I. Overview: The Pennsylvania Space Grant Consortium provides funding for affiliate member institutions and for other commonwealth institutions of higher education. Completed proposals for mini-grants should be submitted to Dr. Christopher H. House, Director of the Pennsylvania Space Grant Consortium, at spacegrant@psu.edu.

We are considering proposal for awards in three program areas:

- **Higher education** projects are defined as projects that benefit the student directly. Funding for these projects may include: student support, fellowships and scholarships, materials and supplies for a student project, and student travel.

- **Research infrastructure** programs benefit the institution and its research efforts. Funding for these projects may include: limited graduate student support (a summer or one semester), limited support for a recent Ph.D. recipient (less than 4 months), and materials and supplies when appropriate.

- **Pre-College** projects are K-12 programs and activities that enhance and broaden the knowledge of both the students and teachers. Funding may include teacher preparation and enhancement, curriculum development and student opportunities.

A proposal can focus on one program area, or can include a combination of the three.

Proposals will be awarded based upon merit and funding availability. We expect budgets to range from $3,000 - $10,000. Proposals must be in alignment with NASA SMART Goals (Appendix A) and NASA Education Outcomes (Appendix B).

*NASA mandates that students who are directly supported and funded under this program must be US citizens.* Requests for student stipend and travel are allowed, provided that the students meet the citizenship requirement. Permanent residents do not qualify. PIs who are non-US citizens may be selected for funding provided that no salary, stipend, travel or other form of direct support is proposed.

II. Proposal Format: While there is no page limitation for the proposal, be judicious while maintaining an adequate level of detail throughout all sections. Please prepare your proposal using the following format:

1. **Cover Page** – Please use PSGC cover sheet.

2. **Body of Proposal**
   a. Brief description of your proposed project and how it fits into the category of higher education, research infrastructure and/or pre-college.
   b. SMART Goals and Objectives of your project, activities, and/or collaborations. Include a discussion of how the proposed activities will contribute toward achieving your stated goals. Reference Appendix A.
   c. Provide a discussion of how the proposed activities will contribute toward the NASA Alignment. Reference Appendix B.
d. **Metrics** by which you will measure the accomplishment of the goals, including diversity and underrepresented minority student participation targets.
e. Briefly describe the **management strategy** that will be employed to accomplish the stated goals.

3. **Budget Request** - Complete a budget with the following categories using the provided excel template. When allocating funds, please designate which program (Higher Education, Research Infrastructure and Pre-College) they will support.

   a. **Budget Categories** (*NOTE: no foreign travel and no equipment purchases are allowed*)

      i. Salary (% of annual effort, salary rate, and number of hours)
      ii. Fringe benefits for salary (include rate)
      iii. Wages (number of hours, rate per hour, number of students)
      iv. Fringe benefits for wages (include rate)
      v. Scholarships and/or fellowships (include number of awards and amount)
      vi. Travel (itemize to include mileage, vehicle rental, lodging, meals, number of travelers/participants, etc.). *NOTE: no foreign travel is allowed on NASA funds.*
      vii. Materials and supplies – per NASA guidelines, we cannot fund a proposal that includes equipment purchases (including computer equipment), only materials and supplies.
      viii. Other direct expenses

   b. **Matching Funds** (Cost-Share) – To satisfy NASA’s grant matching requirements, the total award amount must be matched by at least 1:1 in either cash, in-kind support, or both, by the proposing institution with non-federal funds. Salary and waived/contributed indirect (F&A) are the most common forms of cost-share. *NOTE: Upon completion of the project, the project PI must submit a signed report documenting the institution’s contributions to the committed cost sharing.*

   c. **Budget Justification** - Provide a detailed breakdown of costs, justification or description of each cost and a total requested amount. Label each category clearly.

      i. Salary/Wages/Fringe Benefits- include hourly wage, fringe rate, percent of annual effort, etc.
      ii. Scholarships/Fellowships- include amount of award and how many awards to be granted.
      iii. Travel- please itemize to include airfare, vehicle rental, mileage, lodging, meals, registration fees, number of participants/travelers, etc.
      iv. Materials and supplies- approximate itemized list of materials and supplies.
      v. Other direct expenses- approximate itemized list of other direct expenses.
      vi. Matching funds (Cost-Share)
Appendix A

NASA SMART Goals

- **Specific** – Be precise about what you are going to achieve.
  - Specify target
  - Specify intended outcome
  - Make sure the objective is linked to the goal

- **Measurable** – Quantify the objectives.
  - Evidence of completion (metrics) to indicate success in the area

- **Acceptable** – Aligned with the needs of the target audience.
  - Meeting the objective will advance the goal
  - Identify a specific target audience
  - Are inclusive of diversity within your group

- **Realistic** – Set appropriate targets based on your budget level.
  - Do you have the resources to make the objective happen?
  - Include short-term and long-term goals

- **Time-Specific** – State when you will achieve the objective.
  - Provide a timeframe indicating when objective will be met
Appendix B

Your proposed project must fit into one of the following NASA Education Outcomes:

**Outcome 1:** *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s strategic goals (Employ and Educate) through a portfolio of investments.*

- In accordance with Outcome 1, the PSGC funds **fellowships and scholarships** to high performing undergraduate and graduate students in STEM disciplines. This includes student internships at NASA centers and other industry partners.

- Funding is provided to **higher education programs**, both undergraduate and graduate level. We emphasize hands-on space-hardware laboratories and other research related student support (exclusive of fellowships/scholarships). The PSGC also funds curriculum development, design and implementation of new major and minor areas of study.

- The PSGC supports **research infrastructure** projects by providing funding to institutions to enhance high-quality research projects or programs. This includes providing funding that may lead to other research grants in NASA-relevant areas. Exclusive of fellowship awards, this funding may also encompass research-related graduate student support.

**Outcome 2:** *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty (Educate and Engage).*

- Outcome 2 pertains to funding for **pre-college** (K-12) educators and students. The emphasis should be on the development of pre-service and/or in-service educators in the formal and informal educational arenas. Proposed student-based programs must demonstrate quantitatively how the program will increase enrollment in science, technology, engineering, and mathematics (STEM).

**Outcome 3:** *Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA’s mission (Engage and Inspire).*

- The PSGC collaborates with museums, science centers and other **informal education** organizations to inspire and engage students and bring the excitement of NASA to the general public.
The following objectives have been developed under each of the NASA Education Outcomes above. All NASA programs (including Space Grant, from the national level) will report their contributions to these objectives.

**Outcome 1 Objectives**
1.1 *Faculty and Research Support* – Provide NASA competency-building education and research opportunities for faculty, researchers, and post-doctoral fellows.
1.2 *Student Support* – Provide NASA competency-building education and research opportunities to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education.
1.3 *Student Involvement Higher Education* – Provide opportunities for groups of post-secondary students to engage in authentic NASA-related mission-based R&D activities.
1.4 *Course Development* – Develop NASA-related course resources for integration into STEM disciplines.
1.5 *Targeted Institution Research and Academic Infrastructure* – Improve the ability for targeted institutions to compete for NASA research and development work.

**Outcome 2 Objectives**
2.1 *Educator Professional Development—Short Duration* – Provide short duration professional development and training opportunities to educators, equipping them with the skills and knowledge to attract and retain students in STEM disciplines.
2.2 *Educator Professional Development—Long Duration* – Provide long-duration and/or sustained professional development and training opportunities to educators that result in
deeper content understanding and/or competence and confidence in teaching STEM disciplines.

2.3 Curricular Support Resources – Provide curricular support resources that use NASA themes and content to a) enhance student skills and proficiency in STEM disciplines; b) inform students about STEM career opportunities; c) communicate information about NASA’s mission activities.

2.4 Student Involvement K-12
   o Provide K-12 students with authentic first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers
   o Provide opportunities for family involvement in K-12 student learning in STEM areas.

Outcome 3 Objectives

3.1 Resources
   o Provide informal education support resources that use NASA themes and content to 1) enhance participant skills and proficiency in STEM disciplines; 2) inform participants about STEM career opportunities; 3) communicate information about NASA’s mission activities
   o Develop a significant pool of qualified presenters of NASA aerospace content interacting with a large number of participants.

3.2 Professional Development for Informal Education Providers – Provide opportunities to improve the competency and qualifications of STEM informal educators, enabling informal educators to effectively and accurately communicate information about NASA activities and access NASA data for programs and exhibits.

3.3 Informal Education Provider Involvement Opportunities
   o Develop a national pool of qualified informal educators with experience in NASA-mission and related activities
   o Engage informal educators using NASA themes to enable them to 1) enhance participant skills and proficiency in STEM disciplines; 2) inform participants about STEM career opportunities; 3) communication information about NASA’s mission activities.
   o Establish and maintain a single informal education network for accessing NASA materials that has the flexibility for Special Interest Groups to function as a subset of the larger network.

Programmatic Guidance: This guidance clarifies the direction that has been presented at regional and national space grant meetings and budget calls. Throughout the development of your proposal, thoughtfully consider each of these items to strategically invest the appropriate level of funding to ensure consistency and alignment with the objectives of the Space Grant program and the NASA Office of Education.

- **Education Framework:** The Education Outcomes form a critical component of the Education Strategic Coordination Framework. The Framework guides the planning, implementation, and assessment of the NASA Education portfolio. The Framework provides a coordinated tool to describe the Overarching Philosophy and Operating Principles for NASA education. Higher education projects serve as major links in the student pipeline used to address the education outcomes.

- **Workforce Development:** Workforce development remains an important area of emphasis for the Agency and Space Grant.
• **Diversity:** Student awards through Fellowship/Scholarship, Higher Education, and Research Infrastructure programs are required to provide a specific target for participation of underrepresented minority and underserved students (see definitions below). This target must be consistent with the enrollment percentage for your state per the National Center of Education Statistics Digest.

  - **Underrepresented:** Refers to persons from racial and ethnic groups whose enrollment in STEM education or participation in STEM professions is much smaller than that group's representation in the general population. African Americans, Hispanic/Latinos, and Native Americans and Pacific Islanders currently fit this definition.
  - **Underserved:** Often used interchangeably with “underrepresented,” particularly as it relates to the sciences and engineering. Specifically, it is used to promote access and opportunity to persons of diverse backgrounds—racial, ethnic, gender, religious, age, sexual orientation, disabled, and other populations with limited access—to decent and affordable housing, gainful employment, and other services. In the STEM area, “underserved” has typically referred to women and persons with disabilities.