

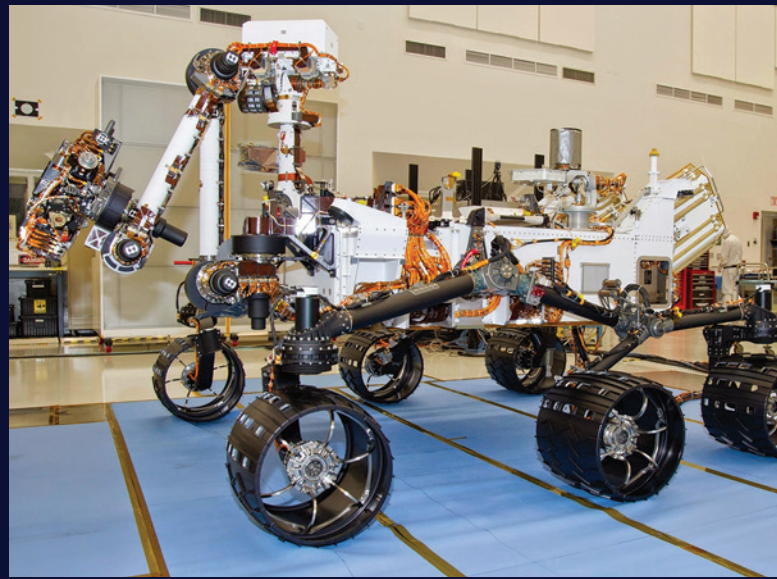


NASA STEM EPDC

TEXAS STATE
LBJ INSTITUTE FOR
STEM EDUCATION AND RESEARCH

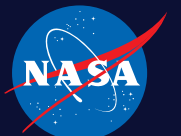


ANNUAL REPORT 2015



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NASA's New Horizons spacecraft captured this high-resolution enhanced color view of Pluto on July 14, 2015.
Photo courtesy of NASA/JHUAPL/SwRI.

The NASA STEM Educator Professional Development Collaborative (EPDC) is a professional learning initiative resulting from a five-year (2014-2019) cooperative agreement between NASA's Minority University Research and Education Project and Texas State University.

The services, products and efforts of the NASA STEM EPDC are aimed at providing educators at all levels with valued professional development experiences using NASA-related science, technology, engineering and math (STEM) content and resources.

Specifically, EPDC advances NASA Strategic Goal 2 (objective 2.4) and enhances NASA's contribution to Goal 1 of the Federal STEM Education 5-Year Strategic Plan put forth by the Committee on STEM Education, National Science and Technology Council.

These goals include:

Advance understanding of Earth and develop technologies to improve the quality of life on our home planet (NASA Strategic Goal 2).

Advance the nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers and faculty in NASA's missions and unique assets (objective 2.4).

Improve STEM instruction by preparing 100,000 excellent new K-12 STEM teachers by 2020 and supporting the existing STEM teacher workforce (Committee on STEM Education Goal 1).

In line with these goals, the EPDC is honored to maintain and build upon the best of the existing NASA professional development offerings and to work closely with NASA subject matter experts, educators and staff to pilot and implement other innovative, high-impact approaches that extend NASA PD services to new audiences of formal and informal educators, with a special emphasis on communities with the highest need.

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Message from the Dean of Education

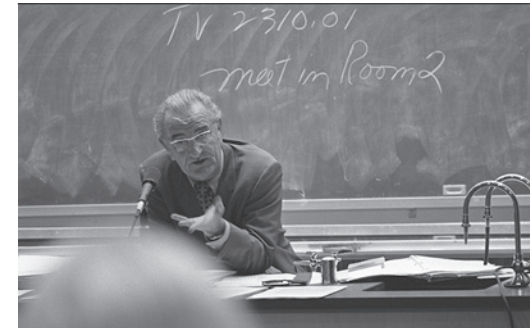
For those who grew up in the 1960s, NASA – the National Aeronautics and Space Administration – are magical words! It was NASA that provided us inspiration in a desert of war and racial and generational strife. Then and now, the country would come together to share in our common triumphs, and sometimes disasters, that were the product and province of our best minds working to push back the darkness and extend the frontiers of science.

While my career interests led me not to NASA but instead into educational leadership, my affinity for NASA never waned, and today, through our university’s affiliation for the NASA STEM Educator Professional Development Collaborative, I find myself reporting on work that is of critical importance to the nation and to the world of the future. Characteristically, NASA is at the forefront of that vision, and we in the College of Education at Texas State could not be more proud to be partners in the enterprise.

High-quality STEM education is essential to provide the country with the future scientists and engineers we need and to provide students with meaningful career opportunities through which they can make important contributions. As our national demographics change, we must develop new strategies to make sure our talent pipeline is filled by everyone who can contribute. Clearly, teacher professional development is an essential ingredient to providing all students, including those who have historically been left out, with STEM teachers who can help them achieve their full potential. NASA is to be highly commended for its leadership and investment in educator professional development and in accessibility for all.

Texas State University is highly committed to ensuring the success of the NASA STEM Educator Professional Development Collaborative, is proud of what has been accomplished in the first year of operation, and looks forward to continuing this important work together. Using unique NASA content as a platform, we can continue to inspire the young people who will help us go to the stars and, in the process, enrich life here on Earth.

Message from the NASA STEM EPDC PI and Program Director



Lyndon Johnson met with students at Texas State University in 1970.
LBJ Library photo by Frank Wolfe

Greetings from the LBJ Institute for STEM Education and Research at Texas State University in San Marcos, Texas!

In 1930, Lyndon Baines Johnson graduated from this institution, then named Southwest Texas State Teachers

College, with a bachelor of science degree in history and a permanent teaching certificate in Texas. With a passionate commitment to equal opportunity, LBJ taught in Cotulla, Texas, in schools with a Hispanic majority population.

As the 36th president of the United States, LBJ viewed education for all as a national imperative. He drove the legislature to pass the Elementary and Secondary Education Act of 1965, the preschool program Head Start, the pre-college preparation program Upward Bound and the Higher Education Act, which was signed at Texas State University as the first U.S. congressional approval for scholarships to undergraduate students.

The LBJ Institute for STEM Education and Research, like its namesake, seeks to improve social and economic opportunities through excellence in education – with a specific charter to promote science, technology, engineering and mathematics (STEM) education. We are proud to work toward increased equity and consistent improvement in outcomes for all students and educators.

The National Aeronautics and Space Administration (NASA) also is synonymous with expanding our boundaries of knowledge. Its remarkable accomplishments demonstrate America’s enthusiasm for the promotion of knowledge and scientific understanding. Throughout its history, NASA has conducted or funded research that has supported education initiatives and led to numerous improvements to life here on Earth.

As we review the first year of the NASA STEM EPDC, we are proud of our team, the services provided and the research work we have launched. We look forward to further advances in providing Educator Professional Development (EPD) services to STEM educators nationally through our unique partnership with 10 regional NASA Centers. With their support and daily collaboration, we are confident our combined efforts will have a positive impact on future generations.



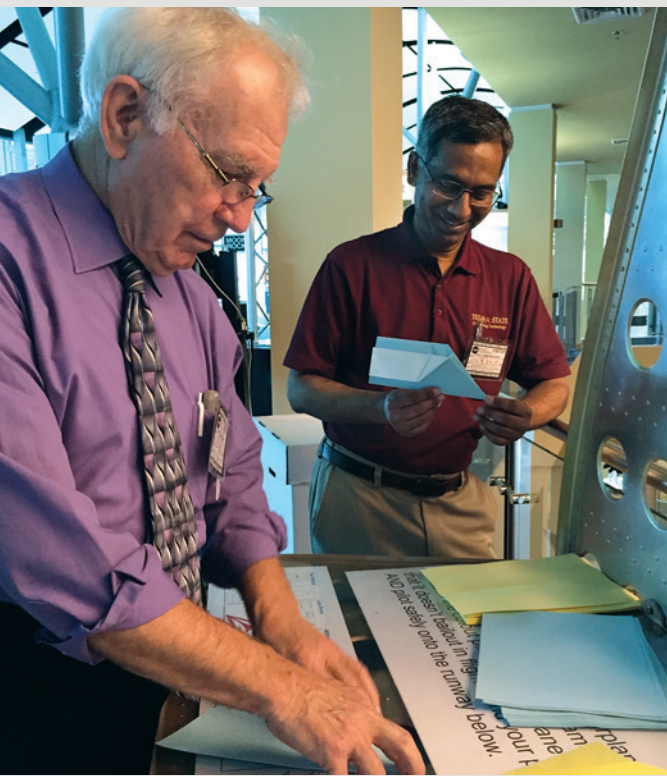
Araceli M. Ortiz
*NASA STEM EPDC,
Principal Investigator*



Leslie Huling
*NASA STEM EPDC,
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Year 1 Major Milestones

NASA STEM Educator Professional Development Collaborative (EPDC) is a national, diversity-focused professional development system that leverages NASA assets and resources to enhance excellence in STEM education. Funded under the direction of the Minority University Research and Education Program (MUREP) through a \$15 million, five-year cooperative agreement between NASA and Texas State University, EPDC provides a multitude of face-to-face and online professional development opportunities and NASA resources for educators in K-12, university and community settings.

Launched in September 2014, EPDC has had a productive year filled with major milestones, including the hiring of EPDC Specialists at each of the 10 NASA Centers, the launch of a new website and a national event registration and management system, and the design and delivery of a wide variety of professional development offerings. Highlights from this first year of operation along with data on the educators served and feedback from stakeholders comprise the contents of this annual report.

EPDC SPECIALISTS

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Ames Research Center

Dr. Barbara Buckner
Armstrong Flight Research Center

Ms. Susan Kohler
Glenn Research Center

Ms. Kelly Hartford
Goddard Space Flight Center

Ms. Sandra Kaszynski
Jet Propulsion Laboratory

Mr. Brandon Hargis
Johnson Space Center

Dr. Lester Morales
Kennedy Space Center

Ms. Marilé Colon Robles
Langley Research Center

Mr. John Weis
Marshall Space Flight Center

Mr. Stephen Culivan
Stennis Space Center

EPDC'S FOUNDATIONAL PRINCIPLES

- Attention to the educator across the professional continuum
- Respect for the culture and language of the learner
- Openness to sharing learning and harnessing the power of scholar/expert partnerships
- Boldness to leverage the potential of massive online learning and badging systems
- Commitment to create an innovative national impact evaluation model that gets to the heart of professional learning and behavior change

This annual report is a summary of the milestones of our first year of operation and a look toward the future for the remaining years on the cooperative agreement

Project Organization and Key Leadership Team

The leadership team of the NASA STEM EPDC at Texas State University is an interdisciplinary team consisting of faculty from the College of Education and the College of Science and Engineering who have an impressive track record of working together on academic improvement and educator professional development initiatives. Further, the EPDC leadership team has extensive experience in grant management and the facilitation of large-scale, multi-institutional collaborative STEM education efforts. Dr. Araceli Ortiz, director of the LBJ Institute for STEM Education and Research, is the principal investigator of the NASA STEM EPDC, and Dr. Leslie Huling, professor in the Department of Curriculum and Instruction, is project director.

The leadership team oversees the work of 10 EPDC Specialists headquartered at NASA Centers across the U.S., various networks involving partner Minority Serving Institutions (MSIs) and school districts, and subcontractors that help in the design and online delivery of the professional development offered by NASA STEM EPDC. The work of each of these partner entities is featured prominently throughout this report.

Educator Feedback

“I have heard nothing but the highest praises from my fellow participants. There were 29 educators, from as far away as Nebraska, South Dakota and Georgia, gathered for an exciting day of learning, best practice sharing and certification to use actual NASA samples in our classrooms. The enthusiasm for space science was palpable, and the workshop is one that we will long remember.”

Missouri high school science and math teacher



With an enrollment of more than 38,000 students, Texas State University is the largest Hispanic-Serving Institution (HSI) in Texas, and ranks among the top 20 universities in the nation for the number of bachelor's degrees awarded to Hispanic students. The university is home to a diverse campus community where ethnic minorities make up 49 percent of the student body, and 33 percent are Hispanic.

Texas State University's College of Education is the largest university producer of teachers in Texas, and the second largest nationally, preparing 800 to 1,000 teachers each year. The College of Education is also the home of the LBJ Institute for STEM Education and Research, which coordinates the NASA STEM Educator Professional Development Collaborative and various other STEM education grant-funded initiatives.

The LBJ Institute for STEM Education and Research is situated in the center of the campus and is housed in newly remodeled facilities consisting of collaborative meeting spaces, faculty offices and an innovative maker space utilized for educator professional development.

Leveraging NASA Innovation

The launch of the NASA EPDC involved the education experts at all 10 NASA Centers from the very beginning. During the first semester of operation, EPDC leadership team members began their visits to each of the 10 NASA Centers to become better acquainted with center personnel and to learn more about each center's innovative work and resources. It was noted that each center offers unique expertise and facilities that will be leveraged and highlighted in educational professional development materials and experiences. In November, the College of Education hosted NASA program officers during their site visit to Texas State, where they engaged in strategic planning with the EPDC leadership team, toured the campus and the LBJ Institute for STEM Education and Research facilities, and met with the deans, university president and provost.

Input was requested of the education leads at each NASA Center as an important element of the selection process to identify the 10 EPDC Specialists who are the front-line EPDC service providers at each of the 10 NASA Centers.

Formal interviews were conducted with the identified EPD lead at each center to determine their needs and priorities in relation to the EPDC Specialist who would ultimately be assigned to their centers. More than 30 excellent candidates were interviewed by the EPDC leadership team. Ten EPDC Specialists began their appointments in January 2015. The specialists hold faculty of practice positions in Texas State University's College of Education. The newly employed EPDC Specialists traveled to San Marcos for their faculty orientation and kickoff meetings with the EPDC leadership team, conducted from January 12 to 16.

PRIMARY ACCOMPLISHMENTS OF THE EPDC OVER THE PAST YEAR INCLUDE:

- Building an excellent cadre of EPDC Specialists collaborating within geographic regions to fulfill critical EPD functions within their respective NASA Centers
- Delivering more than 290 EPD events between January 2015 and August 2015 through a combination of face-to-face events and web-based seminars and workshops
- Establishment of comprehensive online event registration, management and evaluation system tools
- Implementing a strong MSI Teacher Educator Network (MSI TEN) consisting of faculty from Texas State University and five partner Minority Serving Institutions from across the U.S.
- Enhancing online learning opportunities for teachers through credit-bearing online courses and the EPDC digital badging system through our partnerships with Pennsylvania State University and U.S. Satellite campuses



Photo courtesy of NASA

Educator Feedback

“The board members were enthralled by the interaction they had with the NASA scientists and engineers. They hope to attend additional programs in the future to expand their knowledge of STEM education and the Next Generation Science Standards.”

President of the New Jersey School Board Association

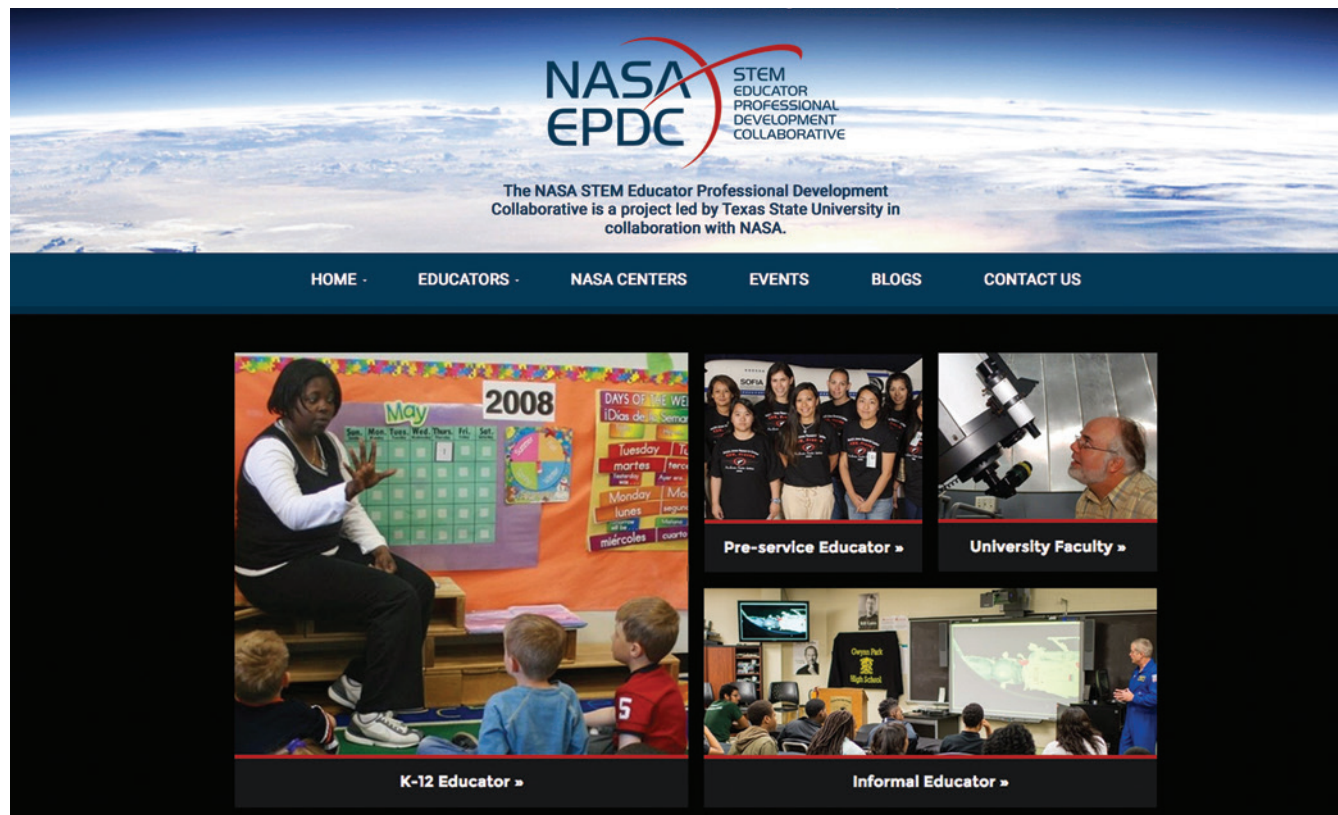


Photo courtesy of NASA



Photo courtesy of NASA

Educator Feedback

“These webinars are wonderful. There are so many great activities on the NASA website, but finding the right one can be overwhelming. These webinars provide background information and walk us through some of the activities — I cannot tell you how helpful that is! It is much easier to use an activity when you know how others have used it. Please keep offering this training.”

A participant in the Hubble and Spaced Out Sports webinar



Sharing Professional Learning Online

A number of avenues support the online learning opportunities offered by EPDC. Site licenses for 12 large-capacity Adobe Connect classrooms were acquired by EPDC so that the specialists at each of the 10 NASA Centers could have his/her own classroom through which to conduct their weekly webinars and other online professional development offerings. All of the Adobe classrooms can accommodate up to 100 participants, and one classroom that can be reserved by the EPDC Specialists can accommodate up to 500 participants. Shortly after the EPDC Specialists were employed, they began offering EPD webinars weekly on a wide variety of STEM topics. These webinars are publicized through the newly developed EPDC website (txstate-epdc.net) as well as NASA Express, a weekly communication disseminated to more than 20,000 subscribers and available to approximately 11 million NASA Twitter followers.

The EPDC website that was launched in January publicizes all upcoming EPD events with a direct link to the EPDC event registration site and provides new blog entries on an ongoing basis that share various STEM teaching strategies and NASA resources. In addition to the EPDC Specialists, blog submissions are received from faculty at the EPDC MSI partner institutions and the EPDC leadership team, ensuring a continuous flow of new content on the website.

EPDC also operates the Digital Badging System that is hosted by Pennsylvania State University’s Center for Online Innovation in Learning (COIL). The NASA STEM EPDC Badging System allows educators to engage in online professional development and earn badges in many of NASA’s STEM content areas as part of their ongoing personal and professional growth. The badges can be converted into continuing education credits, helping teachers meet their professional development requirements and/or gaining them recognition from their employers and licensure boards.

The EPDC Specialists are in the process of developing new badges as well as reviewing and revising many of the almost 90 existing NASA learning modules that were originally part of the Teacher Learning Journeys program developed by NASA Aerospace Education Services Project (AESP) at Pennsylvania State University. This collaborative arrangement with Penn State to support digital badging is an example of how EPDC has been able to leverage existing NASA resources as well as develop new resources that feature the latest NASA developments and supplement curriculum areas, such as engineering education, where there were previously limited NASA education resources available. Discussions are also under way with various school districts that have expressed an interest in developing STEM badges that can be hosted by EPDC and accessed by teachers and informal educators across the nation.

txstate-epdc.net

TECHNOLOGIES SUPPORTING ONLINE LEARNING

- Adobe Connect
- EPDC website
- Digital Badging System
- e Touches Registration System

The 10 EPDC Specialists were employed by Texas State in January 2015, and the following charts show Year 1 data that were collected from January – August 2015.

2015 YEAR-TO-DATE EPDC EVENTS BY SESSION TYPE

Month	Online webinars	Online webshops	On-site face-to-face events	Off-site face-to-face events	Totals
January*	5	0	9	2	16
February	14	0	5	9	28
March	32	10	30	8	80
April	32	1	7	16	56
May	24	2	6	0	32
June	17	1	6	0	24
July	18	2	6	0	26
August	14	0	14	4	32
Year	156	16	83	39	294

*EPDC Specialists began Texas State employment on Jan. 21, 2015.

Creating a National Impact Evaluation Model

In order to collect data necessary to complete reporting requirements from the NASA Office of Education Performance Management (OEPM), to track participating educators across events and over time and to establish a system through which educational research can be conducted, EPDC has implemented a comprehensive event management and evaluation system. The system uses an eTouches platform, through which participants register for events and EPDC Specialists submit their event reporting.

The eTouches system collects and stores a variety of demographic data from participants, so educators provide this information during their initial registration and are not asked to enter the information again on subsequent registrations. Following each EPD event, the system automatically sends participants an online evaluation survey through which participants provide feedback about the quality of the professional development, the effectiveness of the presenter, and the likelihood that they will implement the strategies and resources provided in the training. Once the survey is returned, the participant is sent a certificate documenting their participation and the number of hours completed that they can utilize for continuing education or district professional development credit.

A wide variety of reports can be generated through the eTouches system and provide real-time data on EPDC services and the characteristics of participating educators. This reporting capacity greatly facilitates the compilation of the monthly progress reports provided to NASA and MUREP Management. Further, the system allows EPDC and participating educators to have a record of all of the EPDC activities in which an individual educator has participated. This capacity enables EPDC to investigate the cumulative effects of NASA EPD and provides information to use to select a sample of educators from whom more in-depth information about classroom practices can be collected.



RESEARCH QUESTIONS BEING INVESTIGATED

- Are face-to-face and online PDs equally effective at impacting teachers' STEM attitudes and behavior?
- Do participants' perceptions of PD quality differ by delivery method?
- Do the different sources of PD have equal impacts on teachers' STEM attitudes and behavior?
- What PD implementation strategies are the most successful, and can these characteristics be incorporated into less successful PD to improve their success?

Delivering Professional Learning via Multiple Mechanisms

The delivery of high quality professional development utilizing NASA resources is the primary mission of EPDC and is operationalized by the 10 EPDC Specialists headquartered at the NASA Centers, the EPDC leadership team and faculty at the partner institutions that comprise the MSI Teacher Educator Network (MSI TEN). In addition to EPDC-sponsored online and face-to-face professional development, the EPDC team also engages in partner delivered EPD and community requested EPD. In the first eight months since the EPDC Specialists were employed by Texas State in January 2015, approximately 300 EPD events serving approximately 124,000 persons have been conducted.

The central online event registration system allows EPDC to easily track the number of professional development events delivered and the number of

participants served by role group. EPDC online webinars and webshops are conducted through any of the 12 EPDC Adobe Connect classrooms or NASA Center digital learning facilities. Webinars are primarily presentations by EPDC Specialists and NASA Center content experts, while webshops involve hands-on activities in which participants engage in during and after the online event.

Face-to-face professional development events are classified as on-site or off-site depending upon whether they were conducted at one of the 10 NASA Centers (on-site) or in some other location (off-site). Face-to-face events, while fewer in number, tend to be longer events in which teachers actively engage with NASA personnel and NASA classroom resources.

The chart below shows the number of educators served by role group for each month from January to August 2015. Pre-service teachers are university students preparing to become teachers. Informal educators

are personnel who work in some educational entity other than K-12 schools such as museums, science centers, after-school programs, summer camps, etc.

2015 YEAR-TO-DATE TOTAL PARTICIPANTS SERVED BY MONTH

Month	Elementary teachers	Middle school teachers	High school teachers	Pre-service teachers	Higher ed faculty	Administrators	Informal educators	Other	Totals
January*	101	70	52	52	48	1	5	7	336
February	118	334	253	108	1,284	8	80	0	2,185
March	735	612	197	50	109	23	302	52	2,080
April	318	340	152	492	55	55	104	3,131	4,647
May	272	209	78	20	58	4	53	5,820	6,514
June**	296	320	135	78	75	8	122	105,510	106,544
July	133	182	76	166	93	0	53	83	786
August	74	363	197	26	43	2	263	195	1,163
Year	2,047	2,430	1,140	992	1,765	101	982	114,798	124,255

*EPDC Specialists began Texas State employment on Jan. 21, 2015.

**EPDC Specialists participated in NASA supported events attracting large numbers of educators.

**NASA EPDC MSI TEN
TEXAS STATE UNIVERSITY
COORDINATORS**

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*LBJ Institute for STEM Education
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Kianga Thomas
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Solomon Abraham
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Michael Stone
Salish Kootenai College

Terry Souhrada
Salish Kootenai College

Ruthmae Sears
University of South Florida

Eugenia Vomvoridi-Ivanovic
University of South Florida

**EPDC MSI PARTNER
NETWORKS**

- The MSI Teacher Education Network
- The Emerging Stars Network
- The Community Ambassadors Initiative
- The NASA EPDC Alliance

Harnessing the Power of Scholar/Expert Partnerships

Minority Serving Institutions (MSIs) from across the U.S. are not only essential partners in the preparation of the next generation of STEM teachers, but faculty in these institutions have a wealth of expertise to share about working with diverse learners and the integration of culturally relevant instructional strategies that promote the STEM success of all students. For these reasons, EPDC has established two networks of MSIs to partner in the advancement of our educator professional development work and to ensure that EPDC services are delivered where they are most needed.

THE MSI TEACHER EDUCATOR NETWORK

The MSI Teacher Educator Network (MSI TEN) is comprised of STEM education faculty members from Texas State University and five partner MSI universities that provide specialized expertise in the field of culturally responsive teaching in STEM. The MSI TEN partner institutions that have EPDC subcontracts to work collaboratively with the Texas State STEM education faculty and the EPDC leadership team include:

- Norfolk State University
- North Carolina Central University
- University of South Florida
- Salish-Kootenai College
- California State University, Northridge



The MSI TEN faculty met with the EPDC Specialists in January at their kickoff meeting in Austin, have worked collaboratively in monthly online work sessions and returned to Texas State for their yearly meeting in May at the LBJ Institute for STEM Education and Research. The group has developed a white paper on cultural diversity in the STEM classroom. This working paper is being used to inform the development of culturally inclusive lesson framework. The MSI faculty members are currently piloting a culturally responsive teaching framework in evaluating selected NASA curriculum activities to identify areas that can be strengthened in order to make the activities more relevant to diverse student populations. The group is also utilizing the framework to formulate instructional videos and activities that can be made available through the EPDC website and shared with the EPDC Specialists for use with the educators they serve.

MSI TEN faculty members are engaged in revising select undergraduate and graduate courses at their respective institutions to include additional NASA resources and to emphasize culturally

responsive teaching and are conducting professional development activities for their university colleagues and teacher candidates on these topics.

THE EMERGING STARS NETWORK

An additional network of MSIs advancing the work of the EPDC is the Emerging Stars Network. These MSI institutions are committed to enriching their STEM teacher preparation programs and value professional development in STEM education for their faculty. EPDC Specialists at the NASA Centers frequently provide online professional development for the Emerging Stars institutions, and in April Texas State piloted the first in a series of face-to-face workshops with Emerging Stars member Huston-Tillotson University in Austin. A total of 32 pre-service and in-service teachers from two MSIs participated in the event along with the STEM teacher educators from these two programs. The evening workshop and “learning supper” was titled “Recognizing and Fostering the Ingenuity of All Students in the STEM Classroom” and was led by Dr. Araceli Ortiz, principal investigator of the NASA STEM EPDC. The second and third events are planned for the 2015-16 school year.



Educator Feedback

“I developed an understanding of the inquiry method of teaching with cooperative groups. I returned from those classes and immediately instituted the four roles within the students’ cooperative groupings. I also began to more effectively execute the inquiry method of teaching, which helped my students be more successful in solving math challenges within their groups. As I became more proficient in this method, the students began to blossom while trying to find answers to my guiding questions. They slowly transitioned from worrying about getting ‘the right answer’ to finding answers using different strategies.”

Elementary mathematics teacher

Strategies for Diverse Student Populations and Respect for Teacher Needs

NASA STEM EPDC is committed to helping teachers provide high-quality STEM education for all students through the use of culturally responsive instructional strategies that promote success among diverse student populations. Such a commitment requires reaching out to educators and tailoring professional development that meets the needs of their students and addresses their district priorities. The following two EPDC initiatives are prime examples of such an approach.

THE EMERGING STARS COMMUNITY AMBASSADORS INITIATIVE

One vehicle for reaching educators wherever they may be employed is the Emerging Stars Community Ambassador Initiative, co-facilitated by EPDC and its partner U.S. Satellite Laboratory, the developer of the NASA Endeavor Science Teaching Certificate Project, sponsored by NASA from FY09-FY13. The Emerging Stars initiative will train, support and follow 300 middle school STEM educators from 50 states and U.S. territories over the course of the project. In this EPD online initiative, mathematics, science and technology teachers serving middle grade underrepresented student populations will earn ambassadorships. Sixty educators will participate each year (for a total of 300 over the life of the project) in a series of 12-week online STEM education courses and in doing so will become members of a dynamic online community of educators. As ambassadors, participating teachers earn college credit and will serve as a STEM education resource to other teachers in their communities and will promote the use of NASA resources and innovative instructional techniques in addressing the needs of all students.

The first cohort of 23 community ambassadors representing 11 states began their programs in February and have now completed their initial course, titled “Methods of STEM Education: A Virtual Interactive Course with Culturally Relevant Pedagogy for Upper Elementary-Middle School Educators,” taught by Dr. Felicia Moore Mensah of Teachers College, Columbia University. Recruitment is currently under way for Cohort 2, which will include 40 teachers and will begin in late September.



EPDC EMPHASIZES HIGH-QUALITY STEM EDUCATION FOR ALL STUDENTS

- Through the Community Ambassadors Initiative educators earn college credit and serve as STEM leaders for their schools.
- The EPDC Alliance provides professional development services and recognition to partners.

THE NASA EPDC ALLIANCE

The NASA EPDC Alliance is based upon an understanding that educator professional development is most effective when it engages teachers in meaningful work with their professional colleagues over a period of months or years. The NASA EPDC Alliance is a partnership between EPDC and selected EPDCs to provide personalized professional development utilizing NASA PD resources that is recognized and valued by EPDCs. By working closely with the district in an ongoing manner, EPDC educational specialists and university faculty can not only design and deliver professional development tailored to a district’s specific need, but they can also help teachers identify other specific NASA professional development opportunities such as summer institutes, webinars and badging opportunities tailored to their individualized needs and interests. Arrangements are made with districts to provide teachers with continuing education or district PD credit and/or other incentives that encourage and reward their participation.

Currently, EPDC Specialists are both recruiting new districts for the alliance and are formalizing agreements with districts that they have worked closely with over the years. For example, this summer, Brownsville ISD in Texas supported approximately 20 of their middle school mathematics teachers in participating in a weeklong EPDC summer institute delivered at Texas State University in San Marcos and the Johnson Space Center in Houston. An upcoming event that will involve EPDC Alliance members is a November 2 professional development day tailored specifically for three area districts that have for years worked closely with Marshall Space Flight Center in Huntsville, Alabama.

Educator Feedback

“Every visit, our EPDC Specialist comes with supplies, materials, games and methodologies for inspiring teachers and students. At the end of every presentation, it is the teachers who are sorry to see her go. As the administrator, I am THRILLED to see her coming, knowing that my team and I will grow. ... It is presentations such as these that allow us to take our students to the next level.”

School principal in California

EPDC YEAR 2 PRIORITIES

- **Deliver new professional development with a culturally responsive teaching focus.** This PD will integrate the work of the NASA Mission Directorates and bring to educators cutting-edge, relevant content aligned with state and national curriculum standards
- **Expand the offerings of the NASA EPDC Badging System** and expand partnerships with school districts to ensure that the digital badges earned by teachers meet district and teacher needs and are valued and recognized by the districts
- **Expand and refine the EPDC website** so that it becomes a highly valuable resource to educators and the “go to” place to learn about STEM PD opportunities and NASA resources for educators
- **Expand partnerships with additional MSIs and school districts** to better serve the professional development needs of pre-service and in-service educators, university faculty who prepare STEM teachers and informal educators
- **Research the effects of various STEM professional development experiences** and delivery avenues to advance the fields of STEM pedagogy and STEM educator professional development

Progress Toward Goals and A Look Ahead

In its first year of operation, EPDC achieved a number of key milestones that create a solid infrastructure for leveraging NASA's unique assets and resources to provide high-quality STEM-related professional development to the nation's teachers and informal educators. Noteworthy among these accomplishments is building the exceptional team of STEM educators who comprise the EPDC Specialists and forging strong working relationships with the 10 NASA Centers. In addition, the EPDC MSI Teacher Educator Network partnership has been highly productive in developing resources and delivering professional development to better equip teachers to meet the needs of highly diverse student populations. EPDC is expanding our work with additional MSIs through the Emerging Stars Network and with additional school districts through the School District Alliance.

EPDC online professional development offerings encompass a large portfolio of weekly webinars delivered by the EPDC Specialists, online graduate course offerings in STEM education delivered in partnership with U.S. Satellite, and the newly launched NASA STAR (STEM Teacher Achievement and Recognition) Badging System, through which teachers can earn digital badges in a variety of STEM content areas. EPDC staff has also launched a website and has successfully implemented a comprehensive event management and evaluation system that will improve data reporting, evaluation and research efforts to investigate the effects of professional development on teacher practices.

The EPDC leadership team has identified a number of priorities for Year 2. In the upcoming year, we will continue to pursue our goals for equity and outreach to diverse audiences. We will increase the breadth of coverage through expanded networks of Minority Serving Institution partners, school districts and faculty alliances. Further, we will continue to leverage the use and impact of the EPDC online learning offerings and a digital badging system. True to our priorities, we will continue to share with our educator audiences the exciting and relevant NASA missions, technologies and resources.

As we look ahead to the remaining four years of our cooperative agreement with NASA, we are highly optimistic and energized and are confident that the best of the NASA STEM EPDC is yet to come.



NASA astronaut Suni Williams exits a test version of the Orion spacecraft in the agency's Neutral Buoyancy Lab in Houston on October 6-8, 2015. Photo courtesy of NASA.



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NASA STEM EPDC

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