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Good afternoon. I am honored to be here today to participate in the panel on enabling organizational systems and processes. I will be speaking about this topic in the context of enabling NASA-funded science, technology, engineering, and mathematics, or STEM, educational programs to achieve greater gender equity and diversity through compliance efforts under the federal law of Title IX of the Education Amendments Act of 1972.

Title IX was passed to ensure equal opportunity regardless of gender in all academic activities. In many ways, the law has been effective in accomplishing Congress' intent. For example, since 1972, women have made significant progress in academic programs leading to professional fields, such as medicine, business and law.

However, one area where progress has lagged is that of the STEM fields.

I firmly believe Title IX is one of the most powerful tools we have at our disposal in addressing this issue. Indeed, vigorous enforcement of Title IX and its regulatory provisions is critical to the twin goals of creating greater gender diversity in STEM

programs and effecting positive change in STEM environments. As the Associate Administrator for Diversity and Equal Opportunity at NASA, it is my responsibility to ensure that STEM educational programs receiving NASA grants provide equal opportunity to male and female students.

Just to provide a little bit of background, NASA awards approximately 1 billion dollars annually to anywhere from 600 to 700 grantee institutions across the United States, the majority of which are university and college STEM programs. These institutions, as recipients of federal dollars, are prohibited from discriminating in their educational programs under Title IX.

In conceptualizing how we would conduct our Title IX compliance reviews, we thought carefully about relationships that exist between NASA and its grantees, especially its STEM program grantees. We view the STEM programs to which NASA provides financial assistance as the future of our Nation's science and engineering workforce, and in many cases, a pipeline to NASA's workforce. We also sought to employ a balanced approach in our reviews, in which we would examine both areas for improvement as well as highlight the promising practices that we saw. By and large, we have found that most of the institutions we have visited are attempting to increase the gender diversity of their programs. But their

structures and organizational processes sometimes aren't designed to facilitate these efforts.

NASA has conducted Title IX compliance reviews of grantees nationwide. We have looked at a host of different STEM programs funded by NASA, including the engineering disciplines, for instance, aerospace, mechanical, and electrical, as well as the sciences, such as physics, astronomy, and planetary sciences. I will share the broad themes that have emerged from our reviews, which I believe point to both the continuing need for vigorous Title IX compliance efforts, as well as the tremendous progress gender equity in STEM efforts have made in recent years.

A major focus of NASA's Title IX reviews, from an institutional perspective, is the law's requirement for each grantee to have a responsible official who coordinates compliance. Title IX also requires grantees to have in place internal grievance procedures that allow faculty and students to raise concerns of sex discrimination or sexual harassment.

In addition to the coordination and procedural requirements of Title IX, NASA examines the learning environment of the programs we review. We look at program policies and student experiences in the classroom and laboratory settings, as well as faculty advising, high-stakes testing, and efforts to ensure that program participation

is not limited based on physical safety or on parental or marital status. In addition, we have begun deploying a Title IX survey to students in STEM programs on which we are conducting compliance reviews, to help better understand issues of climate.

As far as Title IX compliance issues, we have seen that the responsible officials for Title IX at the schools, the Title IX coordinators, are not always well known to the STEM program leadership. Of greater concern in the coordination context has been the lost opportunity for STEM programs, including leadership, faculty, and students, to benefit from a strong working relationship between the program and the Title IX coordinator's office. One of the ways we have sought to enhance organizational processes is to strengthen this relationship. Among the promising practices we have observed are STEM programs that have a staff person within the college or department dedicated to overseeing diversity and inclusion efforts.

We also find that there is a critical need for stronger education and coordination efforts among STEM program faculty and students, who often don't know where to go, or how to handle, gender bias or harassment should it arise. This is one of the main structural problems among our grantees. The schools need to do a better job of publicizing and implementing their procedures for filing complaints of sex discrimination or harassment. They also need to do a better job of formalizing their procedures for requesting parental and other family leave and promoting their

existence. NASA often recommends specific mechanisms for schools to better publicize their Title IX related policies and procedures, including frequent electronic dissemination of information, for instance, through student and faculty handbooks, program websites, and email blasts.

Our reviews have also identified structural deficiencies in admissions policies and practices. For example, in one instance a graduate Astronomy program admissions process was flawed by over-reliance on GRE scores, to the exclusion of undergraduate GPA, recommendations, or essays. This issue was identified by a recently hired female astronomy professor in the Department who noticed that many well-qualified female applicants were not making the first cut for admission because of low GRE scores. The Department corrected the issue by making GRE scores one of several criteria that would be used for the first cut.

Another common recommendation made by NASA is for STEM departments to change their recruiting practices to attend events where there are likely to be a lot of female students. This recommendation is in response to STEM officials who state there aren't many female students to recruit at the events they traditionally attend, which do not include events such as the Society of Women Engineers or Association of Women in Science conferences.

We also have had bias alleged by students or shown by faculty members in some of the programs we have reviewed. For example, in one case we heard multiple allegations about faculty advising in which male students who did poorly on certain high-stakes tests were advised that they “would do better next time,” while female students with similar scores were told that they “might want to consider a different major.” NASA recommended that the school conduct an internal administrative review of the program. Based on this review, the program ordered additional Title IX education and awareness for faculty, as well as for graduate students in teaching and research assistant roles.

In another review, women physics students believed they were failing their qualifying exams at higher rates than male students. NASA requested the test scores and found the women were actually NOT failing the test at higher rates. The misperception of the female students could have been avoided if the Department had been more transparent in the sharing of information. NASA made this recommendation to the university.

As a result of our Title IX reviews, NASA finds there is still reason to be concerned about the presence of gender stereotypes and bias in STEM program environments.

Targeted education, awareness efforts, and increased transparency can help to address environmental concerns, but they are not the only answer. More needs to be done to create structural and systemic change in the *approach* to STEM education. This can be achieved through greater collaboration between stakeholders at the national level, including STEM university and college programs, primary schools, government agencies, and advocacy groups.

In an effort to facilitate greater collaboration on civil rights and STEM, NASA has provided technical guidance to our grant recipients in the form of two Title IX publications. In a 2009 publication: “Promising Practices for STEM,” NASA compiled many examples of promising practices observed during our Title IX reviews into a booklet that we disseminated to all of our university grant recipients. We also provided hundreds of copies to professional organizations who helped us to further disseminate the publication. This publication was extremely well-received and is still available in electronic format on our web site.

In 2012, we released a second publication titled “Conducting Title IX Self Evaluations,” which we also disseminated to all of our university grant recipients. This publication provides STEM programs with areas to review and specific

questions to answer to evaluate their gender diversity efforts. The publication is based on requirements under Title IX for grantees to conduct self evaluations focused on employment, admission, and treatment of students. This guidance, available in both print and on our web site, is intended for proactive programs that want to ensure their organizational structures and processes are not unintentionally excluding women or causing them to leave STEM programs prematurely.

In 2012, NASA launched its MissionSTEM web site, a culmination of our efforts to facilitate greater collaboration on civil rights in STEM . Prior to launch, we conducted a series of focus groups with university leadership, STEM program administrators, faculty, and other stakeholders across the country. The focus groups helped us to learn more about the challenges confronting our grantees in their efforts to create greater diversity and more inclusive STEM program environments. The focus groups yielded several common themes such as the need for students to better understand STEM career paths, the potential societal impacts of STEM, recruitment and retention challenges, the need to reach younger students, and the ongoing need for culture change in STEM program environments.

Before concluding, I would like to share some highlights of the MissionSTEM web site so you can better understand our efforts to facilitate change in STEM programs.

First, we have a major area on the MissionSTEM website that describes promising practices in university STEM programs. [main menu on top left of homepage – 4th down is Promising Practices (Colleges)]

Here, you will find both of the publications I described earlier, the Promising Practices booklet and the Self Evaluation Guide, as well as additional promising practices compiled since 2009. We also have an area for “Featured Promising Practices” that we update regularly.

Currently, we have featured promising practices from the MIT Physics program, which has significantly increased its enrollment of female students in recent years, and the University of Maryland’s School of Engineering, which has an excellent Student Ambassadors program providing diverse role models for middle and high school students.

Another major area on the website is the Student Corner, where we address some of the issues raised by the focus groups such as providing students with more realistic STEM career paths and showing how STEM innovations have real world impact.

The newest addition to the website is the Diversity and Inclusion Leadership Series where we feature videos from university presidents and others commenting on how to increase STEM diversity.

Enabling better functioning organizational systems and processes in STEM program environments is a critical part of Title IX compliance efforts. From identifying and removing sources of gender bias, to improving program climate, to facilitating greater collaboration among STEM practitioners, NASA views Title IX as a powerful vehicle for cultural change in STEM.