2021 STEM Better Together Conference

March 18-19, 2021

This document is a summary of presentations, posters, videos, and online chat transcripts with some notes from the live chat added. The links are to be live for 90 days after the conference.

Agenda:
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1615992569bt2-agenda-final-pdf1615992569.pdf

NASA's journeys have propelled technological breakthroughs, pushed the frontiers of scientific research, and expanded our understanding of the universe. These accomplishments, and those to come, share a common genesis: education in science, technology, engineering, and mathematics (STEM). The Office of STEM Engagement (OSTEM) delivers tools for young Americans and educators to learn and succeed.

We seek to:

- Create unique opportunities for a diverse set of students to contribute to NASA's work in exploration and discovery.
- Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content, and facilities.
- Attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA's mission and work.
- To achieve these goals, OSTEM strives to increase K-12 involvement in NASA projects, enhance higher education, support underrepresented communities, strengthen online education, and boost NASA's contribution to informal education.
- The intended outcome is a generation prepared to code, calculate, design, and discover its way to a new era of American innovation.

For more information, visit: www.nasa.gov/stem

NASA STEM Engagement Leadership

Deputy Associate Administrator	Kris Brown
Deputy Associate Administrator	Elaine Ho
Executive Officer	Lisa Stewart
Manager, Budget	Tanye Coleman
Manager, Portfolio Integration	Diane DeTroye
Manager, Program Evaluation	Richard Gilmore
Manager, Strategic Partnerships	Robert LaSalvia
Manager, Infrastructure, Tools and Platforms	Tammy Brandon
Manager, Fellowships and International Initiatives	Carolyn Knowles
Manager, Internships	Lynnette Madison
Manager, Next Generation STEM Project	Dr. Carrie Olsen
Manager, Informal Education and Engagement	Dr. Beverly Girten
Manager, Space Grant College and Fellowship Program	Dr. Rajiv Doreswamy
Manager, Established Program to Stimulate Competitive Research	Jeppie Compton
Manager, Minority University Research and Education Project	Torry Johnson

NASA Mission Directorate Leads

Aeronautics Research	Karen Rugg
Space Technology	Stephanie Yeldell
Science	Kristen Erickson
Human Exploration and Operations	Dr. Alotta Taylor

Table of Contents

WELCOME TO THE NASA STEM Better Together Conference

The conference planning team expresses our sincere thanks to all of the OSTEM project teams for preparing outstanding sessions, as a well as to a host of moderators; volunteers; external guest speakers; mission directorate, technical, and communications guest panelists; and our colleagues who created amazing virtual exhibits and posters for everyone to enjoy. On behalf of the Office of STEM Engagement, thank you for attending the NASA STEM: Better Together for Stakeholder Success virtual conference, taking place March 18-19, 2021. We are excited to have you join us as we explore best practices in engaging students in STEM through topical discussions and briefings with NASA experts, staffed poster sessions, an interactive virtual exhibit hall and more. Over the next two days, more than 1,500 stakeholders, partners, and other NASA OSTEM grantees – including those from Space Grant, MUREP, Next Gen STEM, and EPSCoR – will have a chance to interact and learn from one another. The purpose of the conference for our grantees is three-fold: to connect OSTEM grantees with each other to encourage greater collaboration, to connect grantees to NASA's technical content and mission, and to facilitate dialogue on broadening participation in STEM.

You will have the unique opportunity to:

- •Hear directly from NASA leadership and technical experts about current and future missions.
- •Interact directly with NASA technical experts from projects like Artemis Gateway, Commercial Crew Program, Mars 2020, James Webb Space Telescope, X-Planes and Lunar Technologies.
- •Learn earn more about OSTEM's expansive efforts to reach students, as well as support educators and institutions.
- •Engage with OSTEM stakeholders to build synergies to carry out NASA's vision for our next generation of explorers.

After our two days together come to an end, we want participants to walk away with meaningful, lasting connections with one another, because we truly are better together. To facilitate this, we have incorporated discussions, designated networking times, and included interactive experiences with posters and booths into the two-day program. During the conference, attendees are encouraged to reach out to others via the virtual platform's chat function and, after the conference, everyone will have access to the full list of attendee contact information to keep the conversations going long after the Closing Plenary. We can't wait to see all of you soon!

Sincerely,

The NASA STEM Better Together Planning Team

Please Refer to NASA STEM Better Together for Stakeholder Success Conference Guide March 2021 for more information about the conference, sessions and speakers. The videos included in this summary will be available for 90 days post conference which was held March 18-19, 2021.

An Introduction to EPSCoR

https://youtu.be/Nh77Sp5FROE

A discussion of the requirements behind the program, the four different components and the new pilot elements FAST and suborbital Flight opportunities.

SPEAKERS:

- Jeppie Compton – NASA EPSCoR National Project Manager
- Dr. Mitch Krell – NASA EPSCoR Deputy National Project Manager
- Dr. Lester Morales – NASA EPSCoR Inter-Agency Coordinator
- Grady Smith – NASA EPSCoR Program Coordinator
- Gail Shine – NASA EPSCoR Program Coordinator

EPSCoR FAST – Applying for Fellows Advancing Science and Technology

https://youtu.be/95_ZLjNN1BY

Dr. Chinonye (Chi-Chi) details the FAST application for the NSF track IV FAST solicitation.

SPEAKER:

- Chinonye Nnakwe Whitley – NSF Program Officer with EPSCoR

An Introduction to MUREP

https://youtu.be/0fpgrin3y7Q

The Introduction of MUREP will give you some of the background as to why MUREP was created, what is its purpose and how it goes about supporting Minority Serving Institutions (MSIs) and Under-Represented Minorities (URMs).

In addition, this introduction will share some of the NEW activities and efforts that MUREP has begun by way of partnerships and collaborations with our NASA Mission Directorates.

This introduction will be informative and spark further conversation that we can have during the Better Together Conference Series.

SPEAKER:

- Torry Johnson – MUREP Project Manager

An Introduction to Next Gen STEM

https://youtu.be/RvVspt1Vr1A

Next Gen STEM is a project within NASA's Office of STEM Engagement that endeavors to reach K-12 students where they are with NASA's missions, content, people and facilities. This video presents the activities, products and opportunities Next Gen STEM offers – told by the talented and committed staff that makes it all happen.

SPEAKER:

- Carrie Olsen – Next Gen STEM Project Manager

An Introduction to Space Grant

https://youtu.be/rzwjvN_XgEI

A high-level overview of the National Space Grant College and Fellowship Program. This presentation highlights its goals and objectives, structure, types of awards and sponsored activities and awardee locations across the country.

SPEAKERS:

- Dr. Rajiv Doreswamy – Acting Space Grant Manager
- Dr. Erica J. Alston – Deputy Space Grant Manager

Communications – The NASA STEM Story

https://youtu.be/AmCXtrHe-JU Play

Take a look at how the communications team tells the story behind the inspiring aspects of the Office of STEM Engagement and how they reach communities, students and educators.

SPEAKER:

- Katherine Brown – Communications Lead

Internships 101 – Proposal to Intern

https://youtu.be/03WZOkzYbdM

Join us for an overview of NASA OSTEM Internships. Learn how to add internships to your proposals and tips for identifying potential students. Mentors will share how interns are supporting their projects and the value to NASA's mission. Current and former interns will talk about their projects and the experience gained through the internship.

SPEAKERS:

- Lynnette Madison – NASA Internship Manager
- Raquel Marshall – MUREP Student Engagement and Internships Strategy Lead
- Veronica Seyl Clauson – Internship Operations and Communications Lead
- Valerie Ellis – NASA Space Grant Coordinator

OSTEM IT Tools & Platforms – SharePoint Online and NASA STEM Gateway

https://youtu.be/NlbApXnyOzc

The OSTEM IT Tools & Platforms provides an overview of two specific developments in OSTEM's IT world. The first focuses on the use of Sharepoint online for internal communication, file sharing, and integrated calendar capabilities. And the second topic will give a high-level overview of a new system that will offer universal application and registration functionality for NASA STEM Engagements AND will include integrated Performance assessment and evaluation capabilities as a replacement for the current OEPM system.

If you have any questions for this team, please visit the "NASA STEM Gateway" Poster (#26) within this virtual conference's Poster Hall. There, during the live conference event hours, you'll be able to interact with our personnel through a Question & Answer board.

SPEAKERS:

- Doug Goforth – OSTEM Deputy Manager for IT Tools and Platforms
- Becky Kamas – OSTEM SharePoint Integration Lead & STEM on Station Activity Manager

Performance and Evaluation (P&E) Overview

https://youtu.be/40GKiBzzmP0

NASA is enhancing the effectiveness of STEM engagement investments using performance assessment and evaluation-driven processes. Join us for an overview of the Office of STEM Engagement (OSTEM) Performance and Evaluation (P&E) enterprise function and learn about our strategic approach, FY20 accomplishments, FY21 activities and meet the P&E Core Team.

SPEAKERS:

- Rick Gilmore – Performance Assessment and Evaluation Program Manager
- Tara Strang – Senior Evaluation Specialist
- Clarence Jones – OEPM Database Coordinator/Technology Coordinator

Agency Info: NASA Shared Services Center (NSSC) Grant Administration Overview

https://youtu.be/NoTuyWcXKy8

Are you a new OSTEM awardee or an awardee who'd like a refresher on what's required of you as a NASA awardee? Tune into this session to learn about the award process and the requirements that come along with working with NASA.

SPEAKER:

- Libby Romaguera – NASA Lead Grant Officer

Agency Info: The Needed Precautions When Working with Foreign Nationals or Universities

https://youtu.be/xE_KPFwfh08

Greg Nagurka from the Office of the Inspector General (OIG) gives information on the implications and precautions needed when working with foreign universities or their researchers.

SPEAKER:

- Greg Nagurka – Criminal Investigator

Agency Info: Updates to 2 CFR and the Uniform Guidance

https://youtu.be/3TzOW6iw3A8

Hey awardees! Did you know that 2 CFR, including the Uniform Guidance in 2 CFR 200, has been recently updated? Tune into this session to learn about significant changes to 2 CFR that will impact your award with NASA.

SPEAKER:

- Chris Murguia – Senior Analyst

Guest Presentations

Keynote Speaker - Astronaut Kjell N. Lindgren

https://youtu.be/CvWMwrYuZGU

SPEAKER:

- Astronaut Kjell N. Lindgren

Dr. Kjell N. Lindgren was selected by NASA in 2009. He spent most of his childhood abroad and returned to the U.S. to complete his education and earn a Doctorate of Medicine from the University of Colorado. He is board certified in emergency and aerospace medicine. After serving as the Deputy Crew Surgeon for STS-130 and Expedition 24, he was selected as an astronaut in June 2009 as one of 14 members of the 20th NASA astronaut class. Dr. Lindgren flew on Expedition 44/45 and logged 141 days in space. He participated in two spacewalks and in more than a hundred different scientific experiments.

Plenary 4 chat

Broadening Student Participation

https://youtu.be/aoBu0yjIVYQ

SPEAKER:

- Moiya McTier
  Ph.D. Astrophysicist, Folklorist, & Science Communicator
  www.moiyamctier.com/about

Moiya uses astronomy to teach people the skills they need to apply the scientific method to their problems. Through hard work and a significant amount of luck, she was accepted to Harvard University, where she became the school's first ever student to study both astrophysics and folklore & mythology. After graduating, she decided to pursue her PhD in astronomy at Columbia University.

Plenary 2 Presentation

What the Hack!?

https://youtu.be/ZkjXoA_iP_A


SPEAKERS:

- Rosemary Smith
- Lindsay Thornton

We need YOU! Join us for a deep dive and uncover a new approach to addressing NASA STEM challenges. Let's hack into these obstacles together and find innovative solutions to:

- Creating unique opportunities
- Building a diverse future STEM workforce
- Attracting diverse groups of students to STEM
- Supporting students, educators and our partners.

Let's Dare Mighty Things together!

What the Hack?!
Breakout Brainstorm
Hackathon Map

Breakout Session 5.1 Presentation

Knowledge Boost – Impact of COVID-19 on STEM Education

https://youtu.be/_Wd0K0HT0w4



SPEAKERS:

- Dr. Jennifer Hamilton - NORC at the University of Chicago
- Dr. Heather Thiry - University of Colorado Boulder
- Dr. Kristin Horan - University of Central Florida

The session focuses on the impact that the COVID-19 pandemic has had on delivery and continuity of STEM education at the high school level, the post- secondary level, and in informal learning environments. A panel of subject matter experts will offer observations on impacts and the kinds of resources and support that will help to counteract the disruptions occurring in these educational environments.

Breakout Session 5.4 Presentation

Coffee Hour with Leland Melvin

https://youtu.be/qJ790i7-EvQ

SPEAKER:

- Former astronaut Leland Melvin

By popular demand! Leland has a Bachelor of Science degree in chemistry and a Master's degree in materials science engineering. He worked at NASA Langley Research Center in the area of nondestructive testing creating optical fiber sensors for measuring damage in aerospace

vehicles, resulting in publications in numerous scientific journals. After hanging up his space boots he was appointed head of NASA Education and served as the co-chair on the White House's Federal Coordination in Science, Technology, Engineering, and Mathematics (S.T.E.M.) Education Task Force developing the nation's 5-year STEM education plan. Leland was the United States representative and chair of the International Space Education Board (ISEB), a global collaboration on learning about space. He uses his life story as an athlete, astronaut, scientist, engineer, photographer, and musician to help inspire the next generation of explorers to pursue Science, Technology, Engineering, Art, and Mathematics (S.T.E.A.M.) careers.

Breakout Session 5.3 Presentation

Innovations in STEM Learning

https://youtu.be/wedCnVlVIw8


SPEAKERS:

- Michael H. Levine
- Beth Richman

Michael H. Levine, Ph.D. is Senior Vice President of Learning and Impact for Noggin, Nickelodeon's direct-to-consumer interactive learning platform for young children. An early learning and social policy expert, Dr. Levine is responsible for deepening Noggin's value to children and families through dynamic content, partnerships, and interactive experiences developed for learning and impact. Dr. Levine previously spent 12 years at Sesame Workshop where he served as Chief Knowledge Officer, a member of the senior executive team responsible for driving organization-wide learning, educational partnerships, knowledge exchange, and policy leadership. He is also the Founding Executive Director of the Joan Ganz Cooney Center, a pioneering thought leader in the digital media and learning field. Previously he oversaw innovative grantmaking, strategic communications and program design and scaling strategies for Carnegie Corporation of New

York, the New York City Department of Education, the Mayor's Office and Asia Society. Dr. Levine serves on numerous non-profit and double-bottom line boards including the Cooney Center, JumpStart, We Are Family Foundation and Woot Math. He received his PhD in Social Policy from the Heller School at Brandeis University and his Bachelor's degree from Cornell University.

Beth Richman, Ed.M. is a Senior Learning and Impact Adviser for Noggin. She has spent more than two decades as an Educational Content Specialist and Qualitative Researcher, helping to create media, products and materials that inspire children and support their development. Beth is proud to have been the Research Director for a number of well-known and beloved educational television series, including Bubble Guppies (Nick Jr.), P. King Duckling (Disney Junior) and Peg + Cat (PBS KIDS). As an Educational Consultant, Beth has worked with clients such as Nick Jr., Nickelodeon, Sesame Workshop, Fred Rogers Productions, DreamWorks Animation Television, Spin Master, Pocket.watch, Little Airplane Productions, WildBrain, Space Racers, The New York International Children's Film Festival and littleBits, among others, as well as a number of production companies, creators and researchers around the world. Beth previously spent five years as Director of Development and Creative Executive for Scholastic, where she managed the development and production of new television projects. Beth has also held several positions in the Education and Research Division of Sesame Workshop and is a contributing author to the book "G" is for "Growing": Thirty Years of Research on Children and Sesame Street. Beth holds a Master of Education from Harvard University and a B.A. in English from Amherst College. She enjoys life in Connecticut with her husband and their two young daughters.

Through a new Space Act Agreement, NASA is collaborating with Noggin on the development of cutting-edge aeronautics and space themed products and opportunities for students and families.

Plenary 6 Presentation

Exhibit Hall

NASA Internships: Mentoring the Artemis Generation

https://youtu.be/j1t-LWMZqY4

Welcome!

In one of this country's most sought-after internships, NASA advances high quality, hands-on work experience and research opportunities for a diverse set of students who contribute to NASA missions and mission success.

Provided through the Office of STEM Engagement (OSTEM) Internship Program, NASA people leave their space exploration legacy by mentoring interns, while building a diverse future STEM workforce. Please visit our NASA OSTEM Internship booth to learn more about how students can affect change at NASA and impact an intern's academic and career.

Our booth will help you learn more about:

- Our interns & mentors
- Our impact in 2020 with you
- Our commitment to diversity
- Information about NASA's Pathways Program
- Information about NASA's Fellowship Activity
- Information about NASA's International Internship Program
- MUREP Proposals
- Space Grant Sponsorships
- And so much more!

Chat with us!

Chat with our internships team throughout the summit. Stop by our booth and comment who you are and what organization you're representing. We want to meet YOU!

Want to connect? Reach out to our program managers:

- Lynnette Madison, OSTEM Internships Program Manager
- Veronica Clauson, OSTEM Internships and Pathways Program Liaison
- Carolyn Knowles, OSTEM Fellowships and International Internship Programs Manager

Artemis Student Challenges

NASA's Artemis Student Challenges inspire the next generation - the Artemis Generation. Each of these student opportunities will build foundational knowledge and introduce students to topics and technologies critical to the success of the agency's Artemis program. The Artemis Student Challenges provide students with the opportunity to design, build, and test technologies. Currently, there are seven Artemis Student Challenges - BIG Ideas Challenge, Human Exploration Rover Challenge, Lunabotics, SUITS, Micro-g NExT, First Nations Launch, and Student Launch. Additionally, six Space Grant Consortiums were recently awarded to develop new opportunities. Those include Alabama, California, Colorado, Hawaii, Illinois, and Washington. Take a look at how we are engaging students!

X-Planes

The "first A" in "NASA," NASA Aeronautics explores technologies that reduce aircraft noise and fuel use, get you gate-to-gate safely and on time, and transform aviation into an economic engine at all altitudes. We are with you when you fly; every U.S. aircraft and U.S. air traffic control tower has NASA-developed technology on board to reduce noise, delays, fuel use and emissions.
NASA Aero is a STEM paradise -- from the **science** of sound (our low-boom supersonic flight research) to the **technology** for aviation transformation (electric propulsion, flexible wings, shape-changing components, sensors for autonomous flight) to the **engineering** of test aircraft (X-59, X-57) to the **mathematics** of airspace management (software to reduce delays, provide real-time data).
Our work directly benefits today's air transportation system, the aviation industry and their workforce, and the passengers and businesses who rely on aviation every day.
NASA's aeronautics research is primarily conducted at four NASA centers: Ames Research Center and Armstrong Flight Research Center in California, Glenn Research Center in Ohio, and Langley Research Center in Virginia.

Science Activation Program

What is SMD’s Science Activation program? NASA Science has a new team to

help learners of all ages “do” science! For the next five years, a cooperative network of twenty-nine competitively-selected teams from across the Nation will connect NASA science experts, real content, and experiences with community leaders to do science in ways that activate minds and promote deeper understanding of our world and beyond.

Commercial Crew Program

NASA's Commercial Crew Program is working with the American aerospace industry as companies develop and operate a new generation of spacecraft and launch systems capable of carrying crews to low-Earth orbit and the International Space Station.
Commercial transportation to and from the station will provide expanded utility, additional research time and broader opportunities of discovery on the orbiting laboratory. The station is critical for NASA to understand and overcome the challenges of long duration spaceflight necessary for the journey to Mars. By encouraging industry to provide human transportation services to and from low-Earth orbit, NASA can expand its focus on building spacecraft and rockets for deep space missions.

James Webb Space Telescope

The James Webb Space Telescope (sometimes called JWST or Webb) will be the premier observatory of the next decade, serving thousands of astronomers worldwide. Launching on an Ariane 5 rocket from French Guiana in 2021, its large 6.5-meter primary mirror and infrared capability will study every phase in the history of our Universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems capable of supporting life on planets like Earth, to the evolution of our own Solar System.

Human Exploration and Operations Mission Directorate

HEO provides the agency with leadership and management of NASA space

operations related to human exploration in and beyond low-Earth orbit.

Lunar Surface Innovation Initiative

NASA is rapidly moving forward on the Artemis program to send the first woman and the next man to the surface of the Moon by 2024 and establish sustainable exploration with commercial and international partners by 2028. To champion technologies needed to live on and explore the Moon, NASA's Space Technology Mission Directorate (STMD) established the Lunar Surface Innovation Initiative (LSII).
LSII is a technology development portfolio to enable human and robotic exploration on the Moon and future operations on Mars. The activities will be implemented through a combination of unique NASA work and public-private partnerships. LSII pursues novel technologies needed to increase the viability of oxygen extraction from lunar resources, develop lunar surface power generation and storage capabilities, and enable autonomous excavation, construction, and transportation of lunar resources.
The Lunar Surface Innovation Consortium (LSIC) - an element of NASA's LSII - teams experts from academia, industry and government to shape the technologies and systems needed to explore the surface of the Moon in new ways. Universities and businesses contribute to the Artemis program via the consortium and collaborate with NASA to make recommendations for a cohesive, executable strategy for developing and deploying technologies required for successful lunar surface exploration.

Mars 2020

The Mars 2020 Perseverance Rover will search for signs of ancient microbial life, which will advance NASA's quest to explore the past habitability of Mars. The rover has a drill to collect core samples of Martian rock and soil, then store them in sealed tubes for pickup by a future mission that would ferry them back to Earth for detailed analysis. Perseverance will also test technologies to help pave the way for future human exploration of Mars.

Strapped to the rover's belly for the journey to Mars is a technology demonstration — the Mars Helicopter, Ingenuity, may achieve a "Wright

Brothers moment” by testing the first powered flight on the Red Planet. There are several ways that the mission helps pave the way for future human expeditions to Mars and demonstrates technologies that may be used in those endeavors. These include testing a method for producing oxygen from the Martian atmosphere, identifying other resources (such as subsurface water), improving landing techniques, and characterizing weather, dust, and other potential environmental conditions that could affect future astronauts living and working on Mars.

SMD Earth Science

We live on a dynamic, living planet. Land shifts. Seas rise. Volcanoes erupt. Storms rage. Snow melts. Plants grow. Cities expand. These ever-changing, interconnected systems affect all life on Earth, and the planet itself. To understand these natural and human-caused changes, NASA’s Earth Science Division uses unique global observations from space, air, sea and on land. This data enables informed decision-making for agriculture, water and food security, urban planning, disaster preparedness and response, transportation, climate and weather, and myriad other things that benefit life on Earth.

Day One

Opening Plenary - Opening Remarks & Fireside Chat

Better Together Conference: DAY 1
Opening Plenary
youtu.be

Opening Plenary Chat Transcript

SPEAKER:

- Steve Jurczyk - Acting Administrator of NASA

Center Directors Panel



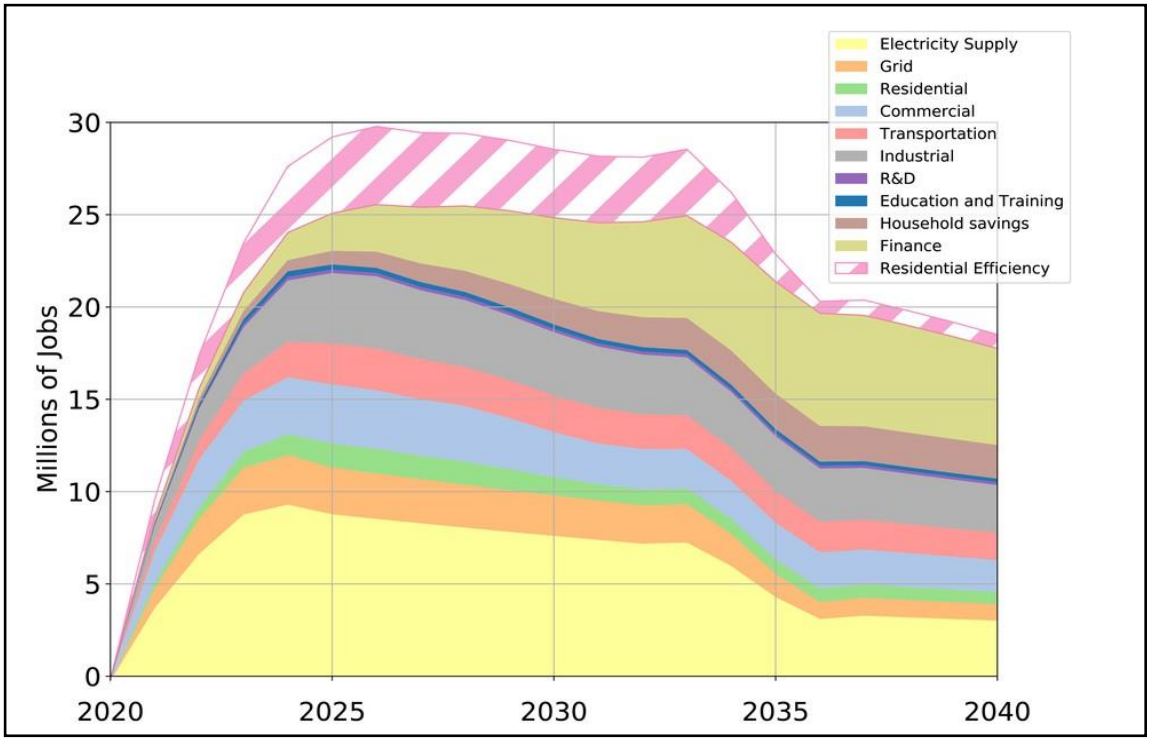

SPEAKERS:

- Dr. Marla Perez-Davis - Center Director, NASA's Glenn Research Center
- Dr. Eugene Tu - Center Director, NASA's Ames Research Center
- Jody Singer - Center Director, Marshall Space Flight Center
- Clayton Turner - Center Director, NASA's Langley Research Center

Join us for a conference welcome from Steve Jurczyk, NASA’s Acting

Administrator! Additionally, Mike Kincaid, NASA OSTEM Associate Administrator will moderate a conversation about the importance of engaging students in NASA's mission with four NASA Center Directors: Dr. Marla Perez- Davis, Director of John H. Glenn Research Center, Dr. Eugene Tu, Director of Ames Research Center, Jody Singer, Director of Marshall Space Flight Center, and Clayton Turner, Director of Langley Research Center. Please note, this is the only session during the conference that will take place as a Webex Event. When you click on the join button (which will be active 5 minutes prior to the session start time), enter your first name, last name and email address (the session password is pre-populated) and you will be connected to the session as a participant. Please send an email to stemtogether2@getvfairs.io if you have difficulty joining the session. We look forward to welcoming you to our opening plenary session!

From Chat:
This graphic of future job projections echos the need for STEM and nonSTEM links



Tech Talks

Understanding the Technical Aspects of NASA Missions

James Webb

Tech Talk 2.1

Session 2.1 Breakout Tech Talk - James Webb
youtu.be

SPEAKER:

- Dr. Eric Smith - Program Scientist, James Webb Telescope Program

The James Webb Space Telescope will be the world's premier space science observatory when it launches later this year. Join Dr. Eric Smith as he shares how Webb will solve mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it. Come hear about the amazing science and technology involved in this international program led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency.

Commercial Crew Program - CCP

Tech Talk 2.2 Chat

Session 2.2 Breakout Tech Talk - Commercial Crew Program
youtu.be

SPEAKERS:

- Carla Koch - Deputy Certification Manager
- Ryan Hurley - Aerospace Engineer, Launch Services Program

NASA’s Commercial Crew Program is working with the American aerospace industry as companies develop and operate a new generation of spacecraft and launch systems capable of carrying crews to low-Earth orbit and the International Space Station. NASA Deputy Certification Manager for SpaceX Carla Koch will talk about the process of certifying spacecraft for launch, and NASA Launch Services Program Flight Dynamics Engineer Ryan Hurley will discuss analysis activities for launch vehicle certification, followed by a panel discussion.

X-Planes

Tech Talk 2.3

Session 2.3 Breakout Tech Talk - X-Planes

SPEAKER:

- Ed Waggoner - ARMD Deputy AA for Programs
- Brad Flick - AFRC Director of Research and Engineering/ Aeronautics Research Director
- Tim McCartney - GRC Aeronautics Research Director
- Mary Dijoseph - LaRC Aeronautics Research Director

X-Planes: The future of flight as we know it is being shaped by NASA's two newest X-Planes. Join NASA's Aeronautics Research Mission Directorate Deputy Associate Administrator Dr. Ed Waggoner to hear about the past, present, and future of NASA X-Planes, supersonic flight, and electric propulsion. Then, join in on a panel discussion and Q&A by the NASA Center Aeronautics.

Artemis

Tech Talk 2.4

Session 2.4 Breakout Tech Talk - Artemis
youtu.be

SPEAKER:

- Debra Luban - Deputy Manager, Gateway Vehicle System Integration Office at NASA's Johnson Space Center

Learn about a vital part of NASA’s deep space exploration plans, the Gateway. The Gateway will be an outpost orbiting the Moon that provides vital support for a sustainable, long-term human return to the lunar surface, as well as a staging point for deep space exploration. In this session you will learn how this destination will be used for astronaut expeditions and science investigations, as well as a port for deep space transportation such as landers en route to the lunar surface or spacecraft embarking to destinations beyond the Moon.

From Chat:

Planning your own Artemis outreach? Please bookmark the NEW Artemis Multimedia Catalog: https://nasa-external-ocomm.app.box.com/s/axhqgtgguakxd0bdxpef2arv8kp4fsov. The new catalog includes the Artemis Graphics Standards Manual and highlighted items from NASA’s collection concept imagery, presentations graphics, presentation templates, print products, videos, virtual meeting backgrounds and infographics: https://nasa-external-ocomm.app.box.com/s/axhqgtgguakxd0bdxpef2arv8kp4fsov.

Mars 2020

Tech Talk 2.5

Session 2.5 Breakout Tech Talk - Mars 2020
youtu.be

SPEAKER:

- David Lavery - Program Executive For Solar System Exploration, Science Mission Directorate, Planetary Systems Division
- George Tahu - NASA Science Mission Directorate Program Executive

This session will go through the technical implementation of the Perseverance rover mission which just arrived at Mars last month, along with a preview of the upcoming deployment and flight of the Ingenuity Mars Helicopter. This will be followed by the discussion session with a detailed review of tools and opportunities for “citizen science” participation by both students and adults in the exploration of Mars.

The Mars Exploration Program actively invites students and citizens to participate in the exploration of Mars, and help investigate the Red Planet through the eyes of our robots. We make the images of Mars acquired by the robotic rovers available to the public as quickly as they are available to the science teams, and urge “citizen scientists” to see what they can discover.

Lunar Technologies

Tech Talk 2.6

Session 2.6 Breakout Tech Talk - Lunar Technologies
youtu.be

SPEAKER:

- Niki Werkheiser - Director of Technology Maturation, Game Changing Development, Lunar Surface Innovation Initiative, Space Technology Mission Directorate

To champion technologies needed to live on and explore the Moon via the Artemis program, NASA's Space Technology Mission Directorate (STMD) established the Lunar Surface Innovation Initiative (LSII). LSII is a technology development portfolio to enable human and robotic exploration on the Moon and future operations on Mars. The activities will be implemented through a combination of unique NASA work and public-private partnerships. Technology development and demonstrations will mature the following capabilities:

- Utilizing the Moon's resources
- Establishing sustainable surface power
- Building machinery and electronics that work in extreme environments, like super-chilly permanently shadowed craters
- Mitigating lunar dust
- Carrying out surface excavation, manufacturing and construction duties
- Extreme access which includes navigating and exploring the surface/ subsurface

Discussion

Discussion - James Webb

Discussion 3.1

Discussion 3.1: Breakout Session - James Webb
youtu.be

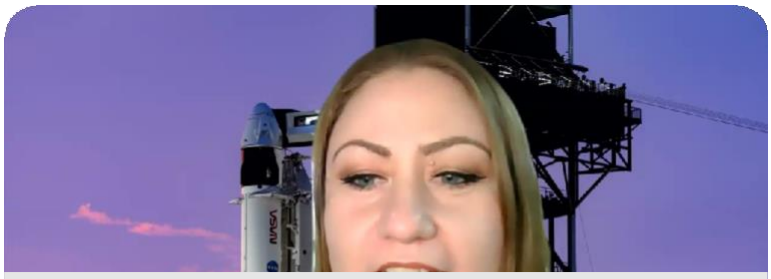
SPEAKERS:

- Natasha Pinol - Communications Lead, James Webb Space Telescope Program, Office of Communications, Science Mission Directorate
- Denise Smith - Deputy Head, Office of Public Outreach, Space Telescope Science Institute

Moderated breakout discussions for attendees to brainstorm and develop actionable ideas that create opportunities for students to engage with JWST.

Discussion – Commercial Crew Program (CCP)

Discussion 3.2



Discussion 3.2: Breakout Session - Commercial Crew Program
youtu.be

SPEAKERS:

- Crystal Jones - Deputy Manager for Ground & Mission Operations Office, Commercial Crew Program
- Jennifer Wolfinger - Public Affairs Officer, KSC
- Jessica Sain - NASA Lead Education Specialist, Office of STEM Engagement, NSPACE

Moderated breakout discussions for attendees to brainstorm and develop

actionable ideas that create opportunities for students to engage with CCP.

Discussion - X-Planes

Discussion 3.3

Discussion 3.3: Breakout Session - X-Planes
youtu.be

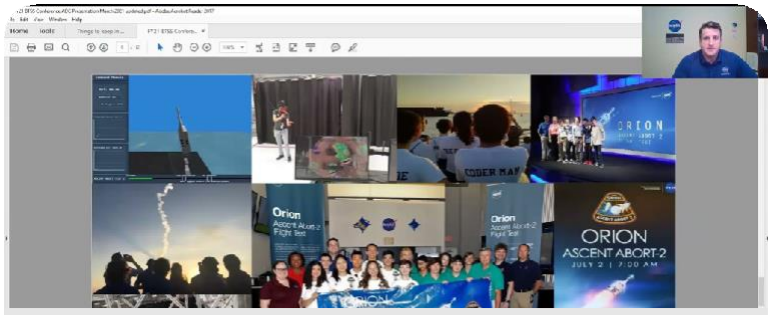
SPEAKER:

- Matt Kamlet - AFRC Aeronautics Public Affairs Officer
- April Lanotte - ARMD STEM Integration Lead
- Karen Rugg - ARMD Lead for Communications/STEM Engagement

Moderated breakout discussions for attendees to brainstorm and develop actionable ideas that create opportunities for students to engage with the X- Planes.

Discussion - Artemis

Discussion 3.4



Discussion 3.4: Breakout Session - Artemis
youtu.be

https://www.nasa.gov/joinartemis

https://www.nasa.gov/sites/default/files/atoms/files/artemis_illustration_coloring_sheet-508_0.pdf

Challenger Learning Centers can now take 5th-8th grade student groups on virtual missions to space (for students schooling virtually, in-person, or

in a hybrid format) with two new programs: Destination Mars and Destination Moon. Very exciting for generating excitement around Artemis: https:// www.challenger.org/what-we-do/virtual-missions/

From Jaydeep in FL Space Grant: James, the Exolith Lab at UCF manufactures lunar simulant and is available for purchase.

https://sciences.ucf.edu/class/exolithlab/

Please take advantage of the resources in the Artemis multimedia Catalog https://nasa-external-ocomm.app.box.com/s/axhqqtgguakxd0bdxpef2arv8kp4fsov

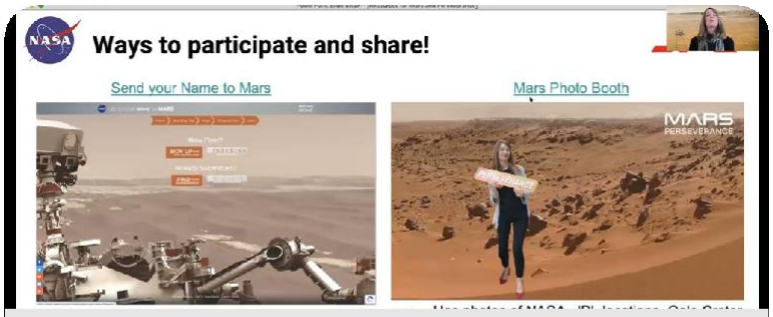
SPEAKERS:

- Debra Ludban - Deputy Manager, Gateway Vehicle System Integration Office (JSC)
- Christina Zaid - HEOMD Comm Strategist
- Alicia Baturoni Cortez - STEM Engagement Embed for HEOMD

Moderated breakout discussions for attendees to brainstorm and develop actionable ideas that create opportunities for students to engage with Gateway.

Discussion - Mars 2020

Discussion 3.5



Discussion 3.5: Breakout Session - Mars 2020
youtu.be

SPEAKERS:

- David Seidel - STEM Engagement Director at NASA's Jet Propulsion Laboratory
- Sarah Marcotte - Public Engagement Specialist at NASA's Jet Propulsion Laboratory

Moderated breakout discussions for OSTEM PIs and grantees to brainstorm and develop actionable ideas that create opportunities for students to engage with Mars 2020.

Discussion - Lunar Technologies

Discussion 3.6

Discussion 3.6: Breakout Session - Lunar Technologies
youtu.be

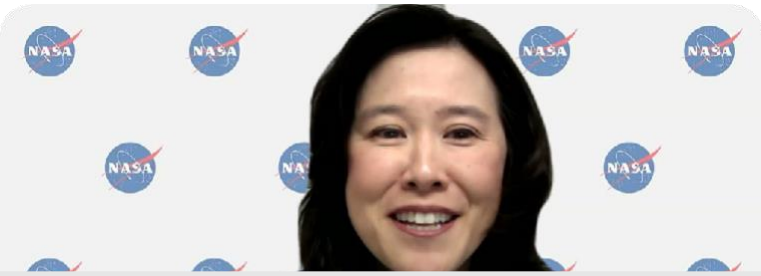
SPEAKERS:

- Drew Hope - Deputy Director of Technology Maturation
- Carol Galica - Strategy and Planning Lead for the LSII, STMD
- Stacey Dees - Higher Education Challenges Portfolio Manager/BIG Idea Challenge Program Manager

Day Two

Opening Plenary - A Conversation with Astronaut Chris Cassidy

Plenary Session 4



DAY 2 OPENING PLENARY – Session 4: A Conversation with Astronaut Chris Cassidy
youtu.be

SPEAKER:

- Chris Cassidy - NASA Astronaut

Hear from Astronaut Chris Cassidy as he shares stories about his own STEM journey, the importance of STEM education to the future of NASA and more. We are pleased to welcome him home from the recent his most recent flight where he served as Commander on the International Space Station for Expedition 63. Cassidy now has spent a total of 378 days in space, the fifth highest among U.S. astronauts.

Good Q&A with astronaut, mostly a inspirational talk for astronaut/NASA path and life in general. Not much value for researchers.
Great story about team building. Was 2 weeks from launch with 2 Russian Cosmonauts. One injured eye. Scrubbed team he prepped with and had close working relationship. Swapped out crew and had to become a team for launch and mission on ISS
What advice would you give for kids wanting to become astronaut: Don't be a jerk. People skills needed to function well with team.
Disney channel doing documentary for ISS Training. Air fall.

Keynote - Diversity, Equity, Access, and Inclusion - A Systemic Approach

Keynote 5

Keynote - Session 5: Diversity, Equity, Access, and Inclusion - A Systemic Approach
youtu.be

SPEAKER:

- Julie Johnson - Program Director in the Division on Research and Learning at the National Science Foundation

Despite ongoing conversations, intentional efforts, and heightened awareness, there continues to be persistent disparities with racial/ethnic minorities, women, persons with disabilities and other underrepresented and underserved groups in STEM fields. Join us for a moderated conversation with Dr. Julie Johnson, who will share her perspective on a common vocabulary and understanding around these issues, offer her thoughts on a framework for a systemic approach, as well as strategies to bridge the gap between research and practice.

-From chat

- NASA Definition of Diversity:
  The entire universe of differences and similarities.
- NASA Definition of Inclusion:
  The full participation, belonging, and contribution of organizations and individuals.

White House Definitions of Equity and Underserved Communities, as defined by the Executive Order On Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and the Executive Order on Establishment of the White House Gender Policy Council.

https://www.nasa.gov/offices/odeo/diversity-and-inclusion/

Discussion 6.1 - Addressing Diversity, Equity, Access, and

Inclusion Challenges in Higher Education

Discussion 6.1

Discussion 6.1: Addressing Diversity, Equity, Access, and Inclusion Challenges in Higher
youtu.be

SPEAKERS:

- Cassandra Runyon - Associate Professor, Geology, College of Charleston, Director of NASA South Carolina Space Grant Consortium and South Carolina NASA EPSCoR
- Paulo Oemig - Director of New Mexico Space Grant Consortium and New Mexico NASA EPSCoR
- Caitlin Nolby - Deputy Director of North Dakota Space Grant and North Dakota NASA EPSCoR
- Erica Alston - Deputy Space Grant Manager

Colleges and universities around the country are wrestling with the challenge of attracting and engaging students into STEM, especially those in underrepresented and underserved communities. Participate in a moderated discussion where three Space Grant Directors will share both some challenges and promising practices that will kick start the conversation!

Discussion 6.2 - Addressing Diversity, Equity, Access, and Inclusion Challenges in Informal Education

Discussion 6.2

Discussion 6.2: Addressing Diversity, Equity, Access, & Inclusion Challenges in Informal
youtu.be

- Julie Johnson - Program Director in the Division on Research and Learning at the National Science Foundation
- Kevin Frank - Informal STEM Engagement Manager, NASA's Jet Propulsion Laboratory
- Rabiah Mayas - Ruth D. and Ken M. Davee Vice President of Education and Guest Experience at the Museum of Science and Industry, Chicago (MSI)
- Derrick Pitts - Chief Astronomer, Planetarium Programs Director, The Franklin Institute

Museums, science centers, and other informal educational institutions are uniquely positioned to spark interest in STEM and keep youth engaged through community-based programs. They play a critical role in reaching students of all backgrounds. Join Dr. Julie Johnson from the NSF, Dr. Rabiah Mayas from Chicago's Museum of Science and Industry and Mr. Derrick Pitts from Philadelphia's Franklin Institute for a facilitated discussion designed to identify challenges and explore approaches to reduce barriers for participation. All are welcome to listen and contribute!

Discussion 6.3 - Leveraging networks to address Diversity, Equity, Access, and Inclusion

Discussion 6.3

Discussion 6.3: Leveraging networks to address Diversity, Equity, Access, and Inclusion
youtu.be

SPEAKERS:

- Dr. Tori Rhoulac Smith - Program Director in the Division of Human Resource Development (HRD) of the National Science Foundation's Directorate for Education and Human Resources (EHR)
- Susan Poland - NASA OSTEM Education Specialist

When tackling different aspects of broadening participation in STEM, individuals, organizations and institutions too often operate independently when they could be sharing ideas and resources by working together. Join special guest, Dr. Tori Rhoulac Smith, in a facilitated discussion as she shares her expertise in how networks, partnerships, and collaborations can support and accelerate efforts to broaden participation in STEM education and careers. Come ready to share questions, ideas, and success stories!

Discussion 6.4 - Opportunities to partner with MUREP

Discussion 6.4: Opportunities to partner with MUREP
youtu.be

SPEAKERS:

- Torry Johnson - MUREP Project Manager
- Daesha Roberts - MUREP Senior Specialist

At the Office of STEM Engagement, we often get the question: how can we work with MUREP? To start the session, MUREP Project Manager, Torry Johnson, will share a quick overview of MUREP, some examples of effective

partnerships and collaborations, and then open it up to “virtual” discussion to hear your questions and brainstorm ideas. (While MUREP grantees are welcome to listen in, this session is focused on how MUREP can partner with those in other parts of the OSTEM community.)

Discussion 6.5 - Trends Affecting Higher Ed Students of Color Post-COVID

Discussion 6.5

Discussion 6.5: Trends Affecting Higher Ed Students of Color Post-COVID
youtu.be

SPEAKERS:

- Dr. Eileen Hulme - Vice President for Enterprise Development and Regional Ventures at Indiana Wesleyan University
- Elaine Ho - Deputy Associate Administrator, OSTEM

As the US emerges from the COVID19 pandemic, concerns that impacted college and universities before the pandemic appear to have been exacerbated by the economic uncertainty facing the country. These trends are already negatively affecting low-income, students of color and their families. Join expert, Dr. Eileen Hulme, who will present data revealing the early indicators of declining enrollment of low socioeconomic status and diverse students and lead a discussion around those students who are thriving and explore practical approaches for ensuring STEM success for all individuals. Participants will have the opportunity to share effective interventions and reflect on the specific changes needed on their campus.

Closing Plenary - Thomas Zurbuchen

Closing Plenary 7

CLOSING PLENARY – 7: Thomas Zurbuchen
youtu.be

SPEAKER:

- Dr. Thomas Zurbuchen - Associate Administrator, NASA's Science Mission Directorate

Don't miss our closing plenary session with Dr. Thomas Zurbuchen about teamwork, innovation and the importance of coming together to engage broader and diverse groups of students in NASA's mission.

Thomas Zurbuchen's Blog: https://blogs.nasa.gov/drthomasz/
Key quotes: Diversity alone doesn't make a great team, inclusion is just as important. The most important gift a team mate can give you is to say no to you. Helps you get to the best idea.
Building a team doesn't mean just wearing the same t-shirt. Need to communicate with empathy, to drive discussions. Communication is much more about listening than talking. Where we are isn't enough.

Links

Here are the links to the videos, posters, and other documents that were available at the Conference. These will be active for 90 days post-conference. These came from the Exhibit Hall and poster sessions.

LCATS is the program an acronym for Lunar Caves Analog Test Sites. LCATS is a 4-year program serving San Antonio PREP (Pre-freshman Engineering Program) students featuring science investigations, space exploration mission operations, technology: https://stemforall2018.videohall.com/presentations/1300

What is NASA STEM Stars, a recorded chat that connected NASA experts with students- https://www.youtube.com/embed/7lb1aElgIoQ?autoplay=1

A Charge Forward: Activating the Nation's Planetariums to Excite the Public About Human Space Exploration of the Moon and Beyond, with PI Denise Young and Co-PI Holly Meninger - https://www.youtube.com/embed/TdfJ2ahmUok?autoplay=1

Space Club: Project Highlights - https://www.youtube.com/embed/Lvz-d0oeBlw?autoplay=1

World Building on Mars - https://www.youtube.com/embed/RXqouYGRdRU?autoplay=1

LADEE Trajectory in J2000 Frame and CR3BP Rotating Frame - https://zealous-brass-molecule.glitch.me/

Teaching the Moonshot: An Introduction to Gravitational Multi-Body Dynamics - https://www.youtube.com/embed/g33rB87EdNM?autoplay=1

The NASA Suits Challenge - https://www.youtube.com/embed/Jh8f3Tlyxe4?autoplay=1

Micro-G NExT - https://www.youtube.com/embed/DuRtGUBewK4?autoplay=1

NASA Artemis Student Challenge: First Nations Launch - https://www.youtube.com/embed/SUot4FZiomk?autoplay=1

NASA Student Launch Initiative - https://www.youtube.com/embed/HjkxZVsBRHw?autoplay=1

NASA Human Exploration Rover Challenge - https://www.youtube.com/embed/END1kZhYSq4?autoplay=1

NASA's BIG Idea Challenge - https://www.youtube.com/embed/bRPkh10BQM8?autoplay=1

Space Grant's Great Lunar Expedition for Everyone (GLEE) Announcement Video - https://www.youtube.com/embed/24ujpW5nN5Q?autoplay=1

I Started as a NASA Intern... - https://www.youtube.com/playlist?list=PLTUZypZ67cduV-d1RiDkhZpOXaDkOxIC3

National Native American Heritage Month - Karen Moore's NASA Intern Story

Meet NASA Interns - https://www.youtube.com/embed/j1t-LWMZqY4?autoplay=1

NASA STEM Stars en Español: Internships - https://www.youtube.com/embed/BBeZHfZxVFI?autoplay=1

NASA STEM Stars: NASA Internships - https://www.youtube.com/embed/0yHjd9pbo1c?autoplay=1

NASA Astronaut Chris Cassidy Speaks with NASA Interns - April 28, 2020 - https://www.youtube.com/embed/1nQWp95fzFo?autoplay=1

NASA Community College Aerospace Scholars CAMPUS PROMO - https://www.youtube.com/embed/6cvH7-W_JLA?autoplay=1

NASA Artemis Student Challenge: First Nations Launch 2020 - https://www.youtube.com/embed/SUot4FZiomk?autoplay=1

Seeing Sound Educator Demo -

https://www.youtube.com/embed/B6lGRfi50lY?autoplay=1

NASA XPLANE-ations: How to Build a Coin Battery - https://www.youtube.com/embed/7UrsO9QBFXA?autoplay=1

The Low-Boom Flight Demonstration Mission Inside Scoop - Summer Fall 2020 Video - https://www.youtube.com/embed/sgj5xXFujPA?autoplay=1

Boeing Starliner Crew Prepares Second Module for Flight - https://www.youtube.com/embed/g4JO-nr3qm4?autoplay=1

NASA Certifies SpaceX Crew Transportation System for Regular Astronaut Flights to Space - https://www.youtube.com/embed/B7r1uHvcamY?autoplay=1

An Introduction to the James Webb Space Telescope Mission - https://www.youtube.com/embed/YF22Ba-xrk8?autoplay=1

NASA’s James Webb Space Telescope: What Is a Galaxy? - https://webbtelescope.org/contents/media/videos/2019/27/1206-Video

NASA’s James Webb Space Telescope: How Do Space Telescopes Break Down Light? - https://webbtelescope.org/contents/media/videos/2018/37/1181-Video

NASA’s James Webb Space Telescope: How Do We Learn About a Planet's Atmosphere? - https://webbtelescope.org/contents/media/videos/2018/30/1158-Video

NASA’s James Webb Space Telescope: Galaxies Through Time - https://webbtelescope.org/contents/media/videos/2020/49/1290-Video

Artemis I – SLS Launch and Mission Animation - https://www.youtube.com/embed/r_OGfu0mPyo?autoplay=1

Mission Overview: NASA's Perseverance Mars Rover - https://www.youtube.com/embed/SYopMbZEhTs?autoplay=1

NASA's Ingenuity Mars Helicopter: The First Aircraft on Mars - https://www.youtube.com/embed/0hviruuvybo?autoplay=1

Posters

The Next Generation STEM: Informal Education Support -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149606546-next-gen-stem-tri-fold-brochure-r-1-pdf1614960654.pdf
The Next Generation STEM project (Next Gen STEM) -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149607307-ngs-overview-booklet-version-updated-11-16-2020-r-1-pdf1614960730.pdf
Creating Informal Learning Opportunities -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1616013800team-ii-mie-alliance-poster-pdf1616013800.pdf
CULTURALLY RESPONSIVE ENGAGEMENT & TEACHING -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149607812-nasa-stem-epdc-culturally-responsive-engagement-flyer-r-1-pdf1614960781.pdf
NASA STEM Engagement & Professional Development Collaborative -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149608023-epdc-murep-highlights-oct-2020-r-1-pdf1614960802.pdf
MUREP/ EPDC Request -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149608214-epdc-murep-overview-poster-r-1-pdf1614960821.pdf
Artemis Lessons for Educators - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/16149608381-ngs-m2m-better-together-conference-r-1-pdf1614960838.pdf
Next Gen STEM Moon to Mars FY20 Metrics App Development Challenge -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 16149608588-ngs-m2m-adc-and-wear-activity-metrics-better-together-conference-r-1-pdf1614960858.pdf
Bridging Earth and Mars (BEAM): Engineering Robots to Explore the Red Planet NASA CP4SMPVC Award: NNX14AD08G -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496125225-st-louis-sci-center-r-pdf1614961252.pdf
MISSION TO STEM: ACTIVATING NASA ARTIFACTS AND NEXT GENERATION SCIENCE STANDARDS WITH DIGITAL MISSIONS FOR STUDENTS AND FAMILIES -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161496130116-great-lakes-sci-center-r-pdf1614961301.pdf
Understanding Earth Systems Interconnections - Six Degrees of Connection from Global to Local using Science on a Sphere® and Art -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496133219-nurture-nature-center-six-degrees-copy-pdf1614961332.pdf
NASA Earth, Solar, and Planetary Science Infusion Project (ESPSI) -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496135026-hb-owens-science-center-r-pdf1614961350.pdf
EVOLVE (Expanding Versatile Offerings for Learning in Virtual Environments) Museum of Science, Boston | mos.org -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496145913-museum-of-science-boston-r-pdf1614961459.pdf
Observing With NASA 2.0 (OWN) Smithsonian Astrophysical Observatory -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161496146514-smithsonian-astronomical-observatory-r-pdf1614961465.pdf
Fun, hands on 1-hour sessions through Zoom* (Groups of 10 youth per 6 week classes) Remote Learning Opportunity -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496147115-boys-and-girls-club-r-pdf1614961471.pdf
SciGirls in Space: Exploring the Moon, Mars and NASA Careers -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496148117- scigirls-in-space-r-pdf1614961481.pdf

Blueprints to BLAST OFF from Carnegie Science Center -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496149218-carnegie-science-center-r-pdf1614961492.pdf
ECOEXploration: Innovative Space Learning Activity Center -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496149920-ecoexploratorio-r-pdf1614961499.pdf
Growing Beyond Earth: Distance Learning for Underserved Communities -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161496150821-fairchild-gardens-distance-learning-r-pdf1614961508.pdf
Growing Beyond Earth Innovation Studio -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496152122-fairchild-gardens-innovation-studio-r-pdf1614961521.pdf
Orlando Science Center: Inspire Learning for Life Mission Mars -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496152923-orlando-science-center-r-pdf1614961529.pdf
ENGAGING STUDENTS IN THE WONDERS OF SPACE: Project IANOS -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161496153724-aldrin-foundation-r-pdf1614961537.pdf
EdVenture's Flight Gallery -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161496154327-edventure-r-pdf1614961543.pdf
UNDERSTANDING THE INVISIBLE: STUDYING OZONE THROUGH BIOINDICATOR GARDENS UNDER NASA'S TEMPO MISSION Virginia Living Museum -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161496155234-va-living-museum-r-pdf1614961552.pdf
Pipeline for Remote Sensing Education & Application (PRSEA) Pacific Science Center -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 161530191529-pacific-science-center-r-pdf1615301915.pdf
From Our Town to the Moon, Mars, and Beyond: Increasing the capacity of libraries to engage the public in NASA's journey -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161530194630-space-science-institute- fotm-r-pdf1615301946.pdf
Discover NASA: From Our Town to Outer Space: Bringing NASA Science and Engineering to Underserved Communities through a National Public Library Exhibition Program -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161530201131-space-science-institute-fotos-r-pdf1615302011.pdf
CP4SMPVC Life on the edge Vida al Limite -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161530205632-sciencenter-r-pdf1615302056.pdf
EXOPlanets: An Interactive Exoplanet Exhibition -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161530211033-dayton-society-of-natural-history-r-pdf1615302110.pdf
Moon Adventure Game QUICK START GUIDE -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/161530218735-az-scicenter-r-pdf1615302187.pdf
2021 NASA Student Launch Handbook and Request for Proposal –
https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/ 16058209332020-2021-slhandbook-pdf1605820933.pdf
2021 Rover Challenge Guidebook -
https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/1605820978edu-herc-guidebook-2021-pdf1605820978.pdf
PROPOSAL GUIDELINE: NASA Spacesuit User Interface Technologies for Students -
https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/ 1605820994proposal-guideline-w-rubric-9-22-20-pdf1605820994.pdf

NASA ROBOTIC MINING COMPETITION (RMC) LUNABOTICS 2021 - https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/1605821024000-rmc-lunabotics-rules-rubrics-2021-pdf1605821024.pdf

MICRO-G NEXT 2021 DESIGN CHALLENGES - https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/16058210372021-micro-g-next-challenge-descriptions-v5-1-pdf1605821037.pdf

Wisconsin Space Grant 12th Annual First Nations Launch Student Competition Handbook 2020-2021 - https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/1605821051fnl21student-handbookfinalpdf-pdf1605821051.pdf

NASA Fellowships Find Your Place In Space Amazing Opportunities for Graduate Researchers - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1615334294fellowships-letterfold-e-brochure-508-pdf1615334294.pdf

MUREP Proposals: Include NASA Internships as part of Your MUREP Proposals - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1614028435murep-proposal-508-pdf1614028435.pdf

OSTEM's SPACE GRANT SPONSORSHIPS - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614028452space-grant-flier-508-pdf1614028452.pdf

NASA Commitment to Diversity: MSI Internships - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614028508diversity-metric-508-pdf1614028508.pdf

Get Involved: THREE WAYS TO HELP BROADEN PARTICIPATION IN NASA INTERNSHIPS - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614029031committment-to-diversity-508-pdf1614029031.pdf

2020 NASA OSTEM INTERNSHIPS IMPACT - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614029057internshipcy2020-impact-508-pdf1614029057.pdf

Minority University Research Education Project (MUREP) for American Indian and Alaska Native STEM Engagement (MAIANSE) - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1615334294murep-and-maiase-single-page-flier-508-pdf1615334294.pdf

NASA'S INTERNSHIP PROGRAMS - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614026388intern-brochure-508-pdf1614026388.pdf

NACA: SOLVING DECADES OF AVIATION CHALLENGES - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614727323naca-nasa-aero-contributions-timeline-pdf1614727323.pdf

X-15: Extending the Frontiers of Flight - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614784370470842main-x-15-frontier-of-flight-pdf1614784370.pdf

NASA Aeronautics Book Series: Green Light for Green Flight - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614784468green-light-for-green-flight-tagged-pdf1614784468.pdf

Explore Flight: We are With You When You Fly - https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/1605821219nasa-aero-101-16-9format-lo-res-10-2020-pdf1605821219.pdf

NASA Aeronautics: Strategic Implementation Plan 2019 Update - https://vepimg.b8cdn.com/uploads/vjfnew/2661/content/docs/1606749336armd-strategic-plan-pdf1606749336.pdf

STEM LEARNING: X-57 Maxwell Electric Plane Educator Guide - https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614722857x-57-maxwell-educator-guide-pdf1614722857.pdf

NASA Virtual Guest Guide -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1612527398nasa-virtual-guest-program-pdf1612527398.pdf
James Webb Space Telescope Printable Materials -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1615930954jwst-printable-materials-pdf1615930954.pdf
James H. Webb Telescope Explore Exoplanets: Multimedia & Interactive Resource -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1615930959jwst-multimedia-pdf1615930959.pdf
James H. Webb Telescope Exploring the Universe: Activity Guides & Program Models -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1615930964jwst-activity-guides-pdf1615930964.pdf
James H. Webb Telescope General Resources and Links -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1615930968jwst-general-resources-and-links-pdf1615930968.pdf
Orion Space Craft: Deep Space Rated Command Module -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1612992617artemis-collector-card-orion-pdf1612992617.pdf
Space Launch System: The Most Powerful Rocket in the World -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1612992680artemis-collector-card-sls-pdf1612992680.pdf
Lunar Landers: Modern Human Lunar Landers -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1612992909artemis-collector-card-lunar-landers-pdf1612992909.pdf
Artemis Space Suits: Surface suits designed for a broad range of movement
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1612992955artemis-collector-card-artemis-spacesuits-pdf1612992955.pdf
Exploration Ground Systems: A network of Earth based structures required for launch -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1612993118artemis-collector-card-egs-pdf1612993118.pdf
Artemis Gateway: Lunar Outpost Around the Moon -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1612993163artemis-collector-card-gateway-pdf1612993163.pdf
Lunar Surface Innovation Consortium -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1613686165202101-february-newsletter-pdf1613686165.pdf
A Perspective on Lunar ISRU Needs Lunar Surface Innovation Consortium -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1615920816isru-needs-pdf1615920816.pdf
Mars 2020/Perseverance NASAFacts Sheets -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614276602mars-2020-fact-sheet-pdf1614276602.pdf
Mars Helicopter/Ingenuity NASAFacts Sheets -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614276648mars-helicopter-ingenuity-factsheet-pdf1614276648.pdf
Mars Perseverance PRESS KIT - https://vepimg.b8cdn.com/uploads/vjfnew/ 3443/content/docs/1614276650mars-2020-landing-press-kit- pdf1614276650.pdf
Mars Perseverance Rover Landing -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/1614276660interactive-virtual-landing-packet-pdf1614276660.pdf
INGENUITY MARS HELICOPTER LANDING PRESS KIT -
https://vepimg.b8cdn.com/uploads/vjfnew/3443/content/docs/ 1614276708ingenuity-landing-press-kit-pdf1614276708.pdf