



**National Aeronautics and Space Administration  
Office of Education**

**FY 2010 NASA Training Grant Announcement**

**National Space Grant College  
and Fellowship Program  
(Space Grant)  
2010-2014**

**Release Date:  
Proposals Due:**

**30 November 2009  
29 January 2010**

NASA Headquarters  
Office of Education  
Washington, DC 20546-0001

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## **I. Summary Information**

The National Aeronautics and Space Administration (NASA) Office of Education solicits proposals for the NASA National Space Grant College and Fellowship Program (Space Grant). Each funded proposal is expected to increase the understanding, assessment, development, and utilization of space and aeronautics resources. The program promotes partnerships and cooperation among universities, federal, state, and local governments, and aerospace industries to encourage and facilitate the application of university resources to aerospace and related fields.

### **A. Eligibility**

Proposals will be accepted from the lead institution of the Space Grant consortia in each state plus the District of Columbia and the Commonwealth of Puerto Rico. Consortia required to establish and implement an improvement plan based on the results of the 20<sup>th</sup> Year Evaluation of the Space Grant Program must adhere to the additional requirements in this solicitation in order for their proposal to be considered.

### **B. Funds Availability**

The Government's obligation to make an award is contingent upon the availability of appropriated funds from which payment can be made.

### **C. NASA Safety Policy**

Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

NASA's safety priority is to protect: (1) the public, (2) astronauts and pilots, (3) the NASA workforce (including employees working under NASA award instruments), and (4) high-value equipment and property. Consortia should always incorporate appropriate safety measures in any consortium-supported or associated activity.

## **II. National, Congressional, and Agency Focus on Education**

Presidential, Congressional, and the NASA Administrator's interest in and goals for education set the direction for NASA education efforts. Appendix D provides links to key Presidential, Congressional, and Agency documents and speeches about education overall at the federal level and specifically within NASA. A few highlights include:

- In September 2009, the "Strategy for American Innovation" from the Executive Office of the President states the importance of "[Educating] the next generation with 21st century knowledge and skills while creating a world-class workforce."
- In a "Memorandum to Heads of Executive Agencies and Offices" (August 4, 2009) from the directors of the Offices of Science and Technology Policy and Management and Budget, the federal Science and Technology Priorities include "[Nurturing] a scientifically literate population as well as a world-class, diverse science, technology, engineering and mathematics workforce."
- In the NASA Authorization Act of 2008 (H.R. 6063), Congress states, "It is the sense of Congress that NASA's educational programs are important sources of inspiration and

hands-on learning for the next generation of engineers and scientists and should be supported.”

- In a speech on “NASA and the Future of the Aerospace Workforce” at the Aerospace Industries Association Defense/Space Industrial Base Breakfast on September 16, 2009, NASA Administrator Charlie Bolden stated, “Our focus in education is Science, Technology, Engineering, and Math (STEM). To advance STEM education [we must] build NASA's and the nation's future workforce, ... attract and retain students in STEM disciplines, ...and include the underrepresented and minority communities.”

### **III. Space Grant Background**

Public Law 100-147, passed in 1987, authorized NASA to initiate Space Grant in response to the need for a coordinated effort to help maintain America's preeminence in aerospace science and technology. Through the establishment of state-based consortia, consisting of universities, university systems, associations, government agencies, industries, and informal education organizations involved in aerospace activities, lead institutions provide leadership and support for program objectives in their state and nationally by interacting with other universities, by broadening joint activities with NASA and aerospace-related industries, and by providing public service functions, such as support to elementary and secondary schools and to the public.

### **IV. Program Overview and Guidelines**

#### **A. National Space Grant Program Goal and Objectives**

The goal of the Space Grant Program is to contribute to the nation's science enterprise by funding education, research, and informal education projects through a national network of university-based Space Grant consortia.

The objectives of the Space Grant Program are to:

- Promote a strong science, technology, engineering, and mathematics education base from elementary through secondary levels while preparing teachers in these grade levels to become more effective at improving student academic outcomes.
- Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related fields.
- Encourage cooperative programs among universities, aerospace industry, and Federal, state and local governments.
- Encourage interdisciplinary training, research and public service programs related to aerospace.
- Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities, for careers in aerospace science and technology.

Space Grant consortia are expected to develop innovative and integrated plans to advance aerospace knowledge and expand related activities.

## **B. NASA Research and Technology Development Priorities**

NASA research and technology development priorities are defined by the Mission Directorates – Aeronautics Research, Exploration Systems, Science, and Space Operations. Each Mission Directorate covers a major area of the Agency’s research and technology development efforts.

Proposals should emphasize connections to NASA, reflect an analysis of the needs, strengths, and potential capabilities of the state and of the Space Grant consortium affiliates/members, and include strategies for strengthening the national educational base for science, technology, engineering and mathematics. Appendix A provides information on NASA research and technology development priorities as defined by the Mission Directorates.

## **C. NASA Education Priorities**

The *NASA Education Strategic Coordination Framework: A Portfolio Approach* describes the alignment of NASA’s education portfolio with the *2006 NASA Strategic Plan* and creates an agency-wide strategic planning, implementation and evaluation framework for NASA’s investments in education. The Space Grant program primary investments are in Outcome 1, while Outcome 2 and 3 are secondary and tertiary investments, respectively. (See Appendix B. NASA Education Strategic Coordination Framework)

Consortia must understand the NASA Education Outcomes, Objectives and Performance Assessment Rating Tool (PART) Measures (see Appendix B.) and be able to collect and report on the contribution of consortium projects and activities to the outcomes, objectives, and measures.

Consortia will be apprised annually of NASA Education priorities and key areas of emphasis. Consortia should strategically identify the areas consistent with the needs of their state and those which will contribute to the goals, objectives, and priorities of NASA. Consortia should highlight in the proposal where these areas of emphasis will be implemented (See V. Proposal Content).

### **Current Areas of Emphasis**

- Authentic, hands-on student experiences in science and engineering disciplines – the incorporation of active participation by students in hands-on learning or practice with experiences rooted in NASA-related, STEM-focused questions and issues; the incorporation of real-life problem-solving and needs as the context for activities.
- Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise. Capabilities for teachers to provide authentic, hands-on middle school student experiences in science and engineering disciplines (see above).
- Summer opportunities for secondary students on college campuses with the objective of increased enrollment in STEM disciplines or interest in STEM careers.

- Community Colleges – develop new relationships as well as sustain and strengthen existing institutional relationships with community colleges.
- Aeronautics research – research in traditional aeronautics disciplines; research in areas that are appropriate to NASA's unique capabilities; directly address the fundamental research needs of the Next Generation Air Transportation System (NextGen).
- Environmental Science and Global Climate Change – research and activities to better understand Earth's environments.
- Diversity of institutions, faculty, and student participants.
- Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities.

Consortia are not expected to implement activities in all of these areas. It is expected that the aggregation of activities across the 52 consortia of the Space Grant Program will demonstrate progress in these areas.

#### *Summer of Innovation*

A new 2010 initiative, *Summer of Innovation*, will be focused on improving middle school student outcomes and teacher preparation. In partnership with federal agencies, philanthropic institutions, universities, nonprofit organizations, and selected states, *Summer of Innovation* will be an investment in new opportunities for students to participate in rigorous STEM education by leveraging educational investments that have demonstrated an ability to improve student performance. *Summer of Innovation* will be designed in direct response to the President's call for greater interagency partnership along with systemic K-12 STEM education reform efforts.

NASA's initial goal is to reach an additional 1 million students and to provide a teaching fellowship experience that builds on the Agency's core competencies, invites deep national partnerships in implementation as well as research and development, and helps to keep pushing the Nation forward in our delivery of STEM education. All states will be encouraged to participate in this initiative, however it is anticipated that the initiative will be piloted in 5-7 states. Once the states are identified, the relevant consortia will be invited to submit proposals for additional Space Grant funding that may be available to their state with this activity.

#### **D. Period of Performance**

NASA Space Grant awards will support a five-year training grant.

#### **E. Funding and Cost-Sharing (Matching)**

Per the President's 2010 budget request, consortia should submit budgets within the following guidelines:

Designated Grant Consortia are invited to submit proposals with the following parameters:

- Maximum Proposal amount: \$575,000

- Minimum Fellowship/Scholarship amount: \$150,000
- Minimum cost-sharing (Match): \$425,000

Program Grant and Capability Enhancement Consortia are invited to submit proposals with the following parameters:

- Maximum Proposal amount: \$430,000
- Minimum Fellowship/Scholarship amount: \$110,000
- Minimum cost-sharing (Match): \$320,000

Definitions of the three grant types can be found in Appendix E. Proposals are expected to reflect alignment with the purpose and intent of the specific grant type. Program Grant and Capability Enhancement consortia may use this solicitation as the opportunity to request a change from one grant type to the other (i.e. Program Grant may request a change to Capability Enhancement and vice versa). Justification for the requested change must be clearly stated.

## **V. Proposal Content**

Proposals should present innovative strategies to accomplishing the goal, objectives, foci, and priorities cited above. Innovation in project execution, methods and approaches, and delivery and implementation mechanisms should be identified.

### **A. Cover Pages (Page limit: as needed)**

- Principal Investigator/Consortium Director information (address, phone, email), proposal title, submitting institutional information, certifications, and appropriate signatures.
- Consortium Concurrence: The designated representative from the lead institution (Director) and each affiliate representative must sign this document. This signature represents the affiliate's agreement with the contents of the proposal. Email concurrences are acceptable.

### **B. Consortium Abstract (Page limit: 1)**

Introductory information about the consortium including mission statement, major goals, and objectives as derived from NASA priorities and the national program guidance. Program specific goals and objectives must be included in the appropriate section below. A summary table of consortium goals and objectives must be included as an appendix to the proposal. The proposal must include targets/metrics for each element and specific consortium targets. Consortium objectives and metrics that contribute to NASA Program Assessment Rating Tool (PART) measures must be identified. See Appendix B for a list of NASA Education PART measures. See Appendix F for the Sample "Table of Consortium PART Measure Contributions". This document must be submitted as part of the proposal package.

### **C. Consortium Profile (Page limit: 1)**

Describe the environment of the consortium, including state demographics, unique consortium aspects as well as any consortium-wide themes or specialization. Provide a

brief analysis of the state's needs and discuss how they align with NASA priorities. This section should convey how the unique mix of projects proposed by the consortium is strategically designed to respond to the state's needs and NASA priorities.

**D. Programmatic Elements:** (Page limit: 10)

Each consortium program or project must demonstrate alignment with the NASA Education Outcomes. (See Appendix B for NASA Education Strategic Coordination Framework, Outcomes and Objectives and PART measures). The Space Grant program primarily emphasizes Outcome 1 with Outcomes 2 and 3 as secondary and tertiary emphases respectively.

**1. NASA Education Outcome 1:** *Contribute to the development of the science, technology, engineering, and mathematics (STEM) workforce in disciplines needed to achieve NASA's strategic goals (Employ and Educate)*

The programs, projects, and activities of the Fellowship/Scholarship, Research Infrastructure and Higher Education Programmatic Elements must clearly identify alignment with and contributions to NASA Education Outcome 1, objectives, and PART measures as well as to NASA goals and missions. As appropriate, proposals should describe participation/collaboration with NASA in the involvement of NASA personnel or use of NASA facilities. Identify the metrics by which the success of the workforce development efforts (e.g. retention in STEM disciplines, employment in STEM field or pursuit of advanced STEM degrees) will be measured.

- a. **Diversity:** For student awards (monetary and non-monetary) through the Fellowship/Scholarship, Research Infrastructure, and Higher Education programs, consortia are required to provide a specific target percentage for participation of female and underrepresented minority students. This target must be consistent with the enrollment percentage for the state as per the National Center of Education Statistics Digest ([http://nces.ed.gov/Programs/digest/d08/tables/dt08\\_228.asp](http://nces.ed.gov/Programs/digest/d08/tables/dt08_228.asp)). Recall that Asian students are not underrepresented in STEM fields and should not be included in the target; the enrollment percentage may be adjusted from NCES statistic to reflect the removal of this cohort of students. Targets for females and underrepresented students must be identified separately.

- b. **Fellowship/Scholarship**

*Description*

Describe the Fellowship/Scholarship program including: purpose, goals, SMART objectives (including targets and metrics), characteristics, budget, assessment and evaluation plans, and support of both graduate and undergraduate students in STEM disciplines. This section should clearly identify the number of projected awards that meet the longitudinal tracking threshold and the number that will not require longitudinal tracking (see Appendix E. for longitudinal tracking guidelines).

### *Competitiveness*

The proposal must demonstrate how fellowships and scholarships will be competitively awarded. If fellowship/scholarship funds are allocated to specific affiliates, the proposal must demonstrate how the affiliate(s) will competitively administer those awards. The proposal should include a discussion of recruitment of applicants, selection of awardees, and plans to insure that students from all academic affiliates within the consortium are eligible to apply for Space Grant fellowships and scholarships.

Fellowship/scholarship program budgets significantly in excess of the minimum amount required must be clearly justified. Proposals lacking clear explanations will be reviewed less favorably.

### c. **Research Infrastructure**

#### *Description*

Describe the Research Infrastructure program including: purpose, goals, SMART objectives (including targets and metrics), project characteristics, budget, and assessment and evaluation plans. This section should clearly identify the number of projected participants that meet the longitudinal tracking threshold and the number that will not require longitudinal tracking (see Appendix E. for longitudinal tracking guidelines).

#### *Interdisciplinary*

The proposal must demonstrate how the Research Infrastructure projects and activities incorporate collaboration or cooperation of two or more disciplines or fields of study.

NASA and jurisdictional priorities – The proposal must demonstrate how the Research Infrastructure projects and activities are responsive to NASA and jurisdictional research and development areas of interest and emphasis. Appendix A provides information on NASA Mission Directorates and their priority areas.

### d. **Higher Education**

#### *Description*

Describe the Higher Education program including: purpose, goals, SMART objectives (including targets and metrics), project characteristics, budget, and assessment and evaluation plans. This section should clearly identify the number of projected participants that meet the longitudinal tracking threshold and the number that will not require longitudinal tracking (see Appendix E for definition of longitudinal tracking guidelines).

#### *Interdisciplinary*

The proposal must demonstrate how the Higher Education projects and activities incorporate collaboration or cooperation of two or more disciplines or fields of study.

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

- a. **Precollege Education**

- Description*

- Describe the Precollege Education program including: purpose, goals, SMART objectives (including targets and metrics), project characteristics, budget, and assessment and evaluation plans. The proposal must identify the specific NASA Education Objective and PART measure(s) to which the consortium projects and activities align. Consortia must describe plans to evaluate precollege efforts in alignment with NASA Outcome 2 objectives and measures. Investments and activities should align with the consortium type as defined in Appendix E.

- The emphasis in precollege programs should be placed on teacher preparation and/or development.

- Proposed student-focused projects must describe how the effort will demonstrate (quantitatively and/or qualitatively) increased enrollment in STEM disciplines or interest in STEM careers.

- Consortia are encouraged to implement precollege programs in collaboration with other NASA pre-college projects or STEM pipeline projects.

3. **NASA Education 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)*

- a. **Informal Education**

- Description*

- Describe the Informal Education program including: purpose, goals, SMART objectives (including targets and metrics), project characteristics, budget, and assessment and evaluation plans. Consortium projects and activities must align with NASA guidance and definition for Informal Education (see Appendix E). The intent of Informal Education is to increase learning, to educate students, educators and the general public on specific STEM content areas, and to expand the nation's future STEM workforce. Investments and activities should align with the consortium type as defined in Appendix E.

**E. Consortium Management** (Page limit: 3)

Describe the following aspects of the management of the consortium. This section must include budget figures for all consortium administrative costs (labor, benefits, supplies, etc.).

1. Consortium Management

- Describe the consortium's management structure, and operational policies and procedures. The consortium Strategic Plan should be included as an appendix to the proposal.

2. Consortium Structure/Network (Internal)  
Describe the composition of institutions that comprise the consortium; include the number, demographics, and characteristics. Describe the roles and responsibilities of campus/organization representatives in terms of on-campus effectiveness, communication of the program to their constituents, process to build a NASA presence at their location, participation and involvement in consortium operations.
3. Consortium Operations  
Describe staffing levels at the lead institution, and support provided by other institutions or organizations (FTEs for director, program coordinator, support staff, affiliate representatives, etc.). Staffing levels and costs should allow for the maximum amount of funds being made available to consortium programs/projects. Describe how staff resources are allocated in terms of management and administrative tasks, resource development, and/or project implementation. Include a discussion of the composition, role/purpose, and meeting frequency of Advisory/Executive Committee(s)/Boards (i.e. internal and external groups). Describe the consortium policy for adding and removing members of the consortium.
4. Collaborations and Partnerships Outside the Consortium  
Describe collaborations and partnerships (number, characteristics, and purpose) outside the membership of the consortium. Discuss how these collaborations/partnerships benefit the consortium. Discuss Publicity/Outreach plans.

**F. Budget: Narrative and Details** (page limits: as needed)

1. Present a budget breakdown for each year of proposed work, along with total budget figures for the entire period of performance (See Section IV.C.) A budget narrative and details must be included for Year 1. Years 2-5 may be budget summaries only (See Appendix D for Grant Information website). The proposed budget should be adequate, appropriate, reasonable, and realistic, and demonstrate the effective use of funds in alignment with the proposed projects and consortium grant type.
2. Notes on Budget:
  - The budget must reflect clear alignment with the content and text of the proposal. The budget should contain sufficient cost detail and supporting information to facilitate a speedy evaluation and award. In order to expedite the evaluation of the proposal, it is highly recommended that the proposal text reference specific and consistent budget categories and vice-versa.
  - The proposal must include the “2010 Budget Form” (Appendix G) as a separate document submission.
  - Significant dollar amounts proposed with no explanation (e.g., Labor: \$35,000, Supplies: \$15,000) may reduce proposal acceptability, or cause delays in funding. Costs should be explained in reasonable detail.
  - Direct labor costs should be separated by titles or disciplines (e.g., director, program coordinator, graduate research assistant, clerical support, etc.) with estimated hours, hourly rates, and total amounts of each. These should be consistent with Section V.E Consortium Management. Indirect costs should

be sufficiently explained such that reviewers can understand the basis of the proposed costs.

- Other Costs (with each significant category detailed) should be explained in reasonable detail, and substantiated whenever possible.
- Requested domestic travel should include purpose, the number of trips and expected location, duration of each trip, airfare, and per diem. Domestic travel should be appropriate and reasonable to conduct the proposed activities. Proposals may include travel, registration fees, and per diem expenses for participation in two national meetings (Spring and Fall – up to three days) and a regional meeting. It is not appropriate for Space Grant funds to be used for expenses (lodging and per diem) on any day(s) at the national meetings in which there are non-NASA meetings and activities.
- Foreign Travel must be Space Grant-related, requires prior approval from the Space Grant Program Manager, and cannot exceed \$1,000/year. “Space Grant” should be included in verbal and written acknowledgments in writing reports and publications. In addition, a post-trip report must be submitted to the Space Grant office describing the benefits gained as a result of the trip. Requested foreign travel should include justification, purpose, the number of trips and expected location, duration of each trip, airfare, and per diem.
- For the director’s time only: complete the table below. Clearly identify the amount of money (in total) that the director is paid by 1) NASA funds and 2) matching funds, AND clearly identify the percentage of time that those dollars translates into based on 12 months. If the director is paid from/supported through a combination of academic year and summer time salary, the information should be based on 12 months.

<u>Director</u>	<i>Dollars</i>	<u>NASA Funding</u> TOTAL Dollars for a 12-month period (academic year + summertime)	<u>Matching Funds</u> TOTAL Dollars for a 12 month period (academic year + summertime)
	<i>Time</i>	<u>NASA Funding</u> Percentage of TOTAL time for a 12-month period (academic year + summertime)	<u>Matching Funding</u> Percentage of TOTAL time for a 12-month period (academic year + summertime)

- Subcontracts to an individual or organizations: Up to \$100,000 requires a separate budget and work statement. Over \$100,000 requires a separate budget, work statement, and a breakout of hourly rate.

**G. Required Appendices and Additional Documents** (page limits: as needed)

1. Consortium Strategic Plan (Include as an Appendix to the proposal.)

2. Program Improvement and Results (PIR) Report (*applicable for consortium on improvement plans based on results of the 20<sup>th</sup> Year Evaluation*) – Provide credible evidence of having met the goals, objectives, and actions set forth in the consortium improvement plan. The PIR must include the consortium accomplishments based on the specific actions in the improvement plan, status of goals and SMART objectives, and evidence that consortium is on track based on the milestone schedule. This section should describe what changes have been made in consortium management and programmatic elements which demonstrate improvement based on deficiencies cited in the 20<sup>th</sup> Year Evaluation. (Include as an Appendix to the proposal.)
3. Summarized Table of Consortium Goals and SMART Objectives (including metrics and targets) (Include as an Appendix to the proposal.)
4. Summarized Table of Projected Contributions to NASA PART Measures (for Year 1/2010). Proposals must include projected contributions to specific NASA PART measures. Each Office of Education project is required to forecast the portion of the target that will be contributed by the project. See Appendix F for a sample table. (This Consortium PART measures table must be submitted as a separate document.)
5. 2010 Budget Form (Submit as separate document.)

## **VI. Proposal Evaluation Criteria**

- A. NASA Education Operating Principles: Evaluation criteria for Space Grant are based on NASA's Education Operating Principles as described in the *NASA Education Strategic Coordination Framework*. All NASA education projects are evaluated according to these general principles:
- Relevance
  - Content
  - Diversity
  - Evaluation
  - Continuity
  - Partnership/Sustainability

Successful proposals are those that provide sound contributions to both immediate and long-term workforce, educational, scientific, and technical priorities of NASA and the federal administration as expressed in current documents and communications. Proposals will be reviewed on the following criteria: Intrinsic Merit of programmatic elements, NASA Alignment, Management and Evaluation, and Budget Justification: Narrative and Details. In addition to these basic elements, proposals will be reviewed for the merit of the following specific components:

### **B. Diversity**

The proposal must address diversity in three areas: consortium management (see Section V.E), individual higher education participants (see section V.D.1), and meaningful involvement/engagement of minority-serving institutions (see below).

Minority Serving Institutions: Describe the consortium’s strategy and specific SMART objectives for seeking opportunities to develop new relationships and/or sustain and strengthen existing institutional relationships with minority-serving institutions (Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, Other Minority Universities, and institutions of higher education that have a higher enrollment of minority students) internal or external to the consortium. Describe plans that will ensure "meaningful involvement" of MSIs through collaborations and partnerships. Note: funds cannot be used outside the consortium to support institutions, faculty, or students.

C. Workforce Development – authentic, hands-on student experiences in STEM disciplines. The proposal must address how the programmatic elements proposed incorporate the active participation of students in hands-on learning or practice with experiences rooted in NASA-related, STEM-focused questions and issues. Engagement with NASA, NASA-related industry, and principal investigators/teams of NASA missions and projects will be reviewed. Reviewers will not be looking for specific “workforce development” projects; reviewers should be able to identify the workforce development thread throughout the programs.

D. Programmatic Rigor

The proposal must demonstrate effective formative and summative assessment and evaluation plans throughout all managerial and programmatic elements. Proposals must demonstrate how the consortium will seek to continuously improve consortium management and programs.

## VII. Proposal Format Guidance

- The complete document may not exceed page limits identified above.
- No less than single-spaced, using standard size (8 1/2" x 11") paper, in no smaller than 12-point font with a minimum of 1” margins on all sides for each page. Use an easily readable font (e.g. Geneva, Helvetica, Times Roman). Illustrations, tables, charts, exhibits, etc. are restricted to no smaller than 10-point font.
- Submit proposal as a PDF. The document should not include scanned materials. Use caution when creating the PDF file to ensure that font sizes, tables and graphics remain compliant with guidelines. If you need assistance converting a Word Document to a PDF, that can be provided.
- A complete submission will consist of a .pdf with:
  - The proposal
  - Appendix of the consortium strategic plan
  - Table of consortium goals and objectives
  - Performance improvement report (for consortia on 20<sup>th</sup> Year improvement plans)
  - Separate documents of the
    - 2010 Budget Form
    - Table of consortium PART measure contributions
- All pages must be numbered sequentially.

- All information that reviewers should consider must be included in the proposal. It is not acceptable to refer reviewers to websites or other external sources for additional information or as evidence for the narrative. Appendices and attachments are not allowed except as specified in Section V. Proposal Content above.
- A Compliance Review will be conducted upon receipt of the proposal.

### **VIII. Proposal Submission**

- Documents should be saved and submitted using the following format: State\_Name\_of\_Document.

*Examples:* XX\_2010Proposal, XX\_2010Budget\_Form, XX\_PARTMeasureContributions where XX indicates your two letter state abbreviation.

- Electronic proposals and all required electronic documents must be submitted by COB Friday, January 29, 2010. A complete electronic submission will consist of
  - A .pdf containing
    - The proposal
    - Appendix of the consortium strategic plan
    - Table of consortium goals and objectives
    - Performance improvement report (for consortia on 20<sup>th</sup> Year improvement plans)
  - Two Word documents:
    - 2010 Budget Form
    - Table of consortium PART measure contributions
- In addition, the original hard copy and 2 hard copies, of the same PDF and documents submissions, must be received at NASA Headquarters by COB Monday, February 1, 2010.

Send the package via express mail, commercial delivery, or courier to:

LaTeicia Durham  
 Program Analyst/Coordinator Space Grant Program  
 Mail Suite 6M35, Office of Education  
 ATTN: Receiving and Inspection (Rear of Building)  
 NASA Headquarters  
 300 E Street, SW  
 Washington, DC 20546-0001

### **IX. Data Submission, Annual Progress Reporting, and Final Report**

Annually, consortia will be required to submit performance data, student profile and award information (for students who meet the longitudinal tracking threshold), project information, and PART data through the new NASA Office of Education Performance

Measurement (OEPM) system. This web-based system replaces the Consortium Management Information System (CMIS). Per grant regulations, consortia will be required to submit annual progress reports. Consortia will be given guidelines for the submission of OEPM data and the annual progress report. Every effort will be made to streamline the reporting burden for these two requirements while complying with federal and education reporting requirements. Since the OEPM will allow for the ongoing submission of data throughout the year, consortia must be prepared to support the Space Grant Program Office in quarterly program reviews.

## **X. Training Grant Guidance**

Compliance with these items will help expedite the processing of packages with the NASA Grants Office.

A. The following restrictions exist on the use of the Space Grant funds:

- Equipment: As with all NASA training grants, no equipment purchases are allowed with NASA dollars. Refer to local institutions guidelines for a definition of equipment. You may also find additional information in the NASA Grant and Cooperative Agreement Handbook (<http://ec.msfc.nasa.gov/hq/grcover.htm>).
- Awards to U.S. Citizens: NASA Grants Handbook Part B § 1260.12 Choice of award instrument. (3) Training grant. A training grant is an agreement that provides funds primarily for scholarships, fellowships, or stipends to students, teachers, and/or faculty. (iii) Students and faculty receiving direct support under a NASA training grant must be U.S. citizens. (<http://ec.msfc.nasa.gov/hq/granta.html#126012>)

B. Certifications: The following three certifications must be included.

- 1) Retrieve the certifications from the Goddard Space Flight Center Grants Office website ([http://code210.gsfc.nasa.gov/grants/grants.htm#Grant\\_Forms](http://code210.gsfc.nasa.gov/grants/grants.htm#Grant_Forms)) for the following three certifications:
  - Certification for Debarment, Suspension, and other Responsibility Matters
  - Assurance for Nondiscrimination Compliance
  - Certification Regarding Lobbying

OR

- 2) If you include the following statement on the front of the package, with a signature from the proper institutional official, separate certifications do not require submission:

**Certification of Compliance with Applicable Executive Orders and U.S. Code**  
By signing and submitting the proposal identified in this Cover Sheet/Proposal Summary in response to the NASA request for a proposal under the National Space Grant College and Fellowship Program, the Authorizing Official of the proposing institution, as identified below:

1. certifies that the statements made in this proposal are true and complete to the best of his/her knowledge;
2. agrees to accept the obligations to comply with NASA award terms and conditions if an award is made as a result of this proposal;
3. provides certification to the following that have been reviewed on the following NASA website [http://code210.gsfc.nasa.gov/grants/grants.htm#Grant\\_Forms](http://code210.gsfc.nasa.gov/grants/grants.htm#Grant_Forms)): (i) Certification for Debarment, Suspension, and other Responsibility Matters; (ii) Certification Regarding Lobbying; (iii) Assurance for Nondiscrimination Compliance.

Institution Authorization: \_\_\_\_\_

## **XI. Inquiries**

Technical questions about this solicitation may be directed to:

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Or

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Inquiries regarding the submission of proposal materials may be addressed to:

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## Appendix A. Strategic Framework for NASA

### I. NASA Mission Directorates

NASA's Mission to *pioneer the future in space exploration, scientific discovery, and aeronautics research*, draws support from four Mission Directorates, each with a specific responsibility.

- The Aeronautics Research Mission Directorate (ARMD) conducts vital research to make air travel more efficient, safe, green, and to uncover leading-edge solutions for the Next Generation Air Transportation System (NextGen) in the United States. ARMD's fundamental research in traditional aeronautical disciplines and emerging disciplines helps address substantial noise, emissions, efficiency, performance and safety challenges that must be met in order to design vehicles that can operate in the NextGen. (<http://www.aeronautics.nasa.gov>)
- The Exploration Systems Mission Directorate (ESMD) Agency role is to develop a sustained human presence on the moon; to promote exploration, commerce, and U.S. preeminence in space; and to serve as a stepping-stone for the future exploration of Mars and other destinations. ESMD establishes the NASA exploration research and technology development agenda. Specifically, ESMD develops capabilities and supporting research and technology that will enable sustained and affordable human and robotic exploration. It also works to ensure the health and performance of crews during long-duration space exploration. In the near-term, ESMD does this by developing robotic precursor missions, human transportation elements, and life-support systems. (<http://www.exploration.nasa.gov>)
- The Science Mission Directorate (SMD) leads the Agency in four areas of research: Earth Science, Heliophysics, Planetary Science, and Astrophysics. SMD works closely with the broader scientific community, considers national initiatives, and uses the results of National Research Council studies to define a set of "Big Questions" in each of these four research areas. These questions, in turn, fuel mission priorities and the SMD research agenda. The SMD also sponsors research that both enables, and is enabled by, NASA's exploration activities. SMD has a portfolio of Education and Public Outreach projects that are connected to its research efforts. (<http://nasascience.nasa.gov>)
- The Space Operations Mission Directorate (SOMD) provides the Agency with leadership and management of NASA space operations related to human exploration in and beyond low-Earth orbit. SOMD enables current space exploration in low earth orbit through its Space Shuttle and International Space Station Programs. SOMD is also responsible for Agency leadership and management of NASA space operations related to Launch Services, Space Transportation, and Space Communications in support of both human and robotic exploration programs. (<http://www.spaceoperations.nasa.gov>)

### II. NASA Research Areas of Interest

NASA EPSCoR research priorities are defined by the Mission Directorates—Aeronautics Research, Exploration Systems, Science, and Space Operations. Each Mission Directorate covers a major area of the Agency's research and technology development efforts.

Information about current NASA research solicitations can be found on NSPIRES at <http://nspires.nasaprs.com> (select “Solicitations” and then “Open Solicitations”).

Research priorities for each of the Mission Directorates can be found at the following locations:

### **Aeronautics Research Mission Directorate (ARMD)**

Researchers responding to the ARMD should propose research that is aligned with one or more of the ARMD programs. Proposers are directed to the following:

- ARMD Programs: <http://www.aeronautics.nasa.gov/programs.htm>
- Research Opportunities in Aeronautics (ROA) <http://nspires.nasaprs.com> (select “Solicitations” and then “Open Solicitations”)

### **Exploration Systems Mission Directorate (ESMD)**

General priorities of ESMD can be found at <http://www.nasa.gov/directorates/esmd>.

#### **Science Research Interests:**

- Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions, NASA Human Research Program and The National Space Biomedical Research Institute  
<http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=154870/NNJ08ZSA002N.pdf>
- Ground-Based Studies in Space Radiobiology, NASA Space Radiation Program Element  
<http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=179575/NNJ09ZSA001N.pdf>

#### **Engineering Research Interests:**

- **Spacecraft:** Guidance, navigation and control; thermal; electrical; structures; software; avionics; displays; high speed re-entry; modeling; power systems; interoperability/commonality; advanced spacecraft materials; crew/vehicle health monitoring; life support.
- **Propulsion:** Propulsion methods that will utilize materials found on the moon or Mars, “green” propellants, on-orbit propellant storage, motors, testing, fuels, manufacturing, soft landing, throttle-able propellants, high performance, and descent.
- **Lunar and Planetary Surface Systems:** Precision landing hardware, software, in-situ resource utilization (ISRU), navigation systems, extended surface operations, robotics, (specifically environmental scouting prior to human arrival, outpost maintenance with and without humans present, and assist astronaut with geologic exploration) environmental analysis, radiation protection, spacesuits, life support, power systems. ESMD also has an extensive program to develop and test models of lunar surface systems in realistic analog environments on Earth. Information on the Analog Tests is available on the Web by visiting: <http://www.nasa.gov/exploration/home/analogs.html>.
- **Ground Operations:** Pre-launch, launch, mission operations, command and control software systems, communications, landing and recovery.

## **Science Mission Directorate (SMD)**

Detailed information on SMD research priorities is available at the following URLs:

- NASA Science Plan 2007: <http://science.hq.nasa.gov/strategy/> and [http://nasascience.nasa.gov/about-us/science-strategy/Science\\_Plan\\_07.pdf](http://nasascience.nasa.gov/about-us/science-strategy/Science_Plan_07.pdf).
- Research Opportunities in Space and Earth Science (ROSES): <http://nspires.nasaprs.com/external/>. Select “Solicitations”, “Open Solicitations”, and then “Research Opportunities in Space and Earth Sciences (ROSES) – 2009”.
- In addition, proposer can visit the following URL: <http://nasascience.nasa.gov/big-questions> which summarizes the research questions across all four SMD divisions and links to their respective 2007-2016 science strategy.

## **Space Operations Mission Directorate (SOMD)**

The primary research and technology development areas in SOMD support launch vehicles, space communications, and the International Space Station. Examples of research and technology development areas (and the associated lead NASA Center) with great potential include:

- Space Communications and Navigation
  - Coding, Modulation, and Compression (Goddard Spaceflight Center (GSFC))
  - Precision Spacecraft and Lunar/Planetary Surface Navigation and Tracking (GSFC)
  - Communication for Space-Based Range (GSFC)
  - Antenna Technology (Glenn Research Center (GRC))
  - Reconfigurable/Reprogrammable Communication Systems (GRC)
  - Miniaturized Digital EVA Radio (Johnson Space Center (JSC))
  - Transformational Communications Technology (GRC)
  - Long Range Optical Telecommunications (Jet Propulsion Laboratory (JPL))
  - Long Range Space RF Telecommunications (JPL)
  - Surface Networks and Orbit Access Links (GRC)
  - Software for Space Communications Infrastructure Operations (JPL)
  - TDRS transponders for launch vehicle applications that support space communication and launch services (GRC)
- Space Transportation
  - Optical Tracking and Image Analysis (Kennedy Space Center (KSC))
  - Space Transportation Propulsion System and Test Facility Requirements and Instrumentation (Stennis Space Center (SSC))
  - Automated Collection and Transfer of Launch Range Surveillance/Intrusion Data (KSC)
  - Technology tools to assess secondary payload capability with launch vehicles (KSC)
  - Spacecraft Charging/Plasma Interactions (Environment definition & arcing mitigation) ((Marshall Space Flight Center (MSFC))
- Processing and Operations
  - Crew Health and Safety Including Medical Operations (JSC)

- In-helmet Speech Audio Systems and Technologies (GRC)
- Vehicle Integration and Ground Processing (KSC)
- Mission Operations (Ames Research Center (ARC))
- Portable Life Support Systems (JSC)
- Pressure Garments and Gloves (JSC)
- Air Revitalization Technologies (ARC)
- In-Space Waste Processing Technologies (JSC)
- Cryogenic Fluids Management Systems (GRC)

## Appendix B: NASA Education Strategic Coordination Framework

### I. Overview

As identified in the 2006 NASA Strategic Plan, education is one of the Agency's cross-cutting management strategies. High achievement in STEM education is essential to the accomplishment of NASA's mission. NASA contributes to national efforts for achieving excellence in STEM education through a comprehensive education portfolio implemented by the Office of Education, the Mission Directorates, and the NASA Centers. NASA will continue the Agency's tradition of investing in the Nation's education programs and supporting the country's educators who play a key role in preparing, inspiring, exciting, encouraging, and nurturing the young minds of today that will manage and lead the Nation's laboratories and research centers of tomorrow.

The *NASA Education Strategic Coordination Framework: A Portfolio Approach* describes the alignment of NASA's education portfolio with the *2006 NASA Strategic Plan* and creates an agency-wide strategic planning, implementation and evaluation framework for NASA's investments in education. This Framework establishes three educational outcomes:

- **Outcome 1 – Higher Education:** Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goal through a portfolio of investments.
- **Outcome 2 – Elementary and Secondary Education:** Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.
- **Outcome 3 – Informal Education:** Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.

The plan encompasses all education efforts undertaken by NASA and guides the Agency's relationships with external education partners. Proposers are strongly encouraged to become familiar with this document. It may be found at: <http://education.nasa.gov/about/strategy>

### II. NASA Education Outcomes and Objectives

#### Outcome 1 Objectives

- **Objective 1.1 – Faculty and Research Support:** Provide NASA competency-building education and research opportunities for faculty, researchers, and post-doctoral fellows.
- **Objective 1.2 -- Student Support:** Provide NASA competency-building education and research opportunities to individuals to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education.
- **Objective 1.3 -- Student Involvement, Higher Education:** Provide opportunities for groups of post-secondary students to engage in authentic NASA-related mission-based research and development activities.
- **Objective 1.4 -- Course Development:** Develop NASA-related course resources for integration into STEM disciplines.

- **Objective 1.5 -- Targeted Institution Research and Academic Infrastructure:** Improve the ability of targeted institutions to compete for NASA research and development work.

### **Outcome 2 Objectives**

- **Objective 2.1 Educator Professional Development—Short Duration:** Provide short duration professional development training opportunities to educators, equipping them with the skills and knowledge to attract and retain students in STEM disciplines.
- **Objective 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.
- **Objective 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; and/or b) inform students about STEM career opportunities; and/or c) communicate information about NASA’s mission activities.
- **Objective 2.4 Student Involvement K-12:** Provide K-12 students with authentic, first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers; and/or provide opportunities for family involvement in K-12 student learning in STEM areas.

### **Outcome 3 Objectives**

- **Objective 3.1 Resources**
  - 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
  - Develop a significant pool of qualified presenters of NASA aerospace content interacting with a large number of participants.
- **Objective 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.
- **Objective 3.3 Informal Education Provider Involvement Opportunities**
  - Develop a national pool of qualified informal educators with experience in NASA-mission and related activities
  - 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.
  - 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.

### III. NASA Education Program Assessment Rating Tool (PART) Measures

<b>PART Measures - 2010</b>	<b>NASA Targets<sup>1</sup></b>
<b><u>Higher Education Measures</u></b>	
Percentage of NASA higher education program student participants employed by NASA, aerospace contractors, universities, & other educational institutions.	60%
Percentage of undergraduate students who move on to advanced education in NASA-related disciplines.	40%
Number of underrepresented and underserved students participating in NASA higher education programs.	8,500
Number of institutions served in designated EPSCoR states.	200
Number of new or revised courses targeted at the STEM skills needed by NASA that are developed with NASA support.	60
Ratio of funds leveraged by NASA funding support.	80%
<b><u>Elementary/Secondary/eEducation Measures</u></b>	
Percentage of elementary and secondary educators who participate in NASA training programs and use NASA resources in their classroom instruction. ( $\geq 2$ days of training)	75%
Percentage of elementary and secondary educators who either obtain NASA content-based education resources or participate in short-duration NASA education activities and use NASA resources in their classroom instruction.	60%
Percentage of students expressing interest in science, technology, engineering, and math (STEM) careers following their involvement in NASA elementary and secondary education programs.	$\geq 50\%$

<sup>1</sup> Target measures are the “Program Performance Measures” for the sum of all NASA Education projects. Space Grant is required to report results that contribute to the accomplishment of certain of these target measures (see Appendix F).

Number of elementary and secondary student participants in NASA instructional and enrichment activities.	470,000
Cost per participant for NASA elementary and secondary education programs.	\$12.57
Dollar invested per number of page views for NASA Education website.	\$0.032/page view
<b><u>Informal Education Measure</u></b>	
Number of museums and science centers across the country that actively engage the public in major NASA events.	350
<i>Details on NASA Education PART Measures can be found at ExpectMore.gov <a href="http://www.whitehouse.gov/omb/expectmore/summary/10002310.2008.html">http://www.whitehouse.gov/omb/expectmore/summary/10002310.2008.html</a></i>	

## Appendix C: NASA Points of Contact

Additional information regarding NASA Space Grant can be obtained from the following:

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Or

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### NASA Mission Directorate Contacts

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<p><b><u>Exploration Systems Mission Directorate</u></b></p> <p>Jerry Hartman Education Lead NASA Headquarters Phone: (202) 358-1451 <a href="mailto:Jerry.G.Hartman@nasa.gov">Jerry.G.Hartman@nasa.gov</a></p>	<p><b><u>Space Operations Mission Directorate</u></b></p> <p>Alotta Taylor Director, Mission Support and Communications NASA Headquarters Phone: (202) 358-2534 <a href="mailto:alotta.e.taylor@nasa.gov">alotta.e.taylor@nasa.gov</a></p>

## NASA Center Contacts

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## Appendix D: Reference Documents and Useful Web Sites

### NASA Links

- NASA  
<http://www.nasa.gov>
- 2006 NASA Strategic Plan  
[http://www.nasa.gov/pdf/142302main\\_2006\\_NASA\\_Strategic\\_Plan.pdf](http://www.nasa.gov/pdf/142302main_2006_NASA_Strategic_Plan.pdf)
- NASA Education Strategic Coordination Framework  
<http://education.nasa.gov/about/strategy>  
[http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Strategic\\_Coordination\\_Framework.html](http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Strategic_Coordination_Framework.html)

### Grant and Administrative Links

- NASA Grant and Cooperative Agreement Handbook  
[http://prod.nais.nasa.gov/pub/pub\\_library/grcover.htm](http://prod.nais.nasa.gov/pub/pub_library/grcover.htm)
- Grants Information  
<http://code210.gsfc.nasa.gov/grants/grants.htm>  
(contains links to Grant Forms including Grant Budget Summary and certifications)
- National Center of Education Statistics Digest  
[http://nces.ed.gov/Programs/digest/d08/tables/dt08\\_228.asp](http://nces.ed.gov/Programs/digest/d08/tables/dt08_228.asp)
- Office of Management and Budget – Program Assessment Rating Tool (PART)  
<http://www.whitehouse.gov/omb/expectmore/>

### National, Congressional, and Agency Focus on Education Links

- NASA Authorization Act of 2008 (H.R. 6063)  
<http://thomas.loc.gov>
- NASA and The Future of the Aerospace Workforce – Remarks By Nasa Administrator Charlie Bolden  
[http://www.nasa.gov/pdf/386965main\\_NASA\\_Bolden\\_AIA\\_Breakfast\\_Final.pdf](http://www.nasa.gov/pdf/386965main_NASA_Bolden_AIA_Breakfast_Final.pdf)
- Memorandum to Heads of Executive Agencies and Offices – Office of Science and Technology Policy priorities  
[http://www.ostp.gov/galleries/press\\_release\\_files/Final%20Signed%20OMB-OSTP%20Memo%20-%20ST%20Priorities.pdf](http://www.ostp.gov/galleries/press_release_files/Final%20Signed%20OMB-OSTP%20Memo%20-%20ST%20Priorities.pdf)

- Remarks by The President at The National Academy of Sciences Annual Meeting  
[http://www.whitehouse.gov/the\\_press\\_office/Remarks-by-the-President-at-the-National-Academy-of-Sciences-Annual-Meeting](http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-at-the-National-Academy-of-Sciences-Annual-Meeting)
- White House Issue Statement on Education  
<http://www.whitehouse.gov/issues/education>
- White House Issue Statement on Science  
<http://www.whitehouse.gov/issues/additional-issues>
- White House Issue Statement on Technology  
<http://www.whitehouse.gov/issues/technology>
- Executive Office of The President National Economic Council Office of Science And Technology Policy “A Strategy For American Innovation: Driving Towards Sustainable Growth And Quality Jobs”  
[http://www.whitehouse.gov/assets/documents/SEPT\\_20\\_Innovation\\_Whitepaper\\_FINAL.pdf](http://www.whitehouse.gov/assets/documents/SEPT_20_Innovation_Whitepaper_FINAL.pdf)
- White House Fact Sheet: A Historic Commitment to Research and Education  
[http://Www.Whitehouse.Gov/The\\_Press\\_Office/Fact-Sheet-A-Historic-Commitment-To-Research-And-Education](http://Www.Whitehouse.Gov/The_Press_Office/Fact-Sheet-A-Historic-Commitment-To-Research-And-Education)
- *Fact Sheet: A Historic Commitment to Research and Education*, The White House, Office of the Press Secretary, April 27, 2009.  
[http://www.whitehouse.gov/the\\_press\\_office/Fact-Sheet-A-Historic-Commitment-To-Research-And-Education/](http://www.whitehouse.gov/the_press_office/Fact-Sheet-A-Historic-Commitment-To-Research-And-Education/)

## Appendix E. Definitions

**Affiliates:** Affiliates are the academic, industrial, governmental, non-for-profit organizations, and other collaborative or member organizations that contribute to the achievement of the consortium objectives and participate in the consortium programs and projects. Affiliation with Space Grant must be a positive attribute for both parties – at a minimum, academic affiliates gain access to Space Grant scholarships and fellowships; in return, affiliates may be asked to assist with matching requirements and to take a meaningful role in consortium activities. Consortia should strive to include, as affiliates, the optimum number and mix, for consortium effectiveness and growth. Consortia should determine affiliate numbers and characteristics, in keeping with national and state program goals. The characteristics of affiliate members should be chosen for optimum consortium fairness and effectiveness. Affiliates may contribute or participate at different levels based on their characteristics and degree of participation in consortium activities.

### Grant Types

- **Designated Consortia** – There is a required amount of funds that must be spent on graduate fellowships and undergraduate scholarships. This amount does not require matching funds; the balance of funds requires an equal non-federal match. The balance of the program funds should be used to conduct education, research, and informal education activities in support of NASA priorities and the national Space Grant program goal and objectives within the context of the state’s priorities. The focus of expenditures and effort varies according to the resources and needs identified in the state.
- **Program Grant Consortia** – There is a required amount of funds that must be spent on graduate fellowships and undergraduate scholarships. This amount does not require matching funds; the balance of funds requires an equal non-federal match. The balance of the program funds should be used to conduct education, research, and informal education activities in support of NASA priorities and the national Space Grant program goal and objectives within the context of the state’s priorities. The focus of expenditures and effort varies according to the resources and needs identified in the state.
- **Capability Enhancement Consortia** – There is a required amount of funds that must be spent on graduate fellowships and undergraduate scholarships. Capability enhancement consortia should focus on the development of space-related research infrastructure in the state and provide funds for improvements in the quality of aerospace research and education. These consortia should minimize precollege and informal education investments in order to concentrate resources on building research infrastructure and improving the state’s aerospace education base. The focus of expenditures and effort varies according to the resources and needs identified in the state.

### Informal Education – NASA Guidance

The intent of Informal Education is to increase learning, to educate students, educators and the general public on specific STEM content areas, and to expand the nation’s future STEM workforce. In addition to intent, the informal education projects must also include at least two of the following components:

- ✓ **Supplemental Materials/Handouts:** Standards-based education materials are used to supplement and enrich the experience, visual, or activity.

- ✓ **Staffing:** Staff/facilitators, trained or qualified in STEM/education fields, actively work with participants to further enhance their understanding and increase the educational value of the experience, visual, or activity.
- ✓ **Content:** Educational standards and/or learning objectives play a key role in developing content and/or design and explore topics in-depth.

**Partnership** -- A reciprocal and voluntary relationship between organizations and the consortium to cooperatively achieve the goals and objectives of the consortium.

**Significant Support for Longitudinal Student Tracking:** A significant award is a monetary award, internship, or experience which **includes one or more** of the following characteristics:

- Has a value of  $\geq$  \$5,000
- Participation of  $\geq$  160 hours
- Has a significant impact on the student's academic achievement and/or employment as demonstrated by a cost-benefit analysis.

**SMART Objectives:**

- **Specific** – Provide enough detail about the program to communicate exactly what will be done.
- **Measurable** – Quantify the objective. Provides tangible evidence of completion (metrics) to indicate success in the area.
- **Appropriate** – Aligned with the NASA guiding documents and target audience
- **Realistic** – Set appropriate targets based on the budget investment.
- **Time Frame** – State when the objective will be achieved; provide timeframe indicating when objective will be met.

**Appendix F: Sample “Table for Consortium PART Measure Contributions”**

PART Measures - 2010	[XX] Consortium Target <sup>2</sup>
<b>Higher Education Measures</b>	
Percentage of NASA higher education program student participants employed by NASA, aerospace contractors, universities, & other educational institutions. (NASA Target = 60%) ( <i>Longitudinally tracked students only</i> )	Required
Percentage of undergraduate students who move on to advanced education in NASA-related disciplines. (NASA Target = 45%) ( <i>Longitudinally tracked students only</i> )	Required
Number of underrepresented and underserved students participating in NASA higher education programs. (NASA Target = 8,500) ( <i>Applies to all categories of higher education students.</i> )	Required
Number of [ <i>higher education</i> ] institutions served in designated EPSCoR states. (NASA Target = 200) ( <i>For EPSCoR States only</i> )	Required
Number of new or revised courses targeted at the STEM skills needed by NASA that are developed with NASA support. (NASA Target = 60)	If applicable
<b>Elementary/Secondary Measures</b>	
Percentage of elementary and secondary educators who participate in NASA training programs and use NASA resources in their classroom instruction. ( $\geq 2$ days of training) (NASA Target = 75%)	If applicable
Percentage of elementary and secondary educators who either obtain NASA content-based education resources or participate in short-duration NASA education activities and use NASA resources in their classroom instruction. (NASA Target = 60%)	If applicable

<sup>2</sup> Measure(s) are applicable if the proposal contains projects that involve course development or the target audience.

Percentage of students expressing interest in science, technology, engineering, and math (STEM) careers following their involvement in NASA elementary and secondary education programs. (NASA Target $\geq$ 50%)	If applicable
Number of elementary and secondary student participants in NASA instructional and enrichment activities. (NASA Target = 470,000)	If applicable
<p style="text-align: center;"><i>Details on NASA Education PART Measures can be found at ExpectMore.gov <a href="http://www.whitehouse.gov/omb/expectmore/summary/10002310.2008.html">http://www.whitehouse.gov/omb/expectmore/summary/10002310.2008.html</a></i></p>	

## Appendix G: Sample 2010 Budget Form

NASA Space Grant Base Budget:	\$		
Other Federal Funds:	\$		
<i><b>NOTE: "Total" cells above DO NOT automatically compute</b></i>			
<b>Non-Federal Matching Funds</b>			
	<b>Cash</b>	<b>Other</b>	<b>Total</b>
Lead Institution:	\$	\$	\$
Academic Affiliates:	\$	\$	\$
State/Local Gov't:	\$	\$	\$
Industry:	\$	\$	\$
Nonprofit Org's:	\$	\$	\$
Other (describe below):	\$	\$	\$
	<b>Cash</b>	<b>Other</b>	<b>Total</b>
<b>Total Nonfederal:</b>	\$	\$	\$
<b>Total Budget:</b>			\$

**NOTE: "Total" cells above DO NOT automatically compute**

### Proposed Expenditures

	NASA S.G	Other Federal	Non-Federal	Total
Direct Labor:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Estimated Travel:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Supplies/Services:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Describe Supplies/Services:				
	NASA S.G	Other Federal	Non-Federal	Total
Other Direct Costs:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Indirect Costs:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Fellowships:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
<b>Total Estimated Costs:</b>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

**NOTE: "Total" cells above DO NOT automatically compute**

### Summary of Proposed Expenditures by Program

	NASA S.G	Other Federal	Non-Federal	Total
Research Infrastructure:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Higher Education:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Precollege:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Informal Education:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Consortium Admin. Costs:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Indirect Costs:	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
Fellowships	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
	NASA S.G	Other Federal	Non-Federal	Total
<b>TOTAL:</b>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

**NOTE: "Total" cells above DO NOT automatically compute**