

Texas Space Grant Consortium (TSGC)
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Lines of Business (LOB): NASA Internships, Fellowships, and Scholarships; STEM Engagement; Institutional Engagement; Educator Professional Development

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Texas Space Grant Consortium is a Designated Consortium funded at a base level of \$360,000 and Augmentation level of \$400,000 for fiscal year 2016.

PROGRAM GOALS

The TSGC strategic goals align with NASA's Educational Outcomes. Our goals and programs serve multiple constituencies with emphases on customer focus, NASA-related content, the STEM (Science, Technology, Engineering and Math) pipeline, increased diversity, effective evaluation of programs, the development of partnerships, and program sustainability. NASA's Educational Outcomes and how TSGC's goals support them are summarized below.

NASA LOB Institutional Engagement (Capacity, Content, Diversity, Sustainability, Network and Community)

TSGC Goal A: *Diversity, Increase and Enhance Minority / Underserved Participation in our programs:* TSGC has a primary focus on increasing the number of minorities and females in its programs. In our *Design Challenge* workforce program, 112 students participated and 41 were minorities and 13 were Female. In 2016, we had 67 directly funded students in our Fellowship and Scholarship (F&S) category, (24 females and 43 males). Out of our 67 directly funded students 25 were underrepresented minorities, (37%). (36% female).

Community College Partnerships

We continue to sustain community college partnerships. We currently have 6 Community College affiliates. We have also sustained these partnerships through our C2 STEM Community College Technical STEM Grant.

TSGC Goal B: *Workforce Development and Higher Education:* Our ongoing *Design Challenge* matches design problems suggested by NASA JSC engineering personnel with capstone engineering design classes at our affiliates. During Spring 2016 and Fall 2016 the program involved 23 design teams and about 50 space professionals (JSC mentors, topic providers, judges) participated in the program. Details are given later in this report

TSGC Goal C: *Research Infrastructure:* (TSGC New Investigator Program). We competitively award research initiation grants to assist new faculty members / researchers at our affiliates in research aligned with NASA's strategic plan.

NASA LOB Internships, Fellowships and Scholarships

TSGC Goal D: *Fellowship, Scholarships and Longitudinal Tracking:* We have successfully tracked 100% of our students for 2016 who are still enrolled. We have determined that in the last five years, approximately 85% of students significantly supported went on to next steps in STEM disciplines.

NASA LOB Educator Professional development

TSGC Goal F: *Precollege and K-12:* Our flagship program, *LiftOff*, continues to provide exemplary STEM professional development for K-12 educators. 51 teachers attended LiftOff 2016 receive 40 hours of continuing education credit with the theme, Exploration: Past - Present - Future. Of the 51 selected, 14 were funded by Space Grant Consortia from other states. Follow-on evaluation results show those attending used NASA materials received with 11,922 students in the classroom and in science clubs and shared resources gained with an additional 2,000 teachers. TSGC staff trained 220 pre-service and classroom teachers to conduct *Family STEM Science Nights* in underrepresented, underserved areas of the state that were attended by 1,700. NASA STEM hands-on activities were implemented with 1,900 students at schools.

NASA LOB STEM Engagement

TSGC Goal E: *General public, informal education and public awareness:* We provided training for the Boy Scouts Leaders, Girl Start, Climate Day volunteers and Boys and Girls Clubs reaching a total of 185 informal educators. We hosted exhibits and hands-on activities at the Earth Science Day Career Fair, Space Exploration Educator Conference, Conference for the Advancement of Science Teachers, Climate Day, and Hot Science Cool Talks reaching over 2,710.

TSGC Goal G: *Internal management:* We continue to focus on management efficiency and effectiveness in all of our activities. We have only one face-to-face affiliate meeting and one face-to-face board meeting each year to reduce travel costs. We have increased our usage of email, teleconferencing, and web-conferencing. We conducted one face-to-face Affiliate and Board of Directors Meeting in the Fall 2016.

PROGRAM/PROJECT BENEFIT TO PROGRAM NASA LOB'S

NASA LOB Internships, Fellowships and Scholarships

As stated earlier, we directly funded 67 students in our F&S category (35.8 % female, 37% underrepresented minorities). To demonstrate the impact of the Fellowship and Scholarship programs, we provide a quote from a 2016 awardee below.

“It assisted in funding to pursue my dream career of performing research in the industry on military aircraft and UAVs. I currently work at SwRI in the Defense & Intelligence Solutions Division primarily performing work on the A-10 aircraft ranging from Data Analysis and Modeling, Systems Engineering and Maintenance, and Hardware and Software upgrades. Working at SwRI also allows me to work on internal research projects, namely cutting edge UAV research consisting of Computer Vision and Deep Learning for completely autonomous UAVs. (Isaac Corley, 2015-2016 STEM (Science, Technology, Engineering, Math) Columbia Crew Memorial Scholarship-TAMU Kingsville)

NASA LOB Educator Professional development

LiftOff, TSGC’s flagship K-12 program, focuses on teacher STEM education. Motivated teachers return to classrooms to excite students in STEM careers, helping to fill the STEM pipeline. Since 1990, TSGC has conducted an annual weeklong summer teacher workshop, *LiftOff*, at NASA JSC. External evaluation results reported:

The teachers’ narrative comments indicated they experienced specific elements as “beyond amazing and not only entertaining but truly awe worthy!”, “had chills from start to finish...this experience can never be topped”, “completely unaware of all this work until now...this was great stuff, very cool!”, “excellent, un-believable good”, “extremely motivational”, “completely useful”, “out of this world and so motivational!”, “loved the activities,” “awesome to see the advances!”, “impressed to see a female engineer!”, “awesome!”.

The narratives also showed the teachers have intentions to make use of what they gained from the workshop. They said, “great activities we can use in the classroom”, “I will use this activity, awesome...very applicable to my classroom”, “good information to take back to my classes”, “I will use a lot of this”, “great activities I can implement in my classes”, “this is perfect to enhance my lessons...many people do not think of these things...can do this as a project in class!”, “I want her to visit my campus”, “absolutely awesome...physics classes would LOVE this”.

NASA LOB STEM ENGAGEMENT

The total number of students receiving STEM resources and activities from TSGC in 2016 was 14,632. We are able to leverage our resources by partnering with the Rio Grande Valley Science Association (RGVSA), Boy Scouts, Women in Engineering, Girl Start, Texas Education Agency and Texas Regional Collaborative for Math and Science to expand our reach to both formal and informal education providers. The *LiftOff* program gives priority to teachers who reach underrepresented and underserved audiences. In follow-up evaluations, the *LiftOff* participants reported they teach over 11,922 students of which 20% are African American, 5% Asian, 36% are Hispanic, 1% Native American, and 38% Caucasian.

PROGRAM ACCOMPLISHMENTS TO NASA LOB'S
NASA LOB Internships, Fellowships and Scholarships

TSGC Goal D - Fellowship and Scholarships and Longitudinal Tracking: TSGC annually awards Fellowship and Scholarships. In 2016 we received 425 applications in our online system, we received 108 were complete online applications which were reviewed. We awarded 46 Scholarships (16 females, 30 males) (21 minorities, 20 Caucasian and 5 Asian), 21 Fellowships (8 females, 13 males) (4 minorities, 2 disabled, 18 Caucasian). We also awarded 31 *Design Challenge* Academic Scholarships (28 males, 3 females, 1 disabled, 12 Minorities, 19 Caucasian).

Fellowships/Scholarships (F&S) and Longitudinal Tracking Texas Space Grant has implemented a comprehensive longitudinal tracking program for all significantly supported students funded by its programs. This integrated system is designed to stay in touch with and regularly survey program participants as they progress through their education and career. It is based upon a balanced blend of automation and direct human interaction to maintain contact with program participants. The system utilizes automated, customizable surveys requests to gather up-to-date information on the participant's history of NASA program involvement, education, employment and antidotal responses regarding the impact of their participation on their education and careers. When participants are not responsive to the surveys the system utilizes automated and manual searches on popular social media sites such as Facebook, LinkedIn, and Google+; university websites; and on-line employer databases. We were able to determine that 85% of students significantly supported from 2006-2016 went onto next steps in STEM disciplines. 58 students took next step in FY15 (SG participation supported from FY06-FY15 funds), 20 are pursuing advanced degrees in STEM disciplines, 5 are seeking STEM Positions, 4 accepted STEM positions at NASA contractors, 14 accepted STEM positions in industry, 1 accepted a position at NASA, 2 accepted STEM positions in K-12 academia, 3 accepted STEM positions in academia, 9 went on to positions in non-STEM disciplines. All 2016 supported students are still enrolled and are currently being tracked for their next step.

NASA LOB Institutional Engagement

TSGC Goal B - Workforce Development and Higher Education: Our *Design Challenge* matches undergraduate student design teams from TSGC affiliates with NASA mentors and real-world space-related design projects. In addition to the student designs, the program has resulted in the development of interdisciplinary space-related courses at participating affiliates. During Spring 2016-Fall 2016, 23 teams at 12 TSGC affiliates participated in the *Design Challenge*. 109 students participated in the program (14 females, 95 males) (44 minorities, 52 Caucasian, 11 Asian, 2 Pacific Islanders) (40% minority participation). Design Teams that participated in the Spring 2016 program were: Lamar University Team L.U.M.A.R.D (Topic: Mars Drill Design), San Jacinto College; The Nanocougs (Topic: Cooling System for Batteries), University of North Texas, Team, Team Iron Iris (Topic: Initial Settlement Village), Team Eagle Engineers (Topic: Space Wifi Mobile) University of Texas Rio Grande Valley, SICOFT (Topic: Olfactory Delivery System); Texas State San Marcos, Team Texas State Wrecking Crew (Topic: Olfactory Delivery System); UT Austin, Team Laundromeda (Topic: Washing Sanitizing System); Lonestar College Cyfair; Team CyDucks (Topic: Leak Determination of Li-Ion Battery Cells); Texas A&M Kingsville;

Team V3 (Topic: Low Force Orbital Cold Plate Design); Prairie View A&M University; *Team Las Panteras De Prairie View* (Topic: Impact Modeling on Windows).

Design Teams that participated in the Fall 2016 program were: University of North Texas; *Team SpatiumLucis* (Topic: *Intelligent Lighting Control*); Lamar University *Team LAMDA* (Topic: Dual Use wideband Microphone Array); San Jacinto College *Team Glaciators* (Topic: Ice 3D Printer); UT Arlington *Team Logical Legacy* (Topic: Prototype of a Space Wifi Modile); San Jacinto and University of Houston Clear Lake *Team Light Integration Technologies* (Topic: Intelligent Lighting Control); UT Austin *Team Marsdrill* (Topic: Marsdrill); Lamar University *Team Lamar Launderers* (Topic: Clothing washing or sanitizing system for Space Flight) Lamar University *Team MEEN Machine* (Topic: Mars Sample Return System); University of Houston Downtown *Team Gator Swamp Lab* (Topic: Mars Field Lab); Lonestar College *Team Cyclone* (Topic: Mars Drill); Texas State San Marcos *Team Orion* (Topic: Orion Heat Shield); University of North Texas *Team Iris* (Topic: Internet protocol addressing in Space); Tx A&M Kingsville *Team Dotterweich Engineers* (Topic: Field Installation for Electrical Bulkheads).

TSGC Goal B - Higher Education Proposal Opportunities: We competitively award new higher education projects to faculty and staff members at our affiliates at a \$10K level matched with \$10K from their home institutions. Our Higher Education Affiliate project continues in 2016 which was awarded to Lone Star College-Montgomery “The Biological Impact of a simulated Martian Environment as an Undergraduate Research Platform for STEM Education” PI: Dr. Daniel Kainer (1 male, Caucasian).

TSGC Goal C - Research/New Investigator Program: TSGC provides research start-up funding of \$10K, matched by the recipient’s home institution, to new faculty each year. These funds are awarded competitively to young investigators starting space-related research programs. We awarded one new Research proposal to Dr. Maruthi Sridhar Bhaskar of Texas Southern University for the proposal titled: “Impact of Landscape and Environmental changes on the Water quality of Galveston Bay, Tx.

NASA LOB Educator Professional Development

TSGC Goal F - K-12 Education Program: TSGC’s K-12 program focuses on teacher education to leverage the excitement of teachers to help fill the STEM pipeline. Since 1990, TSGC has conducted an annual weeklong summer teacher workshop, *LiftOff*, at NASA JSC. The theme for *LiftOff 2016* was “Exploration: Past – Present – Future.” 51 teachers attended the weeklong workshop. Of the total, 44 were female and 7 male, (12 were minorities: 7 Hispanic, 4 African American, and 1 Pacific Islander. 40 Caucasian) (25% minority, 80% female). In addition to the *LiftOff* summer program at JSC, the *LiftOff Alumni Teachers* conduct space-related professional development training which reaches approximately 2,500 teachers annually.

TSGC Goal F - K-12 Education Grants: TSGC provides K-12 Education grants matched by the recipient’s home institution, to affiliate faculty each year. These funds are awarded competitively. In 2016, we awarded three new \$10,000 K-12 projects. One at University of Texas at Austin, “Solar Eclipse”, PI: Ms. Margaret Baguio (1 female, Caucasian) Another with GirlStart Nonprofit organization, “GirlStart-Year-Round STEM Education for Girls” PI: Ms.

Tamara Hudgins (1 female, Caucasian) and University of Texas at Tyler, "Orion Journey to Mars: Bringing NASA Programming to Diverse Rural Settings.", PI: Dr. Julie Delello (1 Female, Caucasian).

TSGC Goal F - K-12 Education: The Student Spaceflight Experiments Program (SSEP):

We funded the SSEP program (\$20,000) and have currently supported Pharr School districts. The program gives typically 300+ students across a participating community the ability to design and propose real microgravity experiments to fly in low Earth orbit (experiments conducted in a "weightless" environment)". Goals include: 1) immerses students across a local community in a high profile science competition that is meant to result in spaceflight experiments designed by the students-the Flight Experiment Design Competition--in this case, an experiment to fly aboard the International Space Station (ISS) via "SSEP Mission 11 to ISS", and 2) leverages the excitement by wrapping community-wide science education programming around the experience-the Community Program. It is about engaging students, their teachers, and their families in science education, with a focus on the process of inquiry, and in a manner that is customized to a school district's strategic needs in STEM (science, technology, engineering, and mathematics) education.

TSGC Goal F - K-12 Education: Zero Robotics. We funded the Zero Robotics program (\$15,000) at Texas A&M University, to support Zero Robotic teams participating. Zero Robotics is a computer programming challenge designed to cultivate interest in Science, Technology Engineering and Mathematics (STEM) by giving middle and high school students unprecedented access to the International Space Station (ISS). Students learn to control free-flying satellites known as Synchronized Position Hold, Engage, Reorient, Experimental Satellites (SPHERES) aboard the ISS, through computer programming and simulations. Finalists ultimately go head-to-head against teams from across the country (middle school) or world (high school), while astronauts referee the final competition live from space using the SPHERES. The SPHERES afford the perfect testing ground for this task because they provide a risk-tolerant environment for students to use ISS hardware, all while advancing space research through an annual challenge relevant to future space missions.

TSGC Goal F - Teacher professional development short term activities: During 2016, we conducted workshops at The National Science Teacher Association (NSTA) meeting, NASA Wavelength for the Science Mission Directorate, Conference for the Advancement of Science Teachers (CAST), the Space Exploration Educator Conference (SEEC), Rio Grande Valley Science Association (RGVSA), Austin Independent School District, and Texas Regional Collaborative for Science and Math. TSGC Outreach staff conducted professional development to 595 educators who implemented programs with over 5,000 youth.

NASA LOB STEM Engagement

Student outreach STEM initiatives:

TSGC was the recipient of a Science Mission Directorate grant titled STEM Enhancement in Earth Science. This grant continued an earth science STEM high school internship program from the NASA GRACE mission. In summer 2016, 30 students were selected nationwide from 585 applicants. Students conducted 60 hours of distance learning events while being mentored by

faculty, NASA scientists, and graduate students and then participated in an on-site two week residential internship program where they conducted authentic research while being mentored by project scientists. 53% were female and 47% male. 75% of the student participants were underrepresented minorities and females. We selected 2 educators to serve as coordinators for the summer program and evaluation shows they increased their knowledge in earth and space science through this participation.

TSGC Goal E – *Informal Education* We maintain an extensive website (www.tsgc.utexas.edu) and a TSGC fan Facebook page (<http://www.facebook.com/pages/NASA-Texas-Space-Grant/286095539201?v=wall>) with over 2,487 fans to date. We also maintain a Twitter page with 664 followers. We advertise our programs through the Education EXPRESS newsletter. The Education EXPRESS message was sent to 22,784 EXPRESS subscribers, and shared with 46.65 thousand NASA Education Twitter followers and 21.3 million NASA Twitter followers. Through the use of social media, content from the EXPRESS message has the potential to be shared with approximately 20 million people.

TSGC has taken the lead in connecting informal education organizations, such as the *Boys and Girls Clubs*, *Boy Scouts*, and 4-H with NASA STEM curriculum, leveraging activities developed in our support of the *Summer of Innovation Program*. TSGC participated in numerous elementary, middle and high school programs, both short and long-term in 2016. In total, these activities reached 5,515 students, teachers, and parents.

TSGC Goal G - *Management and Infrastructure*: We continue to seek ways to manage our program activities more efficiently. We review our strategic plan annually, seek external support, require matching from affiliates on most of our programs, and augment activities initiated by other groups whenever possible. We leverage programs wherever possible.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE GOALS

Diversity

Student data and Longitudinal Tracking: We had 67 directly funded students in our Fellowship and Scholarship (F&S) category, (24 females and 43 males) 35.8 % were female. Out of our 67 directly funded students 25 were underrepresented minorities, (37%). In our Design Challenge program we had 40% Minority participation. Over the last 6 years, 85% of our funded students moved on to STEM disciplines

Minority Serving Institution Collaborations: The Education and Outreach staff of TSGC supported programs and proposals by affiliates, institutions, and partners that serve underrepresented and underserved populations. Minority Serving Institution involvement in our programs and proposals is one of our main focuses. Our F&S Selection Committee is comprised of three members with two of the members from MSIs (UT El Paso, Texas A&M Kingsville, Texas Tech). We continue to advertise our programs with as many of the student chapters of minority and women student organizations at our affiliates as we can obtain contact information for. TSGC also promotes the NASA JSC Pre-Service Institute to all minority serving institutions. Our collaboration with the Rio Grande Valley Science Association (RGVSA) has provided NASA resources to a largely Hispanic population in the Rio Grande Valley of south Texas along the

Mexican border. The “NASA STEM Nights”, co-sponsored by TSGC and RGVSA reaches Hispanic students along the Mexico border of south Texas, the Student Spaceflight Experiment Program supports underserved youth in underrepresented areas of the state, the Women in Engineering program provides female mentors for girls interested in engineering as a profession. We continue to provide NASA STEM resources to the Texas School for the Blind and Visually Impaired students, staff, and teachers who serve this disabled and often underrepresented audience.

Office of Education Annual Performance Indicators:

API ED-16-1 *Assure that students participating in NASA higher education projects are representative of the diversity of the Nation.* Number of NIFS to racially or ethnically underrepresented students, women, and persons with disabilities.

- Goals (41% minority, 40% female). Actual percentages in Design Challenge, (40% minorities and one disabled) in our F&S, (37% minority and 36% Female) and in Educator Liftoff Program (25% minority and 80% Female).

API ED-16-2 *Provide number of educators that participate in NASA professional Development.*

- 3,069 in-service teachers and 50 pre-service teachers through TSGC Pre-college programs
- 963 educators through our K-12 Girlstart program which we funded through our K-12 Proposal opportunity were trained in Professional Development.
- TSGC Outreach staff conducted professional development to 595 educators who implemented programs with over 5,000 youth.
- the *LiftOff Alumni Teachers* conduct space-related professional development training which reaches approximately 2,500 teachers annually.

API ED-16-4 *Continue to provide opportunities for learners to engage in STEM education through NASA unique content provided to informal education institutions designed to inspire and educate the public.*

- 2,990 K-12 (**All Girls**) reached in 2016 Girlstart program after school and summer STEM Camps.
- 12,259 Girls and community members were reached with the Girlstart Program Community Public STEM Programing totaling 15,249 girls and community members.

API ED-16-5 *Continue to provide opportunities for learners to engage in STEM education through NASA unique content provided to informal education institutions designed to inspire and educate the public.*

- Number of Informal Education Events in 2016: 30
- TSGC participated in numerous elementary, middle and high school programs, both short and long-term in 2016. In total, these activities reached 5,515 students, teachers, and parents.

IMPROVEMENTS MADE IN THE PAST YEAR

1) **Community College Collaboration:** Led by San Jacinto College, TSGC Community Colleges continue to collaborate with the C2Stem Transitions Program, which has the goals of providing STEM Scholarships, Aerospace Scholarships, Student Success Initiatives, Internship and Course Development. 2) **New Affiliates:** Austin Astronomical Society and Capitol Area Council Boy Scouts of America. 3) **K-12 Education:** Provided instructors and logistics for the NASA RGVSA NASA Family STEM Science Nights in the Rio Grande Valley which reached over 5,364 students, parents, and teachers. We are the recipient of a NASA Science Mission Directorate Education CAN to expand the high school intern program. Outreach staff joined the state collaborative for STEM education which meets monthly. Our Outreach Coordinator Ms. Margaret Baguio is 2016 Recipient of the Alan Shepard Technology in Education Award has been selected as a Teacher Liaison for the Space Foundation. Two other Liftoff Alumni teachers received this award as well (Kaye Ebelt and Molly Nipper) This is a group of 200 educators from 33 states in the U.S., South America, Africa, Australia, and Asia. Celena Miller, former Liftoff teacher and the teacher who led the SSEP in McAllen, received the President's Award for Outstanding Science teaching.

CURRENT AND PROJECTED CHALLENGES

2016 we have been in the process of transitioning change in Director with the retirement of Dr. Wallace Fowler effective January 31, 2017. We had our Affiliates concur to the change. Timing of our Augmentations funds received was another challenge getting them late in the 2016 year due to a minor change to our Augmentation proposal to include evaluation paragraph of our programs. Another challenge continues to be the small amount of funding relative to the size of the audiences served. As one of the largest state consortia with a correspondingly large minority population. We will continue to support our highly successful flagship projects (LiftOff and the Design Challenge) and will award the remainder of the available funds competitively to our affiliates. As a result, the majority of our affiliates are not recipients of direct F&S Space Grant funding in any given year. Highly leveraging our activities will remain as our primary mode of operations.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

TSGC is structured to provide strong management input and oversight by representatives of its 59 affiliate institutions. Most affiliate representatives play a vital role in defining Consortium operations, goals, and funding distribution and are provided with many avenues for participation in consortium management and programs. They advertise and encourage students to apply for our scholarships, fellowships, and NASA internships, and STEM Space Grant and NASA programs, Review scholarship / fellowship applications, review proposals, assist in tracking program participants, and help to recruit and keep students involved in STEM activities. Below we list all TSGC affiliate members (MSIs are indicated by boldface type).

Four Year University Affiliates (37) - **Angelo State University**, Baylor University, Lamar University, **Prairie View A&M University**, Rice University, Sam Houston State University, Southern Methodist University, **Sul Ross State University**, Tarleton State University, Texas A&M University, Texas A&M University Commerce, **Texas A&M University Corpus Christi**, **Texas A&M International University**, **Texas A&M University Kingsville**, **Texas A&M Texarkana**, Texas Christian University, **Texas Southern University**, **Texas State University – San Marcos**, Texas Tech University, Trinity University, University of Dallas, **University of Houston**, **University of Houston Downtown**, **University of Houston Clear Lake**, University of North Texas, University of Texas at Arlington, University of Texas at Austin, University of Texas

at Dallas, **University of Texas El Paso**, UT Health Science Center Houston, **UT Health Science Center San Antonio**, UT Medical Branch Galveston, **University of Texas San Antonio**, UT Southwestern Medical Center, University of Texas at Tyler, **University of Texas Rio Grande Valley**, **University of St. Thomas**.

Community College Affiliates – (6) - **San Jacinto College, Houston Community College, Austin Community College, El Paso Community College**, McLennan Community College, Lone Star College System.

Industry / State Agency / Non-profit Affiliates – (16) Texas Museum of Science and Technology, Bob Bullock State History Museum, Don Harrington Discovery Center, Lockheed Martin, Office of the Governor, Southwest Research Institute, Texas Higher Education Coordinating Board, United Space Alliance, University Space Research Association, Girlstart, Texas Medical Center, Rio Grande Valley Science Association, National Society of Black Engineers, Scobee Education Center, Seal of Valor, Austin Astronomical Society and Capitol Area Council Boy Scouts of America.

PARTNERSHIPS AND COLLABORATIONS

Key partnerships were sustained in 2016 including collaborations with area school districts, Student Spaceflight Experiment Program, NASA JSC Pre-Service Teacher Institute, Texas Regional Collaborative for Science, the Boys and Girls Clubs in Texas, Central Texas STEM Resource Center, and the Texas School for the Blind and Visually Impaired to provide quality STEM education programs utilizing NASA resources. New partner programs were added with 5 school districts, one area museum, and NASA JSC Network of States. We collaborate with SSEP program and Zero Robotics. Strong collaboration continues with JSC and NASA mentors with our Design Challenge as all detailed in this report above.