



Inspiring and preparing the next generation STEM workforce

2022

REQUEST FOR FY 2023 APPROPRIATIONS

The Committee allocates \$65 million to the National Space Grant College and Fellowship Program. The Committee directs amounts be allocated to State consortia for base grants and directs all 52 participating jurisdictions receive no less than \$1.1 million each.

SPACE GRANT HIGHLIGHTS

Established by Congress in 1989. Competitive, highly effective national partnership program responsive to NASA-aligned state, regional, and national priorities.

Administered by State consortia. Catalysts to enhance STEM literacy and prepare students for careers in STEM fields to meet future national workforce needs.

Engages students in authentic STEM-based learning experiences. Programs comprise internships, fellowships, and apprenticeships involving NASA staff and facilities and industry partnerships. Hands-on experiences include launch vehicle and payload development; engineering challenges; space flight operations; UAVs; remote sensing; and engagement in STEM research.

Leverages partnerships across State consortia and with NASA. Relies on state-based networks in partnership with NASA to cultivate a diverse, inclusive, and broad-based high-technology workforce in academia, industry, and government.

FUNDING JUSTIFICATION

The requested \$65 million provides additional funding to:

- **Strengthen and promote our national network** of state-based programs in partnership with NASA; developing and sustaining a diverse, adaptable, and competitive STEM workforce.
- **Improve student accessibility** to a widening range of STEM-based authentic learning opportunities, researchers, and mentors.
- **Broaden, extend, and accelerate participation** of underrepresented minorities, women, rural, low-income, first-generation, and nontraditional students in diverse and inclusive STEM-based academic programs and careers.
- **Advance the nation's STEM literacy, education, and workforce pipeline** to further the progress of space and earth sciences and engineering that transforms our future and sustains our leadership.



The NATIONAL SPACE GRANT ALLIANCE exists to enhance the capacity of the United States of America to carry out education, research, and public outreach activities in science, technology, engineering, and mathematics (STEM) disciplines; particularly in fields related to space, aeronautics, and earth system science.

SCIENCE AND ENGINEERING WORKFORCE CRISIS

18th, 37th
27.8, 10.4
1.4, 10.5
10.5, 7.5
>\$10B

U.S. ranking in science and math literacy for 15-year-old students among 78 countries.
 Percent of U.S. 15-year-old boys and girls, respectively, at highest academic proficiency level in science or math who expect to work as science and engineering professionals at age 30.
 Percent of U.S. academically proficient advantaged and disadvantaged 15-year-old students, respectively, not expecting to complete post-secondary education.
 Projected percentage growth in STEM and non-STEM occupations, respectively, from 2020-2030.
 Private-sector funding in space-related companies in 2021—an all-time high and about a tenfold increase over the past decade.

SPACE GRANT STUDENTS

4,964
88%

COLLEGE STUDENTS received Space Grant funding
Space Grant COLLEGE STUDENTS remain in STEM fields

FY21

SPACE GRANT PARTICIPANTS

1,211
52

AFFILIATES and COLLABORATORS
CONSORTIA in all 50 states, DC, and PR, plus partnerships with Guam and USVI

FY21

OUTREACH

17,097
179,107

EDUCATORS ENGAGED
PRECOLLEGE STUDENTS REACHED

DIVERSITY

28%
42%

UNDERREPRESENTED MINORITY PARTICIPANTS
FEMALE PARTICIPANTS

References at: <https://spacegrantalliance.org/>

FY21

FY21

A few notable Space Grant participants



Margaret Baguio, B.S., Education
 Prog. Mgr. for Ed. & Outreach, Texas Space Grant
 White House PAESMEM science mentor awardee



Carmala Garziona, Ph.D., Geosciences
 Dean of College of Science, University of Arizona
 Earth and Environmental Sciences



Robert Casey Wilson, M.S., Aerospace Engineering
 Propulsion Analysis Engineer, SpaceX
 Structural analysis for liquid rocket engines



Lori Sandberg, M.S., Mechanical Engineering
 Lead Weight/Mass Properties Engineer, Boeing
 Mass properties design of transport vehicle to ISS



Michael Lammers, M.S., Aerospace Engineering
 NASA Flight Director, Johnson Space Center
 Leader of Mission Control for ISS & ground crews



Michele Manuel, Ph.D., Materials Sci. & Eng.
 Prof. & Department Chair, University of Florida
 Materials Design, Metallurgy Mechanical Behavior



Daniella DellaGuistina, Ph.D., Planetary Sciences
 Asst. Professor of Planetary Sciences, U. of Arizona
 Planetary Analogs, Planetary Surfaces, Small Bodies



Charles Galey, M.Eng., Space Systems Engineering
 Enterprise Systems Eng., NASA Jet Propulsion Lab
 Systems engineering and space systems

Examples of Space Grant student internships and career placements



National Space Grant Alliance Infographic - 2022
Science and Engineering Workforce Crisis Data References

1st bullet: U.S. ranking in science and math literacy for 15-year-old students among 78 countries. Sources: *The Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD)*; <https://nces.ed.gov/surveys/pisa/pisa2018/index.asp#/> and <https://www.oecd.org/pisa/>. Note: PISA is a triennial survey of 15-year-old students around the world that assesses the extent to which they have acquired the key knowledge and skills essential for full participation in society. The assessment focuses on the core school subjects of mathematics, science, and reading. The OECD member countries and Associates decided to postpone the PISA 2021 assessment to 2022 to reflect post-Covid difficulties.

2nd bullet: Percent of U.S. 15-year-old boys and girls, respectively, at highest academic proficiency level in science or math who expect to work as science and engineering professionals at age 30. Source: *PISA 2018 Results, COMBINED EXECUTIVE SUMMARIES - VOLUME I, II & III*, OECD 2019. Table II.2 Snapshot of expectations for the future, by gender and socio-economic status, pg. 19; https://www.oecd.org/pisa/Combined_Executive_Summaries_PISA_2018.pdf.

3rd bullet: Percent of U.S. academically proficient advantaged and disadvantaged 15-year-old students, respectively, not expecting to complete post-secondary education; Source: *Ibid.*

4th bullet: Projected percentage growth in STEM and non-STEM occupations, respectively, from 2020-2030. Source: U.S. *Bureau of Labor Statistics, Employment Projections Program*, Table 1.11 Employment in STEM occupations, 2020 and projected 2030; <https://www.bls.gov/emp/tables/stem-employment.htm>. Note: STEM occupations include computer and mathematical, architecture and engineering, and life and physical science occupations, as well as managerial and postsecondary teaching occupations related to these functional areas and sales occupations requiring scientific or technical knowledge at the postsecondary level. STEM occupations do not include Health Sciences. For more information, see <https://www.bls.gov/oes/topics.htm#stem>.

5th bullet: Private-sector funding in space-related companies topped \$10 billion in 2021—an all-time high and about a tenfold increase over the past decade. Source: *McKinsey & Company, Space: Investment shifts from GEO to LEO and now beyond*; January 27, 2022; <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/space-investment-shifts-from-geo-to-leo-and-now-beyond>.

Space Grant Students, Space Grant Participants, Outreach, and Diversity. Source: NASA *Office of STEM Engagement*, data provided via email. February 14, 2022.