



NAC STEM Engagement Committee Meeting

A group of five diverse young women are posing outdoors. They are wearing light blue t-shirts with the NASA logo. One woman in the foreground has her arm raised. Another woman is holding a camera up to her eye. They are all smiling and looking towards the right. The background shows a paved area and some greenery.

NASA STEM

NAC STEM Engagement Committee Members



Dan Dumbacher (Chair)

Executive Director, American Institute of Aeronautics and Astronautics

Darryl Williams, PhD

Senior Vice President of Science and Education, The Franklin Institute

Julia Ross, PhD

Dean, Virginia Tech's College of Engineering

Erika Shugart, PhD

Executive Director, National Science Teacher Association

New Members

Juan Amador

Executive Director, SACNAS

Jo Webber, Ph.D.

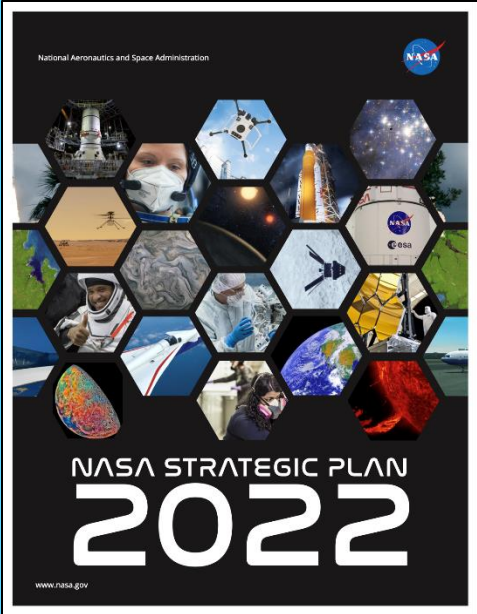
Founder and CEO of Pod and President of STEMconnector

Ron Ottinger

Executive Director, STEM Next Opportunity Fund



NASA STEM Engagement Strategic Direction



NASA Strategic Objective 4.3

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



Priority Areas

- Advance diversity, equity, inclusion, accessibility, and belonging in opportunities to **broaden participation** in STEM.
- Build and strengthen **strategic partnerships and networks**.
- Create a **beneficiary-focused organizational framework** of opportunities and resources.
- Facilitate **evidence-driven, continuous improvement** of NASA's STEM engagement portfolio to ensure opportunities are responsive to evolving beneficiary needs.



NASA STEM Engagement Strategic Implementation Plan



Scan the QR code to read the plan



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



www.stem.nasa.gov

To the AA for STEM Engagement

1. **Re-evaluate the OSTEM performance goals** to ensure they are distinct and well correlated with outcomes.
 - We concurred.
 - Will be re-evaluated during the next NASA Strategic Plan cycle. Meanwhile, will continue to work closely with OCFO on the development of appropriate annual performance measures.
 - Estimated completion: February 2026 or concurrent with FY27 President's Budget rollout in March 2026.
2. Develop a procedure to ensure **OSTEM tracks and reports funding** for all Agency STEM engagement activities.
 - We concurred.
 - We will use the soon-to-be-established STEM Board to consider this recommendation, identifying appropriate guidelines, thresholds, and scope tracking and reporting funding.
 - Estimated completion date: Guidance memo from the STEM Board by December 31, 2024



To the AA for STEM Engagement

3. **Apply relevant NASA project management policy requirements** to existing project plans or record their exclusion and appropriately address budget risk in project plans, including planning for various funding scenarios.
 - We concurred.
 - Will update/revise existing program and project plans for OSTEM: Space Grant, MUREP, EPSCoR and NextGen STEM
 - Estimated completion date: July 30, 2024

4. Develop a **standardized grant process** that ensures mandatory performance reporting and that expiration dates are tracked and monitored to meet requirements and develop practices to ensure grant recipients are **reporting subrecipient awards over \$30,000** as required.
 - We concurred.
 - We'll work with NSSC to accomplish this. Grants Manager will lead the effort.
 - Estimated completion date: September 30, 2024



Audit Recommendations 5 and 6



To the Administrator

5. **Re-evaluate the EPSCoR jurisdictions** to ensure effective and equitable distribution of Agency funds.
 - We concurred.
 - We will conduct an analysis of the jurisdiction award data in comparison to the findings of the OIG audit team and consult with OGC, OLIA, and OCFO to consider their advice about the law to determine whether a NASA-unique eligibility criteria is required, and other factors that would affect the establishment of that criteria.
 - Estimated completion date: November 30, 2024

To the Deputy Administrator

6. Require all NASA organizations **capture STEM engagement activities in STEM Gateway**.
 - We concurred.
 - Will use the STEM Board to validate this approach – align to the MAP definition of STEM engagement “all of NASA’s efforts to attract, engage, and educate students and support educational institutions”
 - Estimated completion date: Guidance memo from the STEM Board by December 31, 2024.



Audit Recommendation 7



To the Deputy Administrator

7. Require OCHCO, Mission Directorates, and Centers collaborate to **identify and incorporate critical Agency workforce needs** when developing future STEM engagement activities and develop a plan that increase the number of **STEM engagement activities aimed at skilled trade occupations**.
 - Consider NASA workforce needs when implementing STEM engagement activities
 - We concurred
 - Work with OCHCO to, annually, receive their determination of Mission Critical Occupations as reported in support of the President's Management Agenda Workforce Priority
 - Estimated completion date: December 31, 2024
 - Develop a plan to increase activities for skilled trade occupations
 - We did not concur.
 - NASA has rare opportunities for civil service employment in these areas and the OSTEM budget has limited ability to increase activities in this area.
 - However, will create additional *Surprisingly STEM* episodes featuring trade and technical professionals and conduct follow-on Virtual Classroom Connections with those subject matter experts.



FY 2023 NASA STEM Highlights Report



Scan the QR code to read the report.



National Aeronautics and Space Administration

INSPIRING AMERICA'S YOUNGEST EXPLORERS

NASA's K-12 Efforts

Today's students are tomorrow's scientists, engineers, and explorers, and NASA is invested in inspiring them to reach for the stars. NASA develops and deploys evidence-based opportunities to engage K-12 students in NASA-unique learning experiences both inside and beyond the classroom. NASA visits student curiosity using a variety of lesson plans, hands-on experiences, and engagements that teach STEM concepts and excite students about NASA's missions.

In FY 2023 NASA engaged the nation's youngest explorers in the missions that will define their generation. This fiscal year, students watched NASA's first Artemis mission to the Moon take flight, had 19 opportunities to speak with astronauts on the International Space Station, learned about exciting STEM careers at NASA, contributed to future spaceflight through Artemis Student Challenges, and much more.

NASA STEM Highlights 2023

STEM Impacts

In FY 2023 (Oct. 1, 2022 – Sept. 30, 2023), NASA impacted 750K+ students and 111K+ educators through STEM engagement activities, opportunities, awards, and content.

9,584 Internships, fellowships, research opportunities, educator professional development, challenges, and other collaborative STEM engagement opportunities

\$44.3M in direct financial support of student and educator participants representing 6,12 institutions and higher education institutions including 2-year, 4-year institutions and all Minority Serving Institution (MSI) classifications

3,577 peer-reviewed publications, technical papers and presentations reported by Space Grant, MURP, EPSCoR grantee and awardee institutions

32.4% of higher education awards were awarded to faculty or educationally underrepresented student participants **

43.2% of higher education internships and fellowship positions were filled by women, up from 38.5% in FY 2018

61% of peer-reviewed publications were authored or cosponsored by students

51 systems were searched to award higher education institutions as a direct result of their NASA STEM Engagement grants or cooperative agreements

111K+ Educator Participants in NASA STEM engagement training activities*

750K+ Student Participants in NASA STEM engagement activities*

80.3M+ Other Participants

*Other Participants represent general public participants in our award, undergraduate students of all ages, parents, educators, and other participants reached through STEM engagement investments.

Inspiring America's Youngest Explorers

NASA's K-12 Efforts

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Internships

Students in high school through higher education gain out-of-the-world experience through NASA internships. As a part of their STEM work, each intern has a role in helping the agency work its grants. This summer grant-based level experience and professional development while working alongside agency professionals. Internships allow students to gain valuable experience in the field of their interest.

Most come off of FY 2023 NASA intern and learn how they got their experience and contact to work at the agency.

Jenna Stork
Oregon State University
NASA Headquarters, Washington, D.C.

Sheldon Scott
Prairie View A&M University
NASA Glenn Research Center, Cleveland, Ohio

Mike Fogg
American Military University
NASA Headquarters, Washington, D.C.

Bosoon Karimi
University of Maryland Eastern Shore
NASA Johnson Independent Verification and Validation (IV&V) Facility, Farming, New Virginia

Highlighting NASA's FY 2023 Investments in STEM

MUREP DEAP Feb. 3, 2023 \$11.7 Million
NASA awarded funds to eight Historically Black Colleges and Universities (HBCUs) through the new MUREP Data Science Equity, Access, and Priority in Research and Education (DEAPE) opportunity. This award, in collaboration with the Science Mission Directorate, enables HBCU students and faculty to conduct innovative data science research that contributes to NASA's missions.

MUREP WCU June 7, 2023 \$2 Million
NASA awarded more than \$2 million in funding to seven Women's Colleges and Universities (WCUs) to research and develop strategies that increase retention of women in STEM degree programs and careers. Part of a Biden-Harris initiative, NASA MUREP created this opportunity to help women overcome obstacles and barriers to working in STEM fields.

EPSCoR ISS Flight Opportunity July 26, 2023 \$500,000
The International Space Station Flight Opportunity provides a niche to low Earth orbit for future, high-growth research projects. This opportunity entails cooperation with NASA's International Space Station Research Office, mission directors, and field centers. NASA selected five institutions to receive \$100,000 each – \$500,000 total – to complete their projects.

M-STAR July 26, 2023 \$4 Million
The M-STAR Space Technology 14 Mission opportunity supports NASA's Space Technology Mission Directorate (STMD) by fostering and increasing Minority Serving Institutions' participation in research and technology development concepts relevant to the agency's needs for upcoming Artemis missions to the Moon. The agency awarded nine institutions a total of more than \$4 million.

EPSCoR RII Sept. 11, 2023 \$500,000
Ten research investigators at nine academic institutions will advance their science and technology projects while contributing to NASA's research priorities through an agency collaboration with the U.S. National Science Foundation (NSF). NSF is providing \$2.7 million in funding through its EPSCoR Research Infrastructure Improvement (RII) program and NASA is providing \$500,000 in funding through its EPSCoR program.

EPSCoR Research Opportunity March 29, 2023 \$10.8 Million
NASA provided a total of more than \$10.8 million across 15 institutions over three years to support scientific and technical research. Early grants will focus on a range of high-priority research needs, including deep space exploration, sustainable manufacturing in space, and advancements in technology and research that will also benefit humanity here on Earth.

EPSCoR R3 June 23, 2023 \$4 Million
Through its 2023 Rapid Response Research (R3) grant, NASA EPSCoR provided nearly \$4 million in total funding to support research aligning with the agency's strategic priorities. These grants are a vital component of NASA's STEM strategy to foster collaboration and stimulate growth in research and development in underserved areas nationwide.

MUREP Curriculum July 26, 2023 \$4 Million
The MUREP Curriculum Award was established in FY 2023 to help Minority Serving Institutions develop their research and technology capabilities, collaborate with NASA on research projects, and contribute to the agency's missions through a total of nearly \$4 million in support of research and technology implementation projects designed to build sustainable institutional curricula.

M-PLAN Aug. 1, 2023 \$900,000
Students and faculty at 15 Minority Serving Institutions will grow their research and technology capabilities, collaborate with NASA on research projects, and contribute to the agency's missions through a total of nearly \$9 million in support of research and technology implementation projects designed to build sustainable institutional curricula.

RESEARCH & TECHNOLOGY SPOTLIGHT
STEM Contributions to New Innovation Featured in 2023 NASA Spinoff
A bio-reactor developed with the goal of growing protein in space for astronauts is being adapted to generate quality protein in urban residential communities in Africa and Asia. The bio-reactor and sterile incubator were built for the International Space Station with help from a grant from NASA EPSCoR awarded to the University of South Florida. The bio-reactor was developed by NASA's Florida and Alabama Space Technologies.

Mission Directorate Collaborations

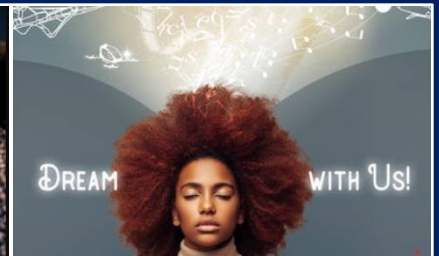
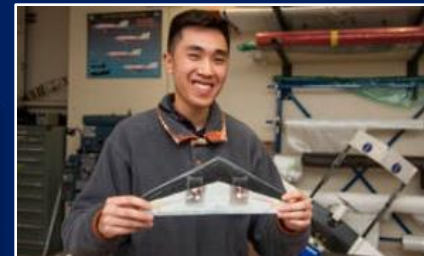


In FY 2024 Mike Kincaid presented to the NASA Advisory Council Aeronautics Committee on the continued collaborations between OSTEM and ARMD.

NASA Grants to Engage Students in Quiet Supersonic Community Overflight

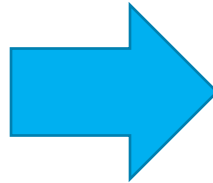


X-59 quiet supersonic research aircraft is dramatically lit for a "glamour shot," captured before its Jan. 12, 2024, rollout at Martin's Skunk Works facility in Palmdale where the airplane was constructed.
© Martin / Michael Jackson



NASA Eclipse Priorities (from SMD)

- Safety
- Broadening Participation
- Share NASA Science
- Public Engagement
- Science Activation
- Citizen Science



NASA Eclipse Call to Action



- 1. Safety First!** ➔
Except during the brief total phase of a total solar eclipse, when the Moon completely blocks the Sun's bright face, it is not safe to look directly at the Sun without specialized eye protection for solar viewing.
- 2. Find Local Events in the Path of Totality** ➔
Find in-person and virtual NASA-related events that you can participate in before or during the eclipse.
- 3. Use NASA Eclipse Resources With Students** ➔
Build a [pinhole camera](#) to safely view the eclipse or learn about careers that study the sun, or what causes sun spots.
- 4. Be A Citizen Scientist and Collect Data** ➔
Collect and submit data on topics like air temperature and clouds during an eclipse.
- 5. Cloudy Day? No Problem! Tune Into Our Webcast** ➔
For complete coverage, watch [NASA+](#) before, during, and after the eclipse.

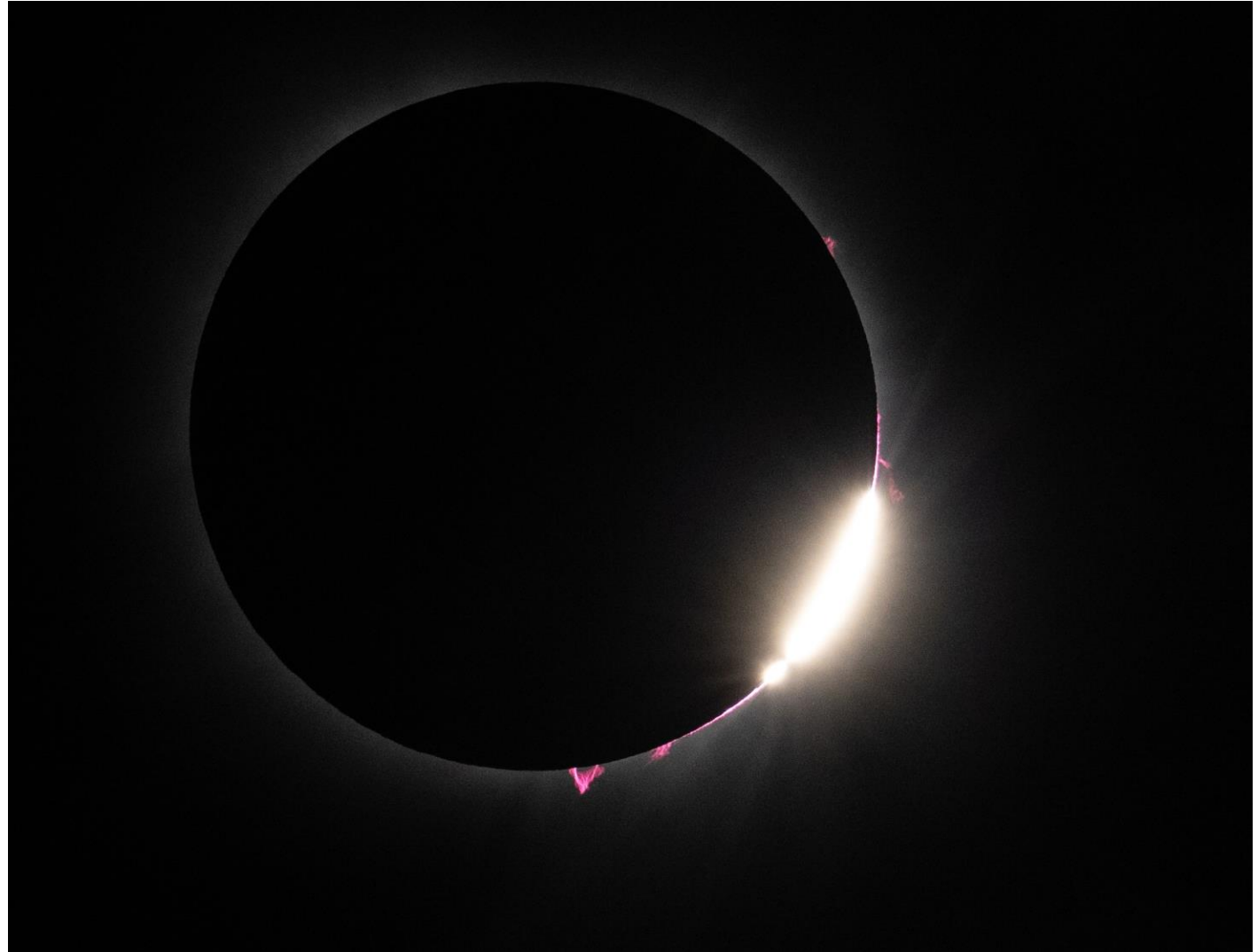


Strategic Approach to Agency Level Partnership Engagement



OCOMM, OSTEM and SMD strategically aligned planning, support, and coordination of partners related to eclipse content to:

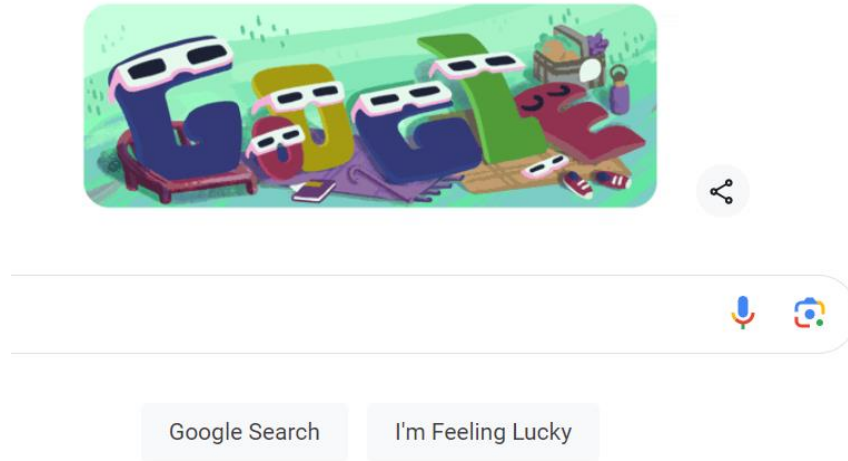
- Share consistent technical information and a clear call to action
- Provide a holistic review and prioritization of external requests
- Strengthen coordination of efforts to amplify partner content across multiple agency social platforms



Broad Engagement (All Audiences)

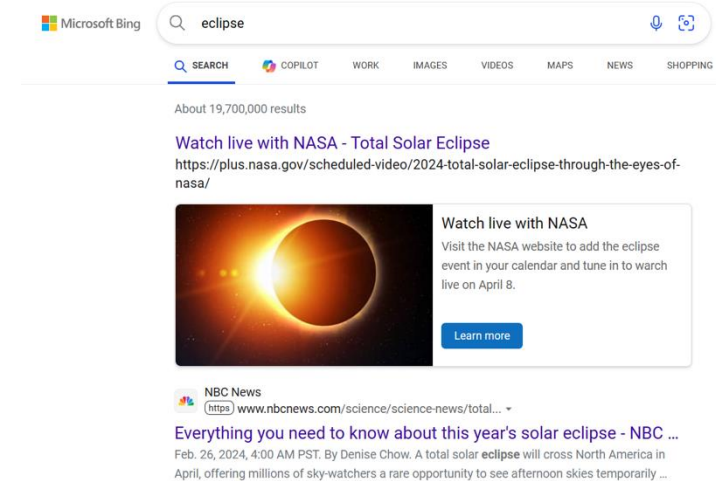


Google Doodle (OCOMM SAA)



- Google Eclipse Doodle was deployed in North and Central America Google's blogpost with NASA resources tied to the Doodle

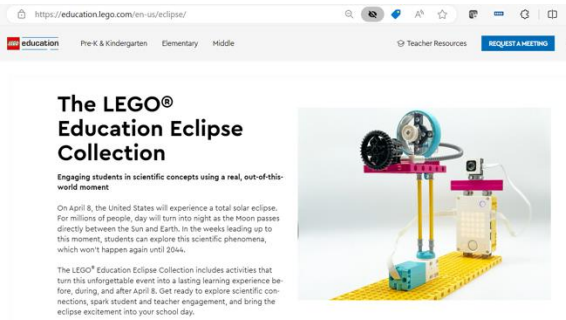
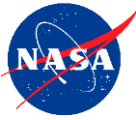
Microsoft: Multiple Platforms (OSTEM SAA)



- Learning Card Content (Quiz) available to English-Speaking Edge Users globally
- Bing Search Banner (live for 1 hour) on April 8
- Windows Start-Up Screen live all day on April 8



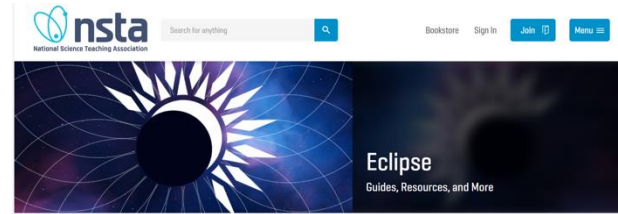
Sample of Education Audience Engagement



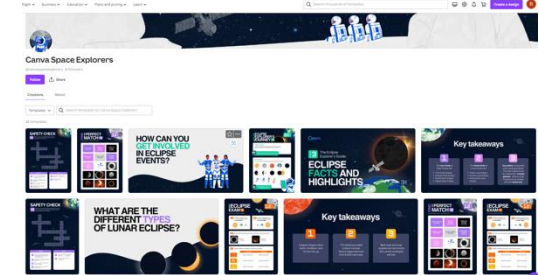
LEGO Education Eclipse Educator Resources (Web and Social)



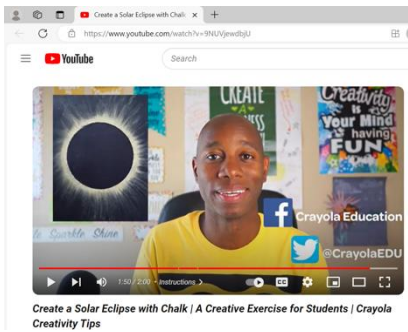
Discovery Education (Channels/Collections Featuring NASA Resources)



Eclipse Resources for Teachers



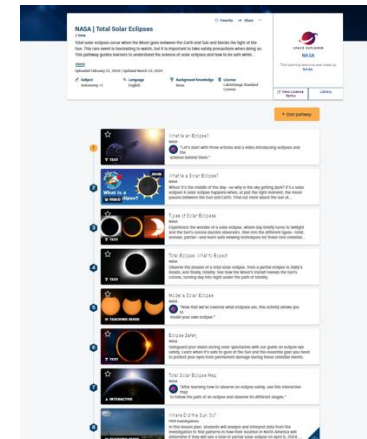
Canva Eclipse Learning Resources



Crayola Education STEAM Activity on Youtube



Million Girls Moonshot (Share with State Networks Social and Newsletters)



LabXchange Eclipse Cluster



US Dept of Ed (Social Views and Newsletters)



Focus on Underrepresented Audiences (Student and Family Examples)



Institution	Plans
Hinds Community College	Watch Party in collaboration with Utica Institution Museum
Northern Oklahoma College	Watch party with Enid Planetarium
Tennessee State University	Campus-wide Solar Eclipse STEM Event
University of Texas San Antonio	Citywide event and local school visits
Clayton State University	Local event on campus and with middle and high school students
Meharry Medical College	Local event with students and faculty
UTEP	Sun City Solar Eclipse Viewing Event
Meridian Community College	Local watch party
Bowie State University	Student and faculty Event

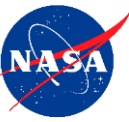


Bowie State University invites community to partial solar eclipse watch party

OSTEM/MUREP coordinated with SMD to provide Eclipse resources, glasses and speakers to MSIs in the path of totality.

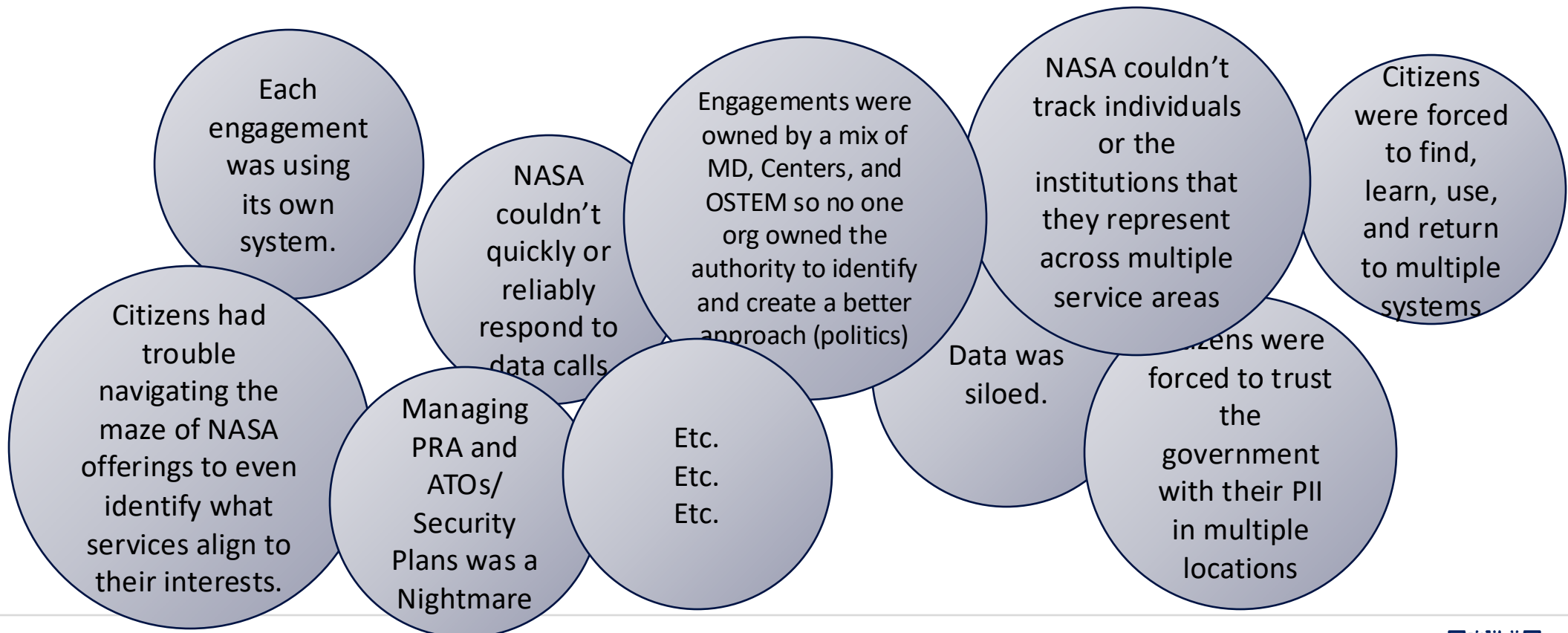


NASA STEM: The Problem Statement

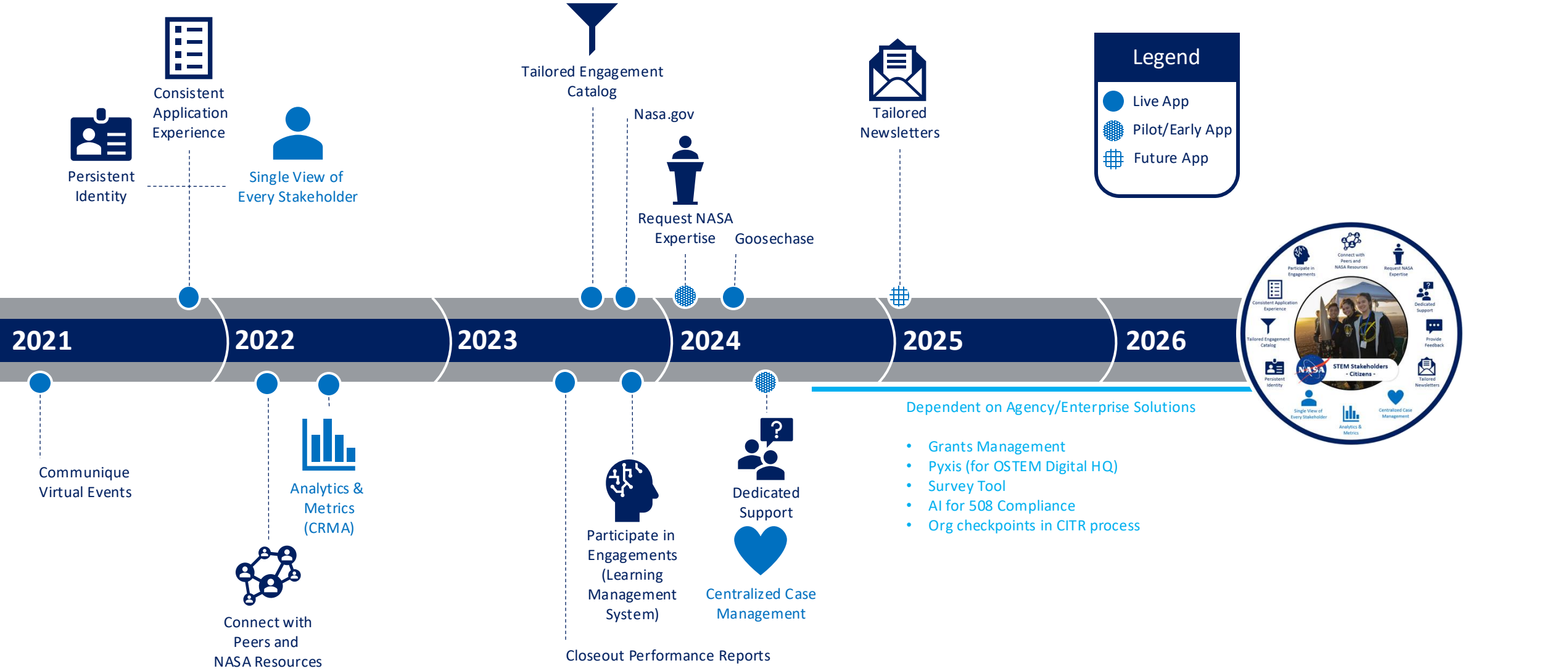


The Good: There were over 100 STEM Engagements operating across the agency – each with a similar goal of offering STEM services to individuals and institutions.

The Bad: Until October 2021, NASA was a difficult partner to the citizens that we were supporting:



OSTEM: Activities In-Flight



NASA STEM: Citizen View

203K+

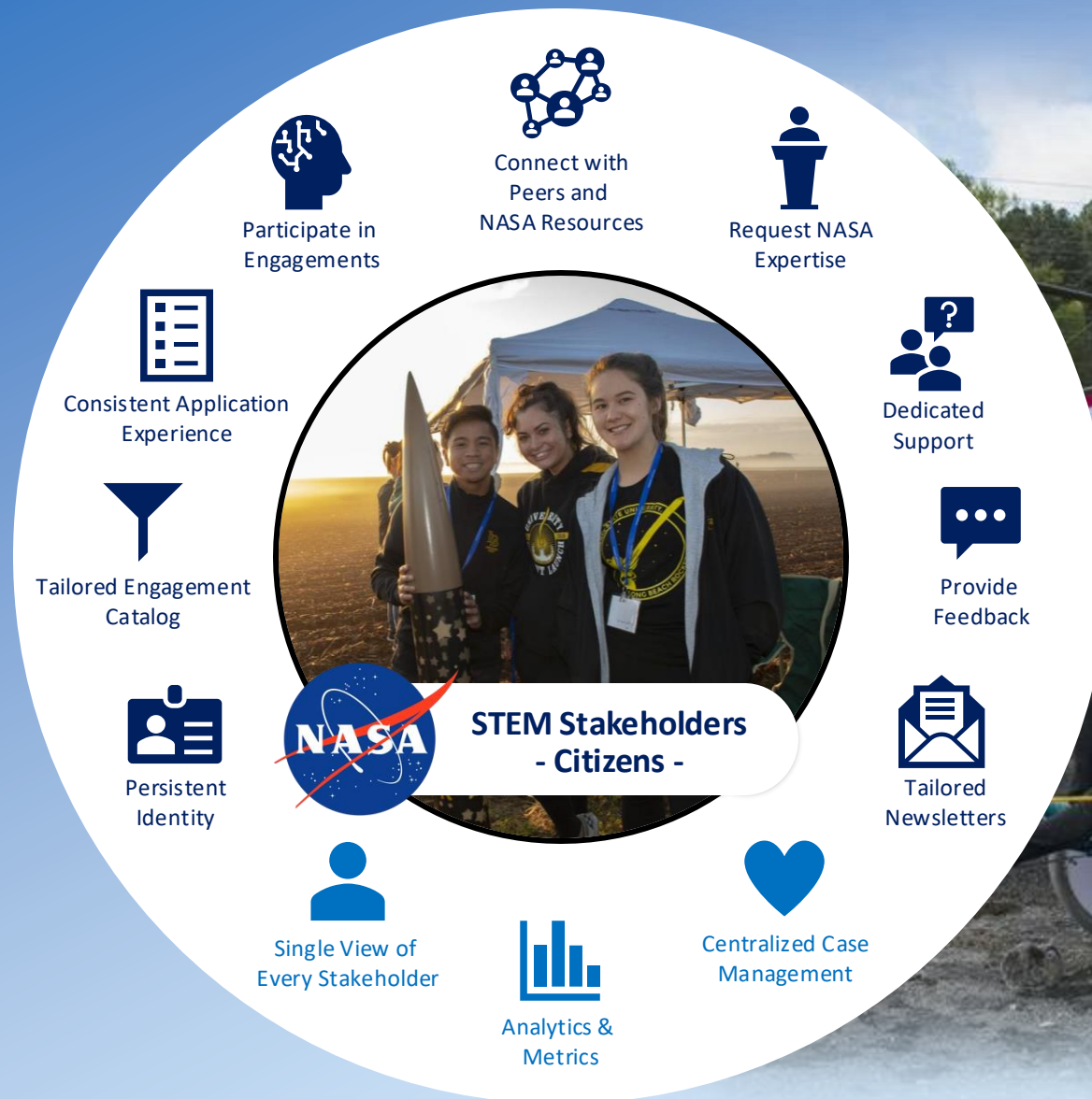
number of citizens
with profiles in
STEM Gateway

7.7K+

number of institutions
with representatives in
STEM Gateway

542K+

number of applications
successfully submitted through
STEM Gateway



NASA STEM

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



stem.nasa.gov

Welcome back, Tim

Education Type: Undergraduate | Current Grade Level: Undergraduate Senior | Primary Institution: Purdue University | Enrollment Status: Full Time

Completed Applications 15	Incomplete Applications 3	Pending Offers 1	Opportunity Matches 2	Pending Deliverables 3	Incomplete Surveys 0
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Explore Opportunities
Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet
[View All Opportunities](#)

Adjust Your Profile
Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet
[View Profile](#)

Let us Guide You
Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet Lorem ipsum dolor sit amet
[Take the quiz](#)

My Bookmarked Opportunities

Posted 10 minutes ago | Registration ends 8/30/23 | **Bookmarked**

Ecological Conservation Mars Support: Outreach & Communications
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit revrr evv.

[Challenges](#) [Virtual](#) [Students](#) [College](#) [US Citizen Only](#)

Posted 10 minutes ago | Registration ends 8/30/23 | **Bookmarked**

Mars Reconnaissance Team Internship
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[Challenges](#) [Virtual](#) [Students](#) [College](#) [US Citizen Only](#)

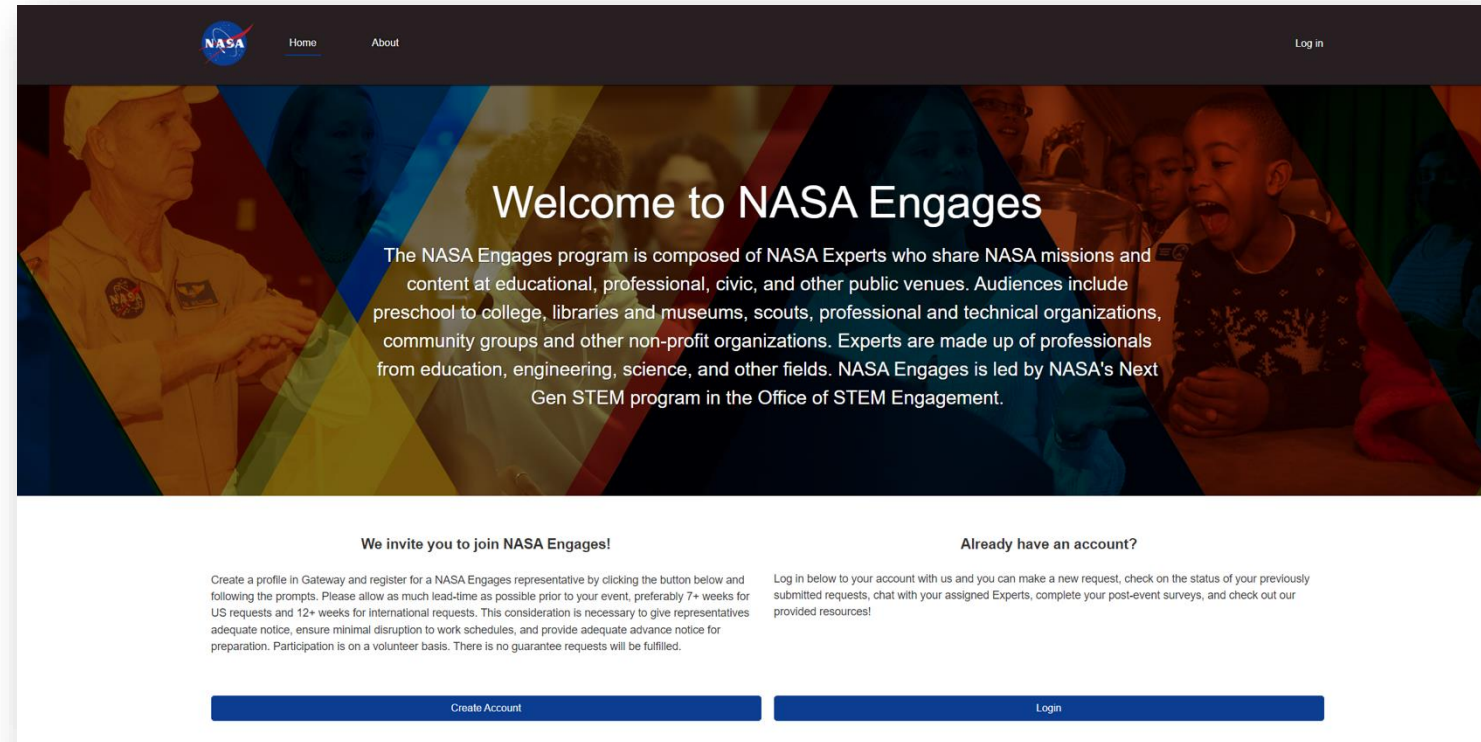
Posted 10 minutes ago | Registration ends 8/30/23 | **Bookmarked**

Earth Observations to Manage Wildfire Risk
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[Challenges](#) [Virtual](#) [Students](#) [College](#) [US Citizen Only](#)

By the Numbers

- Total number of requests received: **858**
- Number of requests active: **199**
- Number of requests fulfilled: **240**
- Number of participants reached based on survey feedback: **61,373**
- Number of "Experts" with a profile: **1,002**
- Number of coordinators: **13**



Developed in collaboration with:

- OCOMM/Speaker's Bureau
- ESDMD/SOMD
- ARMD
- SMD
- STMD
- ODEO
- OCHCO/Recruitment Ambassadors
- Solar System Ambassadors

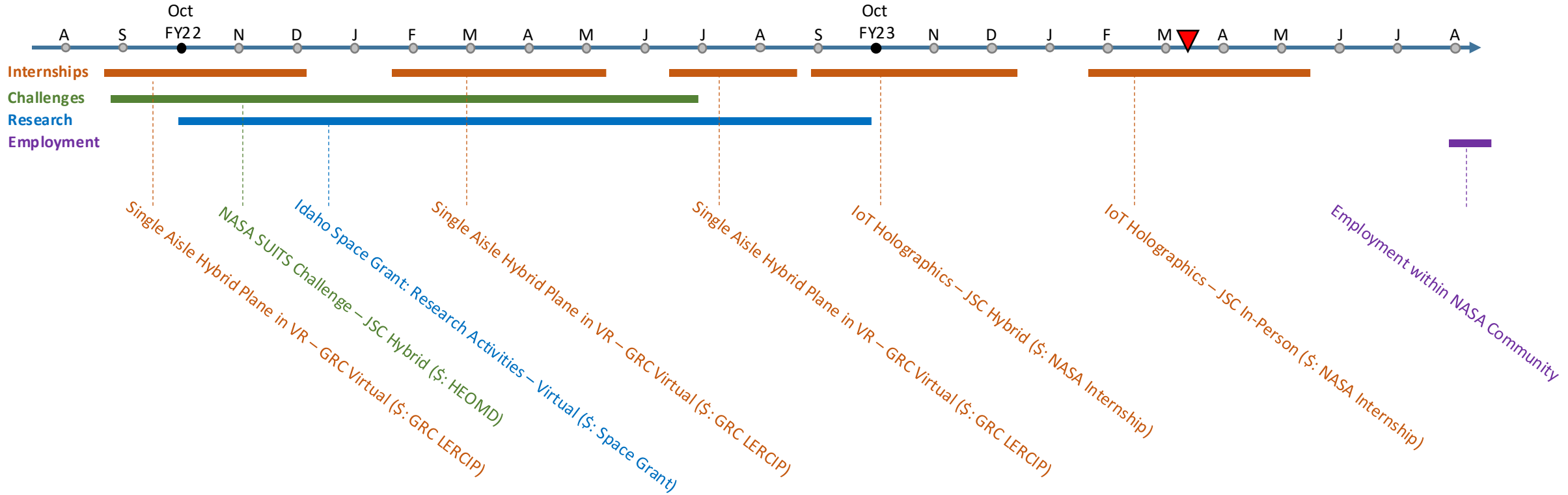


Persistent Identity



NASA STEM Pathway Example: "Student X" - real scenario

No data call needed – information pulled directly from NASA STEM Gateway





Analytics & Metrics



1

2

3

4

5

6

7

1

Filters

- Participant Type
- FY
- Session
- Project
- Managing Org/Center
- Delivery Type
- Activity Type
- Institution
- Engagement Type
- Engagement
- Engagement Opening

2

Engagement Lenses

- Engagement Types by FY
- Engagements by FY
- Openings by FY
- Mission Directorate Content

3

Participant Lenses

- Heat Map by Home Address
- Grade Level / Educator Type
- Disability Status
- Veteran Status
- Gender
- Ethnicity
- Race
- Underrepresented Race
- Underrepresented Learner

4

Institution Lenses

- Heat Map by Institution Address
- Legislative Districts
- Rural vs. Urban
- MSI
- Higher Education Type

5

Award Lenses

- Award Amounts
- Contact Hours

6

Internship/Fellowship Lenses

- Org Code
- Funding Source

7

Participant Rows

- Reference Data



STEM Engagement Strategic Performance Framework



2022 NASA Strategic Plan

Strategic Goal 4: Advance

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



Office of STEM Engagement



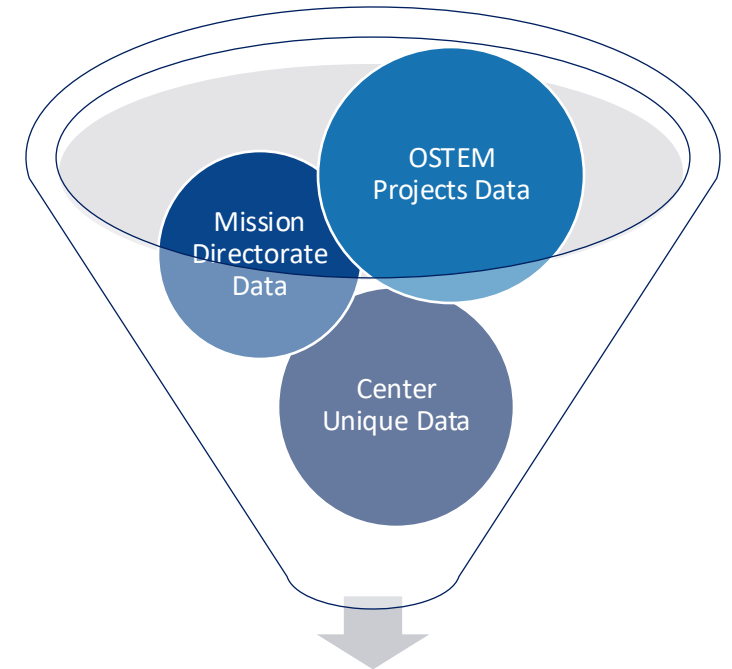
Performance Goals

Success Criteria

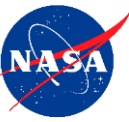
External




Internal

NASA STEM Gateway Fiscal Year (FY) Closeout Performance Reporting Process



Public Reporting Against the Strategic Plan (Agency-Level)



	Cadence	Contains products	Legislation / Strategic Directive	Key Components
Strategic Plan 	• Every 4 years	Strategic Plan	GPRAMA	<ul style="list-style-type: none"> • Vision • Mission Statement • Strategic Goals / Strategic Objectives
		Learning Agenda	Evidence Act (EA)	<ul style="list-style-type: none"> • Priority Questions
		Capacity Assessment	EA	<ul style="list-style-type: none"> • Evidence building capacity
Volume of Integrated Performance (VIPer) 	• Annually	Annual Performance Report (APR)	GPRAMA	<ul style="list-style-type: none"> • Performance Goals • Agency Priority Goals (APGs) • Performance Results • Annual Targets & Milestones
		Agency Performance Plan (APP)	GPRAMA	
		Strategic Review	GPRAMA	<ul style="list-style-type: none"> • Summary of Findings • Summary of Progress by Strategic Objective
		Annual Evaluation Plan (AEP)	EA	<ul style="list-style-type: none"> • Significant Evaluations
Agency Financial Report 	• Annually	Agency Financial Report (AFR)	Financial / GPRAMA	<ul style="list-style-type: none"> • Summary of preliminary performance ratings and overview of performance highlights & challenges by Strategic Goal
	• Annually	NASA STEM Engagement Impacts Webpages	Evidence Act (EA) / CoSTEM Strategic Plan	<ul style="list-style-type: none"> • OSTEM Learning Agenda • Performance and Participant Data • Evaluation Report Briefs • NOTE: Released in September 2023





Findings & Recommendations

Findings

1. The Committee appreciates the valuable and growing coordination across NASA Directorates to further NASA's ability to impact students, educators and families. The Committee also recognizes that further coordination will increase the STEM engagement impact.
2. The Committee applauds the Office of STEM Engagement for its clear leadership in identifying, tracking and communicating key STEM engagement metrics with strong relationship to the OSTEM strategic priorities and plan.
3. Office of STEM Engagement is doing a great service of providing relevant, tangible content for educators and students. The Committee recognizes that the students are more easily finding the content via the internet. Therefore the Committee recognizes the need for more targeted support be provided to educators to assure the content has increased impact.
4. Office of STEM Engagement is performing ground-breaking work with partner organizations, and opening new opportunities for increased engagement across multiple audiences. The Committee recognizes the need for focused discussion, promotion and implementation of methods to better engage students, educators, and families in the under-served, economically disadvantaged, and under-represented communities. Focused attention to audience needs is key to this effort and further engaging the educational community.
5. The portfolio of Office of STEM Engagement partnerships is impressive, extensive and resource limited. The Committee recognizes potential for increased impact with a purposeful, balanced partnership portfolio. The Committee plans further discussion with OSTEM leadership to assist developing a balanced partnership portfolio with appropriate breadth and depth to increase impact for the educational community.

Recommendations

1. The Committee recommends that the NASA Administrator grow the important cross Directorate STEM efforts via leveraging the NASA STEM Gateway, and close coordination among the Office of Communication and others. Clear success is demonstrated with the Aeronautics Mission Directorate, Space Operations Mission Directorate and Science Mission Directorate. Increased educational impact will result from additional coordination among OSTEM, Office of Communications and the Mission Directorates.
2. The Committee recommends that the NASA Administrator develop methods and opportunities for assistance from external sources to improve impact for the under-served, economically disadvantaged, and under-represented communities. This is essential to enhance the STEM workforce necessary for the growing and evolving global competition using the expansive NASA capabilities and recognition.

