ANNUAL PERFORMANCE REPORT

JUNE 1, 2018 – MAY 31, 2019

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NSPACE
NASA STEM Pathway Activities – Consortium for Education

Cooperative Agreements
(80NSSC17M0021, 80NSSC17M0022,
80NSSC17M0023, and 80NSSC17M0024)

A NOTE FROM THE PI

With 50+ years of expertise and experience, Oklahoma State University proudly continues to serve NASA STEM Engagement initiatives and students and educators across the nation by aligning itself with NASA's missions and goals. NSPACE is comprised of a phenomenal team of professionals who work tirelessly to implement excellence in online and face-to-face learning experiences.

During Year Two, NSPACE reached over 155,000 students and over 19,000 educators through our continuing — plus four newly developed — activities. We reached a goal this year of implementing onsite experiences at each of the 10 NASA Centers across the nation. To facilitate this growth, our team has doubled since 2017.

To support the progress of this outstanding staff, we gathered on the OSU campus in Stillwater, Oklahoma, for a Professional Development Leadership Summit featuring expert researchers in STEM education, engineering, online teaching and learning, team building and reaching and serving underrepresented populations. Additionally, we implemented a Ph.D. in Education cohort for NASA professionals seeking a higher degree. These students are able to take advantage of a reduced tuition rate as OSU employees and maximize learning opportunities through hybrid (online with face-to-face meetings at NASA's Johnson Space Center) delivery of coursework. We have begun development of an online community of practice to centralize innovative, research-based professional development and collaborative learning opportunities for all NSPACE employees, and we are exploring the possibility of expanding the Ph.D. cohort opportunity to employees at all 10 NASA Centers.

Along with our partners — the 13-campus Texas A&M University system, 4-H, the Center for Sovereign Nations, Langston University, Northern Oklahoma College and Technology for Learning Consortium, Inc. — we are capitalizing on successes of the past to better serve the future of space exploration as NASA works towards a lunar presence and then on to Mars. The highlights of each activity on the following pages will give you a glimpse of the impact of this important work.

— Dr. Stansberry

Associate Professor, Educational Technology

Co-Investigator, NASA STEM Pathway Activities – Consortium for Education (NSPACE)

Founder, Emerging Technologies and Creativity Research Lab

NASA EXPLORES

NASA's VISION *To discover and expand knowledge for the benefit of humanity.*

NASA's MISSION *Lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the Solar System and bring new knowledge and opportunities back to Earth. Support growth of the Nation's economy in space and aeronautics, increase understanding of the Universe and our place in it, work with industry to improve America's aerospace technologies, and advance American leadership.*

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Quotes found in this report are from a third-party evaluation report. The external evaluator withholds names to protect participant privacy.

NASA'S OFFICE OF STEM ENGAGEMENT FOCUS AREAS

Building a diverse, skilled, future workforce

Enabling contributions to NASA's work

Strengthening STEM through connections to NASA

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL'S COMMITTEE OF STEM PRIORITIES

- Improve STEM Instruction
- Better Serve Groups Historically Under-represented in STEM Fields
- Enhance STEM Experience of Undergraduate Students
- Design Graduate Education for Tomorrow's STEM Workforce
- Increase and Sustain Youth and Public Engagement in STEM

EXECUTIVE SUMMARY–YEAR TWO

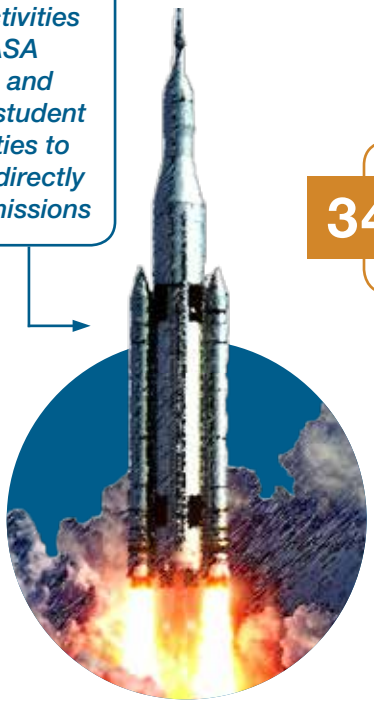
NASA STEM Pathway Activities – Consortium for Education (NSPACE)

Oklahoma State University (OSU) leads the consortium of seven partners, including 13 institutions with the TAMU System, Langston University, OSU Center for Sovereign Nations, Northern Oklahoma College, the Oklahoma 4-H Foundation and the Technology for Learning Consortium, in the mission to collaborate with NASA's Johnson Space Center, agency mission directorates and NASA Headquarters to provide competitive and innovative STEM engagement opportunities to kindergarten through graduate students and educators.

The goals of OSU's NSPACE project are to deliver a nationwide approach to NASA's goals to improve STEM instruction; to increase and sustain youth and public engagement in STEM; to enhance the STEM experience of undergraduate students; to better serve groups historically underrepresented in STEM fields; and to design education for tomorrow's STEM workforce.

https://education.okstate.edu/nasa.html

Aligning activities with NASA missions and increasing student opportunities to contribute directly to NASA's missions



34% *of NSPACE employees are alumni of NASA STEM Engagement activities*

Transitioned to new communication software, Zoom, providing more effective web conferences

7 *employees working on advanced degrees*

Hosted NSPACE Summit at OSU, providing employees targeted professional development aligning with NASA's missions and goals

18% *Increase in full-time NSPACE employees*

Expanded weekly NSPACE meeting to include personnel at four NASA Centers, helping NSPACE reach a national audience and consistent messaging

YEAR 2 TRIUMPHS

15
NSPACE activities

4
New activities launched

155K+
Students reached

19K+
Educators reached

51
States and territories reached

1.3B+
People reached through Twitter, Instagram, Facebook and other social media platforms

BEGINNING ENGINEERING, SCIENCE, and TECHNOLOGY

BEST

Focus Area: Strengthening STEM through connections to NASA

"In robotics, I really like it to be child directed. With the BEST activity, I can now use the engineering design process because it adds accountability."

– 6th grade science and robotics teacher

https://go.nasa.gov/best

NASA's Beginning Engineering, Science and Technology (BEST) introduces the principles of engineering to audiences through hands-on, NASA-themed activities applying the engineering design process to solve problems and generate solutions. BEST activities help develop a unique combination of 21st century learning and innovation skills including creativity, critical thinking, problem solving, communication and collaboration. NASA's BEST supports educators in implementing activities through conferences, face-to-face institutes, professional development sessions and webinars.

IMPROVEMENTS

NASA's BEST engineering design process model is integrated into NASA Professional Development workshops at all six NASA BEST Centers. ◆

ON THE HORIZON

Release of BEST Activity Guide – Engineering Design Challenges for Students which includes three new sections.

YEAR 2 TRIUMPHS

1,741

Educators and students participated in NASA's BEST activities in nine states

61

BEST digital badging certificates awarded to teachers

270

Students conducted BEST activities at two special events

163

Educators reached with five presentations at three conferences

202

Educators reached through nine in-person workshops

COMMERCIAL CREW PROGRAM

CCP

"Excellent to hear from the expert and to connect the knowledge with a hands-on activity. Thank you!"

– Educator

https://www.nasa.gov/stem/ccp

Focus Area: Strengthening STEM through connections to NASA

The Commercial Crew Program (CCP) Next Generation STEM pilot provides integrated, evidence-based, authentic experiences and educational content for students and educators focusing on informing and inspiring the future workforce about the Agency's program to launch American astronauts in American rockets from American soil. CCP capitalizes on the excitement surrounding Boeing and SpaceX building and launching crewed spacecraft to the International Space Station while providing educational content with NASA-unique resources for this historic time in human spaceflight.

IMPROVEMENTS

Ordered a set of 10 Oculus Go headsets and the accompanying gear for the CCP Next Generation STEM virtual reality field trips, increasing NASA's Johnson Space Center's ability to demo this new educational technology.

Continuing beta testing of all educator resources in development during the initial pilot phase of the CCP Next Generation STEM program. Subsequent revisions have been made to adjust for student and educator feedback.

ON THE HORIZON

Astro-Not-Yets storybook geared towards grades K-5 with an accompanying Sound on a String activity.

Pilot educator professional development launch weeks and launch viewing party kits for the upcoming CCP crewed launches.

Demonstrate and share CCP educational resources with educators.

Releasing a CCP explainer video for grades K-5, with two accompanying classroom activities.

YEAR 2 TRIUMPHS

1,200

Students, educators and community members were exposed to CCP educational resources and demonstrations at the FIRST Robotics World Championships ◇

5,000+

Educators recieved CCP information and resources at three national conferences (SEEC, ISTE and NSTA) ◇◆

30

Educators attended the CCP educational activity presentation at SEEC ◇◆

HIGH SCHOOL AEROSPACE SCHOLARS

HAS

Focus Area: Strengthening STEM through connections to NASA

"Probably one of the best experiences I have ever had as a teacher regarding facilitating inquiry-based investigations and STEM with highly motivated high school students. Every teacher involved with STEM could benefit from participating in HAS!"

– HAS counselor

https://go.nasa.gov/has

Celebrating its 20th anniversary, High School Aerospace Scholars (HAS) is an interactive, online course culminating in an all-expenses-paid, onsite experience at NASA's Johnson Space Center. During the school year, Texas high school juniors gain knowledge learning the past, present and future of aeronautics, space exploration and NASA's journey back to the Moon. Eligible students travel to Johnson to complete engineering design challenges and assist in planning a mission to Mars.

The HAS team supported Space Day Texas by speaking with six legislative offices to engage them in NASA milestones, including the 20th anniversary of HAS.

IMPROVEMENTS

Enhanced counselor training, focusing on inquiry-based instruction.

Changed format of NASA subject matter expert presentations to a roundtable discussion, leading to student-driven discussions.

Consolidated student videos projects into a single, collaborative video each week, enabling greater collaboration and leadership opportunities for students.

Streamlined online application requirements.

ON THE HORIZON

This summer, 270 students are participating in the 2019 HAS onsite experience.

Onsite participants will visit University of Houston's Sensing, Workflow, Algorithm, Recognition and Modeling (SWARM) lab.

YEAR 2 TRIUMPHS

263

Students participated in six onsite visits in June and July 2018

778

Students enrolled in the HAS online course, representing 180 cities and 351 institutions throughout the state of Texas

41%

Female for 2018-2019 online course

22%

Of 2018-2019 online course participants are from Title I schools

HIGH SCHOOLS UNITED WITH NASA TO CREATE HARDWARE

HUNCH

Focus Area: Enabling contributions to NASA's work

"Participating in HUNCH taught me fundamental engineering skills and gave me a glimpse of the opportunities available at NASA."

– HUNCH student

www.nasahunch.com

High schools United with NASA to Create Hardware (HUNCH) began 16 years ago with three schools producing hardware training items for the International Space Station (ISS). HUNCH has grown to more than 200 schools from 38 states; a 25 percent increase from last year. In addition to producing space flight hardware for the ISS and crew training, HUNCH reaches a diverse population of students through design projects, sewing flight and training articles, a video challenge and a culinary challenge. More than 20,000 students have participated in HUNCH with 94 percent moving on to pursue undergraduate degrees.

Earlier this year, the 2018 culinary challenge winning dish—Orange Blackberry Croissant—was flown to the space station and positively evaluated by the Expedition 59 crew.

IMPROVEMENTS

Improved video challenge by partnering with Association for Career and Technical Education.

Website 1.0 rollout with automated forms for data collection.

Annual recognition ceremony for students and educators was made available digitally for all HUNCH participants.

ON THE HORIZON

Completing 60 flight locker build agreement and more locker production to continue.

Rollout of website 2.0 with improved automated forms for data collection incorporating lessons learned from website 1.0.

Selecting a winning dish from the 2019 culinary challenge for crew consumption and evaluation.

YEAR 2 TRIUMPHS

2,300+

Students participated in HUNCH during the 2018/2019 school year

18

Hygiene Kits delivered to the ISS Program Office for flight to station

15

Single stowage flight lockers fabricated, assembled and delivered to the ISS Program Office

SIX HUNCH CHALLENGES

SOFTGOODS

HUNCH

Teams presented their designs and prototypes for Materials International Space Station Experiment (MISSE) straps, crew quarters organizer and ISS footpads in April 2019 ◆◆

200

Submissions received thanks to newly expanded challenge requirements ◆

FUN HUNCH FACTS

In partnership with 17 organizations across several industries to provide greater support and resources to students, schools and educators. ◆◆

More than 600 items have been produced by HUNCH students for flight or training in 16 year history.

Providing products and designs for Orion and Gateway programs.

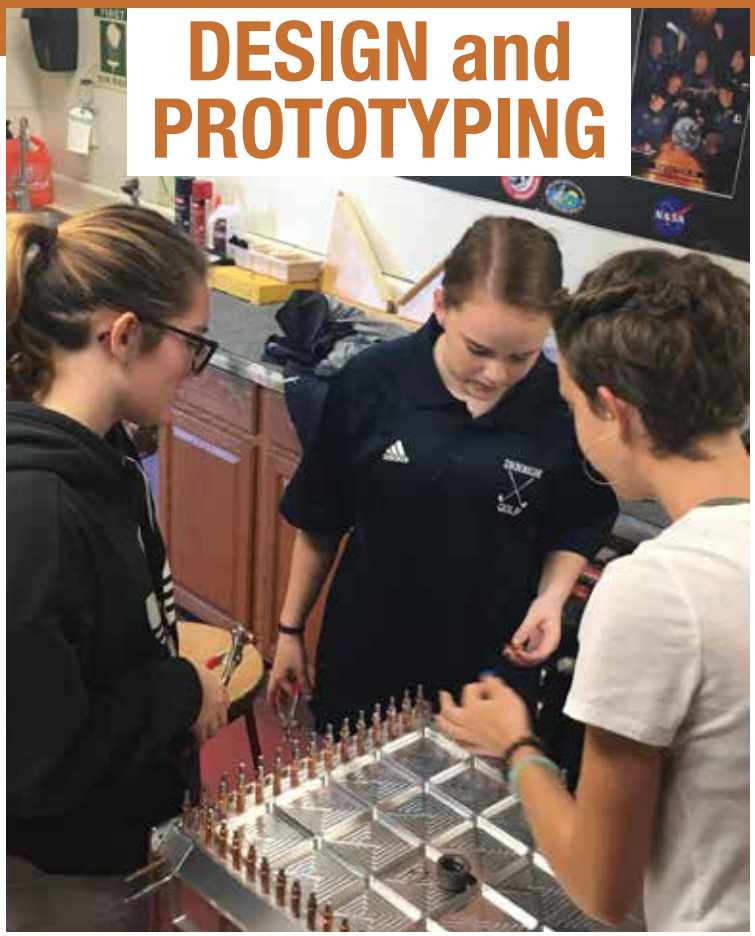
VIDEO and MEDIA

SOFTWARE

3+

Software projects nearing flight-ready status and final review will be held soon ◆

DESIGN and PROTOTYPING



3

Design and prototyping projects will be flown by the end of 2019 to the International Space Station: Ball Clamp Monopod, Tape Dispenser and 3D Printed Fan Cover

CULINARY

6

HUNCH culinary items flown to station, with one put in regular rotation for the crew

HARDWARE

600+

Space Flight Assemblies consisting of over 20,000 individual precision parts have been produced and delivered to the ISS Program Office

HOUSTON INDEPENDENT SCHOOL DISTRICT
AEROSPACE ACADEMIES

HISD

"The Aerospace Academy activity has allowed these students to be exposed to STEM at an early age and will benefit them all their lives."

– Educator

Focus Area: Strengthening STEM through connections to NASA

Houston Independent School District (HISD) Aerospace Academies supports five schools in HISD awarded grants from the U.S. Department of Education to become STEM magnet schools involving programs focusing on aerospace engineering. HISD Aerospace Academies provides content, resources and teacher professional learning opportunities to aid educators in training the next generation of space explorers heading to the Moon and Mars.

ON THE HORIZON

Populating the online learning community with opportunities to support HISD educators' continuous learning.

Reorganizing personnel structure for the 2019-2020 school year.

Providing support for summer camp activities.

Continuing to provide NASA STEM professional development for educators.

YEAR 2 TRIUMPHS

600+

Students served through education events (STEM Day, Career Expo, etc.)

300+

Students and educators participated in the In-flight Educational Downlink and hands-on STEM activities

48

Educators served through teacher institutes

MICROGRAVITY NEUTRAL BUOYANCY EXPERIMENT DESIGN TEAMS

MgNExT

Focus Area: Enabling contributions to NASA's work

"Micro-g is the reason why I applied for JSC internships (both Pathways and USRA) in the first place!"

– MgNExT participant

https://go.nasa.gov/mgnext

Microgravity Neutral Buoyancy Experiment Design Teams (MgNExT) challenges undergraduate students to design, build and test a tool or device addressing an authentic, current space exploration challenge as NASA makes plans for the Moon and Mars. The overall experience includes hands-on engineering design, test operations and public outreach. Student teams travel to the NASA's Johnson Space Center to test their tools in the simulated microgravity environment of the Neutral Buoyancy Laboratory (NBL) — a 6.2 million gallon pool used for astronaut training.

IMPROVEMENTS

Held challenge-specific virtual information sessions with technical subject matter experts allowing student teams to ask more specific questions and leading to better designs.

Introduced two new challenges for students to complete: Extra Vehicular Activity Camera Attachment Mechanism and Mini-Arm End Effector.

Announced team selections via a Facebook Live event. The event lasted 20 minutes and had approximately 100 viewers.

ON THE HORIZON

The zip tie cutter device, designed in a MgNExT challenge by the Lone Star College-Cy Fair team, is scheduled to launch to the International Space Station in July. The tool will be utilized by astronauts in planned spacewalks to repair the Alpha Magnetic Spectrometer.

In June, 39 students and 7 educators from 8 institutions will attend an onsite test week of their designs for this year's challenges: sharp edge detection and removal, camera attachment mechanism and mini-arm end effector.

YEAR 2 TRIUMPHS

CELEBRATING 5 YEARS 2014 • 2019

119

Students and 10 educators traveled to JSC to test their tool in the NBL ◇

19%

Of students are female ◆

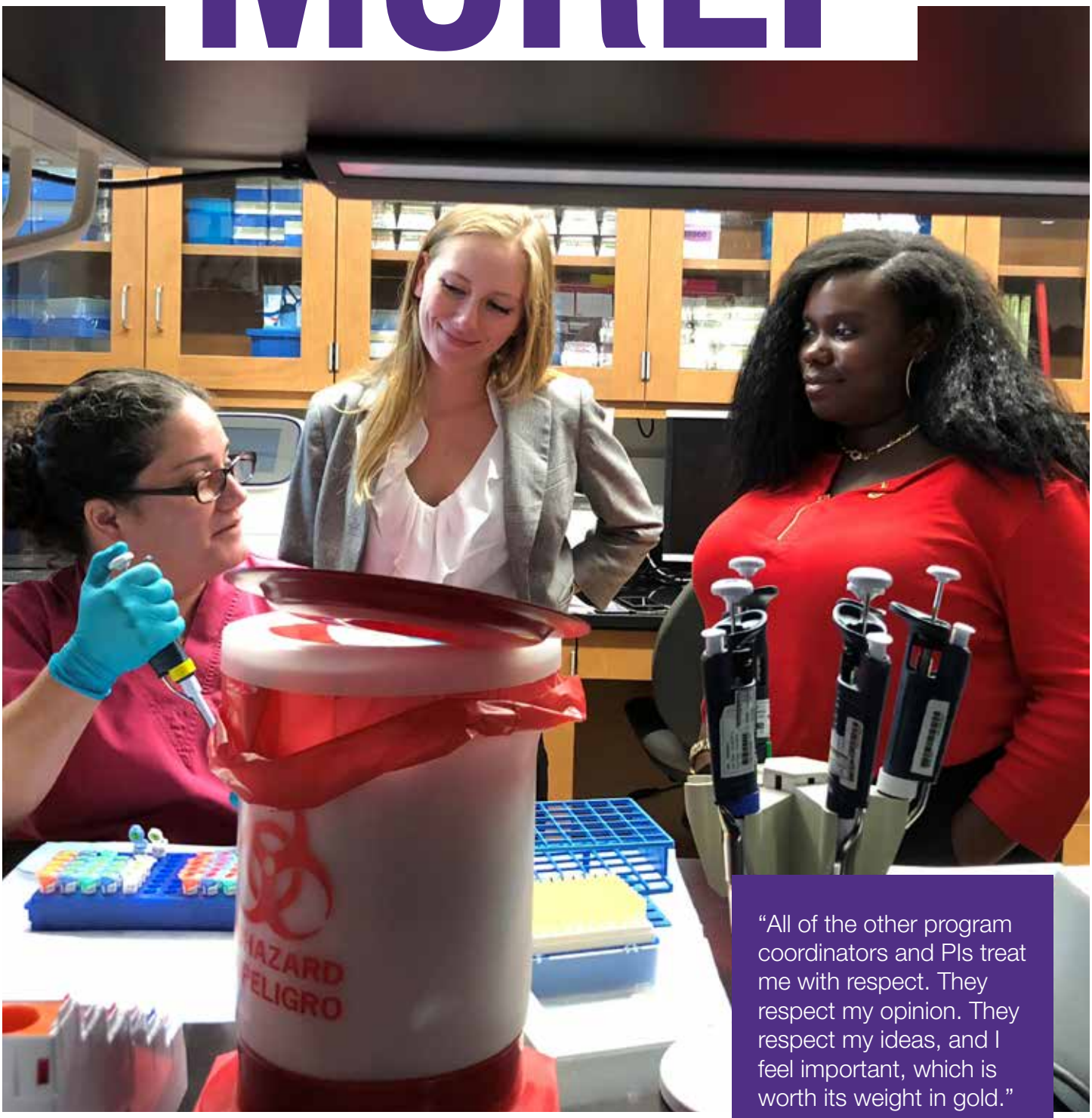
18

Institutions representing 18 states including three Minority Serving Institutions and two community colleges.

ENGINEERING DESIGN CHALLENGE
MICRO-G NEXT
STUDENT INNOVATION
SPACE EXPLORATION

MINORITY UNIVERSITY RESEARCH AND EDUCATION PROJECT

MUREP



Focus Area: Building a diverse, skilled, future workforce

"All of the other program coordinators and PIs treat me with respect. They respect my opinion. They respect my ideas, and I feel important, which is worth its weight in gold."

– MUREP participant

www.nasa.gov/education/murep

MIRO
MUREP Institutional Research Opportunity

The MUREP Institutional Research Opportunity (MIRO) aims to strengthen and develop the research capacity of Minority Serving Institutions (MSI) in areas of value to NASA's mission. NASA invites MSIs across the nation to submit research proposals based on current NASA needs. Selected institutions receive funding, support from NASA subject matter experts and the opportunity for student internships at a NASA center.

6,249
Students impacted through MIRO awardee outreach events and activities

75
Interns placed at seven NASA Centers; 56% of interns placed were female

MOO
MUREP Other Opportunities

1,407
Students and educators impacted through MOO awards given to six institutions

40
Interns placed; 50% of interns placed were female

MUREP Other Opportunities (MOO) awards six Minority Serving Institutions with NASA funding and support to innovatively create and implement STEM opportunities designed to attract, retain and support the success of underrepresented students including women and girls and persons with disabilities into STEM fields. Awards assist faculty and students in research and provide authentic STEM engagement related to NASA missions.

MUREP Sustainability Initiative
MSI

26
Institutional engagement activities involving 135 Minority Serving Institutions

817
College students and eduators reached

The MUREP Sustainability Initiative (MSI) builds capacity to increase long-term sustainability at Minority Serving Institutions by creating awareness of opportunities including grants and cooperative agreements with a focus on increasing contract opportunities in partnership with NASA's Offices of Small Business Programs, Technology Transfer, Small Business Innovative Research, Small Business Technology Transfer and Space Act Agreements.

MUREP INNOVATION AND TECH TRANSFER IDEA COMPETITION

MITTIC

Focus Areas: Building a diverse, skilled future workforce; Enabling contributions to NASA's work

"MITTIC is a great learning experience. It teaches you a lot about how the engineers work together and learn more aspects of the business and project management side that you might not be familiar with in a STEM degree."

– MITTIC participant

https://go.nasa.gov/NASAMITTIC

Minority University Research and Education Program (MUREP) Innovation and Tech Transfer Idea Competition (MITTIC) is a NASA spinoff challenge to develop new ideas for commercialization by seeking concept papers from multi-disciplinary student teams enrolled at Minority Serving Institutions (MSIs). Teams select a NASA technology and partner with a NASA small business company to propose a business plan for competitive review. Selected teams present their business plan in a lightning pitch competition at NASA's Johnson Space Center to a diverse panel of start-up incubators, venture capitalists and NASA personnel. The winning team visits NASA's Ames Research Center and Silicon Valley for an immersive experience to further develop the business plan.

The 2018 winning team visited Silicon Valley's Nissan Research Facility which uses NASA intellectual property in autonomous vehicles.

ON THE HORIZON

Launch MITTIC 2.0.

2019 Historically Black Colleges and Universities (HBCU) Conference Week hosts MITTIC competition..

YEAR 2 TRIUMPHS

70

Students and faculty from 10 MSIs in seven states and one U.S. territory participated in MITTIC

49%

Of participants represent underserved populations

41%

Of participants are female

11

MITTIC participants earn NASA internships

2

Mission directorate partnerships: Space Technology and Science

NASA COMMUNITY COLLEGE AEROSPACE SCHOLARS

NCAS

Focus Areas: Strengthening STEM through connections to NASA; Building a diverse, skilled, future workforce

"The NCAS program allowed me to see my dreams in absolute clarity and fully realize my own potential to do great things. It allowed me to meet and form connections with some incredible people who shared similar interests and dreams as my own. This week will be remembered and stored with my most cherished memories"

– NCAS participant

https://go.nasa.gov/ncas

NASA Community College Aerospace Scholars (NCAS) is an educational experience for community college students interested in exploring STEM. Students participate in a five-week online community, consisting of discussions, webinars with NASA subject matter experts and design challenges about future missions to the Moon and Mars. Select students attend a four-day engineering design challenge at a NASA Center.

IMPROVEMENTS

Added an "After the Leap" webinar inspiring and engaging participants to pursue STEM careers after the NCAS experience.

Hired an activity coordinator to improve NCAS communication and branding.

Added a dedicated travel day to the NCAS onsite experience schedule mitigating delayed starts, ensuring full team presence in team building activities.

ON THE HORIZON

Expanding NCAS to serve greater audiences by replicating it at community colleges across the nation.

Six community colleges from four states (CA, MS, NJ and OK) will implement the NCAS experience on their own campus to increase number of students reached by NCAS curriculum. Faculty at the college will support their own students through the online course then provide an on-campus NCAS onsite experience. One successful student from each school will be placed in a NASA internship.

The next round of scholars begin their online course, and eligible students will attend NASA onsite experiences in fall 2019.

YEAR 2 TRIUMPHS

1,064

Students participated in NCAS online community

757

Students participated in 21 onsite activities at 10 NASA centers and facilities and at the American Indian Higher Education Consortium Conference

23

Webinars presented with NASA subject matter experts and staff with a total of 3,074 attendees

4

Bags of microalgae launched in research payload to the International Space Station, developed by NCAS alum

NASA SPACESUIT USER INTERFACE TECHNOLOGIES FOR STUDENTS

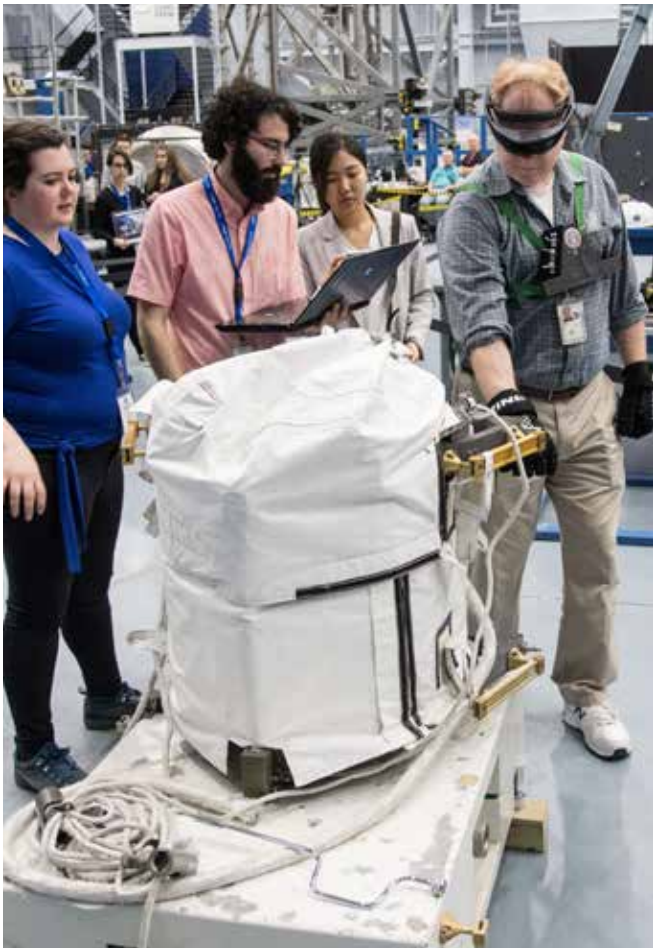
SUITS

Focus Area: Enabling contributions to NASA's work

> "I really feel that this ignited a fire in the younger students to push for a truly awesome solution next year."
>
> ***– SUITS participant***

https://go.nasa.gov/NASASUITS

NASA Spacesuit User Interface Technologies for Students (SUITS) design challenge is a STEM engagement activity where undergraduate and graduate student teams use existing hardware and software platforms, such as the Microsoft HoloLens, to create prototype spacesuit user interfaces to assist astronauts in conducting spacewalk tasks and demonstrate them in simulated environments as NASA prepares for missions to the Moon and Mars. After development, selected student teams travel to the NASA's Johnson Space Center to evaluate their prototypes.



IMPROVEMENTS

Teams not selected to participate in the onsite experience were invited to participate virtually in onsite activities. Virtual participants shared ideas and results with the SUITS community, presented to technical leads and watched live streamed events. ◆

ON THE HORIZON

Student teams continue executing their outreach plans.

Teams are updating their code by applying lessons learned during testing. Teams will submit their final code and report soon.

YEAR 2 TRIUMPHS

150+

Students from 18 institutions participated in SUITS online community ◇◆

62

Students and faculty advisors from 12 institutions tested prototypes at Johnson ◇◆

24

NASA volunteers from eight organizations served as design evaluators

1

Webinar presented by a retired astronaut providing students the opportunity to ask questions about their designs to someone with spacewalk experience ◆

NETWORK OF STATES

NoS

Focus Area: Strengthening STEM through connections to NASA

"Wow! What an incredible week of learning and fun! We cannot wait to bring back all we have learned and share it with our students and community!"

– Educator

https://go.nasa.gov/nos

Network of States (NoS) provided systemic, long-term support for NASA Centers and their communities by building strong regional networks for partner-delivered NASA educator professional development. NoS used the systemic structural design of a connected teaching model to build an education network aligning with national standards and design enhanced teaching practices by integrating NASA-unique STEM content and effective use of technology.

IMPROVEMENTS

Connected participants with NASA subject matter experts and activities related to NASA's missions including: Ascent Abort-2, Apollo 50th Anniversary, Exploration Mission-1, Gateway, NASA 60th Anniversary, Orion, Space Launch System and the Year of Education on Station.

Increased the number of organizations representing the advisory committee from 9 to 11.

Expanded states served from one to three.

YEAR 2 TRIUMPHS

46

Educators hosted at NASA's Johnson Space Center for week-long onsite train-the-trainer workshops

3

States participated: Oklahoma, South Dakota and Texas

11

Organizations make up the NoS advisory committee and meet monthly

STEM IN DEEP SPACE

SDS

CONCEPT IMAGE

"I wanted to reach out with a personal thank you for everything you do for students and teachers. Seeing the spark of curiosity that was ignited within the students at my school today as they participated in the Gateway Videocast was an incredible experience. Please pass my thanks on to everyone involved in this program, as well as the rest of the education teams you work with. You and your teams are making an impact on these students that will last for years to come!" "

– Educator

https://go.nasa.gov/sds

Focus Area: Strengthening STEM through connections to NASA

STEM in Deep Space (SDS) connects students and educators to deep space exploration missions including Gateway, the Moon and Mars using NASA-unique facilities, subject matter experts and resources to inspire students to pursue STEM. SDS also enables avenues for students to contribute to NASA's future deep space missions including a collaboration with NASA's Advanced Exploration Systems in which students will design garments to protect crew from radiation through the Wearable Equipment for Averting Radiation (WEAR) Challenge.

NASA WEAR

Wearable Equipment for Averting Radiation

ON THE HORIZON

SDS will pilot the WEAR Challenge, connecting students to NASA scientists and engineers to contribute to the mission by developing wearable equipment to protect astronauts from exposure to radiation during deep space travel.

SDS will also pilot Gateway Interactive Virtual Environments (GIVE). During GIVE, students will design components for either the Gateway mockup or the Gateway virtual reality habitat.

YEAR 2 TRIUMPHS

ACTIVITY LAUNCHED 2018 • 2019

4

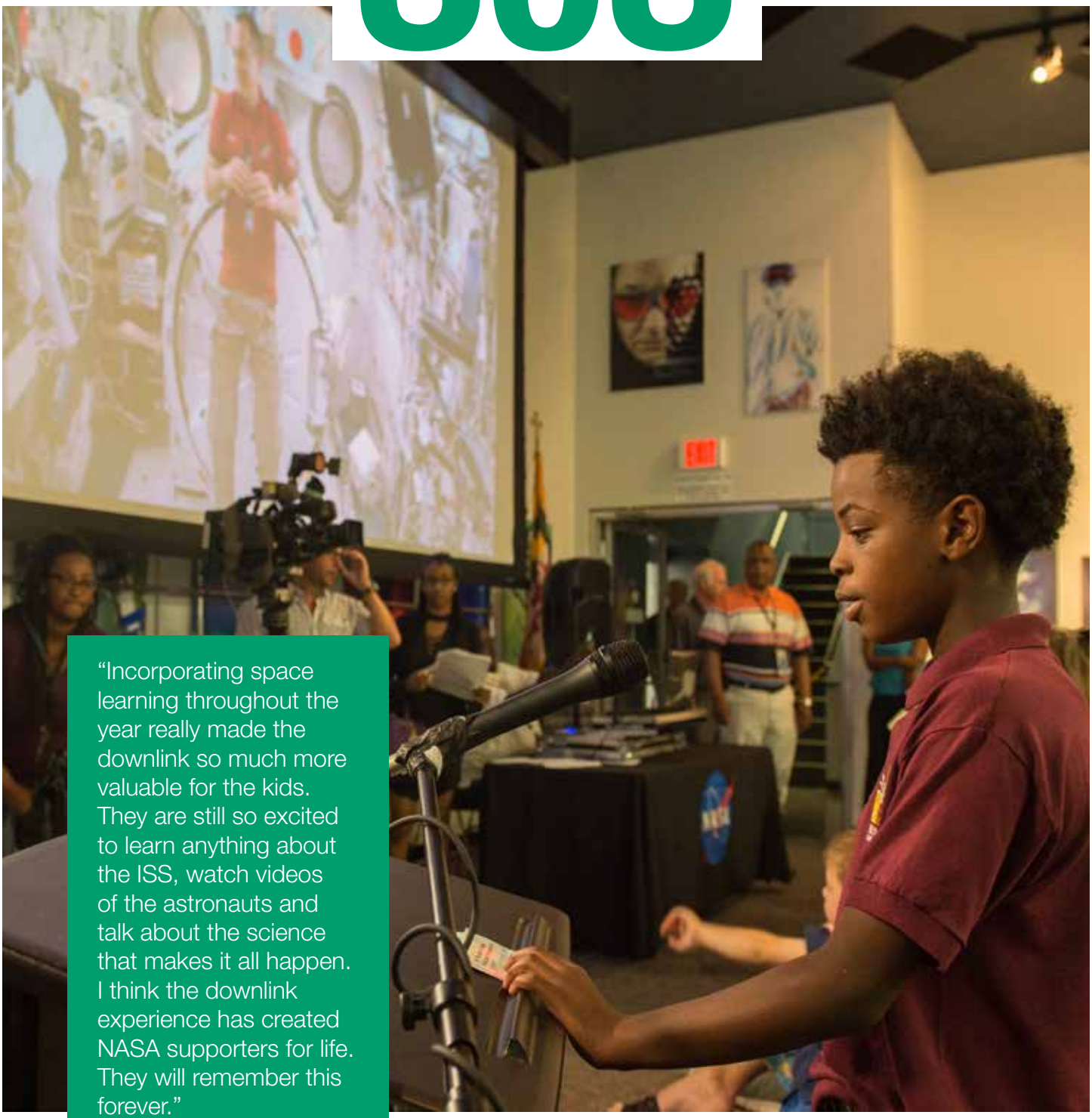
Gateway interactive videocasts with subject matter experts in the Integrated Power, Avionics, and Software Gateway mockup, which were viewed live by 1,236 participants

425

Students on 25 teams are participating in inaugural WEAR challenge

STEM ON STATION

SoS



"Incorporating space learning throughout the year really made the downlink so much more valuable for the kids. They are still so excited to learn anything about the ISS, watch videos of the astronauts and talk about the science that makes it all happen. I think the downlink experience has created NASA supporters for life. They will remember this forever."

– Parent

https://www.nasa.gov/stemonstation

Focus Area: Strengthening STEM through connections to NASA

STEM on Station (SoS) uses the International Space Station, its crew and the onboard research to inspire, engage and educate students and educators. SoS leverages the opportunities of the crewed spacecraft to advance NASA and the nation's STEM education and workforce pipeline through NASA's missions and unique assets including a comprehensive website, conversations with astronauts in space, lessons taught from the space station and hands-on STEM activities developed through high-profile partnerships.

IMPROVEMENTS

Collaborated with NASA's Johnson Space Center audio engineers and live television producer to purchase downlinks tech kits for organizations who do not have required technical equipment to produce quality audio and video which decreased the number of clients with poor quality audio and video during downlinks.

Began sending feedback to crew after each downlink about each event.

Condensed STEMonstration script elements to accommodate limited crew availability. This includes narration from crew post-mission to reduce the amount of crew time required on station.

Collaborated with management to re-establish review process for STEMonstrations.

ON THE HORIZON

Coordinating a research payload challenge for higher education institutions to send experiments to the space station which involve a Citizen-Science aspect for high school and/or middle school students to participate in the research.

Partnering with Microsoft to develop and release space station-focused Hack STEM lessons. Hack STEM lessons are inquiry-and project-based activities that embed computational and design thinking into hands-on lessons for middle school students.

Coordinating seven downlinks scheduled between June and September 2019.

YEAR 2 TRIUMPHS

75,486

Record-setting views on the STEM on Station website in a one-month period

134,000

Students and 2,900 educators reached by 35 in-flight Education Downlinks between astronauts aboard the International Space Station and students in 18 states plus Washington D.C.

23,690

Views on YouTube and 5.79M social media impressions earned by six STEMonstrations

9,000+

Educators reached through ISTE, CAST, SEEC and NSTA conferences

STEM ON STATION: YEAR OF EDUCATION ON STATION

YES

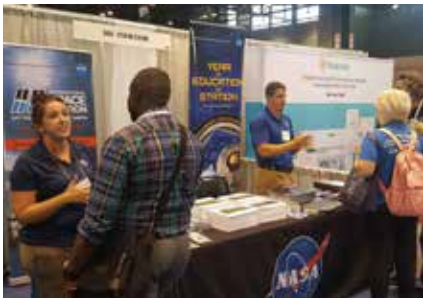
"Being the first New York City Public School to participate in NASA's Year of Education on Station was the most unimaginable experience ever to happen at our school. This all happened because one student inspired me to pursue the opportunity. Everything he loved, imagined and dreamed about space was brought to realization during this educational downlink. His dream inspired an event that energized an entire school community and had an infinite impact on everyone who viewed, attended or contributed to it."

– Assistant Principal

Focus Area: Strengthening STEM through connections to NASA

https://www.nasa.gov/stemonstation

The Year of Education on Station (YES) capitalized on the fortunate scenario of astronauts and former classroom teachers Joe Acaba and Ricky Arnold on back-to-back missions to the International Space Station. YES leveraged this unique opportunity to engage students and educators in NASA-unique STEM activities while providing a strong connection to humans living in space by highlighting the space station as an educational platform.



Collaborated with NASA Centers across the agency with the #ThankATeacher social media campaign. During Teacher Appreciation Week, NASA's 159 posts had a collective reach of 985,000.

ON THE HORIZON

While YES concluded in October 2018, downlinks will continue to inspire students and STEMonstrations will continue to be filmed and released. YES provided significant data to improve processes and quality of product for downlinks and STEMonstrations, standing as the Agency's STEM Engagement Council's example for activities and collaborations as the Office of Education transforms into the Office of STEM Engagement.

YEAR 2 TRIUMPHS

433%

Increase in downlink events from an average year, reaching more than 300K students and 87K educators

200+

Underrepresented and underserved students reached through two Microsoft YouthSpark events

Christa

McAuliffe's legacy was honored as her lost lessons were filmed on the International Space Station by educator astronaut Ricky Arnold and released with accompanying lesson plans for use in classrooms across the nation

NASA STEM Pathway Activities – Consortium for Education

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