

**NATIONAL SCIENCE FOUNDATION  
LISTENING SESSION**



**SECTION 7033 OF THE AMERICA COMPETES ACT**

**HISPANIC-SERVING INSTITUTIONS  
AND  
SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM)**

**March 1, 2009  
2:00 to 5:00 p.m.  
Madison Hotel  
Mount Vernon Salon A  
Washington, D.C.**

**Reported by: Sandra Gartrell**

## **INTRODUCTION AND WELCOMING REMARKS**

**DR. VICTOR SANTIAGO**, Program Manager,  
National Science Foundation

**DR. FAE KORSMO**, Senior Advisor,  
National Science Foundation

**DR. CORA B. MARRETT**, Acting Deputy Director,  
National Science Foundation

**DR. ANTONIO R. FLORES**, President & CEO,  
Hispanic Association of Colleges and Universities

## **P R O C E E D I N G S**

**DR. SANTIAGO:** Good afternoon. Please take your seats. I'm Victor Santiago, program manager at the National Science Foundation. Thank you for being here. This is a good opportunity to turn off your cellphones or set it to silent mode, please.

Let me introduce my colleague, NSF senior advisor Dr. Fae Korsmo. Fae.

**DR. KORSMO:** Thank you, Victor, and thanks to everyone for coming. This is an exciting time. Welcome to the National Science Foundation Listening Session on Section 7033 of the America COMPETES Act regarding Hispanic-serving institutions and science, technology, engineering and mathematics education.

I just want to make a couple announcements. We do have sign language interpretation available. Steve and Pam, do you want to raise your hands? They will stay around a bit in case they are needed.

We also have bilingual interpreters available, Aaron and Teresa. Teresa, would you raise your hand? There is also equipment available at the registration desk, so please feel free to use it if needed.

*(Interpreter asks in Spanish if anyone needs a translator).*

**DR. KORSMO:** I want to introduce our NSF staff. You already met Victor Santiago. We have several additional people here today: Tracy Gorman from the Director's Office, who is at the registration desk; Deborah Crawford from the Computer and Information Science Directorate; Jim Wyche from the Human Resource Development Division in the Directorate for Education and Human Resources; Alan Savitzky from the Biological Sciences Directorate; Brian Patten from the Division of Astronomy and Astrophysics, Math and Physical Sciences Directorate; Karen Pearce from the Office of Legislative and Public affairs. Anyone else, before I give the floor to Dr. Cora Marrett? We have a good cross-section of NSF staff.

At this point I would like to invite the Acting NSF Deputy Director, Dr. Cora Marrett, to give us an official welcome. Thank you.

**DR. MARRETT:** And thank you, so much. I join my colleagues in thanking you for your participation in a very important session. We're calling this the "Listening Session."

As Dr. Korsmo noted, our authorizing legislation, the America COMPETES Act, authorizes the National Science Foundation to establish a new program that would make awards on a competitive merit review basis to Hispanic-serving institutions or HSIs.

This would supplement, but not supplant, what the Foundation already does with reference to Hispanic-serving institutions, and in connection with Hispanics in science, technology, engineering and mathematics or STEM.

We are very excited about this possibility. The goal of the legislation and the intent of NSF mesh in that we are concerned first and foremost with bringing all talent to the STEM areas.

Our nation benefits when we have, in fact, the representation of all of the minds of the nation.

We need, then, to hear input, we need to hear your ideas about what kinds of strategies seem appropriate, what are the challenges, what have been the successes and where there might have been, I hate to say, possibly failures. We certainly do not want to replicate the things that have been unsuccessful. We wish instead to build on the areas of success.

We like to think about this in terms of partnerships. There are partnerships that are possible among HSIs, and between HSIs and other institutions. There are partnerships that certainly could be thought of as critical for the National Science Foundation.

A bit of a background:

Immediately after the President signed the America COMPETES legislation, NSF formed a working group to recommend options that might be implemented. And I'm very pleased that Dr. Deborah Crawford, who is here, agreed to chair that working group on the options.

The group completed an analysis of existing literature, of experiences that we were able to gather, and made a number of preliminary findings. Those findings won't be a surprise to anyone in this room.

The findings are that Hispanics are underrepresented in science and engineering occupations and in higher education in science and engineering fields; there are important transition points in the pipeline from high school to two-year programs, from two-year programs to four-year programs, from four-year programs to graduate education and from completion of higher education into the job market, whether that is the academic job market or beyond.

We uncovered the literature on how students make decisions about college, the importance of costs, as well as proximity to one's own home.

We were especially impressed by the suggestions of successes. Four-year colleges and universities succeed in retaining Hispanic students through degree completion when these colleges have a caring faculty, close faculty/student interactions, mentoring, a nurturing environment. Those are the kinds of characteristics that appear to be extremely important, but how are such characteristics developed and fostered?

Those are the kinds of experiences we know you will share with us.

We have done some preliminary homework but this Listening Session represents an important next step: we must hear from the community.

We thank all of you, then, for responding to our call. And I especially want to thank HACU for agreeing to help coordinate this session in conjunction with the HACU Capitol Forum.

Again, let me indicate what Dr. Korsmo said: There will be numbers of people here today from NSF listening. There are people who could not be here today, and they will be reading the statements.

I won't be able to remain for the entire session, but I am also ready to be a listener, and learn from the important messages you will bring to us on behalf of the nation.

At this point, let me turn the podium over to Dr. Flores.

*(Chorus of Applause)*

**DR. FLORES:** Thank you. Buenos tardes. Can we do better than that? Buenos tardes.

*(Chorus of Response)*

**DR. FLORES:** You just passed your Spanish 101 test for today.

*(Chorus of Laughter)*

**DR. FLORES:** We are delighted to see you all here today to take part in this very important session. And I want to thank the NSF staff, especially Dr. Bement, who couldn't make it here today, and Dr. Cora Marrett, Acting Deputy Director who is joining us here today.

We want to also recognize the important work that HACU staff has been doing to make this session possible, particularly our government relations staff and some of our staff in San Antonio.

I see here in the audience, Dr. John Moder, who is at the back, the chief operating officer for HACU. John, will you stand up to be recognized? And Alex Ramirez is here too.

Dr. Ramirez is one of our senior staffers working in science related matters. Dr. Gumecindo Salas is our vice president for government relations here in Washington.

Of course a number of other staff members in HACU have not only made possible this session, but perhaps even more important the changes in the America COMPETES Act.

I'm going to turn over my prepared remarks to staff so that they can use them at their discretion, because I'm going to depart a little bit from the remarks and paraphrase a few things that I think are critical to understand.

Number one, this is a very, very important development because this will be the very first program in the history of NSF that is going to be focused on Hispanic-serving institutions, per se. This is historic in that sense.

It is also very important to note that there have been a number of members of Congress who have been very instrumental in including this provision in the America COMPETES Act included in the last reauthorization, but I want to especially recognize Congressman Joseph Crowley of New York and Ruben Hinojosa of Texas. And of course they will be recognized in other forums when we have the opportunity to do so.

And I want to thank all of you for making the time, the effort to be here, especially on a day like today when some of you are coming from warm places and are shocked by this weather. All of those who may be coming from equally cold or colder places but still made the time to be here with us, it is very commendable of you to have made the effort. I was hoping that NSF would have a specialist in weather enhancement that we could borrow for the weekend.

*(Chorus of Laughter)*

**DR. FLORES:** For HACU in particular, this is a very important Listening Session because it will avail us and NSF of our own insights as to what is needed to ensure persistence in educational attainment in the STEM fields for Latinos, for Hispanics across the nation.

That is the aim of this program. Congressmen Joseph Crowley and Ruben Hinojosa were well aware of all of this. Hispanics in science, technology, engineering and mathematics are far below the 15 percent proportion of our population in the general population of the nation, let alone the 17.5 percent of the traditional college age population.

As we look at the college-age population and younger, we see a greater proportion of Latino population, a continually growing Latino youth that will attend colleges and universities across the country and need the opportunity of STEM education.

The reality is that we have too many of our youth in preK-12 education programs that are not set up to prepare them for STEM, because they are in schools that are under-resourced and do not have the faculty to offer the advanced courses that are needed in science and mathematics to proceed into STEM fields.

That, of course, is a very critical issue that HACU is also hoping to address. We don't know if this program will lend itself at some point to link up our undergraduate students with those that are coming up the pipeline in secondary schools to ensure that there is a continuum, a pathway to success that is as seamless as it can be, as high quality as it can be.

So we are ready to work with NSF and with all of you here and many more across the country to address the shortages that we experience, not just in the Latino community, but across the nation -- we actually have more non-U.S. citizens foreign-born graduate students in some fields than we have American students, as you may know. Some of those are strategically important fields for our nation.



Too many of our very talented young people don't make it up to the higher education levels when, in fact, if they are provided with the tools and resources necessary to do it, they will excel.

This is, of course, one of the central aims of this initiative, and we are hoping that over time we will be able to measure the progress and improvements that are expected of this new initiative with undergraduate students at Hispanic-serving institutions.

We have to remember that HSIs only represent about 7 or 8 percent of the total universe of higher education institutions in the country. However, they graduate more than 33 percent of all the Latinos with bachelor degrees in STEM fields. So it is important to recognize that they have already proven the capacity, the ability, the commitment to excel when it comes to graduating Hispanics in those fields.

What they need is greater capacity and resources to do more. So we hope that this will be the beginning of a new chapter in the history of HSIs that will lead to greater capacity for them to offer degree programs in STEM fields and not just at the undergraduate level, which is the focus of this program, but well beyond that.

We thank you for all of your support. I know that NSF staff have been extremely supportive of our efforts to get Congress to approve this legislation.

Now that the legislation is in place, of course, we have to work very hard with NSF to make sure that the program they intend to initiate, hopefully later this year, will be very successful.

Thank you, again, so much, and we look forward to the next steps.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you, Dr. Flores.

I'm just going to explain a few logistics of the meeting and then we will start with the first speaker.

Presenters will be called to the podium in order of your response to the Federal Register Notice and today's onsite registrations. Each presenter will have five minutes to speak. We have a timer. Brian and Tracy will alternate, holding it in front of you. You can't miss it.

When you start speaking, they will start timing. The first four minutes you will see the green light out of the corner of your eye. When you have one minute left to speak, you will see yellow.

Then when your five minutes are up, you will see red. It will flash red for 30 seconds. So it is pretty hard to ignore.

Many of you, I know, have a lot to talk about. If we have time at the end, please come up for another five-minute increment.

I would ask you to hold your questions to the end. If we have some time we will do some Q and A for the speakers.

This session will be transcribed and the transcription will be made available on our website, [www.nsf.gov](http://www.nsf.gov), to the public.

Written comments will be accepted through Monday, March 23. This session may inspire you to submit some written comments, and those will also be made available to the public.

Any questions before we start? And we do have someone on the phone, is that correct?

*(No Response)*

The first speaker I would like to call is Dr. Nora Garza from Laredo Community College. Dr. Garza?

If Dr. Garza is not here we will go to our second speaker, Dr. Claudia Pinter-Lucke from California State Polytechnic University, Pomona.

**CLAUDIA PINTER-LUCKE:** Thank you. Good afternoon.

The message that Cal Poly Pomona would like to share with you is the importance of community; community in the classroom, in the lab, in the study hall, and in professional development.

This theme is exemplified at Cal Poly Pomona through the Science Educational Enhancement Services program, also known as SEES, established in 1987 to provide support for underrepresented students in science fields. Services for students in SEES include a first-year experience course, a common study hall, course-related workshops, as well as peer advising and mentoring.

Since 1992 this program has graduated more than 500 students who have gone on to earn 32 M.D.'s, 7 DDS's, 20 Ph.D.'s, 61 MS degrees, as well as countless high school and community college science teachers.

Data collected through this program confirm that this combination of activities designed to reinforce community while building academic skills improves the performance of undergraduate students.

SEES students who start as freshmen have a retention rate 15 percent higher than underrepresented students who are not in SEES, and a similarly improved graduation rate.

Students who participate in the Academic Excellence Workshops, patterned after the Treisman model at UC Berkeley, perform at a higher level in introductory math, physics and chemistry classes. In fact, almost 50 percent earn grades of A or B in courses for which the average GPA for all students is about 2.15.

SEES students are also encouraged to participate in programs for upper division STEM students that offer faculty mentoring, professional development and financial support through research apprenticeships. Three examples are the Howard Hughes Medical Institute, the California Wellness Foundation Health Professionals Program, and the Women's Educational Equity Act.

Of the 20 students who participated in the Health Professionals Program, 75 percent graduated, with 55 percent of them accepted into health-related professional/graduate schools. Of the 35 women who participated in the Women's Educational Equity Act, 63 percent of them graduated in a STEM field within two years, compared with baseline data that indicates that 40 percent of such students leave the field without ever graduating.

Other programs, such as Maximizing Engineering Potential and the McNair Student Research Program anecdotally reinforce these results. The McNair Program, in particular, demonstrates the professional side to "community," the value of role models, both serving as research mentors and presenters at professional conferences.

In the last nine years of our McNair Program, 166 students have participated, of which 134 or 81 percent have graduated. Of those, 42 have gone on to doctoral programs.

To follow the successful path of the students in the SEES, MEP, and McNair programs requires the ability to track these students as they continue at their graduate and professional schools. This is a difficult task for us. This is an area NSF could help. NSF could provide essential assistance not possible for individual institutions. A centralized data tracking system similar to the tracking of participants in the NIH MARC Program would provide valuable quantitative data on the success of students in NSF and other programs after they leave their undergraduate institution.

What else do we need from NSF to promote community at a campus such as ours, a public comprehensive, primarily undergraduate institution? The NSF needs to take a broad view of student research, taking into account that some of our students have never been in a lab with modern equipment, and that just learning to use the equipment is a research experience for them.

We need to be able to include assigned time and summer salaries in our proposals to offer our faculty the ability to maintain their connection with current work in their area, as well as to spend time with students, in research and in mentoring.

We need to be able to include funds for scholarships and summer stipends for research experiences so that the students don't need to work as much and can spend more time at school, and funds for travel so that students can interact with peers from other universities and make contact with professionals that may influence their post-baccalaureate plans.

Finally, we would like to mention some grant programs on other campuses, which have components that support our theme of community and that we believe have the potential for great success. The Catalyst Program at Cal State University Northridge, funded by the NSF Geodiversity Grant, centers around integrated research groups, including MS candidates, undergraduate students from Northridge and local community colleges and local high-school students, that foster student research and provide peer mentorship.

The Department of Homeland Security Science and Technology Directorate sponsors a summer internship program for faculty and student research teams to participate in the DHS Summer Research Team Program for Minority Serving Institutions. The team continues the research back on campus during the next academic year strengthening and extending the community bond that begun during the summer.

And, finally, back at Cal Poly Pomona we are excited about a new Department of Education CCRA grant to create a community "pipeline" for STEM students from high schools, through community colleges to Cal Poly Pomona, and beyond to graduate and professional school. Counselors and instructors are involved at every level, working with their peers and the student participants across the levels. We expect this effort to decrease the time to graduation and the number of courses taken, and increase the students' success after graduation.

Thank you for your time this afternoon.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you, very much.

The next speaker is Dr. Margarita Benitez from the Education Trust.

**MARGARITA BENITEZ:** I'd like to recap the main arguments for establishing this program. The first one, of course, is the workforce of the future argument. With the rate of population growth that we all know, growing the Latino STEM workforce is an urgent national need.

Now, one way that we are addressing this in the Access to Success Initiative, which I'm honored to coordinate with 20 state university systems across the country, among them Cal State and CUNY and Puerto Rico and Florida with significant number of HSIs, is to consider the state demographics and to commit to having a proportion of the graduating senior class in high school represented in the freshman class and to have a proportion of the entering freshman class represented in the senior graduating college class.

The possibility of linking state demographics to STEM goals is one that I would like to propose to the National Science Foundation.

The leaky pipeline argument: Latinos have high drop-out rates at all educational levels, and many don't make it to baccalaureate institutions, suggesting that NSF should try to get them early and get them where they are.

After that, the return on investment argument: most Latinos are found at HSIs. So you can reach 50 percent of your target population by investing in 6 or 7 percent of the pool of higher education institutions. When you consider that most Latinos, 55 percent, enroll at community colleges and 51 percent of them attend college part time, you have your population in front of you and you know where you need to go to find them.

The level playing field argument: HSIs are mostly low cost and low expenditure institutions with limited lab and research capacities means that students are often isolated from STEM experiences because faculty grants and challenging undergraduate research opportunities are scarce at HSIs by comparison to mainstream institutions. This program could provide both.

The doing what you do best argument: NSF has been successful with STEM in the K-12 system at both rural and urban enclaves and at minority serving institutions. You have a wealth of experience to draw from. I commend to you three programs that I know have been extraordinarily successful: ANMSI, Advanced Networking for Minority Serving Institutions, to grow talent in the information technology fields; Model Institutions for Excellence; and, more modest but very effective, the Molecules of Life course with the Faculty Resource Network that brings together mainstream institutions with the faculty of minority institutions. Together they collegially develop exciting new courses and new approaches for students.

And, finally, the "take it from me" argument, which refers to my own experience. Ten years ago I had the honor of witnessing the launching of Title V of the Higher Education Act and of coordinating its development at the Department of Education in the Office of Post Secondary Education. I tried to set up there the best team I could find for Hispanic-serving institutions.

Take it from me, it is NSF that has to play the role of advancing STEM opportunities for Latino students.

The Department of Education does not at this point have the human capital or the clarity of vision and commitment to carry out this project.

I say this with great sadness, but with great clarity and urgency that we cannot allow such an important project to be handled less than expertly and efficiently.

I come here to put my trust in the National Science Foundation.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you. Next speaker, Dr. David Brown from Southwestern College.

**DAVID BROWN:** Good afternoon, ladies and gentlemen. My name is David Brown, as you heard, and I'm a professor of chemistry at Southwestern College in Chula Vista, California, a two-year college and Hispanic-serving Institution.

I brought two versions of this and since we are going to be able to come back around for a second time, I'm going to give you the longer version later, sort of as a hook to keep you here for a good part of the talk. Next time around I'll be Dave.

*(Chorus of Laughter)*

**DAVID BROWN:** Thank you, very much, for this opportunity to share my testimony with you. Please indulge me as I offer a very brief glimpse of Southwestern College.



Southwestern College lives up to its "compass point" name. It is the southwestern-most institution of higher education on the U.S. mainland; eight miles from the border at Tijuana, Baja, California, Mexico, and eight miles from the Pacific Ocean.

Southwestern College is the first institution of higher education encountered by travelers entering the country at the international border between Tijuana and San Ysidro, California, USA. As a matter of fact, we have students that cross on a daily basis to come learn at Southwestern College.

Data reported in 2008 by the National Center for Education Statistics, NCES, indicates that in 2006-07, Southwestern College had a student headcount of 19,446, with 11,444 or 59 percent of the enrollment ascribed to Hispanic students.

Southwestern College was Number 6 in the nation among community colleges with regard to Hispanic enrollment. In terms of full-time equivalent enrollment, Southwestern College recorded 10,943 FTEs that year, with 6,593 or slightly more than 60 percent from Hispanic students.

Statistics on enrollment and achievement make it obvious that any initiatives on the part of NSF intended to have an impact on increasing participation of Hispanics in the STEM disciplines, must include the involvement of two-year colleges.

According to the Integrated Postsecondary Education Data Systems, IPEDS, within NCES, 2006 enrollments indicated that 52 percent of the HSIs were two-year colleges. An investment in two-year colleges will ultimately have an impact on four-year institutions as well, since the majority of two-year college students in STEM majors transfer to four-year institutions.

Thus, by supporting two-year colleges, the four-year institutions benefit by having better prepared transfer students, who bring with them a correspondingly greater likelihood of successful completion of bachelors degrees.

Furthermore, according to the 2009 edition of NSF's "Women, Minorities, and Persons with Disabilities in Science and Engineering," the total undergraduate enrollment in 2006 was 15.4 million. In that same year, the enrollment in the nation's two-year colleges was 6.4 million or 41.6 percent of the undergraduate enrollment.

However, that same source of data reveals that the two-year colleges enrolled 50.8 percent of Hispanic undergraduate students, significantly higher than the total percentage for undergraduate enrollment.

To quote an excerpt from NSF InfoBrief 04-315, "Community colleges are important institutions in the educational lives of science and engineering graduates. Open admissions, proximity to jobs and family, and low tuition and fees make community colleges attractive to a large number of students.

"More than 40 percent of recent S&E graduates have attended community colleges at some point in their educational paths. Hispanics have attended community colleges in greater proportions than have Whites, Blacks, or Asians/Pacific Islanders. "

In the current economy and going forward from here, one can expect continued robust enrollments of Hispanic students in two-year colleges.

The specific elements of support outlined in Section 7033 of America COMPETES are extremely well aligned with my own experience working with STEM majors at an HSI. For the sake of clarity and specificity, I'm referring to support in the form of (a) Instrumentation, (b) Curriculum Development, and (c) Faculty Development.

Throughout the past 10 years I've had the very good fortune to have been the recipient of significant support from NSF. This support has allowed me to engage in curriculum and program development, faculty development, and undergraduate research activities that have significantly impacted our department and the students we serve.

These efforts have allowed me to explore approaches and methods to recruit, engage, and retain Southwestern College students in the physical sciences and engineering. And for the rest of the story, please stay tuned.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Our next speaker is Mr. Ion Manea of the Heritage Farm Cooperative.

**ION MANEA:** Good afternoon. Thank you, very much, for the opportunity for this presentation on behalf of Heritage Farm Cooperative and Flower Power USA.

During 2008, Heritage Farm Cooperative implemented a USDA grant for technical assistance to small, minority agricultural producers in Yakima Valley, Washington.

The program included workshops for farm production and utilization of advanced biofuel and animal feed.

Undergraduate students from Heritage University, a Hispanic-serving institution, were instrumental in providing bilingual education outreach assistance for participants, including recruitment, workshop teaching assistance and on-call technical support.

A follow-up of the program was a grant application for a USDA CSREES HSI, jointly applied by Columbia Basin College, Heritage University and New Mexico State University. Also an NSF CCLI grant application is under development at Heritage University.

We learned that undergraduate students are eager to learn new technologies, including their scientific foundation and practical applicability. They are capable to develop professional level bilingual technical writings, including operation manuals, technology brochures and recruitment materials.

They are motivated learners, capable of understanding integrated complex technologies, providing that they know the purposes of the project and have a chance to practice it through a hands-on experiential approach.

And, finally, they are excellent mentors, teaching assistants and on-call technical supporters. And that translation work of highly technical materials is an excellent exercise in improving technical communication skills of bilingual students.

Our recommendations to NSF's programmatic response are in accordance with NSF's strategic goals, mission, core values and vision. And they are complementary to those outlined in the National Science Board STEM Education Recommendations to the Obama Administration, and in line with other federal agencies' programs for strengthening the ability of Hispanic-serving institutions to carry out higher education programs that attract, retain and graduate outstanding students capable of enhancing the nation's scientific and professional workforce.

Our recommendations for Section 7033(a) are to include: Student recruitment; collaborative initiatives between two or more Hispanic-serving institutions and units of government or the private sector, to maximize the development and use of resources; collaboration with nonprofit organizations that will assist to identify potential project beneficiaries and maximize participation of underrepresented students; international collaboration; and up to 10 percent funding allowance for independent evaluation of project's outcomes and impacts.

And Section 7033 (b) to include: Education materials development and library resources; faculty preparation in the area of teaching competency and leadership, subject matter expertise or student recruitment and advancing skills through further graduate level study in a field relevant to STEM; to include \$50,000 to sponsor developmental training for current faculty and/or administrators at Hispanic-serving institutions that would address one of the NSF STEM strategic goals.

Also experiential learning programs outside the classroom should be encouraged in order to provide the students with the opportunity to solve complex problems in the context of real-world situations.

And stipends for undergraduate students participating in research should be competitive and based on student demonstrated proficiency on the subject matter and research skills.

Replication and/or validation and criticism of "peer reviewed" works by the undergraduate students at a level appropriate to their understanding and research abilities have a high educational, inspirational and motivational value.

They should be eligible for funding as research, providing that they are done by scientific and engineering methods and are disseminated.

The stipends should be more competitive with other non-STEM job offers available for students.

Section 7033 (c) is to include encouragement for students and faculty to design teaching experiments and select or design/build appropriate laboratory instrumentation, test benches and laboratory protocols and methodologies.

In conclusion, this grant program is a great opportunity to provide resources to Hispanic-serving institutions to participate in a pilot program for implementing National Science Board STEM education recommendations for essential components of an effective STEM education system.

Thank you, very much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

I also would like to invite people to leave copies of their written statements with us, or you can send them later by email after the session.

I have two people from California State University, Dominguez Hills: Dr. Laura Robles and Dr. Moshen Beheshti and there is also some discussion – all right. Laura Robles.

**LAURA ROBLES:** Thank you. My name is Laura Robles. I'm dean for graduate studies and research at California State University, Dominguez Hills, professor of biology. I'm speaking on behalf of Antonia Boadi, who is a faculty member in our Computer Science Department. And she was not able to be here today and so I am forwarding her comments to you.

I would like to tell you about California State University, Dominguez Hills, so that you can understand the types of students that we can help and help to bring them into the STEM fields.

Our university is one of the most diverse institutions on the West Coast and throughout the nation, with the student body that is 40 percent Hispanic, 30 percent African-American. So over 70 percent of our students are underrepresented. And in the STEM departments, biology, chemistry, math, physics and computer science, these numbers approach 90 percent.

We have about 13,000 students and about 9,300 full-time equivalent students and we offer 45 bachelor degrees and 23 masters degree with numerous certificates.

Our institution is located within close proximity to dozens of technology-based corporations, including the corporate headquarters of two major automotive corporations (ones that did not receive government bail-outs); the Alameda Corridor, which is the gateway for movement of goods and services from the port of Los Angeles; and the entertainment industry, which relies heavily on digital multimedia technology, is less than 20 miles from our campus.

For those who have visited, it is located in the south part of the City of Los Angeles in a community called Carson.

Regrettably, the residents in our service area lack the academic preparation and training to fully participate in the innovation economy that surrounds them. Our campus is located in Carson, California, which is about 35 percent Hispanic. Nearly 30 percent of the adults over 25 do not have high school diplomas or GEDs.

Dominguez Hills is also next door to another community called Compton, which is over 57 percent Hispanic, and the rest of the population is almost entirely African-American. And over 60 percent of the population in Compton over the age of 25 lack high school diplomas and our students come from these communities.

So in the spirit of bringing all talent to the STEM fields, at Dominguez Hills we pride ourselves on finding and providing talent in unexpected places.

We advocate and cultivate a philosophy that prepared students in our STEM majors can successfully compete at doctoral programs in top institutions, like our sister, California State University campuses, of which there are 23.

We have the NIH MARC, MBRS programs, we participate in the Burke Program, Minority Health International Research Training. We have the McNair Program, we have NSF grants also, the RUI and REU. And students who participate in these programs go on to top doctoral programs in the country.

So these students, even though they may come from a background that does not prepare them for these fields, when they get to Dominguez Hills they become prepared.

The nation's current economic crisis demands the development of technologies and engineering solutions that are responsive to unprecedented economic, environmental and financial constraints. The people in our service community are indigenous by nature. Their daily survival depends on it. Our nation can expect to receive more than cookie-cutter solutions from them when given the opportunity.

We appeal to the National Science Foundation to develop programs designed to meet the unique needs of our community. With financial support, be assured Dominguez Hills will have the means to develop the dormant talents of the individuals in our service area. That is constant with our philosophy of "communiversity", the university's commitment to engage in partnerships that promote the educational, economic and social development of the communities we serve.

And the phrase "communiversity" was coined by our past president, James Lyons, who is now here in Maryland in higher education.

We urge support from faculty to engage students and students to have protected time to concentrate on STEM studies. We tell you this is necessary to prepare these talented individuals for our nations workforce.



Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you, very much.

Another speaker from Cal State Dominguez, Dr. Mohsen Beheshti.

**MOSHEN BEHESHTI:** Good afternoon. My name is Mohsen Beheshti. I'm the chair of the computer science department. I will talk a little bit about the academic needs from the faculty point of view a little bit more, and about the computer science department and the needs that we have for the students in the STEM, especially in computer science.

Cal State Dominguez is an urban university. So most of the students that come here are mostly working class students. They can't just come and do the research. They need to get paid. If they don't come to school they have to support their families. Sometimes they have to support the entire family, including the parents.

We need to make sure if you want to get them into research and to the graduate program, provide them financial support, a stipend, so they can take time from working and come to school and make sure they get paid, otherwise they will not get in.

We have a series of programs that I will talk about them little by little. But supporting the family is one of the issues. Most of the time they cannot get into any program. That is kind of an obstacle.

The level of support in California, actually, is not as good as other places. I have been in Texas and I have been to Hispanic- serving institutions and HBCUs for the last 15 years and I have seen what happens. In California they do need to support the students because there is not much support by the state.

I attended a conference where they asked high school students, what is computer science? Eighty percent of them don't know. So we need to go to the K-12 schools and give them an indication of what computer science is, so by the time they graduate they have some idea of what it is and actually have it as an option. Otherwise they will never get to computer science.

As you know, computer science is actually lacking. We're going to need 700,000 IT people and we don't have any in the pipeline. We have to make sure we work on that now before it is too late.

What we need to do especially for Hispanic students is to nurture them. They are talented but they need to have confidence. We need to tell them they can do it. Once they get the confidence, they can do many things. I have gone through this with many students.

I created labs and have seen the students work and how they can do things if you give them the opportunity and nurture them because they never have had the opportunity during high school, many of them.

So we really need to nurture them and go through the process with them as a friend and an advisor.

Cal State is part of an alliance, CAHSI, Computing Alliance of Hispanic-Serving Institutions, which is part of NSF's Broadening Participation in Computing. It has been successful as an intervention to prepare students who lack preparation. The research group is trying to disseminate these practices.

But also we need to get a little bit more from the high schools. We need to go to K-12 and bring them into the program. That's not easy unless you have the support. Most of the 11<sup>th</sup> and 12<sup>th</sup> grade students need to work in the summers and prepare for the family.

If you don't give them a stipend in the summer after high school to get them in the college environment, they never come there. So you never see them. You need to support them. Financial support is very important.

I have some research and I bring 11<sup>th</sup> or 12<sup>th</sup> grade students who never thought of going to the graduate program. From freshman all the way to grad, they have been hired by Raytheon, by Northrop Grumman because they are capable. You can't just come through for free, you have to provide support to do that. We need to do this on a larger scale to get students from the greater pipeline from the high school.

There is a need for new programs and a lot of times there is some need for support from NSF to bring these programs in because most of the institutions don't have the money.

Collaboration with the other community colleges and high schools is very important. We are working with Cal State and Compton Unified Schools, to bring the students in during the summer and regular semester and give them training so by the time they finish high school, they already have a few credits and get some motivation to go to the university and continue with their education.

So we actually ask Science Foundation to provide some money to support the students, get support for the new programs and also support to create research activities that include Hispanic-serving institutions. In doing that we need to have equipment, money to support the students to be able to get in the program, and some support for collaborative work for high school and colleges because everything is related to each other. If you can help them at that point, you can go all the way through the process.

Thank you, so much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Next is Dr. Mehdi Shadaram, University of Texas, San Antonio.

**MEHDI SHADARAM:** Good afternoon. My name is Mehdi Shadaram and I represent College of Engineering, University of Texas at San Antonio. Let me tell you a little bit about the university and college.

Currently the student population at the university is more than 28,000. This is the fastest growing university in Texas -- in UT system, I'm sorry. And College of Engineering is the fastest growing college within UTSA. The enrollment at the college has grown more than 120 percent from 2000. In 2000 we had 1,000 students. In fall of 2008 we had 2,200. The university offers currently 21 Ph.D. programs, 44 Masters and 66 B.S. programs. College of Engineering offers three Ph.D. programs and the fourth Ph.D. program probably will be initiated in fall of 2009.

The college also offers five Masters programs and three undergraduate programs.

Probably most Hispanic-serving institutions agree with me that the main problem we have is lack of preparation. Most of the Hispanic students coming out of the high schools go to schools the school districts that don't have access to resources.

I know many high schools in San Antonio area that do not offer pre-calculus on the campus.

Of the typical students coming to our college during freshman year, 15 percent of them fall into Calculus 1 and Calculus 2. And 35 percent of them fall into college algebra. Only 30 percent fall into pre-calculus, and 15 percent of them get into remedial math. That means they are not even qualified for any other measure, not English, I hate to say that, history or English or any other programs.

So only about 20 percent of the students coming to College of Engineering at our campus are really qualified to get into the College. These are the ones who, after placement tests, get into Calculus 1 and Calculus 2.

Fortunately most organizations like NSF, Department of Education, Texas Higher Education Coordinating Board and other organizations, already know the problem. And we are receiving funding to improve this preparation.

One of the problems we have is communication with the school district. I don't know how many of you are familiar with Texas.

Most principals in Texas are worried about TAKS [Texas Assessment of Knowledge and Skills] until end of May. TAKS is a state run exam for all high schools and middle schools. So we cannot communicate with them for anything until end of May.

For example, we have summer internship programs for high school students. We advertise these programs. We send memos to parents, if we have their emails or addresses. But unfortunately schools do not encourage students to apply for the summer internship mainly because they are involved with TAKS. They all get busy with this, which is actually after May, and sometimes it is too late for us.

We have received funding to improve technical skills or, let's say, hard skills such as math, physics and so on. We have been active at the high school level and at the university level.

One thing probably NSF can do is improve funding or provide resources in order to improve soft skills. Again, a lot of people disagree with me when I call it "soft skills," teamwork, studying skills and so on. And perhaps we can do that by creation of internship, research experiences for undergraduates, which we already have, and international collaborations. Thank you, very much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Next we have two speakers from Atlantic College, Ramon Barquin and Carlos Hamill. I don't know what order you want to go in, whatever order you would like.

**CARLOS HAMILL:** Only one speaker.

**DR. KORSMO:** And you are?

**CARLOS HAMILL:** Carlos Hamill.

Thank you. This is a great opportunity. I had a friend who said that in these NSF activities, you have to do something which is called "*dar cara*", which means you bring your face to the table so people will know you exist and what is going on because we are a small institution.

As a background, Atlantic College is a young 100 percent Hispanic-serving science and technology institution located in the greater metropolitan area of Puerto Rico. That means I came from warmer weather. And it is accredited by corresponding state, regional and federal accrediting agencies.

It was founded in 1983, which is not that far back, by Ambassador Ramon Barquin as a nonprofit institution. The institution grew, and it is the only academic institution recognized for technological excellence and is ACIS [Accrediting Council for Independent Colleges and Schools].

According to our knowledge, Atlantic College is the only Hispanic institution with focus on digital graphic design, digital animation and video games as a science. This is an emerging effort that is coming into industry. It has about 340 undergraduate students enrolled in bachelor of science in digital animation and 100 in bachelor of science in video game design.

Atlantic College has a graduate and undergraduate student body of 717 in the program of digital graphic design. Atlantic College also has the baccalaureate and other traditional education programs in business administration and accounting and computer information systems. So it has a broad technical spectrum.

Something very interesting is the placement experience in the territory with over 70 percent employability. These students come out and chances are very good that they will land a job. The student retention is 95 percent, and 98 percent of the graduates recommend the institution once they leave, based on surveys.

So why are we here, why is Atlantic College here?

Well, we are here to learn and participate in this NSF opportunity, which is new to us. We never had an NSF grant, per se, but this is a small institution that is now growing. There is a tremendous amount of interest. And this will give us guidance in how we should grow Atlantic College to meet the science and technology demands of the United States by the Hispanic community.

We strongly believe that there are tremendous opportunities for our students in the area of science and technology and digital graphic design, I emphasize that, and animation to satisfy the demands of the pharmaceutical, aerospace and defense industries, among others, in Puerto Rico and the continental United States. That is a growing area of interest.

It is a widely known fact that simulators have taken over many traditional activities performed in industries across the board. Flight simulators are used by the armed forces and contractors to design, test and validate products and services and later to train as a student resource.

The pharmaceutical industry, which has one of the more supportive manufacturing facilities, can use simulators to support their own research and development and improve their speed to market increasing safety, efficiency and competitive advantage.

Until recently digital graphic design and animation was not considered an integral part of the knowledge economy. However, today it is an essential component of the growth and opportunity to develop competitive advantage in the above referenced industries.

Section 7033 provides a unique opportunity to include Hispanics as part of an underprivileged community, that has not traditionally participated in the science and technology fields, to become part of the national effort to strengthen the United States leadership and STEM worldwide.

What can be done? First of all, something that is very interesting is to make learning fun for the students. The students are highly qualified. And they come out with projects that amaze. Engage visual and multimedia resources like digital sciences and art, strengthen the faculty in the interest areas and increase student aid in these fields, increase grants to Hispanic-serving institutions.

We must continue to lobby the government on behalf of HACU members and HSIs. Develop and support partnerships. I mentioned this faculty and student interchange as a possibility.

Based on the inputs we receive here, we will then be making additional recommendations to NSF and what things should be done.



Thank you, very much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Our next speaker comes from the Society for the Advancement of Chicanos and Latinos and Native Americans in Science, SACNAS, Dr. Ernest Marquez.

**ERNEST MARQUEZ:** Good afternoon. I know we have a very short time so I will try to go through this as quickly as possible.

My name is Ernest Marquez and I'm a microbiologist, and a recent retiree of the National Institutes of Health, a biotechnology lecturer at Johns Hopkins, and a member of the Board of Directors of SACNAS.

I am here today, because SACNAS believes that excellent science is based on new ideas and experiences, which give rise to innovation and implementation, which in turn makes this country scientifically competitive throughout the world.

We must strive to include larger portions of all segments of our nation's population in the scientific workforce. If we do not, we greatly diminish that diversity of ideas and we lose a large pool of talent that goes untapped. Diversity of ideas, perspectives and experience in the scientific workforce is a strength that will make America competitive in the world of science.

SACNAS is a society of scientists dedicated to fostering the success of students from underrepresented populations in attaining advanced degrees, careers, and positions of leadership.

For 35 years SACNAS has provided strong national leadership in improving and expanding opportunities for minorities in the scientific workforce and academia, in mentoring college students within STEM as well as supporting quality pre-college science education.

SACNAS' annual national conference and pre-college teacher training workshops, chapters programs, postdocs and leadership initiatives, and online internship and job placement resources are tools that help a diverse community of undergraduate and graduate students, postdocs trainees, professors, administrators, and pre-college educators achieve expertise within their disciplines.

In regard to the present initiative, what can SACNAS do to help NSF achieve its goals? In a nutshell we can fill in the gaps in the career development pathway of these scientists in training.

Based on our experience over many years in promoting the scientific career development of minority students in STEM fields, we would suggest that there are important elements in attracting and particularly in retaining these students.

Very few institutions, and not all HSIs, have in place the appropriate mechanisms for delivering some of these requisite elements for retention of minority students as STEM majors. One such critical element is faculty members known to students as role models and advisors, with whom they can identify, and who will give appropriate advice that speaks directly to student backgrounds and skills.

A second is formal and informal mentoring mechanisms, both professional-to-student and peer-to-peer. SACNAS provides students with an assemblage of role models and mentors unparalleled in any one university or gathering of students.

A third is the ability to engage students in meaningful research with appropriate guidance. And last, but not least, is financial assistance. Since most of these young people come from economically disadvantaged families.

SACNAS has, for the past several years, held annual conferences attracting more than 2,300 participants, about 2/3 of which are students. We have chapters at over 40 universities. We are very inclusive, with a representation that is approximately 9 percent White, 9 percent Black, 7 percent Native American, 5 percent Asian and 70 percent Hispanic/Chicano STEM students, and for over half of those students our annual conference is their first scientific conference.

Our surveys of the students attending our last conference showed that the mentoring and advising they received at our conference was considered by them to be better than the mentoring and advising they get at their home institution.

For these and other compelling reasons, we believe and have evidence which indicates that SACNAS is an important element in helping these minority students achieve careers in the sciences.

An organization such as ours is one of the elements important to the national goal of diversifying and increasing the scientific workforce. SACNAS partners with other organizations to maximize our ability to help students, and we have memoranda of understanding with several institutions, including HSIs.

SACNAS is a well-established society historically dedicated to developing scientific careers for Hispanics/Chicanos and Native Americans by fostering their success in pursuing advanced degrees in STEM. We are indeed agents in carrying out the mission with which the America COMPETES act entrusts NSF.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Next from Florida International University, Dr. Pete Markowitz.

**PETE MARKOWITZ:** Thank you for the opportunity to speak to you today. We have seen many perspectives on opportunities at Hispanic-serving institutions. All have the common theme of improving undergraduate STEM education at Hispanic-serving institutions, a critical issue for those here today.

I am Pete Markowitz and, as detailed in the request for stakeholder input, I would like to provide you with details on our transformative model for physics education outreach at Florida International University.

Florida International University is an urban, public research institution with over 38,000 students located in Miami, Florida. FIU is the nation's largest producer of Hispanic bachelors and Masters degrees recipients. South Florida is a diverse region, home to large minority populations that include many recent immigrants from Latin America, the Caribbean, and South America. It includes the fourth and sixth largest public school districts in the country.

Many FIU students come from the region, resulting in a 60 percent Hispanic as well as a 60 percent female population that matriculates at FIU. Thus FIU provides a unique opportunity to develop models for working with students who are traditionally underrepresented.

Within this diverse population we have successfully built a thriving research and learning community that has resulted in both increased participation as well as better prepared undergraduate physics majors.

The foundation of our model is to combine research validated curriculum with cutting edge physics research and embed these components within a student centric combined high school and university community. Critical to our success has been support from multiple NSF directorates, a sustained commitment from FIU's administration, and a talented multi-disciplinary research team.

Our transformation began in 2003 with the CHEPREO project. CHEPREO is an acronym for the Center for High Energy Physics Research and Education Outreach, an NSF project funded by the physics, education, and computer science directorates.

The goal of the project is to do cutting edge particle physics research at CERN enabled by cutting-edge networking and grid computing, all of which serve as a vehicle to energize students and teachers to bring them into physics and the sciences.

It also supported implementation of research validated pedagogy at both the high school and university levels, specifically incorporating techniques that attract and retain underrepresented minorities and women, as well as establishing a physics education research group to quantify the impact of the reform.

The education outreach research team includes Physics Department and College of Education faculty, sparking transformation in the physics and education programs while creating the foundation for broader science and mathematics.

The CHEPREO team has built a vibrant research and learning community that deploys "modeling instruction" into the classroom. Modeling instruction is a research-validated, guided inquiry pedagogy that engages students as scientists as they build their physics understanding, and at the same time it provides students and teachers the opportunity to engage the frontier of science at CERN's Large Hadron Collider.

Modeling Instruction has been deployed both into the local high schools and at FIU, providing a common framework from which to grow the community.

CHEPREO supports teacher professional development and year-round activities that bring teachers, students, and faculty together on a regular basis. Teachers employing modeling have seen more than a factor of two improvement in students' understanding when compared to traditional teachers, as measured by the Force Concept Inventory.

Thus CHEPREO has created pathways for students to seek physics and physical sciences careers, while better preparing them for success at college.

The reform continues at FIU where modeling instruction is used in several studio-based sections of introductory physics. Here students have enjoyed even further improved conceptual understanding as compared to traditional students, roughly a factor of 2.5 at FIU.

These reformed classes also have led to significantly improved students success that reaches across both gender and ethnic boundaries, averaging a factor of 4 improvement in DFW rates, that would be students receiving D's, F's, or withdraw/drops, as compared to traditionally taught students.

Further, the modeling class has achieved a significant measurement of increased student favorable attitudes towards physics and physics learning, which is the first reported increase in an introductory physics course in the country, as measured by the Colorado Learning About Science Survey.

The CHEPREO community, through supporting both high school and university modeling classes, creating opportunities for high school students and teachers and especially undergraduates, and providing pathways and stewardship for all participants, has increased interest in physics and in education.

The FIU Physics Department has seen a 240 percent increase in intended and declared physics majors and a 400 percent increase in physics bachelor's degrees, when recent three-year averages are compared to the early 1990's.

Thus multiple measures illustrate the transformative nature of the CHEPREO-supported reform at FIU.

The CHEPREO model is being employed as the foundation of additional multi-disciplinary education reform, going beyond physics and education and into other science and mathematics departments. To extend the model to explicitly target physics teacher preparation, FIU operates one of five active PhysTEC sites.

PhysTEC's goal is to produce models for becoming deeply engaged in the production of more and better prepared science teachers who are committed to interactive, inquiry-based approaches. These efforts have been further leveraged as FIU was recently awarded an NSF Noyce project, which provides financial incentives and teacher to content area majors, in exchange for teaching in high-needs districts.

The FIU Noyce project extends the PhysTEC framework to include mathematics, chemistry, and earth sciences students. Clearly, the NSF-funded CHEPREO project has led to transformation at FIU and South Florida, transformations that will continue as the CHEPREO model extends to engage additional sciences and mathematics.

Thus I would advocate that the HSI undergraduate STEM project include elements that we have determined to be critical in our reform deployment. The elements include:

- Research validated curricula and pedagogies that empower all students, included underrepresented groups.
- Frameworks that create multi-level research and learning communities.
- Access to cutting-edge research that motivates participation.

-Sustained institutional commitment to reform from the department to the university president.

-A multidisciplinary education research team that encompasses stakeholders in all STEM departments and provides stewardship of the educational discipline.

-Determination of effectiveness of efforts and formative assessment.

-And, finally, the outcomes must include a national dissemination model with thorough documentation to allow reliable deployment with reproducible results.

Thank you, very much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Alexandra Hadley from USGS, who is the chair of EEOC Hispanic STEM Task Force.

**ALEXANDRA HADLEY:**

I'm Alexandra Chavez Hadley. I'm the Title VI program manager and the Hispanic employment program manager, federal employee at the U.S. Geological Survey. As you know, we are the guys who hopefully tell you when the earthquake is just about there, like two seconds before --

*(Chorus of Laughter)*

**ALEXANDRA HADLEY:** -- or when the volcano is about to get you. We are much better at the science of magma studies.



While the USGS has sponsored me being here, the USGS has also been good enough to also sponsor me to be the nominated chair of a task force that was started at the Equal Opportunity Employment Commission for Hispanic Initiative Studies, focusing on why we are not getting more Hispanics involved in the federal government.

That started about the middle of last year and it resulted in a variety of different subcommittees to study the issues of not only student populations, but retention of Hispanics in federal government. And ultimately all of the committees met for a period of half a year.

Several of us who work for science research entities, from NOAA, NASA, Department of Energy, U.S. Geological Survey, some areas of the Department of Agriculture, and NIH, proposed a subcommittee on STEM.

And we had a reaction: what is STEM? Isn't it covered by all of these other committees?

Well, no, it is not. Any rate, by the time we got done with our small subcommittees, a couple of recommendations on STEM were presented at the final meeting of the Equal Employment Opportunity Commission. Then the Chair was Naomi Earp.

She is still a Commissioner, but now the current Acting Chair is Stuart Ishimaru. Both Stuart and Naomi have joined hands in the spirit of this administration and have said, "We are going to keep that small STEM committee in existence because it is critical to the President's administration that STEM move forward, that we deal with climate change and we deal with all of the sciences. This is the future of America."

So I am proud to say I just wanted to introduce you all to your small committee at the moment. We are asking National Science Foundation to please join us once a month. We are discussing a variety of issues.

The one point I wanted to make, and this comes from my position as a Title VI program manager, is that when we take deliberative programs to the communities, the response that we got back from students and the students' families who want to hear more about federal government is, "Wow, I didn't know that what you did in science affects the water that I drink, affects the hazards that we deal with, potentially throughout the world. And what exciting careers scientists have. It's not boring. My son is really good at math. He can do this. He doesn't have to be an accountant."

At any rate, I just wanted to introduce you to us. We do have a philosophy on our committee. We are not just talking about employment. We want to develop and encourage students, and have you help us as educators, help us encourage the federal government to look at that kind of combination, especially with Hispanics, *la familia* is so important.

The students see federal science research in their communities and understand it is helping in their communities. It will bring the families to want to encourage them, I think, to work more with us and encourage us to be better federal employees and a better responsive government.

So thank you, very much, for listening.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Dr. David Johnson from the National Hispanic University.

**DAVID JOHNSON:** I also am one of those who decided when I got here that it would be good to speak. So I may not sound as though my remarks are prepared.

Let me just start by making a little plug for Hispanic mission-driven institutions. In the continental U.S. there are only three four-year universities whose central mission is the education of Hispanics. There is Boricua College in New York, St. Augustine's in Chicago, and National Hispanic University in California.

I'm not sure what the ultimate importance of these institutions is going to be, but if you look at the importance of the Historically Black Colleges and Universities in the moving of African-Americans in professional life, those institutions have been tremendously important as symbols and as actual trainers of people. And I hope that these three small institutions will get some notice.

I'm thinking that one of the important ways that we can be of some service to everyone is that since that is our exclusive focus, we are in good places to do some of the research that others have said needs to be done about bringing the right kind of pedagogy to the enterprise.

I would like to jump to what kind of student we are trying to serve here, and most of the salient characteristics have been mentioned by other people.

Students come from a poor background, they have not had much experience with college. They live in a very small world, really. I have had students who have never been in an airplane. We live 27 miles from the Pacific Ocean. I took a set of students on a field trip there and one of the girls got off the bus and said, "Is this the Pacific Ocean?" That's the size of the world our students are coming from, and we have to make the world much bigger to them.

SACNAS and NAFEO and all the groups that have been around for quite a while have been taking students out of their small worlds and introducing them to bigger worlds. Those are important components of the overall plan.

So lots of things have been tried over the last 40 years have been successful, and they need to be incorporated into the overall plan.

The idea of money has come up again and again, money for the students. Because the reality is that they are going to work. If they have to make a choice between school and work, they will choose work. That is just what they do.

Knowing that, we have to channel the money that is available for those students toward work that is going to support their education, rather than detract from it.

At our institution we are trying to start some technology-oriented small businesses on campus to employ the students. Our idea is they won't have to leave the university, but they are making money and what they are doing is supportive of their education rather than detracting from it.

The same idea can be extended in a lot of directions. We scout out internships with corporations in the area. We are part of the set of corporations and universities in Silicon Valley that get together several times a month to try to plot out how to keep the Silicon Valley economy going.

And then there is the systemic idea. If the high schools, middle schools, colleges, community colleges in an area are not thinking together, then at some point remediation is going to have to happen. If you can build a partnership from one end of the educational spectrum to the other into this program, maybe there will be a day when remediation is not such a large part of HSIs' enterprise.

That would be a real luxury because then we can go straight on to the things we want to work on.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

Next we have a speaker from the University of Texas at El Paso, Dr. Roberto Osegueda.

**ROBERTO OSEGUEDA:** Thank you, very much. My name is Roberto Osegueda, vice president for research at UT El Paso. I have been at the institution for over 21 years, went through college at Texas A&M and went through the faculty ranks at El Paso. So it is a place I really love and very fond of because of who I am and who we serve.

UT El Paso is a majority Hispanic-serving institution with a current enrollment of approximately 20,500. We serve the El Paso region, and the current demographics for the university reflect the demographics of the region.

Twenty years ago the university vision used to be "Harvard on the Border." Through an inclusive philosophy, providing access to our population base and demanding excellence on the outcomes, we have been able to pursue our mission.

Twenty years ago enrollment used to be about 14,000 students; now we have over 20,000 students. Twenty years ago we didn't have Ph.D. programs; now we have about 14 Ph.D. programs on our campus. Twenty years ago our success was not good; now it is. Three million in research before; now we have exceeded 50 million-dollars in research expenditures.

The university has had a tremendous leadership, thanks to the vision of our current president, who was totally committed to execute and implement a lot of the programs that are being discussed here.

All those transition points, for example, and bottlenecks that I hear about have been addressed already with K-12. The university also has a tremendous benefit: one mature community college feeds 50 percent of the students to the university and the rest of the 50 percent are the transfers coming back to El Paso from universities from all over the country. Those are the students who left the region and are coming back.

Some of the challenges I see moving forward, primarily in relationship to the America COMPETES act, are that all of the changes that need to happen, all of the programs that need to be funded, must be sustainable and there must be a total institutional commitment to absorb those programs to the end.

At UT El Paso, for example, we received funding from NSF about 15 years ago to create something they call the "El Paso Collaborative," which really was a partnership between the university and the community college and all the school districts.

The major goal of that program, by the way, was the success of students and the increase in the capacity of the schools to provide more STEM-bound graduates. All of that has been executed. Now we have, for example, 55 percent of the top high school graduates in the region coming and deciding to stay instead of going to the more affluent universities, UT Austin or Texas A&M University. So we have succeeded with those.

As we address the issues of retention and success, we received funding from the NSF the Model Institutions for Excellence program, and we experimented a lot with a program that focused on first-year student retention and success. That was specifically to address, for example, the low success rates of the early months and first year, and all those problems were corrected.

Then we also addressed the middle years and now we are addressing also the senior years, the transition, with the Bridges to the Doctorate Program and so forth.

So we have been there. We have tripled the number of STEM graduates in 20 years and we are getting there.

As a representative of UTEP, I believe that the production of STEM graduates and the quantity and level of diversity in the U.S. that is needed to maintain global competitiveness, will require active participation among government, academia, and industry. NSF should establish initiatives to promote, educate, and reach out to Hispanic-serving institutions and industry partners in areas such as outreach to K-12, retraining of experienced engineers as K-12 teachers, basic and applied research development for undergraduate students, practice-based course curriculum development, and so forth.

Thank you, very much.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

The next speaker I would like to call on comes from the University of Sacred Heart Puerto Rico, Jose Jamie Rivera.

**JOSE JAMIE RIVERA:** Well, again, I think this is a very important opportunity to raise some issues that I feel need to be addressed.

This piece of legislation comes from a perspective not of higher education, but of economic development. I think within that framework it has to be seen.

It requires a more systemic outlook than just higher education. I'm concerned about the fact that we have not mentioned the elements that go into this process of developing STEM leaders. The pipeline problem has been mentioned.

I believe there would have to be a special task force or group to identify why and how given socio-economic backgrounds of students and family and communities, the values of science are not necessarily promoted in the context of our K-12 system. So that would have to be addressed, and interactions between schools and universities would have to be rewarded.

Another thing is faculty, collegiate faculty especially. Many of our HSIs are primarily teaching institutions and, though we may have faculty members who did a doctoral degree years ago, they have not kept up.

A retooling or a fine-tuning program would get faculty back into the types of projects that they worked on when they were graduate students. To take a new topic of interest and to work on it would be something valuable because it would attract students around them. We need to become more focused on undergraduate research.

I haven't heard anything about the physical infrastructure. Our institutions are mainly occupying buildings that have -- mine is about 100 years old. And the newest one is about 60 years old. So there is infrastructure work to be done in the labs and the physical resources.

Knowing what NSF knows, I wonder how much guidance NSF can give universities; perhaps each university trying to go after topnotch labs may not be an efficient way to purchase. What should be the expected goal of a STEM program and what types of equipment are needed -- this is perhaps better known by NSF staff and experts than the faculty at many of our institutions.

I say these with respect but those are facts.

Working also on the methodology of teaching: as baby boomers (most of us in the faculty), we were raised in a lecture model and that is exactly what we are doing now with kids that are primarily visual. That has to be recognized. The Department of Education should be wondering or caring about it. It needs to be addressed.



Summer immersion programs and intensive work with incentives for K-16 students could help the university students learn what they are being taught because they would have to teach it to other students. Those of us who have had the opportunities to be tutors at some point in our lives, we know the best way to learn something was to be a tutor. You knew what you knew, and if you didn't know you would ask.

An important area is staff development in the labs. I have heard nothing about the staff, and many of the labs are not necessarily taught by the faculty. There are staff supporters and a lot of members of a team and we need to address their needs for development and growth also.

And then we have the development of science education materials in a bilingual format. The cost of textbooks means that students have no access to books. That is a major reality for many of our students. Without the books they depend on lectures.

We need to develop more open materials that are web-based and to develop them in a bilingual format.

And, finally, I think the problems that we have in the world are not STEM based; they are people based. I don't hear anything from NSF or STEM leadership about how much we need to develop our students in a very strong liberal humanistic education, which values the capacity to analyze the consequences of actions taken by STEM field professionals. A lot of the trouble we have had is not because of lack of ethics courses or knowledge of a field in finance or accounting. It had to do with values.

I think somehow NSF has to make it known that the best framework for the development of STEM is a strong humanistic general education component.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you. Our next speaker is Alejandro Ortiz from the Pontifical Catholic University of Puerto Rico.

**ALEJANDRO ORTIZ:** Hello. I'm Alejandro Ortiz. I'm a Ph.D. student from the Pontifical Catholic University of Puerto Rico.

Actually I'm speaking to you today because when I went through the list of speakers I saw that there were no students. You are dealing with us, yet none of us are here speaking and giving opinions.

Right now I'm doing an internship on the Department of Health, where there is a campaign that says, "Nothing about us without us."

So I would like to speak about a friend, his name is Lening Olivera. He is basically born and bred in Puerto Rico. He got his education at Hispanic-serving institutions, the Catholic University first and then at the Ponce School of Medicine. He has a Ph.D. in clinical psychology.

Right now he is a post-doctoral fellow at McGill University in Canada doing neuroscience research.

I tell you about Lening for one simple reason, that is, the quality of the students that we have at Hispanic-serving institutions. He rose from there to a world class institution in neuroscience.

Now, I'm trying to do basically the same thing. I started my undergraduate work at Interamerican University and then I moved to Catholic University. So we are moving from one different university in Puerto Rico and basically having the same effect, same success rate.

For years now we have been doing more with less, which is not necessarily the best thing in the sense that we are not being developed as students at our maximum capacity.

What I would basically recommend is tuition assistance, help us pay for graduate school, help us pay for undergraduate school.

For example, I have a huge debt. I know that once I am out of school I have to do, well, maybe not research because I have to pay back student loans. And I know research doesn't pay enough to pay my student loans.

Second, while in school there are stipends. They are really necessary. And I mean it from the point of view that while learning and doing research in school, support is necessary.

I ended up working. I said I'm not going to do this. I'm going to do the work. I am making in a week more than he did for a whole month as a researcher and that is ridiculous.

Second, we need research tools. We need access to databases. We need full-time teachers. Don't expect full-time research results when we only have part-time teachers.

Finally, for the National Science Foundation people, will you please try to bring in students? They are inside on these kinds of things.

Finally, this is really a Facebook moment. So someone take a picture.

Thank you.

*(Chorus of Laughter)*

*(Chorus of Applause)*

**DR. KORSMO:** Thank you, very much. We are going to have somebody much younger running these events in the future. They will be on Facebook and YouTube.

There are two speakers who would like to circle back and then I would like to open it up for audience participation, either more presenters or questions to the speakers.

David Brown, I promised you, you would get your second chance and here it is.

**DAVID BROWN:** Thank you, Fae. Well, thanks for staying around for Dave Brown, the sequel. Just to remind you I was going to complete the story.

Approximately a decade of funding from NSF has transformed Southwestern College and has brought great opportunities to our students.

In 1997, my second year as a full-time faculty member at Southwestern College, I looked around and saw the conditions -- a fortunate part of coming back around is I've heard a lot of the things that really strike close to home and one of those things is infrastructure and access to instrumentation, the things that are really going to engage and inspire students in the sciences.

I didn't know what the odds were but I decided I would write my very first grant proposal and submit it to the National Science Foundation. It went to, at that time the ILI program, which is now morphed into the CCLI program. Back then it was the Instrumentation and Laboratory Improvement Program, which has since morphed into the Course Curriculum and Laboratory Program within the Division of Undergraduate Education. And I was fortunate enough to be awarded a grant that catalyzed a subsequent cascade of future grants and projects.

The collection of instrumentation that was acquired with those grant funds included NMR, FTIR, ultraviolet-visible spectrometers, along with GC/MS and HPLC systems. For you folks who are not chemists and are not used to the alphabet soup of instrumentation, suffice it to say that really filled the toy box, a lot of cutting-edge instruments that are used 24/7 out in industry and in highfalutin' academic laboratories. So it is really a boost to us.

This single award facilitated a complete overhaul of our curriculum from top to bottom, incorporating the hands-on use of the aforementioned instrumentation into our general chemistry and organic chemistry sequences, analytical chemistry, and for use in undergraduate research projects.

Furthermore the instrumentation served as a nucleus about which the next NSF-funded project was built.

The subsequent project was funded through an award from the NSF Advanced Technological Education, or ATE program, another program within the Division of Undergraduate Education. With that we established an associate degree program within the chemical technician education program at SWC.

The curriculum for our Pharmaceutical and Laboratory Science program was developed working together with professionals from the local industry and the American Chemical Society, with the two-fold aim of serving the vast chemistry-based sector of the San Diego economy. For those of you who don't know, San Diego is rich with hundreds of biotech and pharmaceutical companies. It's one of the largest concentrations of such companies in the entire nation.

So we had a twofold aim of serving the vast chemistry-based sector of the San Diego economy and to provide a career pathway for our students.

That's an important part of engaging the students as well, if you can give them something they can believe in, a credible way into the workforce, good paying jobs close to home. Somebody mentioned *la familia*. Our students like to stay close to home. There are jobs -- well, there were jobs out there, and they will be back. Kind of like me.

But, nonetheless, our program is viable and active in putting people out into the workforce.

One component of the development of the curriculum for the Pharmaceutical and Laboratory Science program was a series of summer workshops for science teachers from local high schools that feed into our college district. Not only were we able to provide those teachers with enrichment activities, they were then able to communicate effectively elements of our program, serving to enhance recruitment activities.

Students have contacted me indicating that their chemistry or physics teacher told them about our program and how it may be a valuable educational option for them.

One of the most powerful endeavors that has contributed to Southwestern College student engagement and success is undergraduate research. I've heard that mentioned here. Through no other activity have I witnessed a more powerful transformative effect than undergraduate research.

Collaborations supported by the NSF Divisions of Materials Research and the SBIR/STTR program, have provided sub-awards to Southwestern College that have allowed students to take part in cutting-edge research activities. These activities have led to publications in peer-reviewed journals and poster presentations by students at regional and national meetings.

The crowning achievement to date has been an invitation of Southwestern College students to present research supported by the SBIR Phase II-CC program at the prestigious Posters on the Hill event in 2008, held just a short distance south of here, just this past year, sponsored by the Council on Undergraduate Research.

Southwestern College is the first community college in California ever to participate in that event and only the second community college in the history of the event.

These activities and accomplishments at this particular two-year HSI are not due to anything extraordinary about the college or its personnel. They could and should be the "norm" at many similar institutions. What made these things possible were wise investments on the part of NSF.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

I missed one registrant, Deborah Santiago, Excelencia in Education.

**DEBORAH SANTIAGO:** Hello. I'm Deborah Santiago, vice president for policy and research with Excelencia in Education.

I want to give some recommendations for NSF, looking at it from the policy angle and the importance of this program to other programs that we really care about.

At Excelencia we focus on accelerating Latino success in higher education. The importance of a program like this is that begins looking at Latino students.

So a few recommendations: First, technical assistance; we need technical assistance to develop and track realistic and appropriate measures by our grantees. This can form the evaluation of programs and ensure that data are disaggregated to be able to understand how Latinos are being served and how they are performing.

Too often we don't find this element in a lot of programs and therefore we cannot translate the results into other programs and see what they mean. Second, fund evaluation of the entire program to see how it is meeting national goals, especially the participation of Latinos in STEM to further inform policy and funding. We don't have this in a lot of federal programs either. We don't know how the programs are performing and making a difference for our community.

Third, we have to leverage our investment more broadly and NSF can really help with that, first by collecting and disseminating what works along with evidence of effectiveness for potential replication and scalability to accelerate Latino student success.

We are doing that as a nonprofit through examples. We have pointed to some of these STEM-based programs as examples. We are a small nonprofit, and we hope you all will nominate examples. This is an area where NSF can certainly take a leadership role.

And, finally, leverage investment by convening grantees to share what is working or not working and facilitate learning to strengthen our networks. Because we often find that it is by convening ourselves and talking realistically of what is and is not working that we can try to accelerate Latino student success overall.

Thank you.

*(Chorus of Applause)*

**DR. KORSMO:** Thank you.

All right. At this point are there any more people that would like to get up and speak? There is a microphone in the middle of the room if you don't want to come all the way up to the podium. Any speakers?

**MEG CANTWELL:** I'm Meg Cantwell from the Grant Resource Center of the American Association of State Colleges and Universities.

As I am hearing the ideas that people are throwing out for the scope of the program, it occurs to me that your applicant pool is going to come from a wide range, from shovel-ready to never having received a National Science Foundation grant before.

So I would encourage you to give a lot of lead time as you establish the competition schedule and to do everything you can to bring your outreach skills to bear on preparing the applicant community. I think a series of regional workshops online and in person is something that is in order for the transformational kind of things you are talking about.



**AUDIENCE MEMBER:** At some point again some of the speakers mentioned the number of agencies, the National Institutes of Health, there are 10 or 15 agencies in the U.S. Government that deal directly or indirectly with STEM issues.

My suggestion would be that the government should put their act together to try to see how they would identify who is doing what, where to go for different things.

I heard a number of times the issue of health care and health professions. I remember this came up when we were looking at the CCRA. When they wrote the legislation it included nurses and other related fields for all the other groups except for Hispanics. And we were told, nothing having to do with that would be allowed.

The issue of health and the issue of health professionals is so critical for the Hispanic community, especially getting bilingual professionals in those fields. Even if the NSF is not going to deal with it directly, there should at least be indirect support.

For example, when we have a grant we would like to include some of the basic biology and chemistry courses that serve the needs of the nursing program. Faculty said, no, they couldn't do it.

This is what they said. So if that is not the case I would like to know at some point.

But the boundaries have to be made clear. And since there are so many agencies dealing with these topics, it is really confusing for at least small institutions that don't have very strong powerhouses for grant making and traveling and all of that.

So, finally, if you are going to make those needed workshops regional, it is very important they go Puerto Rico because the travel cost for us coming here is very high. It is easier to send people down there than having 50 people come up here.

Thank you.

*(Chorus of Applause)*

**DAVID JOHNSON:** Dave Johnson.

I just want to piggyback on what was just said about the idea of being able to look at the programs across the federal government that are supportive. This has some precedence, and you might be able to look at how it was done in the past.

The biggest effort in that area was after the Reagan administration when the Office of Science and Technology Policy and the Office of Management and Budget together managed the multi-agency coordination.

So one idea is to get OSTP interested in bringing all of you together so that you can see where those boundaries are. I think you have a mental idea of where they are, but actually talking to each other is often a good idea.

**SUSAN MOYA:** Susan Moya, Florida International University. I promised I would ask this question so I will.

The stimulus package has a considerable amount of money, not specifically for HSI, but for NSF. Part of the America COMPETES Act was funded by the stimulus package. We are just about to approve the Fiscal Year '09 appropriations fund, a bill that also has money for NSF. And my question is, for the betterment of FIUs and others, think about and share with us at some point in the near future how you plan to address the three from a timing standpoint, from a subject standpoint and how we could best serve your institution in all three because they are all concurrent.

Thank you.

**AUDIENCE MEMBER:** I'm from UT El Paso.

One thing I have not heard mentioned by any of the speakers is the issue of the diversity of types of Hispanic-serving institutions.

As you know, HSIs range from 25 to 100 percent enrollment. In that range you will find yourself. Over the years there has been a growing number of HSIs as a result of the Hispanic population growth in the U.S. The one thing I would encourage is there are models that work, that need to be implemented by those who are emerging.

But whatever solicitation is put out for a COMPETES act, I think the broad spectrum of institutions from the 25 percent to the 100 percent must be included.

Thank you.

**MEHDI SHADARAM:** This is Mehdi Shadaram from University of Texas, San Antonio. We have all talked about the participation of Hispanics in the STEM fields. One issue that at least my college is facing is lack of female Hispanics in the college. Overall 15 percent of our graduates are female. If you look at Hispanic graduates, only 7 percent of them are female. So that is something probably we need to look at.

**REBECCA OROZCO:** Rebecca Orozco, Cochise College in Arizona.

We are a Hispanic-serving institution right on the Mexican border. Arizona is famous in the United States for being worst funded from K-12 education. I think we are 49th.

Eighty percent of the students who come to Cochise College are remedial and the need for a strong basis in science and math is not included in our state No Child Left Behind test. The students who come haven't even had science or very much science when they come in. So our need is to bring students up where they can compete in the kind of technical education, nursing and computer science, that is needed for the high paying jobs in our area, the only jobs in our area, in many cases. It is a tremendous need that we need to address.

Thank you.

**DR. KORSMO:** Thank you. Anyone else to contribute remarks?

Are the speakers who previously spoke willing to entertain questions? There may be questions for those previous speakers. Having heard no defiant answers, the floor is now open to questions for the speakers.

I might have some, if no one else does. Is Pete Markowitz still here?

Pete, I would like to ask you about the program, when and how it started and how it grew. It sounds like it started as a teacher preparation program and then involved other colleges and universities.

**PETE MARKOWITZ:** Our first funding year was 2003 and it started with a group of faculty in different parts of FIU, that was the College of Education, the Department of Physics, the Center for Internet Augmented Research and Assessment and the School for Computer Science at FIU. We started with partners at California Institute of Technology, University of Florida and Florida State University for the first several years.

We worked with approximately 90 high school teachers in the past five years and, I'm going to get the number wrong, but on the order of 19 or 20 high schools in South Florida around the Miami area and half dozen or so that are outside the immediate area.

We really did start based on high energy physics and on physics education reform. Those were the two key thrusts. But we wanted to use the advances in computing as a tool to accomplish them. So that meant we could bring in high school classes remotely by using a tool called EVO, which is a just a video conferencing tool we used.

It also meant that we could work with scientists at Cal Tech and other places, again using similar tools or traveling to places like Fermi Lab outside of Chicago or Urban National Laboratories, as the need arose.

Did that answer your question?

**DR. KORSMO:** Yes. Thank you.

We will be here until 5:00. The mic is open or, if you would like to take the time to informally chat among yourselves, -- okay. Here we go.

**DAVID BROWN:** You can't leave a hot mic around me.

One thing that I didn't hear, and it affects me and my progress in trying to bring about favorable change, is the FTE issue. I find myself struggling with administration to look beyond the bottom line. Part of it is outside their power in that the funding that the community colleges in California receive is on an FTE basis.

I think in addition to faculty development there may be something necessary for administrator development. I don't mean that in a pejorative kind of way.

*(Chorus of Mumbles)*

**DAVID BROWN:** Seriously. I do it personally. I talk to the vice presidents about why I need the support. The issue of sustainability was brought up earlier. How do we get sustainability unless you can get buy-in from the top of the administrative pyramid?

Again, I don't mean that in any kind of negative way. I think there should be a conference for CEOs of Hispanic-serving institutions.

If we are going to make this a real positive change, if we are going to address this very important national imperative, we need to put our heads together and see how we can do this and look beyond the confines of our own needs to cut the checks for our own faculty and pay the light bill.

**DR. KORSMO:**

There is another speaker -- you might want to line up. Looks like we have a line developing there.

**MEG CANTWELL:** Can I give a quick response to that. One easy answer to that is to have a requirement that the PI be a president and provost.

*(Chorus of Boos)*

**MEG CANTWELL:** The types of projects you are talking about, the scope of them and the type of change that you are trying to effect, needs to be directly tied to the institutional mission.

I can understand why there is negative reaction to that. But I think it is also a sure fire-way to make sure that the sustainability and the top educational buy-in is there.

**DR. KORSMO:** Thank you.

**ALEX RAMIREZ:** Alex Ramirez with HACU. There are ways of working with the institution as a whole. And the VPs for research are oftentimes critical to this as our the CEOs, the presidents. There are ways to work it, but this may not be the right crowd.

*(Chorus of Laughter)*

**ALEX RAMIREZ:** But I think this might be the right crowd to keep in mind we have a real opportunity and at the same time a real puzzle. We have the stimulus package, which has been passed. And NSF is just now trying to figure out how they are going to fund what they need to fund within the time period that they have.

So I don't think you are going to get an answer, because they are scrambling to figure that out, like everyone else, how they are going to do it in an intelligent way. I believe they will do it in an intelligent way.

One way would be to increase the success rates for the proposals that are out there now. So this means that now may be an excellent time for submission to the programs that are there. Make sure that you put in your proposals in all areas, begin to start thinking about ideas that you have had, the things that "if we just had money this would go right now," the so-called shovel ready sorts of things for any directorate.

And keep in mind 80 percent of all NSF awards are to unsolicited proposals. Other institutions are now working on getting proposals into the pipeline and you should be doing the same. And focus on the math and science partnership program, since this has been identified as an area for funding.

We heard about K-16 partnerships; here is a real opportunity to put that in. We also heard about major research instrumentation. MRI is another place that has been identified as important for funding. So now is the time to try to get in some of those infrastructure proposals.

If you don't have the wherewithal, look for a partnership with some other institution, either another HSI or other institutions.

I would be glad to try to help with some of those partnerships, with some institutions that may be research institutions. We have excellent examples of institutions here that also could assist so that everybody participates in the grant.

So you should be working on proposals now and try to take advantage of it and not wait for anyone else to come up with a stimulus package. It might be too late.

**JULIO BLANCO:** Julio Blanco, California State University, Bakersfield.

I know it is a Listening Session, but I wonder if NSF might be able to comment on what the previous speaker said. Any idea of when we may see announcements for a competition? Particularly because most of the HSI institutions and the smaller campuses, the community colleges, do not have the staff and are not ready to receive a call for proposals and be told it is due three weeks later. So that will be important, that we have a little bit of a lead time.

This may or may not be true. Rumors that come to me that are disheartening. People say that because of the inability of NSF and the agencies to make announcements on a timely basis to solicit proposals, that they will automatically fund past proposals that were unfunded, thereby denying the opportunity to others. This makes people say, "Is it useful to even try?"

So I think maybe some comments would be appropriate.

Thank you.



**DR. KORSMO:** Well, thank you for that input. I invite my colleagues to jump in as well.

At NSF we are required to give 90 days notice when we publish program solicitations and program announcements. If the notices are not reaching you, then we have to do a better job. We have on our website a way to see all of the deadlines. If you go to [www.nsf.gov](http://www.nsf.gov) under "Find Funding," you will see a link that will give you all the upcoming deadlines. We also have a custom news daily update. You can subscribe to this to receive by email updates on programs.

With regard to the stimulus and the '09 omnibus, we have issued press releases and there is really not a lot more I can say than what is already in the law itself and in the President's request and budget summary.

If you leave me your card, I will send you information as quickly as we can get it. But I disagree with the idea that "there is something fixed about this so don't even try." We will be looking to fund the best ideas that come to us and we are not going to go back and automatically fund a lot of things that should not have been funded after review. I think what you mean is, "Are you going to go back and fund things that you decided not to fund previously?"

**JULIO BLANCO:** Well, in previous competitions, you might receive a nice letter saying it was great but didn't get funded. Will you be able to go back to those unfunded?

The point is there may be wonderful proposals that were submitted in the past but, of course, those who did not participate back then will be disenfranchised from doing so.

**DR. KORSMO:** We have many pending proposals right now, and perhaps will be able to increase our funding rate, which has been declining steadily over the last few years. But also we will be doing some new competitions this year. So I would encourage you all to sign up for the NSF email updates because it is important to be ready.

**JULIO BLANCO:** You may be absolutely correct in what you're saying but the fact is that many institutions that are primarily undergraduate are unable to submit proposals to NSF because of the highly competitive research component that is attached to it.

If people knew two months ago, three months ago, that there will be a windfall funding available, they would have submitted a proposals at that time, even with the research obligation to it.

So to go back now and look at proposals that were submitted even though -- and we all understand the decline in funding that NSF has had over the years, to simply increase the funding to proposals that were submitted, still disenfranchises those that were unable do so.

**DR. KORSMO:** I understand your point.

Thank you.

**GAUTON SEN:** I'm Gauten Sen from FIU and associate dean of research in arts and sciences. I have two quick comments. One is in some programs you limit the number of proposals an institution can submit, and that creates a lot of problems. Sometimes good ideas actually fall on the wayside.

So if you would think about opening that up, I think you will see greater competition and good stuff coming out.

Second thing, we have a lot of institutions here. What I'm hearing is that what would really work is collaboration between institutions. We heard Pete Markowitz talk about that, and I would extend it to say it is not possible to have large instruments in every institution. You can design a two-step plan where you fund basic instrumentation in colleges so students have hands-on experience and also insight to high-powered research by remotely accessing instruments in major institutions.

So you can take these creative approaches where you basically get a greater return for the buck invested. Those are the two comments.

Thanks.

**DAVID BROWN:** Last time. Dave Brown on the subject of partnerships through the programs with sound research that ended up on Capitol Hill, and that is partnering with small businesses.

The SBIR/STTR program in NSF has a mission to be self-sustaining. You put seed money in the business which ultimately commercializes a product and sell their goods and services and they are taxed and the money is back into the federal budget.

You mentioned the email. I'm on the daily digest and I sit by my computer waiting for the email.

I remember in January of 2006 an email came in with a "Dear Colleague" letter on the creation of a new program, the SBIR Phase II-CC. And I read that program, which was partnering a small business that had received a Phase II SBIR award with a community college research team and I said, "My gosh, thank you, NSF, for making a program just for me."

Because I thought I was just working in a vacuum, I was the only community college research team out there. I have since learned there are a few others out there, but there are not many of them. That may be a program that could be expanded to include HSIs in general, maybe not exclusively community colleges but four-year institutions as well.

If you want to build more partnerships, and the economy is vastly stimulated by small businesses, we need the IBMs and the Motorolas and Microsofts of the world, but they are not necessarily the movers and shakers of innovation in the country. It's the small businesses where that begins.

So maybe that is something to take back to my buddy Juan Figueroa, a great program officer in SBIR who has been really supportive of Southwestern College and other places out there. Maybe that is a place where an expansion could be initiated to help other Hispanic-serving institutions.

**GUSTAVO ROIG:** Good afternoon.

My name is Gustavo Roig. I'm with the College of Engineering at Florida International University.

One of the things I would like to recommend to the group here is that we all should include in our proposals the three key ingredients for successful program, the public schools, the community colleges and the universities or four-year institutions.

I think funding just a public school system approach or a community college approach or a university approach by themselves is not wise. I think that we should be forced, all of us, to work in partnerships. You have seen it today here -- many excellent partnership examples and also the needs.

We talk about the student needs, the family needs, *la familia*, everything, it is by including the whole spectrum that we could be successful.

Also these grants should be very, very -- with a lot of money.

*(Chorus of Laughter)*

**GUSTAVO ROIG:** They should not be grants that just give you an appetizer.

Thank you, very much.

*(Chorus of Applause)*

**CLAUDIA PINTER-LUCKE:** I'm Claudia Pinter-Lucke.

There is another aspect of equipment and instrumentation that caused conversation on our campus as we were preparing for today. It is not that we can't afford the equipment with the help of a grant, but what we can't afford is the maintenance and the training of the staff to use that equipment.

And so if some seed money is there to help the institution get to the point where we will be able to maintain the equipment after we have purchased it with the grant, that would be very helpful to us.

**AUDIENCE MEMBER:** On the previous topic I would like to remind NSF that the MRI program did not have a cost share requirement and now it is 30 percent. And that particular fact eliminates the opportunities of so many institutions to compete for MRI grants.

Thanks.

**MEG CANTWELL:** The talk of MRI and some of the other existing NSF programs makes me wonder whether, in addition to, not in place of this distinct program for HSIs authorized by America COMPETES, has there been talk of using some funding to have a separate HSI track within existing programs for which HSIs have not been as competitive in the past?

**RICHARD ALO:** Richard Alo from the University of Houston Downtown.

I want to speak out for one of the major partnerships that really affected the Houston area and the improvement of young Latino students and also improvement of our teaching faculty in the schools. And that was the NSF Urban Systemic Initiative.

I was very much involved with that. I know the math-science partnerships came up earlier.

Margarita Benitez made a comment about NSF taking a lead back from the Department of Education. I support that fully. The Urban Systemic Initiative in Houston was a major partnership. It was extremely effective in lowering the attrition of young Latino students in the middle schools and high schools.

It made a tremendous impact on improving teacher training in the middle schools for math and science. It brought forward new certification programs for middle school teachers. It was partnerships that created cohorts within the community. The community came together. A parent cohort, business cohort and industry cohort, all of these worked together for six years.

And if you look at the results and the assessments that were done, this was extremely effective, as Gustavo has mentioned. You have to bring the schools together, you have to bring the community colleges together, you have to bring the universities together.

Thank you.

**DR. KORSMO:** Thank you. Very interesting and useful comments as well as provocative questions.

Is there anyone else would like to take the mic?

Again we will be here for another half an hour. If you would like to walk around and visit with one another that is fine.

*(Whereupon, at 4:30 p.m. the formal session concluded.)*