic profession; and (2) capacity-building for STEM education research. Using the EHR data from CAREER, the potential for developing monitoring metrics to serve as a prototype for NSF and other federal agencies had become clear.

Dr. Lee provided a report outline that included an introduction situated in context of COVID-19 and systemic racism, followed by a Vision and a Purpose that framed the report in the context of ongoing EHR initiatives and priorities. Dr. Lee explained results divided into four main areas:

1. *Who are EHR CAREER PIs in terms of demographic subgroups?*
2. *How many CAREER proposals did EHR CAREER PIs submit for the CAREER award?*
3. *How productive were CAREER PIs for receiving NSF funding after the CAREER award?*
4. *How productive were CAREER PIs for publications resulting from the CAREER award?*

Dr. Lee presented the findings, recommendations, and closing sections of the report. The findings included the following:

- Most of awards were made to females (58.6%), compared to the awards made to males (18.2%).
- Most of the awardees were White (56.6%). Asians made up 12.1% of the awards. Blacks/African Americans and Hispanics/Latinos made up 8.1% each. Multiracial individuals made up 4.0%. No awards were made to American Indian/Alaska Native or Native Hawaiian/Pacific Islander individuals (0%).
- No awards were made to persons with disability (0%).
- Unknown groups ranged from 19.2% for race, 23.2% for gender, and 39.4% for disability. Across the demographic groups, more than 1 out of 5 awarded demographics were unknown.
- Dr. Lee noted that while PIs voluntarily reported their status, none had reported disabilities although disabled individuals had made submissions. Conversely, in the case of Native Americans, truly none had made submissions.

The subcommittee recommendations included promoting BP in the CAREER program and the improvement of the data quality through the collection of the missing data for more robust analysis as not all CAREER PIs reported demographic data – the program data that was analyzed only included known data voluntarily reported to NSF. The subcommittee did not review biases as only 20% of PI demographic data was voluntarily reported by the CAREER PI community. The subcommittee submitted their report to the AC for approval.

Dr. Lee opened the floor for discussion, prompting EHR AC Members to think about next steps and provide input on whether the subcommittee should create a dashboard, investigate belonging, or publish stories. Questions and comments posed to Dr. Lee and Dr. Richardson focused on further details about the CAREER study, including clarifications about funding rate,

comparing the demographics of awards vs. declines, a discussion around why EHR receives fewer proposals per year than other directorates and programs, and investigating the program resubmission award rate. Additional questions were as follows:

1. *How can EHR or NSF incentivize higher PI respondent rates for demographic data requests?* The Committee inquired if it would be possible to go back after awards have been made to collect demographics with an appeal letter for data collection. Dr. Marrongelle will follow up with senior agency officials to this end.
2. *Given the significant underrepresentation of some racial & ethnic demographic groups and persons with disabilities, what are some additional EHR efforts that could address the need for increasing CAREER funding, submission, and awards for these groups?*

The Committee inquired as to whether there are any advantages/disadvantages to revealing disability status. Dr. Lee deferred to NSF as she views information share as civic duty for PIs to self-report. Dr. Marrongelle indicated that NSF is wrestling with voluntary data collection challenges, but there is awareness among staff for the need to increase the transparency of how information will be used and secured to communicate a guaranty that no negative impact will occur from the information being shared. Dr. Lee suggested the Agency to perhaps encrypt or secure the demographic data agency-wide to increase PI demographic reporting.

3. *How can the report's monitoring metrics be applied across EHR (or other) NSF programs?* The Committee inquired if there is a persistence component to this report. Dr. Lee considered discussion of framework as contribution along with findings and cautious recommendations submitted to EHR to follow-up.

Several recommendations were proposed as next-steps during robust conversation. Dr. Strutchens recommended composing CAREER awardee case studies to showcase impact that CAREER awards have made at the individual level to leverage perspective and increase diversity among role models. The Committee recommends:

1. A research-arc'd and student training data dive.
2. Messaging that would increase PI support of graduate student and post-doctoral CAREER applications.
3. Use of a similar CAREER approach at systems level to get more people engaged across institutional departments. Faculty from underserved institutions may have a heavier teaching load. Perhaps CAREER could allow different credit provisions or buy-outs for these faculty to get reduction in their teaching loads to allow them to do the work in the proposal.

After committee recommendations were made, Dr. Strutchens acknowledged that the BP Subcommittee Report had been received and discussed by the AC and moved for a vote to provide the report to the NSF EHR Assistant Director. All members voted to accept the report.

3:30 PM –3:45 PM BREAK

3:45 PM – 4:45 PM	SESSION 3: FINDING CENTRAL THEMES AROUND BROADENING PARTICIPATION RESEARCH ACTIVITIES
	<p>Moderator: Jermelina Tupas, Deputy Division Director, Division of Human Resource Development, EHR</p> <p>Presentations</p> <ul style="list-style-type: none">• Thematic Assessment of HRD’s Broadening Participation Research (BPR) Activities Brian Zuckerman Science and Technology Policy Institute (STPI)• NSF INCLUDES Sylvia James, Deputy Assistant Director, EHR <p>Session Discussion</p>

Dr. Strutchens welcomed everyone back and introduced Dr. Jermelina Tupas, the Deputy Division Director, Division of Human Resource Development, who then provided a brief overview of the session on the central themes of broadening participation research activities within the EHR Directorate and introduced session presenters.

Dr. Brian Zuckerman of the Science Technology and Policy Institute (STPI), a federally funded Research and Development Center (FFRDC) chartered by Congress (42 U.S.C. 6686- Science and Technology Policy Institute), with funding administered by NSF, presented and described thematic assessments of HRD’s Broadening Participation Research (BPR) activities along with themes in the EHR-wide BP portfolio, as well as implementation research in the HRD portfolio, and the origins of INCLUDES Alliances.

The thematic assessment asked: *Which NSF programs are engaged in supporting BPR? What research topics are included in the BPR portfolio? Do the results from BPR awards vary by program with respect to publications and citations? How have previous NSF investments contributed to current efforts?* The findings required defining BPR as fundamental research conducted to understand, or address supports for barriers or build capacity to conduct research as defined by:

- Biological, psychological, or sociological elements that account for differences in the participation of underrepresented groups in STEM learning and workforce; or
- Supports for barriers (social, cultural, physical, or cognitive) to participation in STEM learning and workforce.

The HRD BPR portfolio analysis spans seven HRD broadening participation programs: *Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE); Core R&D Programs (ECR); Historically Black Colleges and*

Universities - Undergraduate Program (HBCU-UP); Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES); Louis Stokes Alliances for Minority Participation (LSAMP); Research in Disabilities Education (RDE); and, Research on Gender in Science and Engineering (GSE)*. [*Note: RDE and GSE have been rolled into ECR].*

Themes in EHR-wide BPR portfolio included: STEM persistence, Self-efficacy, self-regulation and motivation, identity development, disability, family context, social identity threat, and social cognitive career theory.

Looking thematically over time, three NSF INCLUDES Alliances (IGEN, ASPIRE, and CAHSI) appear to have antecedents in prior NSF HRD funding. These three Alliances had the largest number of partners that were also institutions with HRD awards.

Dr. Zuckerman then introduced Dr. Sylvia James, the EHR Deputy Assistant Director. Dr. James provided the historical overview of the NSF INCLUDES program from its inception through its most recent funding opportunities. Dr. James proceeded to present on how thematic analysis may help NSF INCLUDES consider expanding its work and highlighted NSF INCLUDES current activities, events, and research component of the Alliances. These Alliances bring together programs, people, organizations, technologies, and institutions to achieve results at scale, provide new research, and leverage NSF's broadening participation investments. Their work is contributing to NSF INCLUDES' ability to synthesize and build the research base for broadening participation in STEM and to support the implementation and adaptation of broadening participation strategies that have demonstrated effectiveness. More broadly, their work is contributing to the NSF BP portfolio and contribution to the field.

In the interest of time, all questions were held until the end of the session. The following discussions on thematic assessments of HRD offered the following insights and recommendations on general broadening participation and STEM education research intersections:

- *What are critical intersections between broadening participation research, broadening participation implementation research and STEM education research?*

When the AC asked how the research of EHR's broadening participation efforts and NSF INCLUDES activities might relate to other Directorates in relation to other agency-wide programs, it was shared that when DCLs have been issued the goal is to not think of broadening participation in isolation or operating independently in a single Directorate.

The AC recognized that regarding CAREER awardees, the outcomes focusing on getting future grants might be narrow forcing many individuals also go to other agencies for additional funding. The AC suggested that EHR attempt to capture other avenues and pathways that grantees might be taking to tell the full story that the broader STEM education research community might be interested in knowing.

As NSF has moved away from BP implementation research and embraced STEM education research, some AC members requested a new initiative to focus on replication

of implementation of BP in new institutional settings. Dr. Marrongelle recognized this request and shared that NSF is always interested both in ensuring improvements and also what is known about a limitation. For full implementation, institutions may become reliant on those funds rather than making critical decisions that should be made at the campus level. A large portion of the EHR portfolio gets at capacity-building. NSF is interested at sustainability at scale and really pushes the sustainability portion of those awards.

Additional discussion/insights relating to NSF INCLUDES and the BP intersection:

- *What is the most effective approach to conceptualizing and measuring the success of NSF INCLUDES and other broadening participation programs, to enable operationalization of the vision for shared measures in broadening participation?*

In answering this question, the AC noted that NSF as a foundational matter may need to better define program “participants.” Project teams may scope participation broadly, in terms of who the participants are and what they are doing. NSF explained that these definitions are flexible because the agency supports BP of underrepresented/underserved groups in STEM, and that the portfolio is expansive with some programs being specific to discipline, gender, or other demographics. NSF leaves it up to the PI to make decisions on which group is targeted as long as it falls within the specific umbrella program for where proposal is submitted.

AC members noted that effectiveness will be defined by what participation in a particular project looks like, which won’t always translate into research publications. The committee recommends that it may be useful to acknowledge different targets for all the EHR programs after which affinity groups could be identified (e.g., research on PI careers, researchers in tracking individuals, etc.)

- *Ultimately, NSF is guided by the vision of the Missing Millions: the STEM workforce will reflect the diversity of our nation. However, we need to better understand what's working and why (or why not).*

As STPI looked across many EHR programs, some affinity groups have been created for historical programs. One committee member recalled Juan Gilbert’s talk from the fall 2021 meeting and recommended research that evaluates the sustainability of black recruitment into new positions or that EHR support research into sustained change and longevity of its broadening participation efforts.

DAY 1 END

Day 2 – May 27, 2021

12:00 PM – 5:00 PM

11:00 PM – 12:30 PM	SESSION 4: REPORTING ON RESULTS FROM COMMITTEES OF VISITORS
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	<p>Moderator: Corby Hovis, Program Director and COV Coordinator, EHR</p> <p>Report from the COV for the Division of Human Resource Development (November 2020)</p> <ul style="list-style-type: none"> • Introduction: Diana Elder, Division Director, Division of Human Resource Development, EHR • Summary of Report by the COV Co-Chairs: Kaye Husbands Fealing, Dean of the Ivan Allen College of Liberal Arts, Georgia Institute of Technology, and EHR AC Member; and Robert Megginson, Arthur F. Thurnau Professor, Department of Mathematics, University of Michigan • Discussion and Approval of Report <p>Update on Divisions’ Actions to Respond to Recommendations of Prior COVs</p> <ul style="list-style-type: none"> • Actions on Recommendations of the COV for the Division of Graduate Education (October 2018): Kim Barrett, Division Director, Division of Graduate Education, EHR • Actions on Recommendations of the COV for the Division of Undergraduate Education (November 2018): Lee Zia, Acting Deputy Division Director, Division of Undergraduate Education, EHR • Discussion/Q&A
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Marilyn Strutchens welcomed everyone to the session and turned it over to the coordinator, Dr. Corby Hovis to introduce the speakers.

Dr. Hovis gave a summary of what the AC should expect in the session and who the overall speakers would be and the topics that would be discussed. Dr. Hovis stated that the COV focused on the whole division, and that the COV reports to the AC. He noted that historically, before 2015, the COV was held per program, which was a lot of COVs and groups meeting. After 2015, EHR consolidated the process to make COVs division-wide, with DRL being the first.

Division	COV Meeting Dates	Report Presented to EHR AC
Division on Research and Learning (DRL)	March 30-31, 2015	May 2015
Division of Human Resource Development (HRD)	Nov. 29, 2016	June 2017
Division of Graduate Education (DGE)	Oct. 11-12, 2018	April 2019
Division of Undergraduate Education (DUE)	Nov. 8-9, 2018	April 2019
DRL	Oct. 17-18, 2019	May 2020
HRD	Nov. 16, 17 & 20, 2020	May 2021

Dr. Hovis explained that COVs review the execution of the merit review process. Division wide processes allowed coherence across programs. He went over the scope of a COV report, informing the AC of “Things to keep in mind”. He reminded the AC that the COV uses a standard template form and that the same form was used NSF-wide. He also noted that within the form is a section for “other topics to discuss” which allowed the COV to discuss topics that may not have been covered but that the committee wanted to discuss. Dr. Hovis then turned things over to Diana Elder (HRD DD) to discuss the report from the COV that was conducted October 2020. Dr. Hovis also noted that following Dr. Elder’s introduction, there would be the summary report by COV co-chairs.

Dr. Hovis introduced Dr. Diana Elder, the Division Director for the Division of Human Resource Development who then introduced and thanked the COV chairs, Dr. Kaye Husbands-Fealing and Dr. Robert Megginson for leading the effort. Dr. Elder then summarized the scope of the COV, spanning nine programs, thanked the HRD staff for their tremendous effort preparing the data and documents as well.

Dr. Kaye Husbands Fealing presented the HRD COV findings and presented recommendations on: the merit review process, selection of reviewers, management of programs, portfolio of awards, along with general feedback and overall recommendations.

Dr. Husbands opened the floor for discussion, questions, and feedback on the report.

Several AC members wanted to discuss the disincentive/incentive for early career scientists to apply for CAREER or serve as reviewers or to be active participants in NSF activities. While the committee strongly encourages administrators to encourage faculty, there was shared concern that this could be pushing early career faculty at minority serving institutions or technical institutions to increased workloads. The committee acknowledged the structural barrier some faculty may face and gave thought to alternative strategic fellowship/partnership programs, but no solutions surfaced.

There was strong appreciation for a recommendation around tribal colleges and associate degree granting institutions. The committee recommended development of strategies that build capacity, so these institutions become competitive and thus, more likely represented.

Another alternative was to increase representation through partnerships with R1s or other local organizations/institutions. The committee contends that there is a clear need to find ways to get beyond challenges.

All voted in favor of accepting the report – none opposed.

When discussions were completed, Dr. Husbands Fealing turned the floor over to Dr. Strutchens.

Dr. Strutchens acknowledged that the COV Report was received and discussed. Dr. Strutchens then asked the AC to vote to accept it and provide it to the NSF EHR Assistant Director, Dr. Marrongelle. The advisory committee unanimously voted to formally accept the COV report.

Dr. Strutchens turned the meeting over to Dr. Kim Barrett, Division Director, DGE, to present actions taken on the recommendations of the DGE COV. Dr. Barrett provided an overview of DGE that serves as a major focal point for graduate education both inside and beyond the agency supporting graduate and undergraduate programs to prepare tomorrow's leaders in STEM research and the STEM workforce while building capacity for STEM education research. Dr. Barrett presented DGE's response to the original COV recommendations on the merit review process, selection of reviewers, management of programs, and DGE's award portfolio.

Dr. Barrett turned the floor over to Dr. Lee Zia, the Acting Director of DUE who presented actions taken on the recommendations of the DUE COV. Dr. Zia provided an overview of DUE, presented DUE's response to the original COV recommendations on the merit review process, selection of reviewers, management of programs, and DUE's award portfolio.

Dr. Zia opened the floor for discussion, questions, and feedback on for actions taken on recommendations for both DUE and DGE.

The AC discussed the COV recommendations in both the HRD and DGE COVs that intersectionality be a criterion. In the HRD report, the COV asked for clarity on the meaning of intersectionality. This suggests that it is problematic to make it a criterion without clear meaning attached.

The AC also discussed the geographic distribution of awards, wondering if awards correlate with areas of country where the reputation of science is relatively low, and if so are there initiatives to improve standing/public discourse on science. The committee recognized a clear and present issue related to trust and public health during the pandemic. There was discussion on whether improving number of awards in those regions might have some impact on improving scientific reputation in those areas or even to increase public appreciation of impact of science. One member found it quite striking how initiatives are concentrated on coasts and noted few others in places with a desert or in the mid-West.

NSF has the EPSCOR program that provides opportunity to EPSCOR states that stretches funding to match EHR investment. Dr. Zia noted that EHR cannot fund a project for which we do not receive a proposal and that EHR is working hard through outreach and engagement to geographically broaden submissions.

AC members also asked about GRFP's decision to uphold the ineligibility of a second application from Masters' students now enrolled in PhD programs, in light of the success of minority students in Bridge to the Doctorate programs who may need that second chance. DGE reiterated that whole intent of GRFP had been as a recruitment tool. Allowing grad students to

apply in their second year of grad school has resulted in a further concentration of GRFP awards in smaller number of elite R1 institutions because they have effective strategies for their students. More support is needed to bring such strategies to MSIs to help them make their students more competitive whether master's focused or MSI. And to continue to really push for undergraduates, which is a far more diverse population.

The AC also asked about the HRD COV's finding that cybersecurity is an urgent national need, inferring that there may not be a large number of equity-oriented institutions that are about to provide a program requiring such sophisticated skills in high level areas of science. DGE noted the broad distribution of awards in SFS Cybercorps. There are programs in places where you may not think have major STEM research enterprises. NSF and NSA have focused on smaller schools. We have outreach to community colleges as a pipeline to bring those schools along and mentor them. There is very much an opportunity for smaller regional schools to mount programs in cybersecurity. Dr. Zia added that ATE's focus two-year colleges also has a strong cybersecurity focus. In support of Dr. Barrett's point, Dr. Zia offered that there are institutions that are seeing the opportunity to commit to developing expertise in that area.

Dr. Hovis returned the floor to Dr. Strutchens.

12:30 PM – 12:45 PM BREAK

12:45 PM – 2:00 PM	SESSION 5: FUNDING OPPORTUNITES IN SUPPORT OF EQUITY
	<p>Moderator: Ellen Carpenter, Acting Deputy Division Director, Division of Graduate Education, EHR (Connection to NSF Response to COVID-19: https://www.nsf.gov/about/congress/funding%20updates/COVID_update_Jan19.pdf)</p> <p>Presentations</p> <ul style="list-style-type: none"> • Racial Equity in STEM Education (EHR Racial Equity) Program Description Narcisha Norman and Ellen McCallie, Program Directors, EHR • Advancing Innovation and Impact in Undergraduate STEM Education at Two-year Institutions of Higher Education Program Description Pushpa Ramakrishna and Michael Davis, Program Directors, EHR • Dear Colleague Letter: Supplemental Funding for Postdoctoral Researchers to Mitigate COVID-19 Impacts on Research Career Progression Kim Barrett, DD DGE and Michael Rook, Science Analyst, EHR

	Discussion/Q&A
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Dr. Strutchens welcomed the AC back from the break and introduced the session moderator, Dr. Ellen Carpenter, Acting DGE DDD.

Dr. Carpenter began the session by noting that the presentations maintain focus united in support of equity. Dr. Carpenter introduced Dr. Narcisha Norman, a Division of Graduate Education Program Officer who presented the Racial Equity in STEM Education (EHR Racial Equity) Program Description (PD) to the AC.

This PD has representation from all EHR divisions, and the portfolio will cover all divisions. Dr. Norman shared that there has been noticeable public interest in the program: three one-hour webinars reaching 900 institutions and 1400 unique attendees; numerous phone calls, emails, and one-pagers. More than half of these institutions have not had an award from EHR in the last 5 years. Dr. Carpenter opened floor for discussion by asking the AC members to address the following questions:

- 1. What impact do you hope this funding opportunity will have on EHR, NSF and its programs? Additionally, what kinds of proposals, projects, and methods do you hope to see us funding?*
- 2. Authentic partnerships are an essential component of the program description, keeping in mind that many, from previous experience, may not have confidence in the notion of a partnership being authentic. What thoughts or advice might you have for us? What work do you think might need to be done with the field to promote authentic partnerships?*
- 3. So far, we have reached a range of institutions and individuals just by publishing the program description, some of whom may not have previously applied for NSF funding. What ideas might you have concerning continued promotion to these communities and what would keep them engaged in the potential of the program description?*
- 4. What are your thoughts on NSF issuing this funding opportunity? What reactions have you heard from the community and what challenges do you recommend?*

Many AC members liked the framing and approach of this program. One member inquired on if the program gives the recipients the resources to combat the system that is oppressing them. It was noted that the resource NSF gives is funding to combat the system and the power structure was left to the PI to navigate. This PD is an open call that allows proposers to explore and articulate where there is a need in the community. NSF reiterated that the proposal concepts that have come in are very exciting but there are no answers yet. The AC discussed how success might be evaluated and stressed a need to build trust with the community in order to define success. Dr. Lee shared her image of the program as an open invitation that not only allows but requires underrepresented groups to take a seat at the table. She shared that a new presence at the table may shift perspectives and how we reframe critical questions. The AC members received the new PD well and believed that by reversing the traditional seats at the table will put the power back with the people who have not had the access allowing them to tell us what's important that touches on the intersectionality of people. The AC felt that the Racial Equity in

STEM PD should address intersectionality by requiring the multi-sectionality of disciplines. The AC noted the need to foster public trust through pro-active outreach; quality of the reviews provided through evaluation; social media; authentic public relationships; promotion of scientists and engineers within the community to allow students to relate to; sponsorship of professional development and community engagement; and have PD incentivize community engagement. The discussions tied in persistence of the need. Individuals with equity expertise need to be at the STEM table if the community is asked to define terms so that NSF can be committed to holding to those definitions during review of proposals.

Advancing Innovation and Impact in Undergraduate STEM Education at Two-year Institutions of Higher Education Program Description

Dr. Carpenter introduced Drs. Pushpa Ramakrishna and Michael Davis. Dr. Ramakrishna presented the *Advancing Innovation and Impact in Undergraduate STEM Education at Two-year Institutions of Higher Education Program Description* by providing the motivating rationale for two-year colleges along with the goals, and Dr. Davis spoke to the potential approaches of interest and outreach efforts (e.g., office hours, one-pagers, one-on-one sessions) of the program. Dr. Carpenter opened the floor for discussion by asking the following:

- 1. What are your thoughts on this funding opportunity? What features should be included to address the needs of the diverse two-year college students?*
- 2. What impact do you think this PD will have on welcoming back, supporting, and retaining students that have been disproportionately impacted by the pandemic?*
- 3. What are the opportunities and key strategies for the PD to identify and address gaps in STEM education in order to build an IUSE two-year college community?*
- 4. What targeted metrics for success should be considered?*

Committee members applauded the launch of this program area as it was an area of high need. Many members recognized financial impacts that present students with economic challenges. The ability of community colleges to respond going forward needs to be sensitive to the needs of student accessibility to computers and relevant technological support services. The AC members recommend including essential support services as a part of the program to increase responsiveness. Consideration for metrics that predict longer-term success should also be included. Experienced researchers involved in metrics would be interested in providing important metrics to support NSF's efforts on this front.

Pushpa reiterated that the open call within this PD was to allow flexibility to allow proposals that improve undergraduate STEM education rather than support technical workforce development purposes. One AC member recognized that the current Administration was pushing for free two-year colleges but there were some roadblocks and recommended that this PD could

rephrase this as, “what STEM can do at 2-year colleges.” Also, there was a recommendation to consider the PD as a prototype that includes infrastructure as part of STEM – it is engineering that affects rural/tribal areas.

Accessibility is a concern during COVID and there have been many efforts to close the gaps in the education pipeline and increase enrollment and matriculation to four-year. David Monk noted course offerings in the general education and trades are struggling at technical colleges. Internships are also important as pathways to increase diversity in industry and direct funding support can be a powerful lever for increasing participation and diversity.

DCL Supplemental funding for Postdoctoral Researchers to Mitigate COVID-19 Impacts on Research Career Progression

Dr. Carpenter introduced Dr. Kim Barrett and Dr. Michael Rook who provided an overview for the rationale for the DCL, which posted in April and does not close until December 2021. One key question relating to the design features of the awards is whether we support individual fellows that apply directly or institutions that request support for a cohort of postdocs.

The DCL also invites research projects to contribute to diversity, equity, and inclusion in STEM and STEM Education Research, and the goal is to assist in the transition to research. The DCL is available to 11 NSF programs and all requests requires discussion of disproportionate impact. Dr. Carpenter opened the floor for discussion, questions, and comments:

- 1. Does the DCL effectively address the needs of the community and encourage submissions?*
- 2. What metrics should we use to judge success of the DCL?*
- 3. If NSF were to consider a stand-alone postdoc program for STEM education research: What design features would be important? How might we attract MSIs and individuals underrepresented in the field to apply? Do you have other thoughts?*

Some AC members supported the institutional approach versus individual approach and felt that the DCL may miss people who may really benefit if we leave it as a pull system rather than a push. Dr. Barrett shared that she has heard that other directorates are looking at this, but thus far the DCL only considers the listed EHR programs but recognizes a broad agency need. There is a general policy to consider supplements that pertain to COVID-19 implications. Dr. James Spillane recommended and encouraged playing out what are the tradeoffs with the two different models: If supporting people who have been disenfranchised even more through pandemic, then an applicant-focused program could work more; but, then again institutional could work. Institutional model may reach more first-generation postdoc/academics and could incorporate peer mentoring.

Dr. Marrongelle reiterated that EHR sees a need post-pandemic for this DCL, and that the larger question is if here a need in STEM education research and sciences more broadly for postdoc programs. She noted that EHR has not historically funded postdocs. They are not as plentiful in education as most other directorates do have a robust post doctorate program. Dr. Strutchens stated that postdoctoral programs are beneficial to underrepresented groups because they give the individual the opportunity to try out places before landing in a more permanent spot and relief

from the high stress of a tenured spot. The AC members felt strongly about supporting the next generation but inquired about program intersectionality and progression. Dr. Lee noted that when thinking about opportunities for individuals as well as institutions, there must be concerted effort for outreach any opportunity has possibility to widen rather than narrow the gap.

2:00 PM –2:30 PM BREAK

2:30PM – 3:30 PM	SESSION 6: REVISITING EHR’S NAME
	<p>Moderator: Lee Zia, Acting Division Director, Division of Undergraduate Education, EHR</p> <p>Presentations</p> <ul style="list-style-type: none"> • HRD Name Change Diana Elder, Division Director, Division of Human Resource Development, EHR • EHR Name Change Karen Marrongelle, Assistant Director, EHR <p>Session Discussion</p>

Dr. Strutchens welcomed the Committee members and called the session back to order. Dr. Strutchens introduced Dr. Lee Zia, Acting DUE DD who then provided an overview for revisiting EHR’s name and presented a historical overview of the name and the directorate. The current name dates to 1990. EHR is not reorganizing the directorate, nor will HRD reorganize. The formal change will be part of the FY23 budget development. The aim of this session was to seek reactions and input for the several alternatives put forward.

Dr. Zia introduced Dr. Diana Elder who then provided an overview of HRD name change. HRD was established March 3, 1991 and serves as a focal point for NSF’s agencywide commitment to enhancing the quality and excellence of STEM education and research through BP in STEM of historically underrepresented groups, including minorities, women, and persons with disabilities. The HRD program portfolio includes programs that remove barriers to students and many programs are longstanding: LSAMP 30 years; ADVANCE 20 years; and TCUP nearly just as long. The current name is dated and implies a deficit perspective, and a name change is due to a renewed internal and external interest in HRD’s portfolio of programs. The selection process began with terms and built to phrases. The division recommends the name: “*Division of Equity for Excellence in STEM*” incorporating the 3 most popular discussion terms equity, STEM, and excellence.

Dr. Elder opened the floor for the HRD name change discussion and initial feedback by posing the following questions:

1. *What is your reaction to the name change?*

2. *Do you think that the proposed name accurately describes our work?*
3. *Does it capture the essence of who we are?*
4. *How should we communicate this change to the community?*

One member shared that the use of “Equity” indicated that NSF was making efforts towards equity for all and felt that the idea of inclusivity was captured. Another member stated that “‘Equity for excellence’ means equity in service of excellence and this is not the same for ‘equity in excellence’ and inquired how the division chose “for” versus “in”. The committee believed that excellence cannot be achieved without equity and the new proposed name takes into consideration those disproportionately affected. The committee believed that equity for excellence meant that if NSF addressed equity challenges, the Agency might move towards providing solutions to societal issues.

When introducing the name change to the broader education community, the AC recommended to revisit and showcase highlights of HRD funded projects in equity for excellence to show demonstrated success in support of this aim and the legacy of what has been. The new name and portfolio support societal changes and captures STEM history. One member found that the title was not only an aspiration but a message of what was essential – an expression of what has been implicit in the past and why it has become urgent in the present.

Dr. Elder then introduced Dr. Karen Marrongelle to present EHR’s name change.

Dr. Marrongelle recognized the history of EHR spans more than 20 years. The motivation for a name change was similar to the HRD - to refresh and update work of directorate. Directorate discussions included the inclusion of “STEM”, “Sciences”, and “Research” within the name. The recommendation put forth by the Directorate is the *Directorate for STEM Education* (Acronym:EDU). Alternative options are: *Directorate for STEM Education Sciences* (Acronym: EDU), and *Directorate for Equitable STEM Education* (Acronym: EEDU). Dr. Marrongelle opened the floor for the EHR name change discussion and initial feedback:

1. *What is your reaction to the name change?*
2. *Do you think that the proposed name accurately describes our work?*
3. *Does it capture the essence of who we are?*
4. *How should we communicate this change to the community?*

The new name was well received by the Committee. Discussions that following included how the workforce would fit in the new EHR name and what discussions were surrounding possibly including it. Dr. Marrongelle offered that those within EHR wished to keep naming simple.

One member shared concern that the informal aspects of education may get lost but conceded that perhaps it would be a matter of educating people that education was both formal and informal. Dr. Lee shared that education cuts across STEM disciplines – “That is our identity. We are Education broadly across the spectrum”. Dr. Lee shared concerned about the STEM Education not playing a central role by asking “*What is the role of STEM education? What is our voice? If we have an identity, we should have a STEM education member at the cabinet level in the presidential administration. Perhaps we look at all taskforces across the gambit and look at*

where there should be a STEM Education expert that needs to be represented. The name states that we are the experts in education across ALL STEM disciplines”.

Thomas Brock countered by asking what the forward-looking aspect across divisions was. He shared his view that the name was static and not forward thinking enough. He proposed “*Directorate for STEM Education and Advancement*”. Dr. James Spillane aimed to keep alive the informal education by offering “*Directorate for Advancing STEM Education*”.

There was robust conversation on the new name for EHR. Hyman Bass stated that the Committee should consider names that would give you a seat at the table and shared that if it we just kept it at education there would be a seat at the table thanks to the disruption of the pandemic – “because we are science based, we may be missing out on the broader policy implications”. Dr. Lee countered with “If we stay too general, we may lose our identity”.

Dr. Marrongelle reiterated the new EHR name should reflect where the Directorate needs to be.

3:30 PM – 3:45 PM	PREPARE TO MEET NSF DIRECTOR SETHURAMAN “PANCH” PANCHANATHAN AND CHIEF OPERATING OFFICER F. FLEMING CRIM Moderator: Marilyn Strutchens, Chair, EHR Advisory Committee
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AC members suggested questions and topics for which the AC would like insight into from NSF Director, Sethuraman “Panch” Panchanathan, and Chief Operating Officer (COO), Fleming Crim. Topics included: major challenges facing the agency currently, particularly as they relate to EHR and its landscape; NSF’s 20% budget increase; partnerships; perspective about the PreK-12 teacher workforce, particularly as related to diversification; the new AD search; recruitment of young scientists; and NSF’s role in the reconstruction of public trust in science.

3:45 PM –4:00 PM BREAK

4:00 PM – 4:30 PM	TALK WITH NSF DIRECTOR SETHURAMAN “PANCH” PANCHANATHAN AND CHIEF OPERATING OFFICER F. FLEMING CRIM Moderator: Marilyn Strutchens, Chair, EHR Advisory Committee
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Dr. Strutchens opened the session and asked AC members to introduced themselves.

NSF Director, Dr. Sethuraman “Panch” Panchanathan briefly presented his guiding vision and strategy for NSF’s – strengthening at speed and scale – and emphasized that NSF must lead by values and by conducting quality innovative research with integrity. The Director’s vision also focused on addressing the “missing millions” – the talented individuals that have been historically left behind due to a lack of available opportunity. First and foremost, NSF must focus on cultivating domestic talent to bridge the gap of the missing/invisible millions. Dr. Panch shared that a billion dollars is to be allocated to students and institutions disproportionately

affected by COVID-19 to address their need and not leave good talent behind. He shared that the Biden Administration's budget calls for the largest increase to NSF at 20% (almost \$1.7B). He noted that the desire to compete and be successful internationally requires the recruitment of talent from HBCUs, MSIs, and TCUPs. Dr. Panch believes that the agency is well on its way to actualize his vision.

Dr. Strutchens opened the floor for discussion, questions, and comments. AC members thanked Dr. Panchanathan for sharing his vision and asked what he believed the major challenge was that NSF faces, and which challenges EHR will face in implementing and realizing this vision. Dr. Panch reiterated that NSF is a pathway to reaching talent and the only federal agency that has the broad mission that touches talent in every part of the nation's infrastructure. He restated the comments that he shared with Congress that if equity and accessibility were the keys to innovation and security, NSF must be a useful vehicle for sustained change. Dr. Panchanathan shared that the greatest challenge was that of the missing millions who are not part of the STEM enterprise currently. NSF will, can, and must do a lot, but it alone cannot become the solution. NSF must work in partnership (bilaterally and multilaterally) with other agencies, organizations, and companies. Dr. Panch shared that we are currently living a great moment in science, and science can solve real problems. He used the development of the COVID vaccine that was made available in 311 days as an example. Dr. Panch stated that science and engineering increase our resiliency, and we owe the public an outline of what sciences can do in crisp clear impactful terms and that we all share the responsibility of story-telling at scale. He illustrated a clear need to inspire students across the pipeline and encouraged all to; change the paradigm, remove barriers, and leverage partnerships. Dr. Panch stated that broadening participation offices are needed at every institution charged with targeting institutional themes that will then move the needle when aggregated to begin making noise as a community. Current NSF programs and grants are focused at the institutional level, but there's a broader need to connect with young people who don't see themselves entering STEM fields or may feel excluded. When Dr. Panch was asked what role NSF can play in recruitment, he referenced the impactful role that primary level teachers play in K-6. He indicated that EHR should aim to have more science-inspired teachers inspire the kids in the trenches as teachers have the greatest impact. The goal is to get teachers to use scientific principles to solve problems so they can continue to inspire their students.

When asked, Dr. Panchanathan made clear that public trust is earned and not given. NSF plays a role by ensuring that STEM allows individual and community prosperity. The delivery of outcomes is what people wish to see. Dr. Panch believes that if the American citizenry sees that children have possibilities, trust will follow. He stated that trust is a collective process. NSF has the power of the purse strings, but through good partnerships, including with industry, better foundations can be set by delivering outcomes. Dr. Panchanathan emphasized that NSF must lead by values and by conducting quality research with integrity. Likewise, innovation must permeate both internal actions of NSF and what the agency supports externally. To strengthen scale and speed of NSF's education and innovation investments and outcomes, NSF must focus on partnerships, people, and translation to empower communities and expand participation.

Dr. Strutchens opened the floor for discussion, questions, and comments.

Dr. Panchanathan thanked the committee for its time and guidance provided to EHR.

4:30 PM – 5:00 PM	CLOSING REMARKS
	Karen Marrongelle , Assistant Director, EHR Marilyn Strutchens , Chair, EHR Advisory Committee, & Emily R. & Gerald S. Leischuck Endowed Professor, Mildred Cheshire Fraley Distinguished Professor, Department of Curriculum and Teaching, Auburn University

Dr. Karen Marrongelle and Dr. Marilyn Strutchens thanked all AC members for their valuable input and time. Dr. Marrongelle made several announcements. Dr. Strutchens then asked the AC what they would like to charge EHR with, or if they would like to share parting remarks:

The Advisory Committee was congratulatory on the COV deep dive and the renaming initiative. Systematically, EHR and divisions have been doing the work, but there may be a need for additional CEOSE linkage to ensure new programs or PDs that the idea of equity for excellence remains the focus. Issues of inclusion and diversity appear to be central and that there is a genuine engagement and the appreciation for the complexity of these issues and the intersectionality and sophistication was commended by the Committee. One member of the Committee was excited by the equity work and heartened by the increase in funding and interest in community college linkages. The AC charges EHR to keep thinking on how to form communities of likeminded individuals to share information and resources thinking collectively on how to create larger learnings from current awards and funding. The Committee recognized that science used to be esoteric to public discourse as it relates to policy. For example, wearing a mask – this daily act is based in science. Science has become part of our daily life that impacts social justice and equity. The role of NSF to society matters because of accountability. The Committee further recommends that EHR keep making teachers’ voices matter.

Dr. Marrongelle thanked all EHR staff who helped the meeting come to fruition and reminded AC members that the next meeting would be November 3-4, 2021. Dr. Marylin Strutchens thanked all members for their contributions to a productive discussion and adjourned the meeting at 5:04p.m.