I. Overview: The NASA Pennsylvania Space Grant Consortium (PSGC) provides funding for Affiliate member institutions and for other Commonwealth institutions of higher education in support of qualifying proposals to continue, expand, or develop new programming. Participants who receive direct funding must be U.S. citizens. Completed proposals for mini-grants, including a cover sheet, statement of work, budget, and budget justification, should be submitted to Dr. Christopher H. House, Director of the Pennsylvania Space Grant Consortium, at SpaceGrant@psu.edu.

The PSGC accepts proposals on a rolling basis based on our current grant period of performance. Proposed project efforts may begin in summer 2020, fall 2020, spring 2021, or summer 2021 and should be completed within one year.

To satisfy NASA’s grant matching requirements, the total PSGC award amount must be matched by at least 1:1 by the proposing institution with non-federal funds in either cash, in-kind support, or both. Salary and waived/contributed indirect costs (F&A) are the most common forms of cost-share. Mini-grant budgets must include detailed justification.

NOTE: Upon completion of any PSGC-funded project, the project PI must submit a signed report documenting the institution’s contributions to the committed cost sharing.

At this time the PSGC will consider qualified proposals for awards in each of our three program areas:

- **Higher education** - projects that benefit the student directly. Funding for these projects may include, for example, student support (limited stipends or wages), materials and supplies for a student project, and student travel.

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

- **Pre-college** - K-12 programs and activities that enhance and broaden the knowledge of both the students and teachers. Award may include, for example, support for teacher preparation and enhancement, curriculum development, and student opportunities.

Mini-grants will be awarded based upon merit and funding availability. Award amounts are determined by the depth and breadth of the proposed project at three levels: $6,000, $12,000, and $25,000. All proposed budgets must include detailed justification. Proposals must include S.M.A.R.T. Goals and align with NASA Education Outcomes and one or more priorities of NASA’s Mission Directorates: Aeronautics Research (https://www.nasa.gov/aeroresearch), Human Exploration and Operations (https://www.nasa.gov/directorates/heo/index.html), Science (https://science.nasa.gov/), and Space Technology (https://www.nasa.gov/directorates/spacetech/home/index.html).
II. Proposal Format: While there is no page limitation for the proposal, be judicious while maintaining an adequate level of detail throughout all sections. Prepare your proposal using the following format:

1. **Cover Page** – 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. Reference Appendix A.
   c. Provide a discussion of how the proposed activities will align with NASA Education Outcomes and one or more priorities of NASA’s Mission Directorates.
   d. Describe the metrics you will use to measure accomplishment of goals, including meeting 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. NASA mandates that students or other participants who are directly supported and funded under this program must be U.S. citizens. *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.
   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 and/or internships (include number and monetary 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, the PSGC can only support purchases of qualifying, relevant materials and supplies. Equipment purchases cannot be funded. Equipment is defined as an item (machinery or tool) that is not used up or incorporated into a product (like a circuit board or even a low-end tablet for which the value is short-term), but something that is a long-term asset, like a computer system, for which the value would depreciate over its lifespan.
      viii. Other qualifying 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 costs (F&A) are the most common forms of cost-share. Institutional F&A rates must be included with proposal budget. **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** - A detailed breakdown of costs, justification or description of each cost and a total requested amount is required. Label each category clearly.

   i. Salary/Wages/Fringe Benefits- include hourly wage, fringe rate, percent of annual effort, etc.
   
   ii. Scholarships/Fellowships/Internships- include amount of each and how many individual awards or positions.
   
   iii. Travel- itemize to include airfare, vehicle rental, mileage, lodging, meals, registration fees, number of participants/travelers, etc. Foreign travel cannot be supported with NASA PSGC funds.
   
   iv. Materials and supplies- itemized list of materials and supplies.
   
   v. Other direct expenses- itemized list of other qualifying direct expenses.
   
   vi. Matching funds (Cost-Share)
Appendix A

NASA S.M.A.R.T. Goals and Objectives – Definitions

- **Goal(s):** Statement(s) about the broad, long-range, or more general aims or purposes of the program.
- **Objectives:** Brief, clear statements that describe how the goal(s) will be achieved.
- **Outcomes:** The concrete, specific, expected results of the program.
- **Metrics:** The specific quantitative (fact-based) and qualitative (subjective response such as survey) data that will be collected/measured to assess the extent to which expected outcomes have been achieved.
- **Target Number:** Quantitative measure of outcome.
- **Deadline:** Date for accomplishment/completion.

S.M.A.R.T. is a mnemonic that provides criteria to assist in project management.

- **Specific** – Be precise about what you propose to achieve.
  - Specify area of study or improvement and audience/impact
  - Specify intended objective(s)
  - Specify intended outcome(s)

- **Measurable** – Quantify indicators of progress.
  - Describe metrics to be used in program/project assessment and evaluation

- **Achievable** – Show how the outcomes of the program/project can be attained.
  - Explain how proposed statement of work and budget can produce desired outcome(s).

- **Relevant** – Explain how the program/project aligns with NASA priorities and with the PSGC’s mission to expand opportunities for U.S. citizens to learn about and participate in NASA’s aeronautics and space programs by supporting and enhancing science and engineering education, research, and outreach programs.
  - Reference specific NASA and/or PSGC alignment

- **Time-Specific** – Describe program/project life-span.
  - Provide a timeframe that includes start and end dates as well as significant milestones for achieving objectives, assessment, and reporting.
  - Provide a timeline for budget spending and reporting.
Appendix B

The proposed program/project must support one of the following NASA STEM Engagement 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.

- Funding is provided to **higher education projects**, for both undergraduate and graduate levels. The PSGC emphasizes hands-on space hardware laboratories and other research-related student support. The PSGC also funds curriculum development, design, and implementation of relevant new major and minor areas of study.

- The PSGC supports **research infrastructure projects** by providing funding to institutions to enhance high-quality 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 limited 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) communicate 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: 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 STEM Engagement.

- **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/Internship, Higher Education, and Research Infrastructure programs are required to provide a specific target for participation of underrepresented minority and underserved students (see definitions below).
  
  - 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, Hispanics/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.