

**NASA Advisory Council  
Science, Technology, Engineering and Mathematics (STEM)  
Engagement Committee**

**NOTES**

October 1, 2020

**STEM Engagement Committee Members**

**Present:** Dan Dumbacher (Committee Chair), Darryl Williams (Committee Vice Chair), Ray Mellado, Carl Person, Michael Lach, Norm Fortenberry

**Not Present:** Cristin Dorgelo

**Others Present:** General Lester Lyles (NASA Advisory Council Chair), Beverly Girten (Executive Secretary), Michael Kincaid, Kris Brown, Elaine Ho, NASA HQ Office of STEM Engagement; Rick Gilmore, Anne Gooding, Glenn Research Center

**Opening Comments**

Dr. Beverly Girten, Committee Executive Secretary welcomed everyone and noted the meeting is a virtual meeting via Webex is taking place in accordance with the Federal Advisory Committee Act (FACA). Meeting will be recorded. Dan Dumbacher, Chair, General Lyles, Chair NASA Advisory Council (NAC), provided introductory comments. Individual members introduced themselves.

**National STEM Updates**

Mr. Kincaid shared the next Office of Science and Technology Policy (OSTP) Committee on STEM Education (CoSTEM) progress report will be posted to the OSTP web site in a few weeks. Mr. Kincaid also welcomed committee members to respond to the Request For Information to support the implementation of the CoSTEM Strategic Plan and to gain insights into the impact of COVID-19 on the STEM community.

**Office of STEM Engagement Updates**

**Overview / Impact of Coronavirus / Accomplishments / Strategic Outlook**

Kris Brown shared progression and decisions for conducting work despite coronavirus impact. Ms. Brown highlighted the transition of the internship program to completely virtual for summer 2020 and the solicitation, Remote Opportunities Rapid Response solicitation created in response to COVID-19 which was defined and executed in its entirety before end of fiscal year. General Lyles inquired about what a virtual internship looks like. Ms Brown explained laptops were shipped to all students. Students were provided with tools for enabling virtual interactions with mentor and mentor teams. Mentors developed projects that could be transitioned to virtual implementation. Obviously students were not able to participate in hands-on, side-by-side learning with mentors but were able to engage in technical work with mentors. Student had opportunities to meet with people, including Dr. John Mather, Nobel Prize recipient and Senior Astrophysicist at Goddard Space Flight Center, to learn about technical work. Students participated in an Agencywide virtual poster session at end of summer, joined by NASA's technical community. Students and mentors praised the swift and thoughtful transition to virtual. Mr. Dumbacher confirmed some of his

students participated in the virtual internship and came away with positive experiences and were thankful for the work that went into the internship program. Plans for fall and spring internships are all virtual. Mr. Kincaid noted they had 1600 interns in the summer and that the fall program will be bigger than ever and acknowledged the mentors who signed up for the program. It is not us throwing money. He also indicated the virtual model allowed OSTEM to reach some people who may not have been able to participate in a in-person internship. Dr. Williams noted NASA can serve as a leader for modeling virtual and hybrid internships. Kris Brown noted OSTEM is continuing to build on experiences and looking at what a hybrid model might look like. Some Centers will be all virtual while other Centers may have opportunity for some in person bringing interns onsite. Mr. Dumbacher closed the topic by noting that we need remain aware of underserved and underrepresented communities and their ability to access virtual internships, specifically for students who may have limited internet access.

### **Strategic Outlook**

Ms. Brown shared the updated NASA Strategy for STEM Engagement 2020-2023 noting this is an agencywide strategy that includes the work of HQ functional offices, Mission Directorates, and Centers. This revised strategy document moved from focus areas to strategic goals and added a new goal, Strategic Goal 3, for attracting diverse students to STEM. The work was completed with a Tiger Team from the STEM Engagement Council which also looked at the priorities for FY 2021 and FY 2022. The STEM Engagement Council elected to move to a systemic model with two key priorities: pre-college and higher education.

### **Program Update**

Ms. Elaine Ho reviewed progress made in each of the four projects for moving to a mission-driven STEM Engagement program commenting the team seeks out opportunities for integration and collaboration across the projects. Ms. Ho shared FY 2020 program highlights, introduced the new MUREP strategy for using planning grants to develop concepts for building Minority Serving Institution (MSI) capacity. During COVID, projects individually engage every OSTEM PI at regular frequency to understand the impacts of COVID. Ms. Ho highlighted how OSTEM is working collaboratively with the Mission Directorates, noting matching dollars from Science Mission Directorate (SMD), Space Technology Mission Directorate (STMD), Human Exploration and Operations (HEO) Mission Director and the Office of the Chief Economist to Space Grant institutions to leverage Artemis Student Challenges. General Lyles asked about the different themes for Artemis Challenges which are online training curriculum for Artemis, building hardware, and student Competitions. When asked about efforts for Space Grant institutions to reach out to and mentor MSIs, Ms. Ho replied Space Grant institutions partner with other institutions, including MSIs, and that they always look for ways to include MSIs. Mr. Kincaid added the funding goes to lead the institution in the state. NASA doesn't decide how money is transferred and lead institutions have ability to partner across states. Mr. Kincaid noted a prime focus is to reach underrepresented communities and there is an expectation for lead institutions to partner with MSIs. Mr. Mellado noted it is a best practice across the whole Federal government to partner with MSIs.

### **Artemis K – 12 STEM Engagement Framework**

Mr. Kincaid shared the Artemis K-12 STEM Engagement Framework and how OSTEM reaches students across the OSTEM ecosystem. Mr. Kincaid also discussed the Engaging the Artemis Generation fireside chat livestreamed over YouTube in July 2020 as well as the recently released Moon Pod Essay Contest. Committee members are encouraged to share this contest with their networks to encourage student participation. General Lyles asked about opportunities to engage pre-K students, citing the partnership Northrup Grumman has with Wolf Trap. Ms. Brown noted OSTEM is in final stages of signing a partnership agreement with an organization that serves the pre-K audience but is unable to share the name of the partner in a public forum in midst of final signature stages. Mr. Dumbacher asked about involvement of the Aeronautics Research Mission Directorate (ARMD) to which Ms. Ho responded that OSTEM has a new position, an ARMD embed within OSTEM whose role is to look for an initiate opportunities between OSTEM and ARMD.

### **STEM Engagement's Strategy for Broadening Student Participation**

Dr. Fortenberry inquired about OSTEM's efforts to broaden participation at majority institutions to which Mr. Kincaid responded that Ms. Brown is leading a STEM Engagement Council (SEC) working group on broadening participation. The working group reviewing data to identify focus areas for the working group. Ms. Brown noted the group is currently developing an action plan for FY 2021. Dr. Fortenberry added the Department of Education recently changed the definition of Hispanic-Serving Institution (HSI). University of California Irvine is now an HSI. Within the portfolio of HSIs, some have a population of 50% Hispanic while others have a population of 25% Hispanic. Torrey Johnson added that NASA is working with the National Science Foundation to identify areas for investigation. Mr. Johnson noted that when making awards, they have balance factors and do look at MSI diversity, for example, if they have not had recent awards to Tribal Colleges and Universities, they will delve deeper into that space. Mr. Mellado added that even institutions designated as HSIs or other MSIs, while they may have large enrollment of underrepresented students for the institution as a whole, enrollment among underrepresented students in accredited engineering and science programs may be limited.

General Lyles asked when working with mission directorates if there is balance among the directorates to which Mr. Johnson responded there is engagement on different fronts. Over certain periods of time, mission directorate may have had larger participation but they do look for balance among all mission directorates over time. Mr. Dumbacher asked if OSTEM interacts with MSIs to identify they support structures the institutions need to become more successful. Mr. Johnson responded OSTEM has continual dialogue with MSIs to identify ways NASA can be supportive, for example, timing of when solicitations are released and providing mentoring through Space Grant to schools which may need additional support. Mr. Kincaid added that NSF INCLUDES gets back to what MSIs want from Federal agencies.

### **Performance and Evaluation: Diversity Update**

General Lyles questioned whether the summary statistics provided on under represented race and ethnicity awards were broken down by specific groups to which Dr. Gooding confirmed they were. Dr. Williams suggested conducting a deeper exploration of how and to what extent we are creating access for particular groups to be able to be aware and understand the opportunities they have with NASA. Mr. Gilmore explained they are conducting multiple studies around broadening

participation and using key takeaways to effect change in portfolio.

General Lyles asked if there are any studies looking at retention? Mr. Gilmore responded they do look at retention and recruitment. Mr. Kincaid noted for OSTEM, retention is if students finish one of our programs, when we get them to come back for another one and then can we get them back for our workforce. When government changed rules for coop, what is now Pathway, agencies struggled with converting internships to workforce. This is something they are trying to figure that out at the CoSTEM level. Mr. Mellado asked if there are any studies with current science and technology NASA workforce to see how each mission directorate is doing with respect to diversity and inclusion. Mr. Gilmore responded that studies are based on data they have access to, specifically internships funded by mission directorates. OSTEM has limited access to current workforce data. Mr. Mellado noted it would be interesting to see how NASA is doing as a baseline and then to see how NASA programs affect a change. Mr. Gilmore noted OSTEM does not have access to that data but that they may be able to look at that in the future.

Mr. Kincaid noted OSTEM is looking at students in the OSTEM population. Specifically, are the students succeeding, not just in the NASA workforce but also in the contractor workforce. Looking at the NASA workforce is not within the scope of OSTEM. Mr. Kincaid noted NASA is kicking off a Unity Plan to look at representation at different levels but that it is not a STEM Engagement activity. It is a benchmark but not something for the evaluation team to answer.

Mr. Dumbacher asked if there is a geographic component to the analysis. Mr. Gilmore noted that currently there is not a geographic component but that they are looking into adding into the new data management system. The team is working with the CoSTEM interagency working group to define that work

## **Observations, Findings and Recommendations**

### **Finding**

#### **Title: Agencywide Approach to STEM Engagement**

The Committee requests that NASA continue the “whole of NASA” approach to STEM and particularly the involvement of Minority Serving Institutions. NASA’s Mission Directorates (ARMD, HEOMD, SMD, STMD) should continue to be encouraged to identify and grow opportunities to partner with OSTEM. Focused effort with MUREP by the Mission Directorates are needed to increase awareness and engagement with Minority Serving Institutions.

Engagement should inform and build MSI understanding of Mission Directorate efforts and programs and opportunities for research and program participation. The goal of this engagement is to maximize the impact of the MUREP funding on NASA missions and inclusion of MSI’s more deeply in NASA efforts. This engagement should be focused on locations of highest potential impact including geographic locations currently not receiving MUREP funding.

Mission Directorates have improved their respective coordination with OSTEM recently. This is evidenced by the OSTEM Artemis focused activities and the multiple Mission Directorate collaborations. The Committee implores the NAC through the various Committees to support OSTEM’s strategy for STEM engagement. Consistent and valued effort with OSTEM across the Mission Directorates will lead to more coordinated, streamlined, and impactful results.

NASA is the first and only Agency to have established a goal of one percent of total contract value of prime and subcontracting awards for acquisitions to Historically Black Colleges and Universities/Minority Serving Institutions. NASA is to be commended for implementing the 1% goal. Currently NASA has only achieved .16% and .17% in FY18 and FY19 (data provided by the Office of Small Business Programs), respectively towards the goal. This reflects contract awards with only 50-60 MSIs in FY18-19 (per the Office of Procurement data). The “whole of NASA” approach must continue, in earnest, in order to realistically meet the 1% goal.

**Recommendation:**

**Title:** Continued Emphasis on the Agencywide approach to STEM Engagement

The Committee recommends that NASA require regular, periodic reporting at the Administrator and NAC levels on how Mission Directorates are supporting OSTEM in meeting the STEM Engagement Objectives. This includes Mission Directorate support and coordination on engagement, use and growth of Minority Serving Institutions, and meeting the 1% contracting goal.