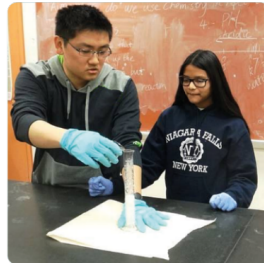


National Aeronautics and  
Space Administration



# NAC STEM Engagement Committee Report

1 MARCH 2022



# NASA STRATEGY FOR STEM ENGAGEMENT 2020-23



## VISION

We immerse students in NASA's work, enhance STEM literacy, and inspire the next generation to explore.

## MISSION

We engage students in NASA's mission.

## Strategic Goals



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.

*Increased emphasis on diversity, equity and inclusion*

# NASA STRATEGY FOR STEM ENGAGEMENT 2020-23






1

**STRATEGIC GOAL 1:** Create **unique opportunities** for a diverse set of students to contribute to NASA's work in exploration and discovery.

**OBJECTIVES:**

1.1 Provide student work experiences that enable students to contribute to NASA's missions and programs, embedded with NASA's STEM practitioners.

1.2 Create structured and widely-accessible experiential learning opportunities for students to engage with NASA's experts and help solve problems that are critical to NASA's mission.




2

**STRATEGIC GOAL 2:** Build a **diverse future STEM workforce** by engaging students in authentic learning **experiences** with NASA's people, content and facilities.

**OBJECTIVES:**

2.1 Develop and deploy a continuum of STEM experiences through authentic learning and research opportunities with NASA's people and work to cultivate student interest, including students from unrepresented and underserved communities, in pursuing STEM careers and foster interest in aerospace fields.

2.2 Design the portfolio of NASA STEM engagement opportunities to contribute toward meeting Agency workforce requirements and serving the nation's aerospace and relevant STEM needs.



3

**STRATEGIC GOAL 3:** **Attract diverse groups of students to STEM** through learning opportunities that **spark interest** and **provide connections** to NASA's mission and work.

**OBJECTIVES:**

3.1 Attract a broad and diverse set of students to STEM through targeted opportunities and readily available NASA STEM engagement resources and content.

3.2 Foster student exposure to STEM careers through direct and virtual experiences with NASA's people and work.

Emphasis on *diversity, equity and inclusion* with focus on broadening participation

# FY2020 STEM ENGAGEMENT PERFORMANCE AT A GLANCE

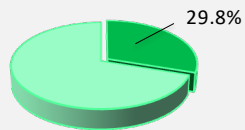


## Higher Education Students

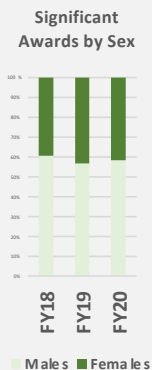
In Fiscal Year 2020, NASA provided **6,410** internships, fellowships, scholarships, and other sustained engagement opportunities (e.g., engineering design challenges, student competitions) to 5,992 higher education students across all institutional categories and levels. These significant awards provided a total of over **\$38M** in direct financial support to higher education students.

**29.8%** of participants in these opportunities were racially or ethnically underrepresented students, exceeding the national average of 26.2% for underrepresented students enrolled in STEM degree programs.

### Underrepresented Race or Ethnicity



Additionally, **41.6%** of the Agency's higher education internships and fellowship positions were filled by women.



## Research and Development

NASA's performance in providing opportunities for learners to contribute to NASA's aeronautics, space, and science missions and work is assessed across peer-reviewed publications and technical paper presentations directly resulting from research funded by NASA STEM Engagement grants and awards to higher education institutions.



# 1,831

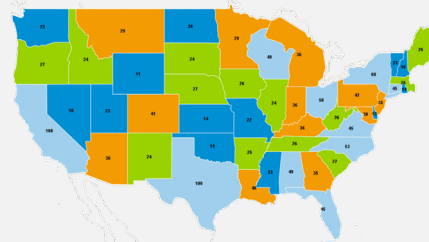
Space Grant, MUREP, and EPSCoR grantee and awardee institutions reported **1,831** peer-reviewed publications and technical papers and presentations in FY 2020.

Notably, **40%** percent of the peer-reviewed publications were authored or coauthored by students.

Additionally, **79** patents were awarded to higher education institutions as a direct result of their NASA STEM Engagement grants or cooperative agreements.

## Collaborators

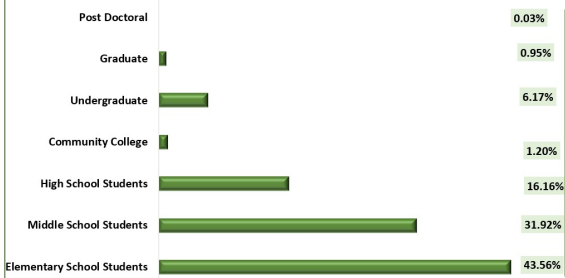
# 1,672



NASA's Office of STEM Engagement collaborators are funded and unfunded and located in all 50 states, DC, GU, PR, and VI. Collaborators include: government agencies, industry, formal and informal education institutions including museums, science centers, planetariums, and youth-serving organizations, non-profit, and other education organizations. Collaborators extend the reach of NASA STEM engagement opportunities by supporting the execution of an opportunity. In FY 2020 OSTEM collaborated with **1,672** institutions and organizations.

## Engaging Students in NASA Missions

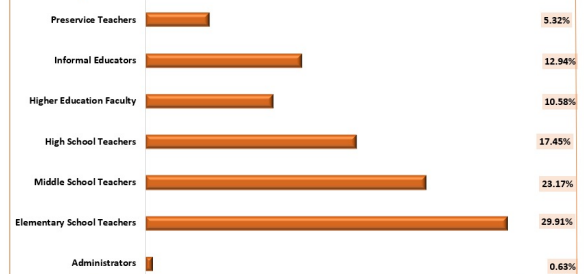
**586,400** Students participated in NASA STEM engagement Activities



\* Participation numbers are self-reported by external grantees, awardees, and collaborators.

## Training STEM Educators to Engage the Next Generation of STEM Researchers and Explorers

**65,090** Educators participated in NASA STEM engagement training Activities



\* Participation numbers are self-reported by external grantees, awardees, and collaborators.

# CONNECTING WITH NASA STEM IN FY2021



**96,107** Facebook followers



**355,317** Twitter followers



**437,955** Pinterest followers



**332,738** views on YouTube



**56,109** NASA EXPRESS subscribers



Follow and connect  
**@NASASTEM**  
or  
**stem.nasa.gov**



Average time spent on website **↑ 17.5%** from FY20 to FY21

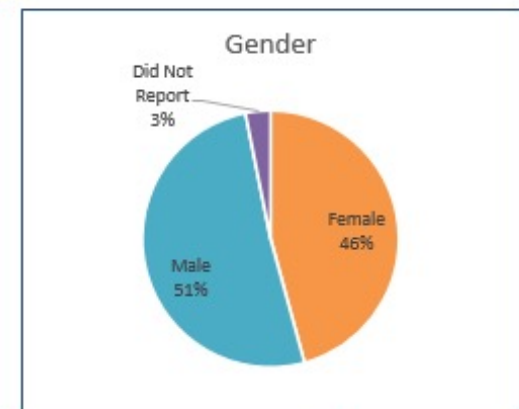
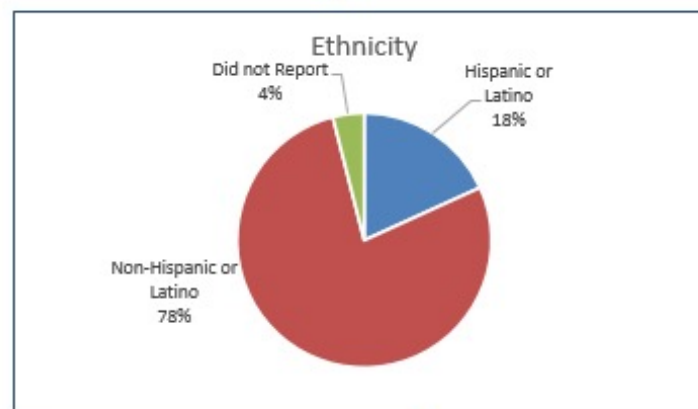
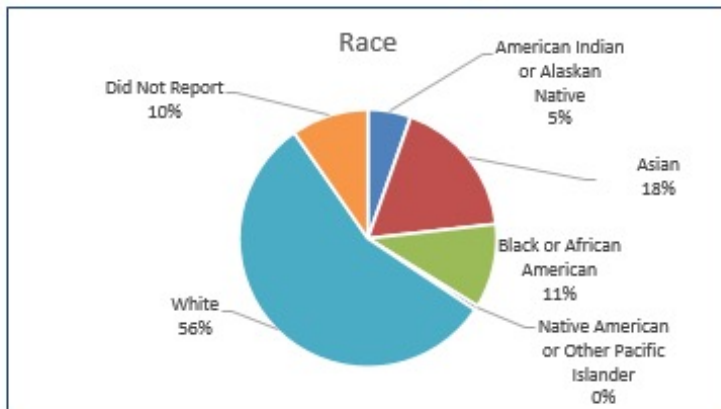
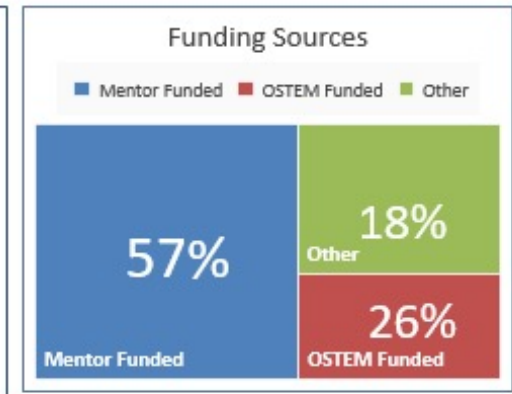
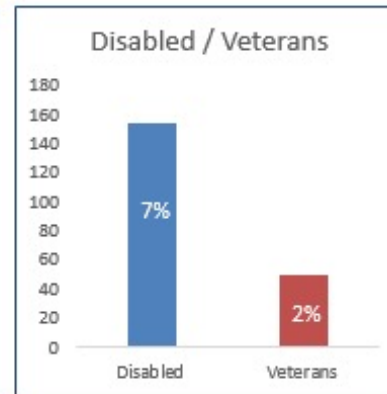
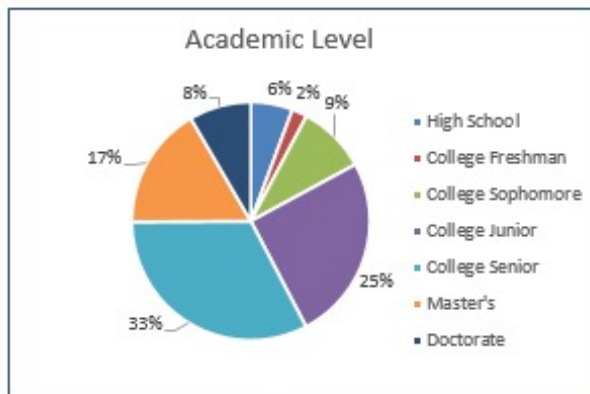
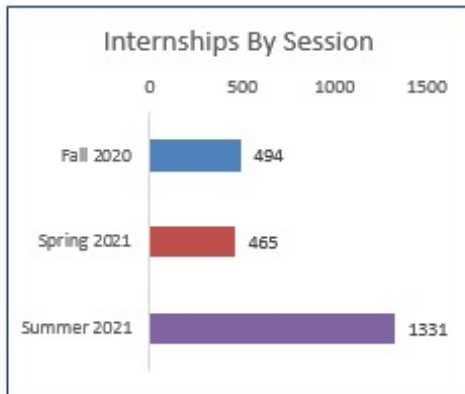


# NASA INTERNSHIPS SUMMARY - FY2021 (FALL 2020, SPRING 2021, SUMMER 2021)



Total OSTEM Interns FY 2021: 2290

Data Based on Einstein Analytics



# NASA INTERNSHIPS DIVERSITY RESULTS

## SUMMER 2020 COMPARED TO SUMMER 2021

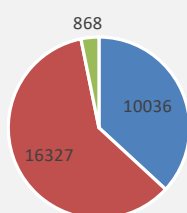
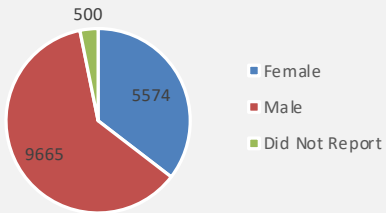


### Applicant Pool - Diversity

Race/Ethnicity	Summer 2020	Summer 2021	% of Increase
American Indian or Alaskan Native	836	1663	99%
Asian	3231	6509	101%
Black or African American	1375	2172	58%
Native Hawaiian or other Pacific Islander	145	224	54%
Hispanic or Latino	2429	4417	82%
White	10049	16241	62%
Did Not Report	1406	2456	75%

Summer 2020 - Gender

Summer 2021 - Gender



% Change: Female = 80% / Male = 69%

### Total Applicants

Session	# of Applicants
Summer 2020	15,739
Summer 2021	27,231

**73% Increase**

### Total Selected Interns

Session	# of Interns
Summer 2020	1,163
Summer 2021	1,331

**14% Increase**

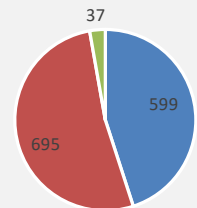
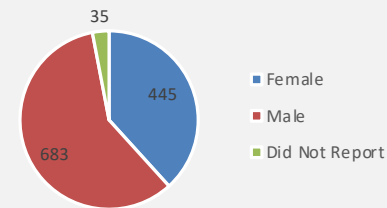
*Diversity is self-reported.  
Students may select multiple races.*

### Selected Intern - Diversity

Race/Ethnicity	Summer 2020	Summer 2021	% of Increase
American Indian or Alaskan Native	71	79	11%
Asian	187	264	41%
Black or African American	121	162	34%
Native Hawaiian or other Pacific Islander	8	6	(25%)
Hispanic or Latino	171	218	27%
White	782	811	4%
Did Not Report	103	115	12%

Summer 2020

Summer 2021



% Change: Female = 35% / Male = 2%

# FY2021 NOTABLE ACCOMPLISHMENTS: STRATEGIC PARTNERSHIPS



Engagement with **94** Organizations (April 2020-May 2021)

## 12 New Agreements (Active or In-progress)



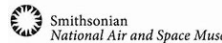
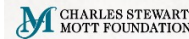
U.S. Department of Education



Gearbox Labs



## 17 informal collaborations to share content or engage students



U.S. AIR FORCE





## FINDINGS – DO NOT REQUIRE ACTION

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- There continues to be clear evidence progress is being made on the strategic goals and vision for OSTEM.
  - Committee recognizes the thoughtful design and approach to evaluating the progress of the OSTEM activities. Future work will assess metrics and outcomes used to measure performance
- Good success identifying and making resources available for educators and STEM community
- Internships data – there is marked progress in reaching a more diverse pool of students
  - Committee plans future discussions to better understand process and infrastructure for internship recruiting
- Evidence of significant progress in building STEM Community partnerships
- The DE&I effort is exceptional and is well placed to leverage future progress



# RECOMMENDATIONS – REQUIRE ACTION

- **Recommendation #1** - Continue emphasis on strategic plan, especially integration and use across the Mission Directorates
  - OSTEM has made significant progress in tracking strategic plan status and coordinating across Mission Directorates. Continued momentum will continue to enhance NASA STEM impact
  - Consequences – lack of coordination across the agency on STEM activities, could lead to duplication of efforts, unaddressed priorities
- **Recommendation #2** - The Administrator and Mission Directorates, along with the Office of Procurement, should ensure NASA assists building research capabilities and infrastructure at Minority Serving Institutions (MSIs)
  - This will enable MSI's to be competitive and successful in contributing to NASA work and help build a strong K-12 pipeline of interest and engagement.
  - Consequences – lack of coordination, impedes NASA's capability to build a diverse workforce for the future
- **Recommendation #3** - 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 pandemic. NASA alone cannot solve this.
  - Pandemic has created significant disruption in the education community and NASA's STEM involvement can be key aspect of addressing resulting challenges
  - Consequences – there are long term implications to the workforce; lack of coordination around recovery efforts; duplication of efforts; gaps in support for the community; could impact metrics/evaluation efforts



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

# NAC STEM ENGAGEMENT COMMITTEE MEETING

Thursday, February 17, 1 pm to 5 pm Eastern  
Open to the Public

## Returning Committee Members



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

## New Committee Members



Kristin De Vivo  
*Executive Director*  
Lucas Education Research



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

Full Details Available on the Federal Register [website](#)



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