

NAC STEM Engagement Meeting

SEPTEMBER 30, 2022

NAC STEM ENGAGEMENT COMMITTEE MEETING

Monday , August 1, 2 pm to 5 pm Eastern
Open to the Public



Daniel Dumbacher
Executive Director
American Institute of Aeronautics & Astronautics



Ray Mellado
Founder & Chairman
Great Minds in STEM



Darryl Williams
Senior Vice President of Science and Education
The Franklin Institute



Norman Fortenberry
Executive Director
American Society for Engineering Education



Kristin De Vivo
Executive Director
Lucas Education Research



Jamarius Reid, Student Representative
President, Student Government Association
Embry-Riddle Worldwide

Agenda:

- Opening Remarks by Chair
- OSTEM Recent Events
- Revisit NAC Topics of Interest
- STEM Engagement 2022 Priorities: Partnerships
- Formulation of New Findings and Recommendations
- Other Related Topics



AGENDA

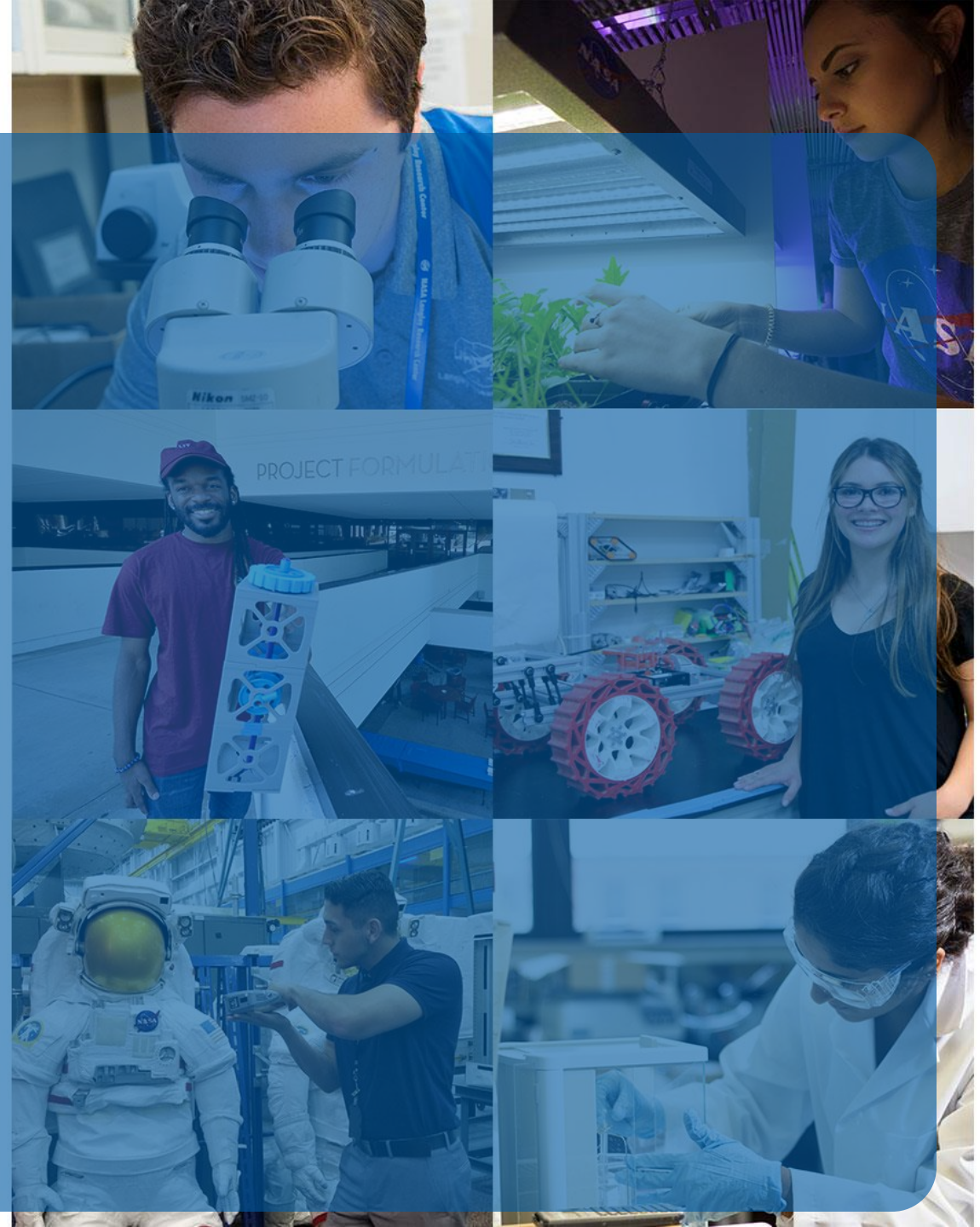
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Office of STEM Engagement: Recent Events

NAC Topics of Interest

Partnerships

Discussion



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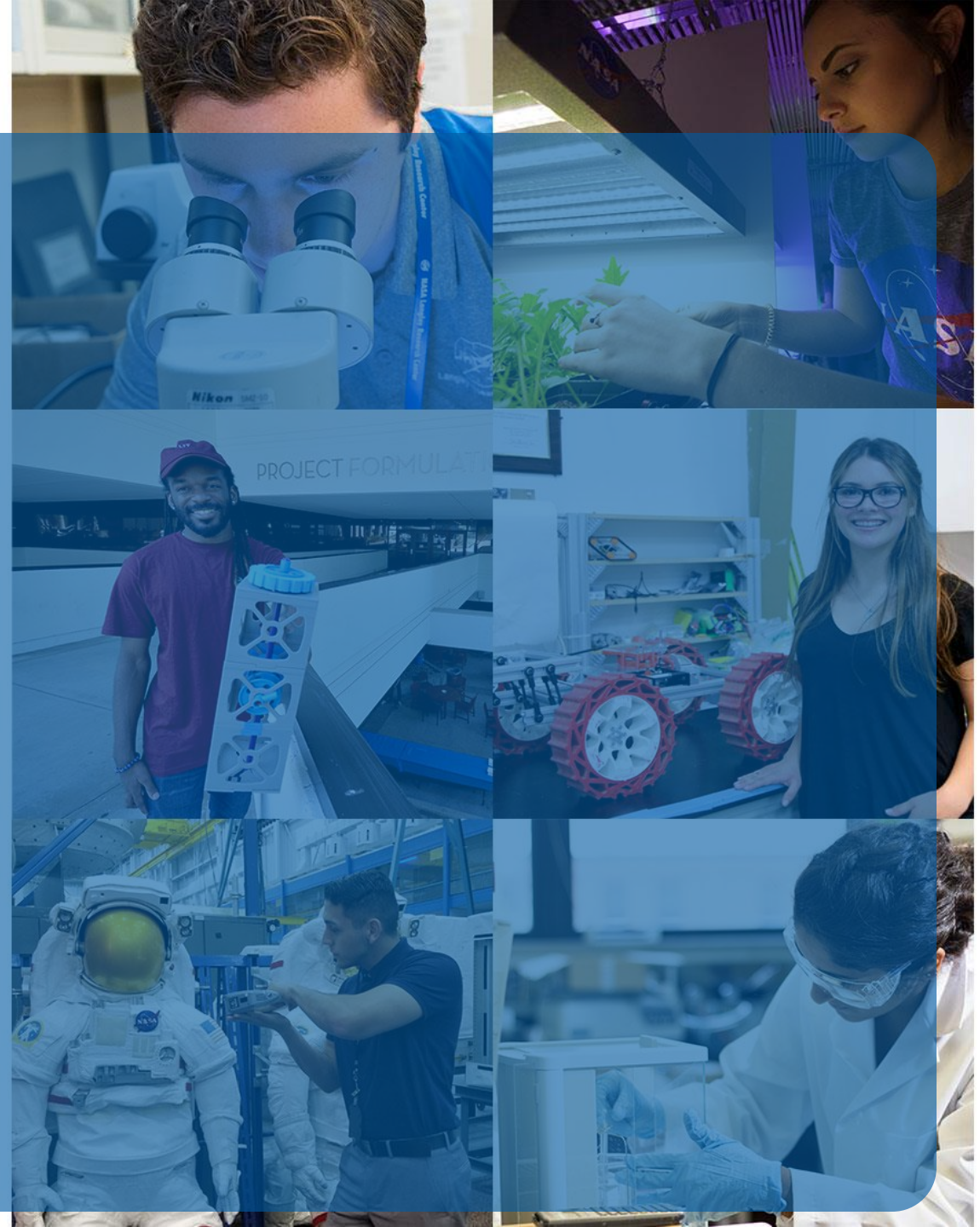
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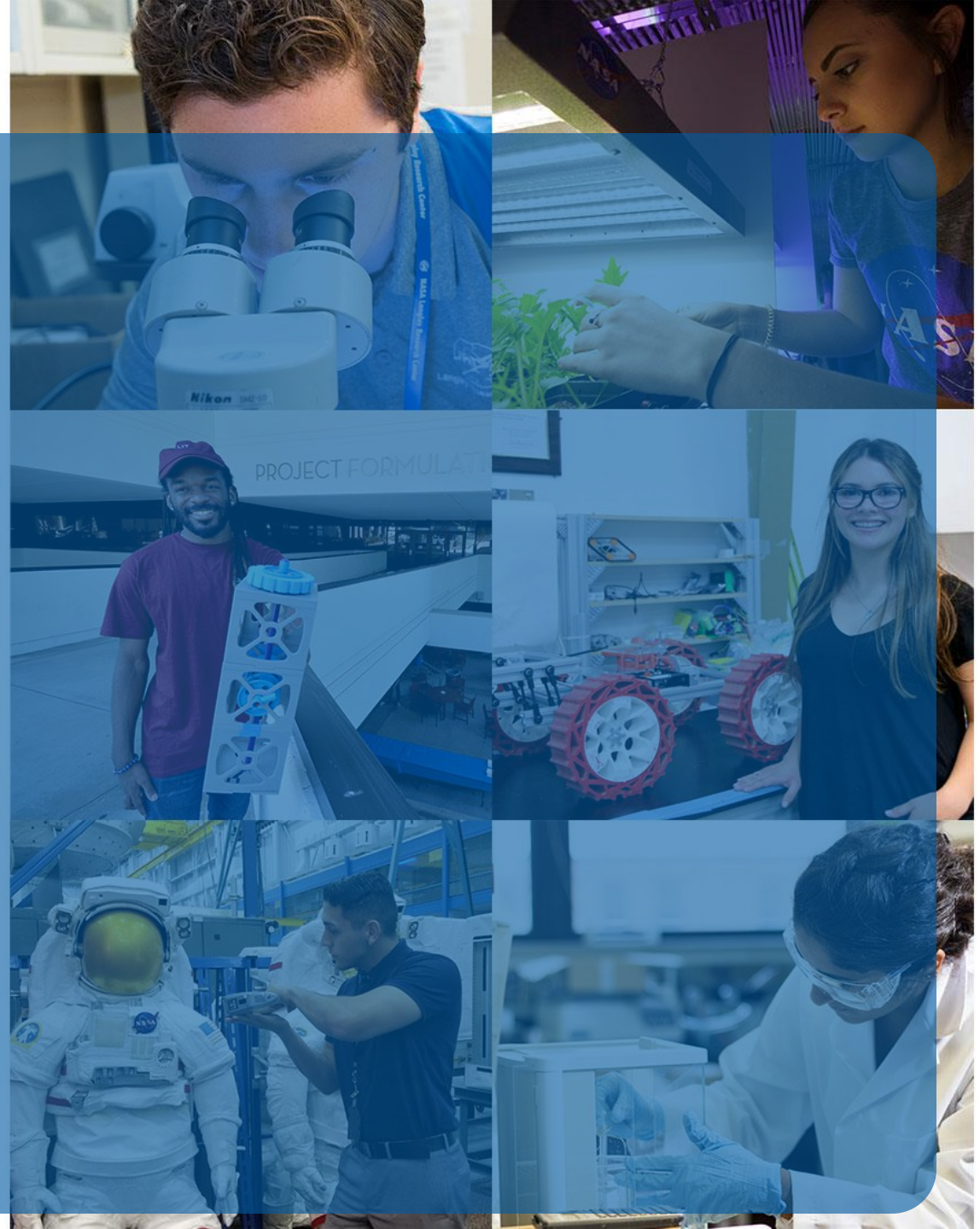
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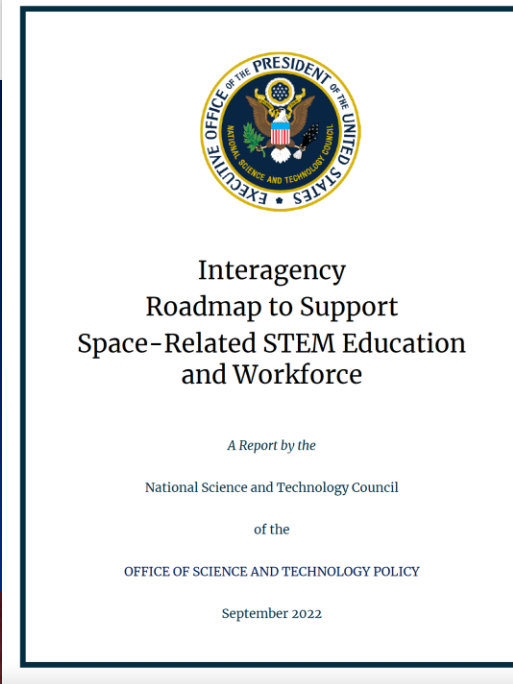
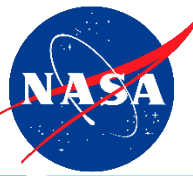
NAC Topics of Interest

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Discussion



NATIONAL SPACE COUNCIL (NSPC)



OSTEM is making substantive contributions to the National Space Council (NSpC) priority for STEM Education efforts:

- Co-chair and membership on new Interagency Space STEM Task Force
- Active participation in drafting the Space STEM Roadmap

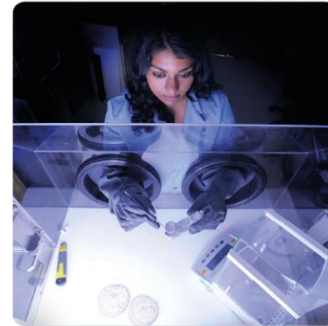
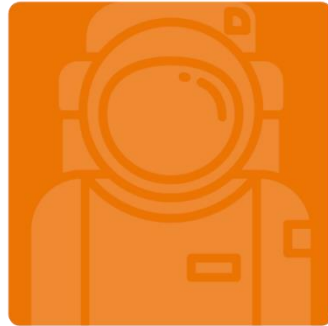
NASA will be a key contributor in execution of actions outlined in the roadmap



Remarks during recent NSpC:

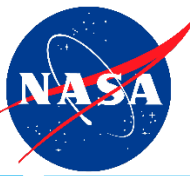
Deputy OMB Director, Nani Coloretti stated "...the budget request seeks to broaden and diversify student participation in STEM to inspire and develop the next generation of scientists, engineers, and explorers...these investments are critical for delivering on the administration's priorities." Vice President Harris responded by saying "as we often say, the budget should reflect our priorities."

NASA STEM Engagement Back-to-School Campaign 2022



Katherine Brown

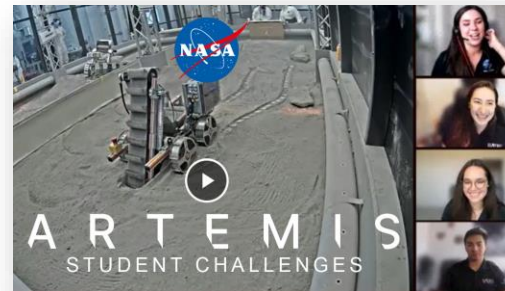
Public Affairs Officer, NASA's Office of STEM Engagement



BACK TO SCHOOL

Campaign Overview

Week 1	Week 3
9 Posts	7 Posts
448,000 Impressions	392,000 Impressions
7,000 Engagements	6,000 Engagements
57,000 Views	52,000 Views
Week 2	Totals
7 Posts	23 Posts
889,000 Impressions	1,730,000 Impressions
10,000 Engagements	23,000 Engagements
71,000 Views	180,000 Views



Highlights

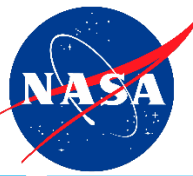
- Week 1**
Downlink Promo
 211,000 Impressions
 2,000 Engagements
 41,000 Views
- Week 2**
Victor Glover BTS Message
 230,000 Impressions
 3,500 Engagements
 47,000 Views
- Week 3**
ASC Twitch
 81,000 Impressions
 2,300 Engagements
 39,500 Views (on Twitch)



28 agency accounts participated
 in the campaign.



BACK TO SCHOOL



Side-By-Side

14 NASA Accounts Participated

125 posts from NASA STEM

Across Facebook & Twitter for the 3-Week Period:

39 Million Reach

2,000 Follower Gain

Back to School 2021

28 NASA Accounts Participated

45 posts from NASA STEM

Across Facebook & Twitter for the 3-Week Period:

76.8 Million Reach

2,256 Follower Gain

Back To School 2022





NASA Experts Answer "When Will I Ever Use This?"

Department of Education Collaboration
Shared on nasa.gov homepage and social media

YouTube Views: 19,700

Currently #5 most viewed on our page
Earned 203 subscribers

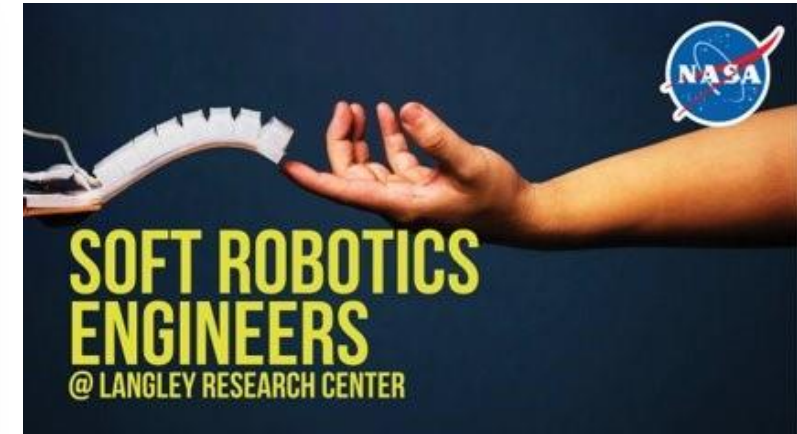


Surprisingly STEM: Marine Biologists @ NASA Kennedy

Premiere of Surprisingly STEM series

YouTube Views: 8,700

Other STEM Social Views: 13,500
Earned 93 subscribers



Surprisingly STEM: Soft Robotics @ NASA Langley

Second episode of Surprisingly STEM

YouTube Views: 22,000

Earned 396 subscribers



AGENDA

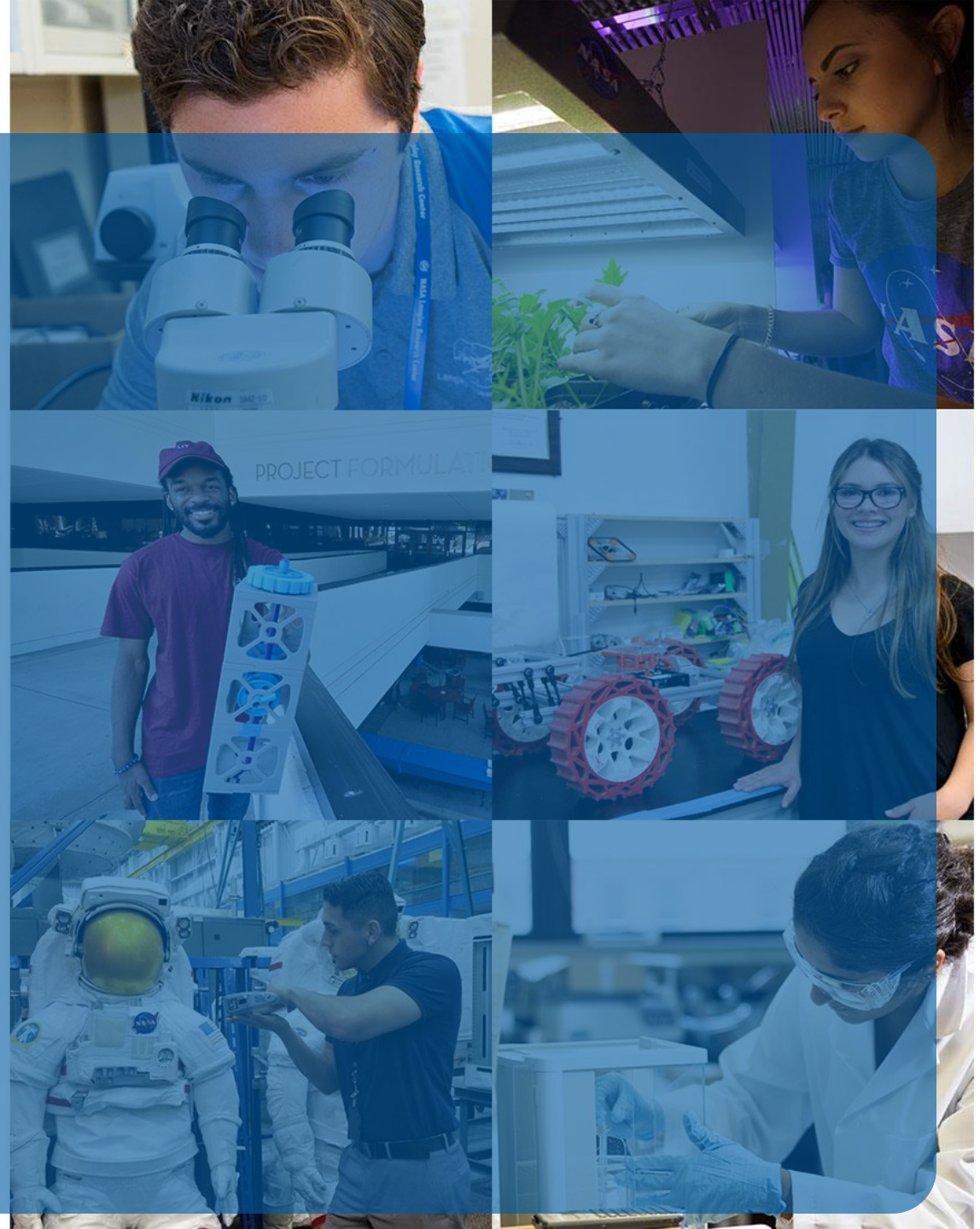
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NAC STEM ENGAGEMENT COMMITTEE RECOMMENDATIONS – FEB 2022

The Council recommends continued emphasis on the NASA STEM Strategic Plan (*NASA Strategy for STEM Engagement, 2020 – 2023*), especially integration and use across the NASA Mission Directorates.

The Council recommends that the NASA Administrator and NASA Mission Directorates, along with the NASA Office of Procurement, should ensure that NASA assists building research capabilities and infrastructure at Minority Serving Institutions (MSIs).

The Council recommends that the NASA, other Federal STEM agencies, and other partners (current and potential) should collaborate to support the STEM education community in addressing the disruption of schools and other identified challenges resulting from the ongoing COVID-19 pandemic. NASA alone cannot solve this.



NASA's COMMITMENT TO DEIA

“NASA is fully committed to Diversity, Equity, Inclusion, and Accessibility (DEIA) for our entire workforce and all our workplaces. This means our Agency will continually prioritize the following: reinforcing a culture in which our employees feel they can be authentic, welcomed, respected, included, and engaged; maintaining an environment where our employees consistently and systematically receive fair, just, and impartial treatment; and ensuring our employees can fully and independently access facilities, information and communication technology, programs, and services.”



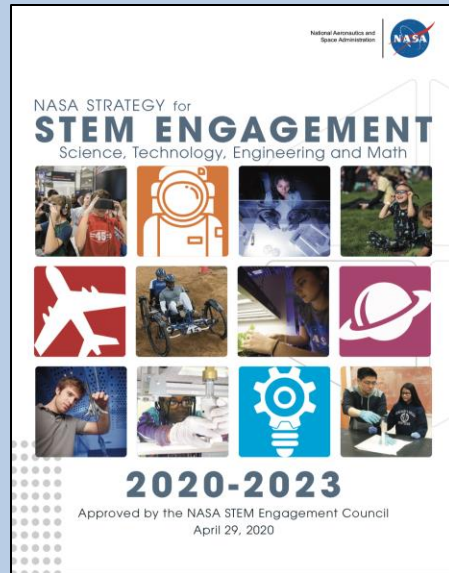
Sen. Bill Nelson
NASA Administrator

September 29, 2021

NASA STEM ENGAGEMENT STRATEGY AND DIRECTION



NASA Strategic Objective 4.3
Build the next generation of explorers.
Engage students to build a diverse future STEM workforce.



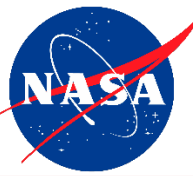
NASA STEM Engagement Goals:

1. Create unique opportunities for a diverse set of students to contribute to NASA's work in exploration and discovery.
2. Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content, and facilities.
3. Attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA's mission and work.

Focus Areas:

- **Broaden student participation** to increase diversity, equity, and inclusion in STEM through NASA opportunities and activities.
- **Build strategic partnerships and networks**, expanding NASA's STEM ecosystem to magnify reach and impact.
- **Expand NASA contributions in engaging K-12 students** in STEM pathways.

FOCUS AREA: BROADENING STUDENT PARTICIPATION



Purpose: Provides an integrated set of efforts for broadening student participation to increase diversity, equity, and inclusion in STEM through NASA opportunities and activities.

Overarching Goals:

1. Enhance communications and stakeholder engagement and build networks and relationships.
2. Strengthen practices and systems.
3. Focus on metrics and evaluation to effectively measure progress.
4. Drive a collective focus across NASA's STEM Engagement community.



EFFORTS TO BROADEN STUDENT PARTICIPATION

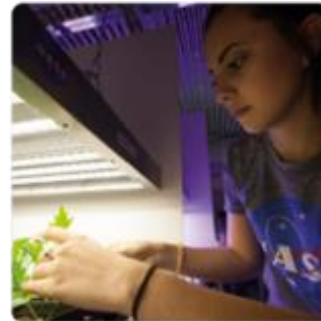


Where Are We Headed?

- Reexamining existing efforts
- Reevaluating **target goals** and developing a **formalized feedback process**
- Integrating DEIA requirements language in solicitations and contract awards
- FY 22 **performance assessment** and **evaluation studies**
- **Expanding partnerships** with other federal agencies (NSF, DoD, ED, NOAA)
- Strategically **leveraging partners, networks and influencers** to expand reach to underrepresented/underserved students

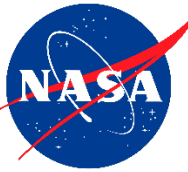


Agency Diversity, Equity, Inclusion, and Accessibility (DEIA) Initiative



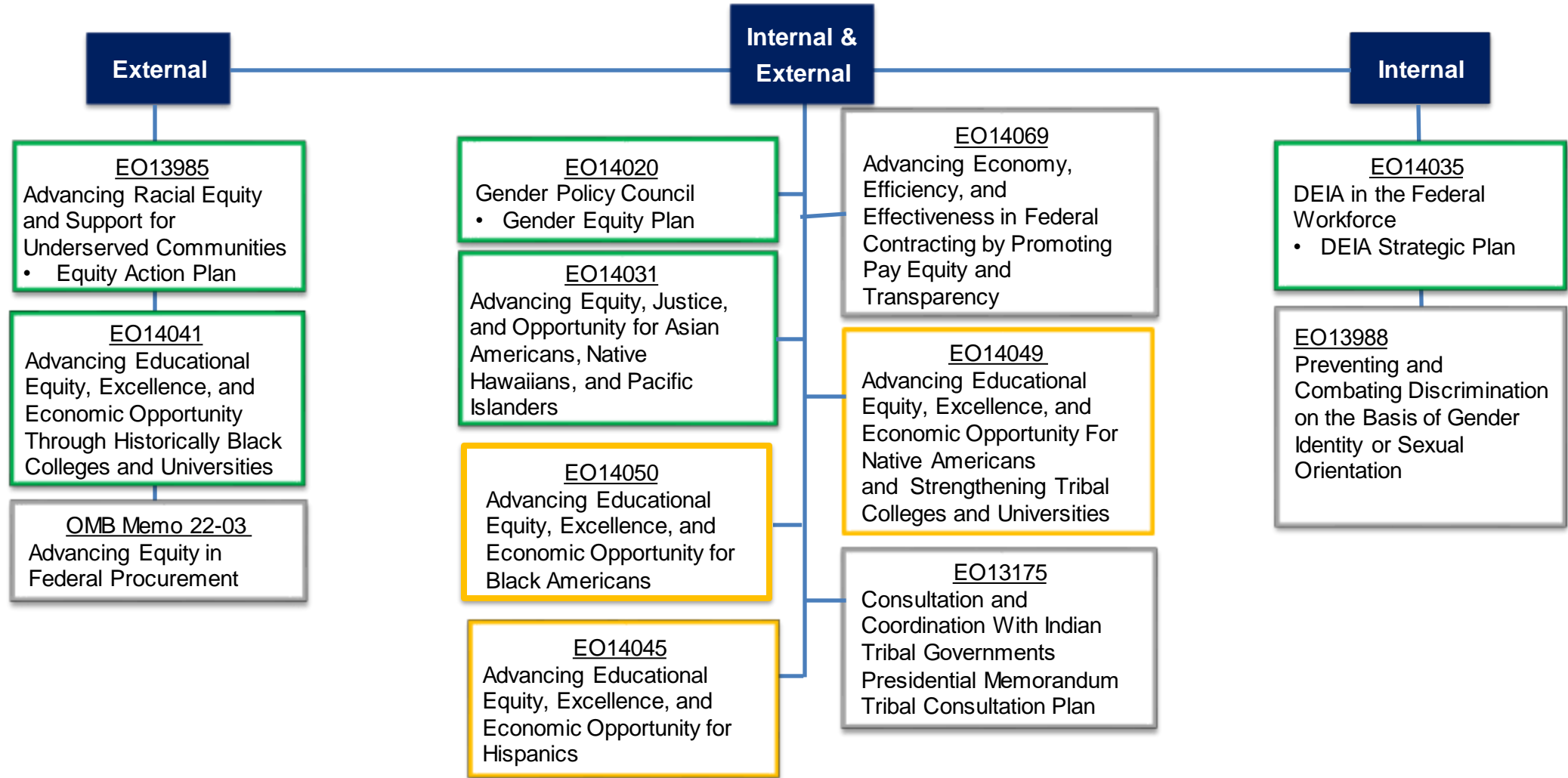
Diane DeTroye

Manager, Portfolio Integration, NASA's Office of STEM Engagement



Agency-wide DEIA Initiative

* Administration Executive Orders *



Green = Plan has been developed or is in work
Yellow = OSTEM will be a part of the plan
Gray = EO does not involve OSTEM

OSTEM and Agency-wide DEIA Initiatives

Understand the requirements and scope of the Executive Orders

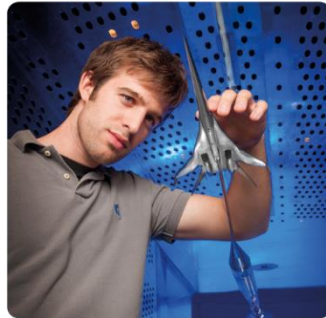
Work collaboratively with Agency Lead offices and other Agency organizations in the development of plans

Leverage existing work and activities where possible

- Support the establishment of new plans, activities, measures, metrics

Ensure our efforts are accurately reflected

Minority University Research and Education Project



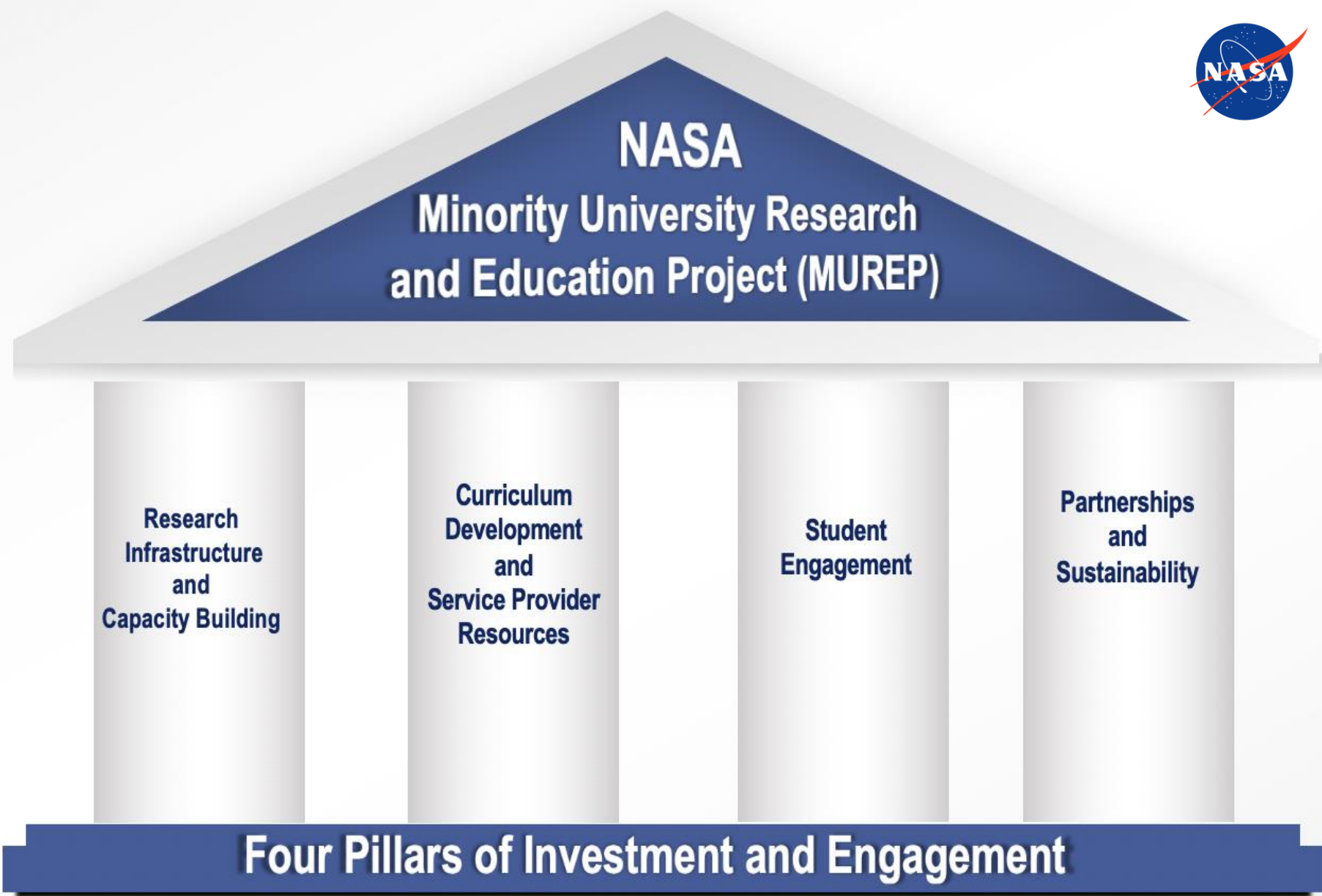
Torry A. Johnson

Manager, Minority University Research and Education Project,
NASA's Office of STEM Engagement

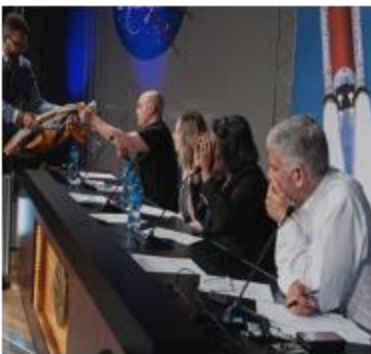


MUREP VISION

To enhance the **research, academic and technological capabilities** at MSIs by providing authentic **student learning experiences** related to **NASA missions** that contribute to a **diverse future STEM Workforce.**



FY 22 MUREP ENGAGEMENT UPDATE – WHAT'S NEW?



MSI Entry Point Activities – Planning Grants, Prizes, Challenges

- ❖ MSI Space Accelerator / SMD Challenge
- ❖ MUREP Small Business Technology Transfer Research (MSTTR) / STMD Planning Grant
- ❖ HEOMD / ARMD Planning Grant

Dedicated Solicitations for HBCU, PBI & Tribal / Indigenous Institutions

- ❖ MUREP Precollege Summer Institute (PSI)
- ❖ Data Science Equity Access Priority (DEAP) / SMD
- ❖ MUREP for American Indian and Alaska Native STEM Engagement (MAIANSE) Connect

Broadening Participation

- ❖ Graduate Degrees for Minorities in Engineering and Science (GEM) Fellowships
- ❖ Women's College / University effort

Pending Partnerships

- ❖ Advancing Minorities Interest in Engineering (AMIE)
- ❖ United Negro College Fund (UNCF)
- ❖ Thurgood Marshall College Fund (TMCF)

FY22 NEW MUREP AWARDS



MUREP High Volume in Partnership with ARMD

Seeks to support the development of a broader technical aerospace high-volume manufacturing workforce while increasing interest in related entrepreneurship opportunities.

\$3M / 4 Awards



MUREP PSI in Partnership with Department of Education

Designed to strengthen support for students in pre-college summer programs

\$640k / 10 Awards



MAIANSE CONNECT – Indigenous Institutions

Aimed at fostering connections between Indigenous culture and NASA.

\$1.3M / 4 Awards



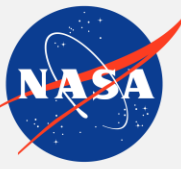
MSI Space Accelerator Challenge in Partnership with SMD

NASA's first MSI Space Accelerator designed to advance agency goals to improve future science missions.

\$150k / 3 Faculty

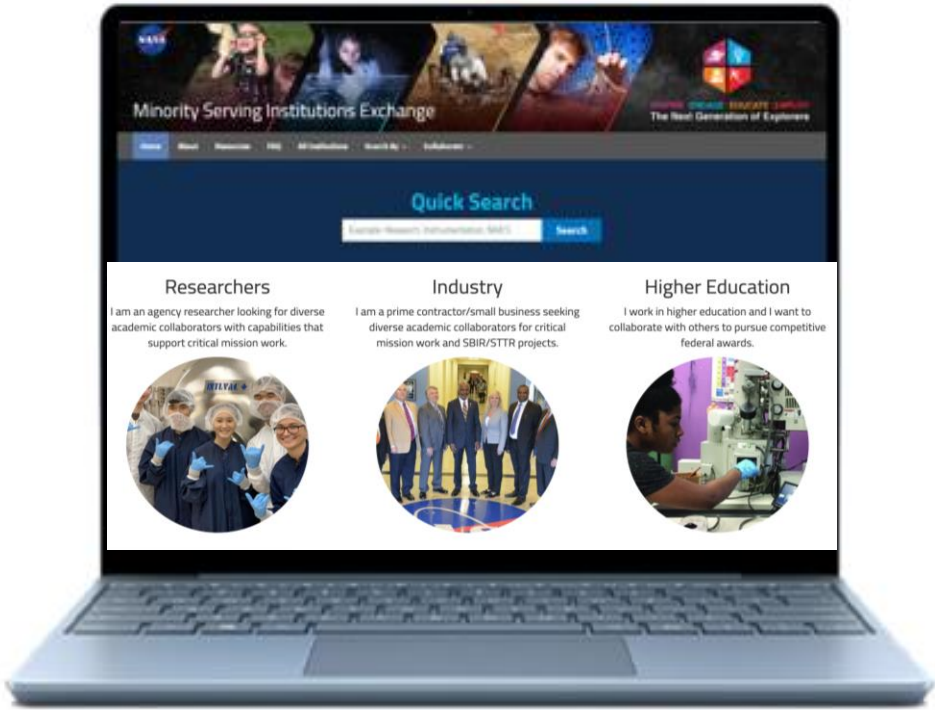
- Access to incubators and venture capital mentoring
- 10 weeks to commercialize Idea





NASA MSI Exchange:

Leveraging Technology to Drive Participation



KEY FEATURES & BENEFITS

- Official NASA MSI Listing
- MSI Capability Statements
- MSI Awareness & Connectivity
- Powers Your Search for Diverse Academic Collaborators!

SERVICES

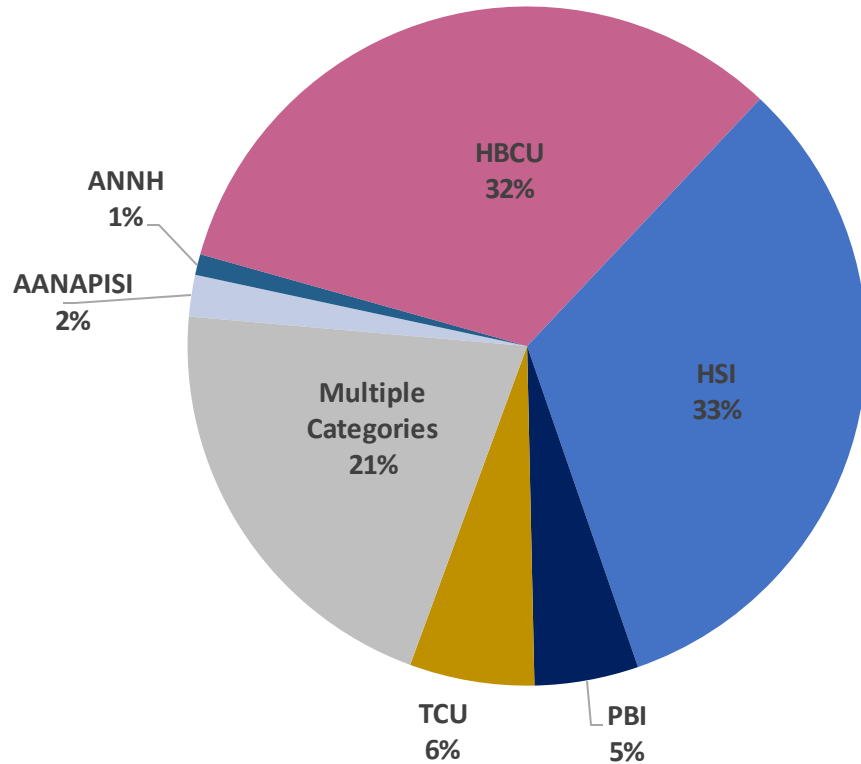
- Bi-Weekly Newsletter
- MSI Training & Development
- Data Collection & Reporting



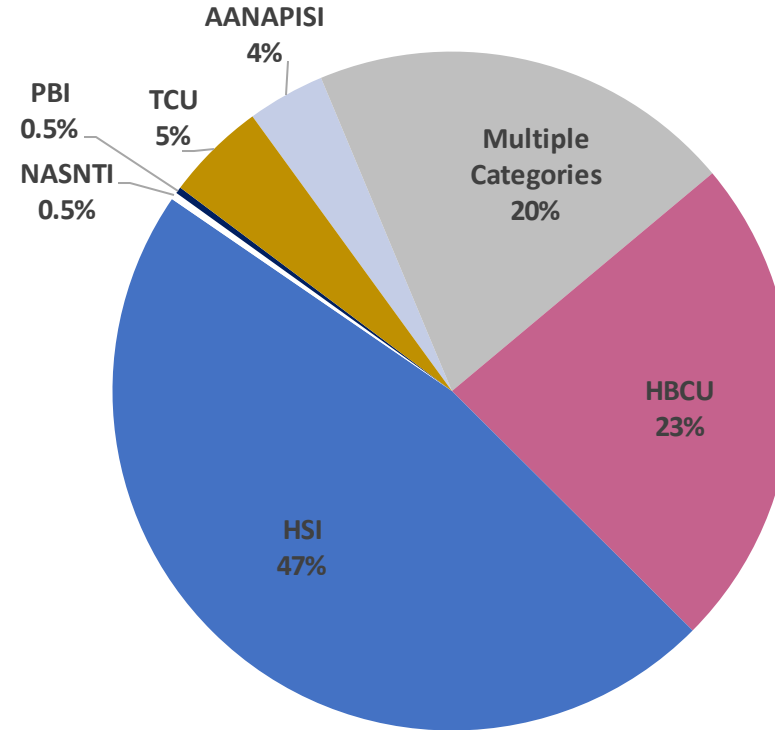
MUREP AWARD OBLIGATIONS BY MSI TYPE

(Grants & Cooperative Agreements)

FY21



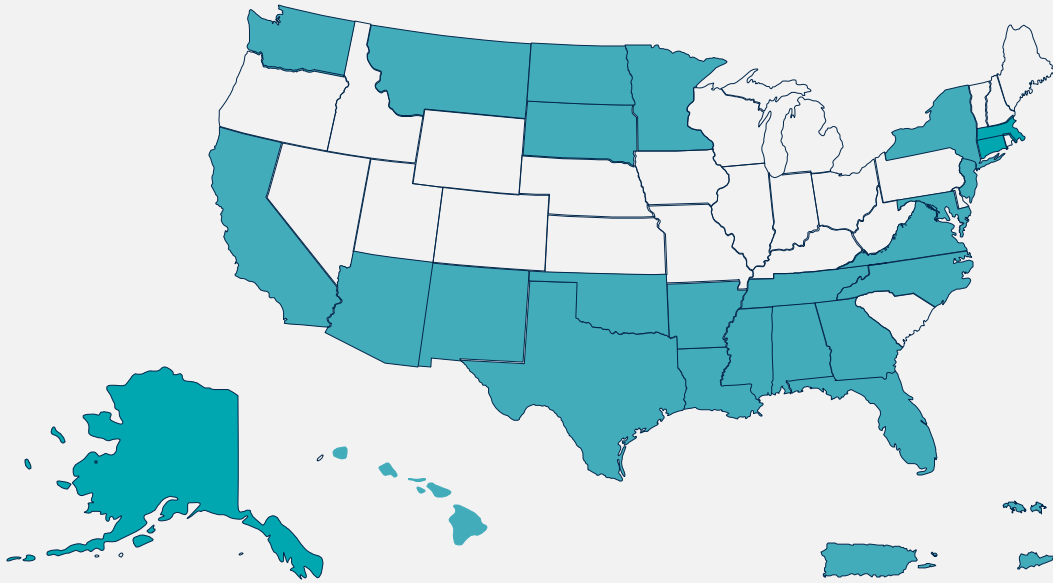
FY22



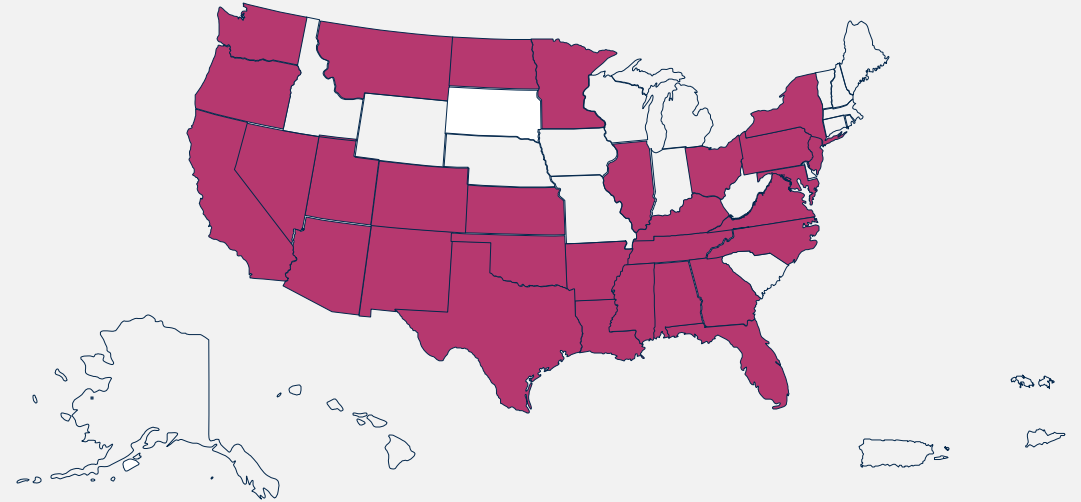


FY2021 Map of MUREP MSI Engagement

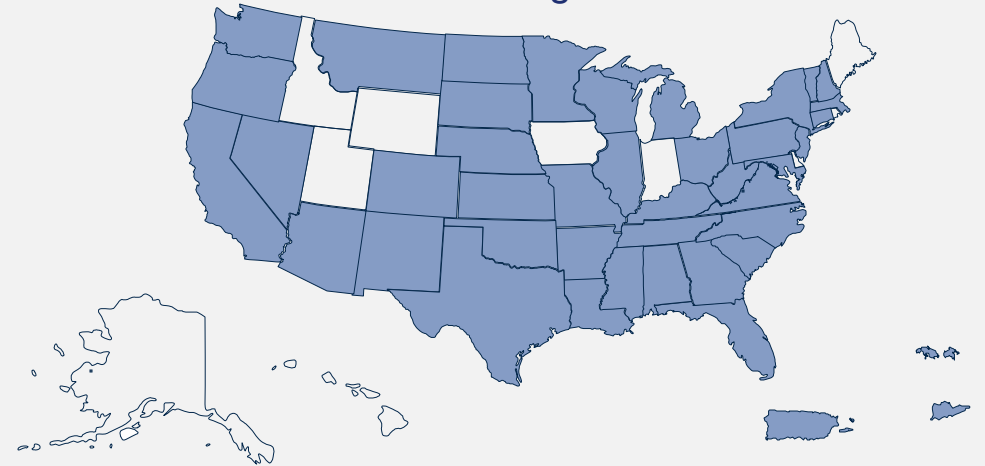
Active Awardees



Internship Placement



MSI Exchange



NASA/MSI TECHNOLOGY INFUSION ROAD TOUR



Objectives

- ❖ Showcase HBCU / MSI Research Capabilities
- ❖ Matchmaking w/Govt Agencies, SBIR/STTR, Small Business & Prime Contractors
- ❖ Relationship Building to Enhance Partnerships & Maximize Opportunities for Success!

Designed to address NASA's one percent (1%) federal contracting goal with HBCU/MSI partners.

Road Tour Stats – FY21/FY22

- ❖ 3 Events
- ❖ 131 MSIs Represented
- ❖ 267 Faculty & Staff Participants
- ❖ 106 Business Partners Engaged



Key Agency Partners

Internal:



External:



INSPIRE - ENGAGE - EDUCATE - EMPLOY
The Next Generation of Explorers



NASA Partnering with White House Initiative to Advance HBCUs and Scholars!

HBCU WEEK ENGAGEMENT:

Mini NASA MITTIC Student Pitch Competition

- Student Poster Session
- Showcase Spinoff Technology Concepts
- "Space Tank" Panel and Judges
- Winner Cash Prize & NASA Immersion Experience

NASA Exhibits

- MSI & Student Opportunities

NASA Sessions

- HBCU Agency Collaboration
- Federal Contracting Career Recruitment



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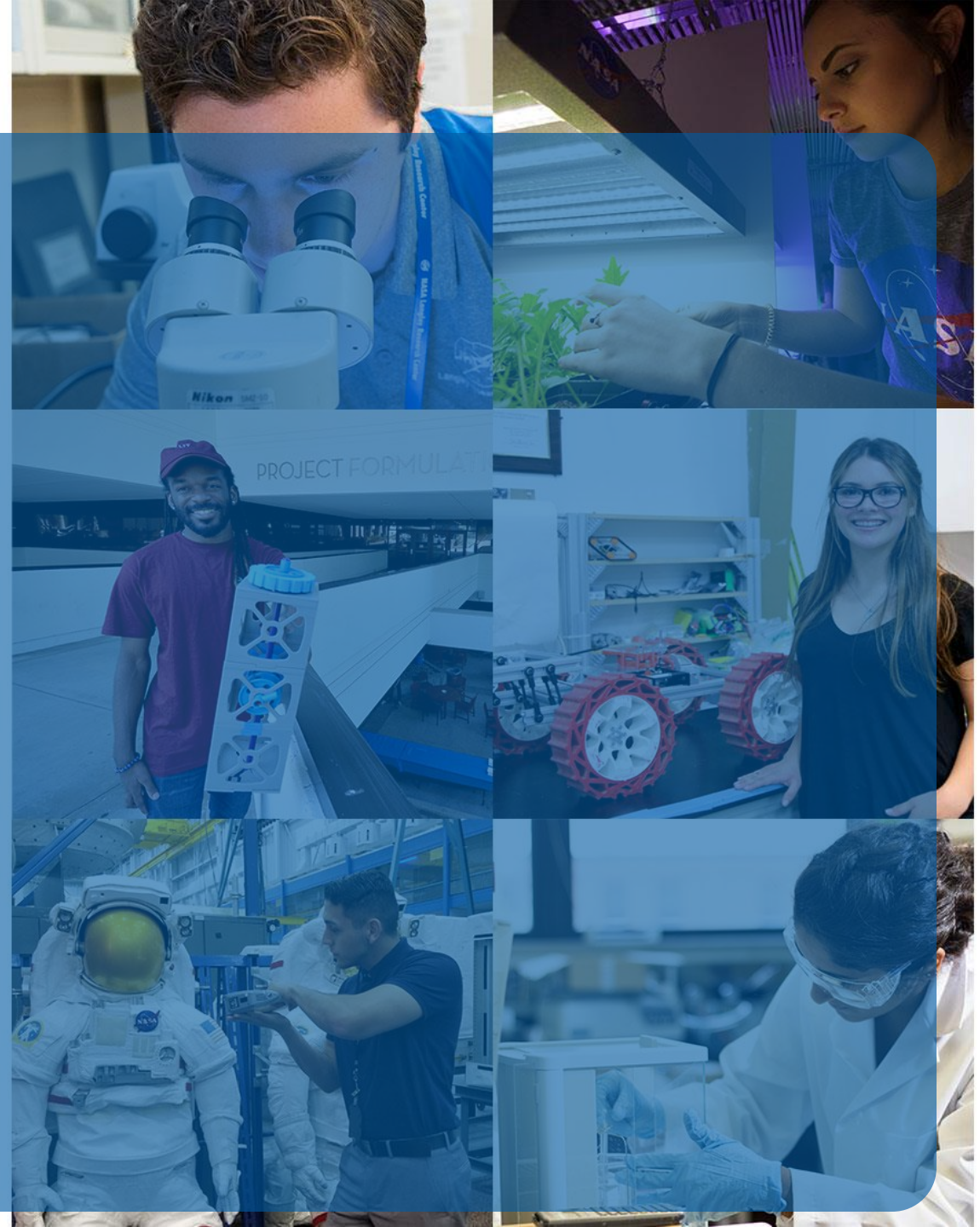
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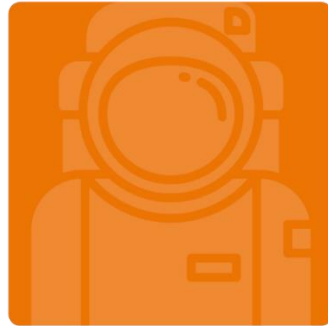
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Discussion



NASA STEM Engagement Partnerships Overview



Rob LaSalvia

Partnership Manager, NASA's Office of STEM Engagement

AGENDA

1. Connection to Agency Portfolio
2. STEM Engagement Partnership Strategy
 - Goals and Priorities
 - Coordination and Process
 - Selection Criteria
3. Summary of Engagement
4. Mission Collaboration: Artemis Engagement
5. Trends and Recommendations for Improvement



CONNECTION TO THE AGENCY PORTFOLIO

NASA Support Structures (STEM Engagement)

Grants and Cooperative Agreements

- NASA Defines Requirements and Provides financial support
 - Space Grant
 - EPSCOR
 - MUREP
 - TEAMS II

Networks and Alliances

- NASA led support structure to share mission content and direct services to institutions or educators.
 - Museum and Informal Education Alliance
 - Astro-camp

Partnerships

- NASA and External organizations collaborate on mutually beneficial goals.
- Level of effort is substantial enough that a formal agreement is generally necessary.
- No NASA funding is provided.



STEM ENGAGEMENT STRATEGY (2020-PRESENT)

GOALS

Expand NASA's STEM Engagement Reach

Catalyze Internal and External Innovation

Collaborate to Address High Priority National Goals

INPUTS

NASA:

- NASA mission data and imagery
- Subject matter expertise (technical, NASA missions/programs)
- Subject matter expertise (NASA STEM education and related disciplines)
- Role models and real-life examples of STEM

Partners:

- Subject matter expertise (target audience)
- Subject matter expertise (product/activity development)
- Audiences and networks: students and educators

OUTPUTS

- National campaigns (social media, platforms, traditional media)
- Products showcasing STEM careers and role models
- Products and activities designed to educate and engage students
- Products and activities designed to support educators in STEM topics
- Student challenges, competitions, citizen science or research opportunities
- Evaluation reports, best practices, lessons learned, publications

OUTCOMES

- Engage students across the United States in opportunities connected to NASA missions, themes or programs
- Bolster external efforts that contribute to federal STEM goals.
- Broaden participation of students from groups traditionally underrepresented in STEM careers



ENTERPRISE-WIDE PARTNERSHIP COORDINATION

Guiding Documents:

- Agency Partnership Handbook (Update in Progress)
- STEM Engagement Partnerships Practical Guide (2021)
- STEM Engagement Partnership Best Practices (2021)
- Open Partnership Call (Annual Updates)
- STEM Engagement Partnership Rubric (2021)



PARTNERSHIP SELECTION CRITERIA

Office of STEM Engagement releases on open call for partnerships. This document is updated annually based upon feedback from the SEC and OGC.

- Goals
- Priorities
- Supports Available
- Selection Process and Criteria
- Format for Statement of Interest Submission
- Timeline
- Shell Agreement

Selection Criteria (Top Level)

Alignment to Goals

Benefit to NASA and Partner

Target Audience

Diversity and Inclusion Plan

Intended Outcomes

Anticipated Return on Non-Financial Investment

Timeline

<https://www.nasa.gov/stem/partnerships/index.html>



INSPIRE - ENGAGE - EDUCATE - EMPLOY
The Next Generation of Explorers

FY2022 NOTABLE ACCOMPLISHMENTS: STRATEGIC PARTNERSHIPS



Engagement with **119** Organizations (April 2021-May 2022)

Key Numbers

- 25** Active Non-Reimbursable Space Act Agreements
- 21** Informal collaborations to share content or engage students
- 16** Projects (completed or in-progress) about the Artemis I Mission
- 7M+** Digital engagements (Content Downloads, Education Multi-Media Uses and Virtual Event Participants)*

Example Collaborators



NASA STRATEGIC PARTNERSHIPS

HIGHLIGHTED BY NATIONAL SPACE COUNCIL SEPTEMBER 2022



\$1.25 million for After School Learning Centers:

- Department of Education is providing \$1.25M to support NASA's engagement in 21st Century Community Learning Centers



Artemis Moon Trees Educator Resources:

- Department of Agriculture and NASA are announcing the Artemis Moon Trees Program with online educational resources



LEGO Build to Launch Series:

- LEGO Education – NASA partnership developed series for students to explore the technology, STEM concepts and careers behind the Artemis I mission



“Noggin’s Space Place” Series:

- Series developed through NASA partnership with Noggin, Nickelodeon’s standards-aligned media platform that reaches of millions of young children and families



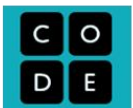
COSI Learning Lunchbox STEM kits:

- TEAM II funded Center of Science and Industry (COSI) in Columbus, Ohio to provide STEM Learning Lunchbox kits to underserved youth and families



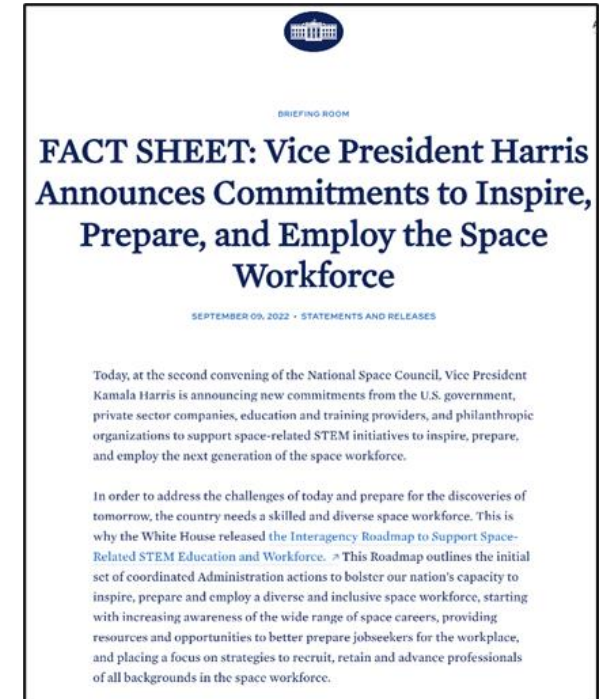
Million Girls Moonshot Flight Crew Program:

- NASA’s partnership with STEM Next Opportunity Fund provides resources for its Million Girls Moonshot Flight Crew program with youth representatives from every U.S. state



Space Exploration Theme for Hour of Code Activities:

- Code.org will highlight connections between computer science and space exploration in the 2022 Hour of Code. NASA’s partnership to provide extensive support



<https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/09/fact-sheet-vice-president-harris-announces-commitments-to-inspire-prepare-and-employ-the-space-workforce/>

PARTNERSHIP EXAMPLES

Google



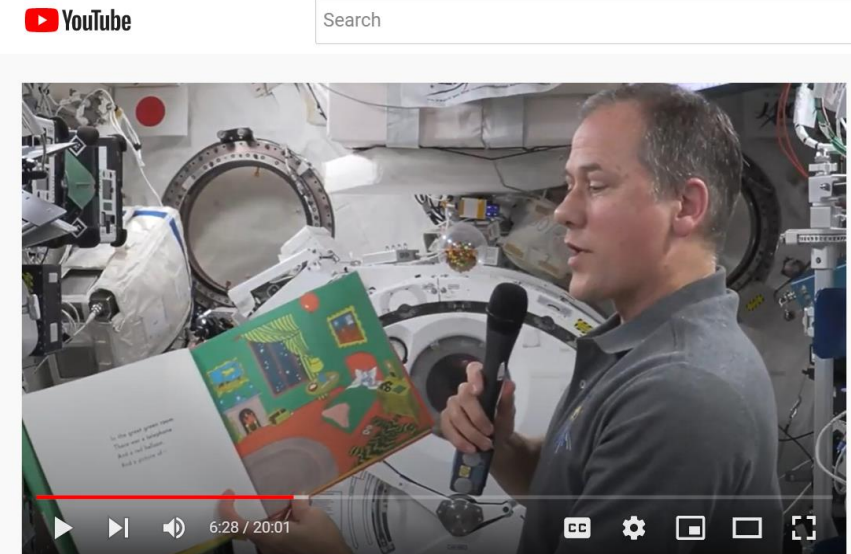
- Collection of 65 NASA Developed 3D Models and support resources for educators and the public.
- Launched on Sept 13, 2022, is now featured in Search, Classroom and Arts and Culture.

COSI Learning Lunchboxes



- Innovative collaboration to distribute STEM kits through food banks to underserved students.
- Over **75,000** Artemis I themed kits have been distributed to students and families to date.

Crayola Education: Good Night Moon



- STEAM Read and Draw Event with Harper Kids and Crayola Education connecting the Artemis I Mission and the iconic children's book.
- Garnered **144M+** Social Media Impressions

PARTNERSHIP EXAMPLES

STEM Next Opportunity Fund



- Collaboration to support the Million Girls Moonshot in afterschool programs through Curriculum Support Resources, STEM Mentors and Educator Training and Support
- ISS downlink and watch party reached over **24K** students and educators

Microsoft



- NASA supported Microsoft in use of Artemis data sets and themes as a real-world context for online coursework.
- **65K** users have earned badges. Courses have a 4.8 (out of 5) approval rating.

NOGGIN/Viacom



- Collaboration to introduce Pre-K and elementary students to STEM concepts and careers.
- Scheduled release of Space Themed Playlist in October 2022.
- You tube Feature "Rhymes Through Time- My Best" garnered **1.5 Million** views.

PARTNERSHIP EXAMPLES

LEGO Education



- Build to Launch Series focuses on open ended student design and creativity. The 10-week series introduces students to a variety of NASA STEM careers.
- This Artemis themed series has engaged over **4,000** teachers

Girl Scouts



- NASA supported the Girl Scouts in their first virtual STEM summit:
- Utilized **17** NASA speakers
- Reached **7,000** girls during the 5-hour event.
- Collaborated on an Artemis I essay contest which recently announced 90 national winners.

Discovery Education



- Collaboration to equip students and educators with access to resources and events.
- Create NASA Themed Channel and playlists resulting in **4.5 million** uses of NASA created or inspired products in the platform.

Upcoming "Connected" Experiences



Lights on for Afterschool (Oct 20, 2022)

Lights On is an annual celebration of the importance of afterschool programs across the country. NASA is leading an effort to raise the awareness of STEM careers.

NASA will work with multiple partners to:

- Host virtual and in-person events and connected watch parties
- Release supporting activities and career profiles

Hour of Code

(Week of Dec 5, 2022)- The Hour of Code occurs each year around the birthday of Admiral Grace Hooper, a pioneer in computer programming with the US Navy. This year Hour of Code will feature space exploration as a Central Theme.

NASA is working with Code.org and multiple partners to:

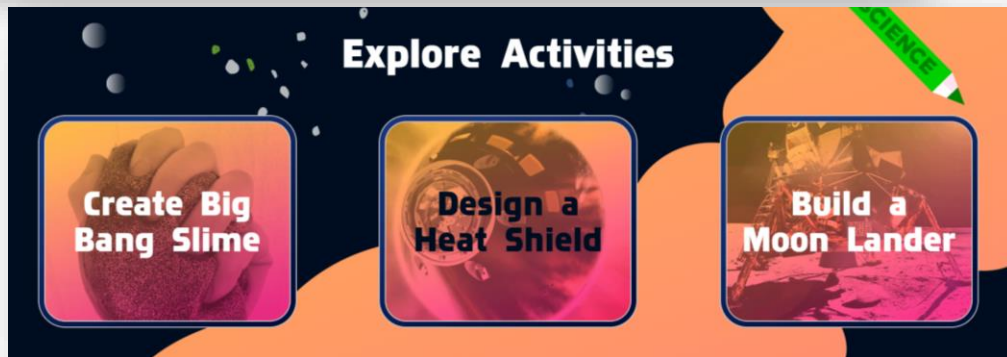
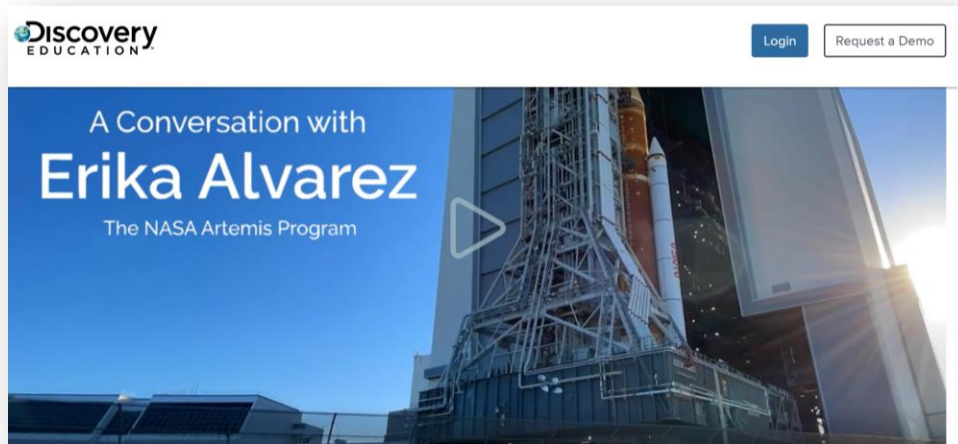
- Share NASA Themed Coding Activities with Students
- Offer NASA Roles models in live and pre-recorded student engagements
- Raise Awareness of Coding and related Computer and Data Science Careers

Introduce a Girl to Engineering Day (Feb 23, 2023)

This day encourages volunteers, educators, and others to act as role models and facilitate engineering activities to show girls how engineers change our world.

NASA will connect with multiple partners to host national virtual events and local opportunities.

SAMPLING OF PARTNERSHIP REACH (SY20-21)



Org	Digital Reach	Type
Discovery Education	4,700,000	Products and Videos Used
NOGGIN	859,756	Video Views
Microsoft Learn	70,000	Product Usage
Ryan's World	1,500,000	Video Views
Frito-Lay	71,000	Product Downloads
Girls Scouts	7,000	Presentation Attendees
Tynker	15,000	Video Views
Peanuts	92,000	Product Downloads
Total	7,314,756	



PARTNERSHIP TREND 1: STEM CAREER PATHWAYS (FOCUS ON D&I)

Trend Overview	Almost all external organizations seek support in identifying NASA role models to share their career journey and specifics of a STEM job. The primary request is for video content that demonstrates the diversity of NASA's scientific and technical workforce. Most partners prefer leveraging existing video for products, but a small percentage have resources to create their own.
NASA Contribution Summary	<ul style="list-style-type: none">• Many organizations were able to leverage existing videos or information under Agency Media Usage Guidelines. NASA had to provide significant support in identifying videos as NASA does not have a common location for these resources.• OSTEM worked with Mission Offices and Centers to identify SME's when new content creation was requested.
Discussion Question:	How might we better leverage and position video profiles for outside groups?

PARTNERSHIP TREND 2: INTERNSHIPS

Trend Overview	Outside organizations seek agreements that place students in NASA internships or research experiences. In some instances, organizations provide stipends for students. The current NASA internship program is over-subscribed and the Agency has limitations on available mentors. Outside agreements place an unfunded burden on OSTEM coordinators who assist with mentor recruitment and onboarding.
NASA Contribution Summary	<ul style="list-style-type: none">• NASA points organizations without funding to the internship portal and encourages them to have their students apply.• NASA has an inconsistent approach to organizations who offer funding for students. OSTEM, Centers and Missions pursue individual agreements.
Discussion Question	What criteria might NASA consider for externally supported interns working in Centers and Missions?



PARTNERSHIP TREND 3: STEM+

Trend Overview	Outside organizations request NASA support for content that cuts across many disciplines. The most frequent examples include Computer Science, Coding, Data Science and the Arts.
NASA Contribution Summary	<ul style="list-style-type: none">• NASA supported external request, where possible, by providing access to technical experts and role models to help modify existing content or review new content for accuracy.• Access to NASA data sets for educational purposes represents a potential area of growth. My NASA Data (SMD) is one of few opportunities responsive to these requests and is very well-regarded by partners who review materials.
Discussion Question	How might NASA better support topics like Data Science, Computer Science and the Arts (particularly with K-12 student audiences)?



AGENDA

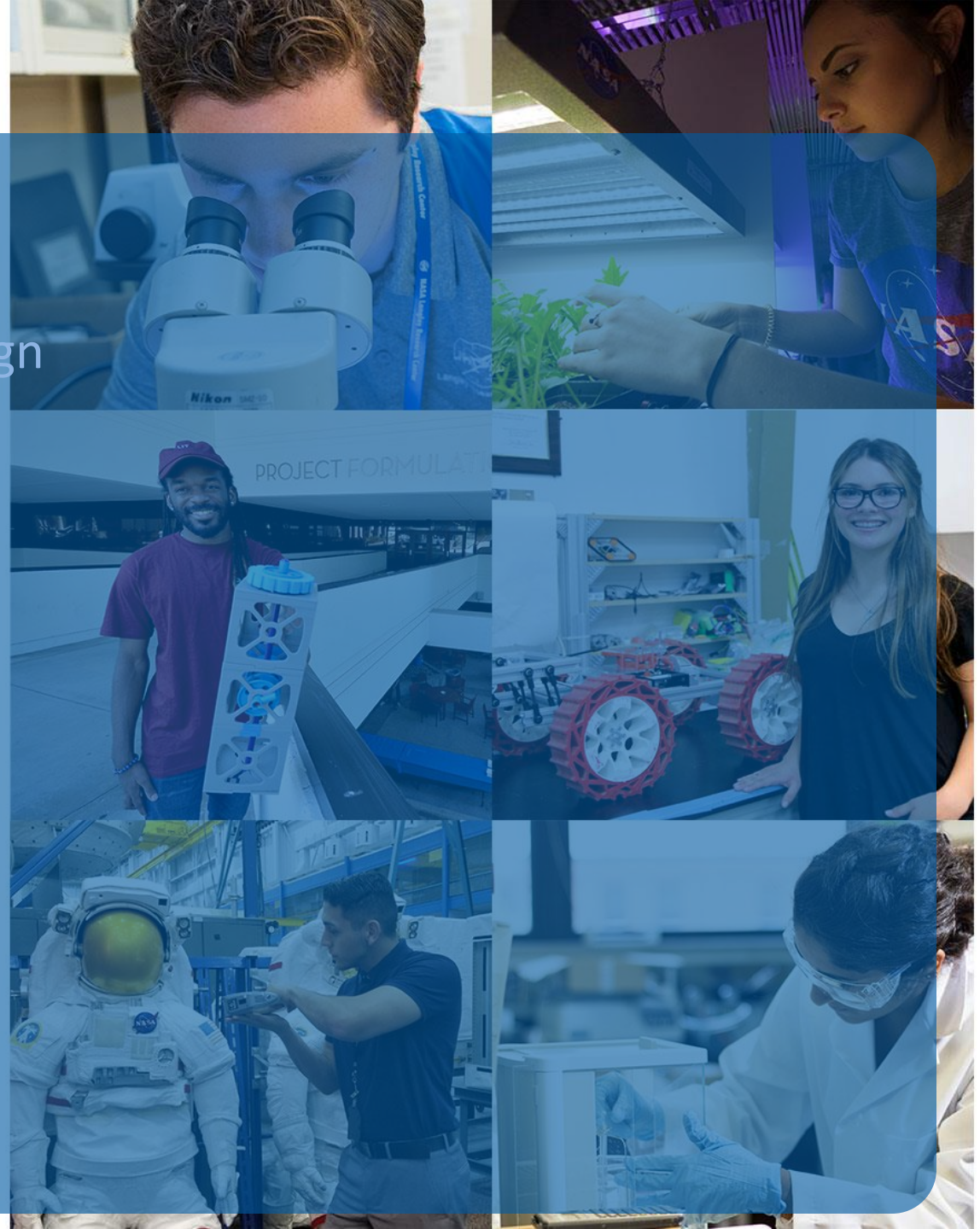
Opening Remarks by Chair

Office of STEM Engagement Back-to-School Campaign

NAC Topics of Interest

Partnerships

Discussion



Discussion

