APPENDIX J

NASA Minority University Research Education and Project (MUREP)

Aerospace Academy

J.1 SCOPE OF ACTIVITY

J.1.1 Overview of the Funding Opportunity

The NASA Office of Education Minority University Research and Education Project (MUREP) solicits proposals from Minority Serving Institutions (MSIs) to create and implement a NASA MUREP Aerospace Academy (MAA) to increase participation and retention of historically underserved and underrepresented K-12 youth in the areas of Science, Technology, Engineering, and Mathematics (STEM).

The predecessor to the NASA MAA was the NASA Science, Engineering, Mathematics, and Aerospace Academy, or SEMAA, which began in 1993, as a partnership between NASA Glenn Research Center and Cuyahoga Community College, Cleveland, Ohio. Through a portfolio of NASA-unique experiential learning opportunities and challenges, NASA encourages innovation, critical thinking and problem-solving skills, which are characteristics required of our Nation’s future STEM workforce. Recognizing the need to increase the number of United States (U.S) youth who have an effective, authentic STEM experience each year prior to completing high school, and the need for NASA to do an internal consolidation, SEMAA was incorporated into MUREP, thus creating additional funding and learning opportunities to attract and retain underserved and underrepresented youth in grades K-12.

MAA funding affords MSIs the opportunity to develop exciting new avenues for inspiring students in STEM fields. Proposers are encouraged to be innovative in their design and delivery of the MAA. Existing SEMAA curriculum may be used as is or modified to meet community needs. Proposers are highly encouraged to identify and form partnerships with institutions interested in participating in the dissemination of activities, strategies, and materials. Successful proposers will have a clear plan for engaging partners to increase scalability and replication of the MAA. Successful proposals for an MAA site will be funded as multi-year cooperative agreements not to exceed three (3) years. Short-term, pilot or proof-of-concept projects for summer learning for K-12 students and/or teachers, or for thematic conferences and workshops are also eligible to apply. No award is expected to be less than one-year in duration.

J.1.1.1 Goals and Objectives

STEM engagement is a priority area for MUREP. STEM engagement establishes a pipeline as well as a mechanism for learners to be inspired, engaged and educated while progressively being challenged. Research indicates that instructional approaches or learning opportunities that engage students actively increase skill acquisition and information retention; encourage more positive attitudes toward STEM disciplines; and strengthen student persistence to study STEM disciplines. Through coordinated and collaborative efforts as an Agency, utilizing STEM engagement, NASA is attracting and retaining students in STEM disciplines who will contribute to the economic growth and global competitiveness of the United States. NASA is investing in the
youth of today in order to meet its STEM-related missions of tomorrow. Through activities such as the MAA, NASA is cultivating talent that will allow our Nation to explore space while improving life on Earth.

The goals of the NASA MAA are to utilize NASA’s unique resources to:

- Improve STEM literacy by engaging students, family members and teachers through the integration of emerging technologies.
- Educate students utilizing a STEM curriculum that meets national science, technology, engineering and mathematics standards aligned to NASA’s mission directorates.

The specific objectives of the MAA are to:

- Increase the number of historically underserved and underrepresented students interested in NASA specific STEM careers.
- Provide skills to parents/caregivers to work with and encourage their children in STEM activities and programs.
- Involve community groups, business, industry, museums and educational and professional organizations through mentoring, field trips, guest speakers and other MAA activities.
- Engage students in participatory activities such as hands-on-learning, research, use of advanced technology, peer support groups, and mentoring relationships with professionals working in the STEM fields.

To achieve these goals and objectives, NASA solicits proposals from MSIs to implement the NASA MAA; to engage youth particularly underserved and underrepresented; and to develop a keen interest in STEM.

**J.1.1.2 Agency-wide Priorities**

NASAs education programs work in collaboration with other Federal agencies to improve the quality of STEM education in the United States, which supports both NASAs current Strategic Plan and the measurement and performance goals. The MAA addresses NASA’s Strategic Plan goals and objectives outlined to the Office of Education. The activity also addresses NASAs short term Multi-year Performance Goals and Annual Performance Indicators, which set quantifiable targets for NASA offices, programs and activities. NASA Strategic Goals and Objectives relevant to education are outlined in the 2014 NASA Strategic Plan:


MAA proposals should focus on the following NASA Strategic Goal and Objective:

**Goal 2:** Advance understanding of earth and develop technologies to improve the quality of life on our home planet.
**Objective 2.4:** Advance the Nation’s STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers, and faculty in NASA's missions and unique assets.

The MAA supports the following NASA Office of Education Multi-year Performance Goal and Annual Performance Indicators.

**Multi-year Performance Goal**

**FY 2015 and FY 2014 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content

**Annual Performance Indicator:**

**FY 2015 ED-15-5:** 600,000 elementary and secondary students participate in STEM engagement activities.

The MAA is intended to provide experiential learning opportunities (ELO) for students. ELOs are designed to increase learners’ involvement, knowledge, comprehension and application of learning in one or more STEM subjects/disciplines. They involve inquiry-based/activity-based learning approaches designed to the level of the learner to inspire, engage, and educate them while progressively being challenged. ELO activities enable learners to acquire knowledge; understand what they have learned; and apply that knowledge through inquiry-based/activity-based activities.

The MAA is consistent with national priorities for STEM education, as outlined in the Federal STEM Education 5-Year Strategic Plan established by the National Science and Technology Council (NSTC) Committee on STEM Education (CoSTEM), (see [http://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf)).

Specifically, the MAA addresses the following priority:

*Increase and Sustain Youth and Public Engagement in STEM—Expand the number of U.S. youth (especially those from traditionally underrepresented groups) who have an effective, authentic STEM experience each year prior to completing high school. Designed experience may be inside or outside of school in which learners engage directly in STEM from “hands on” science, to problem based learning to inquiry.*

**J.1.1.3 NASA Relevance**

Each proposer shall identify the primary NASA area(s) with which the proposed curriculum will align. NASA-themed space exploration, aeronautics, space science, earth science, or microgravity, or combinations of these themes are samples, but not limited to eligible technical content areas. For detailed information on the technical content areas for each Mission Directorate, review Section 10, of the Education Opportunities in NASA STEM (EONS) 2014.
The following websites can also be used to access additional information about the NASA Mission Directorates:

The current NASA Mission Directorates are:

- Aeronautics Research  
  http://www.aeronautics.nasa.gov/
- Human Exploration Operations  
  http://www.nasa.gov/directorates/heo/home/index.html
- Science  
  http://science.nasa.gov/  
- Space Technology  
  http://www.nasa.gov/directorates/spacetech/home/index.html

### J.1.1.4 Framework of MAA sites

The NASA MAA is tailored to impact the lives of students through support from family members, teachers, and partnerships with schools, business and organizations.

MAA advances student development through activity components that are fully integrated to form a comprehensive support system. Through its components, MAAs shall deliver: (1) Curriculum Enhancement Activities (CEA), hands-on curriculum activities relevant to NASA missions, (2) an Aerospace Education Laboratory (AEL), and (3) an innovative Family Café.

**Curriculum Enhancement Activities (CEA)**

The first core component of the MAA consists of a suite of K-12, hands-on, inquiry-based Curriculum Enhancement Activities (CEAs). In addition to being aligned with national standards, these activities encompass the research and technology of each of NASA’s four mission directorates.

Implementing the MAA can be accomplished utilizing current existing grade appropriate CEAs designed by SEMAA or developing new CEAs. SEMAA-developed CEAs include primary, intermediate, and secondary education designed curriculum-support materials. MAA students will be required to complete a minimum of thirty-six (36) hours each year. Curriculum may be delivered during the academic year, the summer or a combination of both.

**Aerospace Education Laboratory (AEL)**

The second core component of the MAA is the Aerospace Education Laboratory (AEL). This computerized classroom puts technology at the fingertips of MAA elementary, middle and/or high school students. The original SEMAA AEL consisted of ten computerized research stations loaded with CEAs that provided participants with real-life aerospace challenges involving NASA-related STEM. Equipment associated with the SEMAA AEL included: an advanced flight simulator, Mars robotics laboratory, weather station, wind tunnel, drop tower, GPS, and radio antennas.
While the SEMAA AELs were stationary, proposers may elect to design or redesign a stationary, portable or virtual AEL and can consider partnerships with other computer-assisted education opportunities such as those offered by Challenger Centers. Proposers must explain the AELs sustainability, adaptability and portability when appropriate.

**Family Café**
The third core component of the MAA is the Family Café. The Family Café is an interactive forum that provides STEM education and parenting or caregiving information to any supportive adult role model(s) who interacts with the students. The Family Café traditionally includes hands-on activities, workshops, guest speakers and roundtable discussions. The Family Café must include three major elements:

1) **Family Focus Groups** – Focus groups specifically for parents/caregivers that take place simultaneously with the K-12 NASA MAA academic year sessions. Designed to increase parenting and STEM-education knowledge, these interactive forums serve as the cornerstone of the Family Café.

2) **Family Nights** – Specially designed, dynamic learning events that bring students and their parents/caregivers together to work on hands-on, STEM-related activities and projects within the school setting.

3) **Home-Based Family Initiatives** – Hands-on, STEM-focused activities for students and parents/caregivers to work on together in the home setting.

Design of the MAA framework is supported by evidence-based research:

- Students who engage in inquiry-based activities where the focus is on student-centered learning instead of educator-centered teaching, tend to have higher interest in and more positive attitudes toward careers in science (Gibson & Chase, 2002).

- Technology-based materials can be particularly powerful for STEM subjects, because they can assist in visualization, experimentation and data collection (President’s Council of Advisors on Science and Technology, 2010).


- Programs that included a parental involvement component were associated with more positive achievement effects than those that did not (Cooper et al., 2000).

- Evidence suggests a correlation between frequent attendance in out of school learning activities and positive outcomes, including an increase in academic achievement (Redd, Z., et al. 2012; McCombs, et al., 2011; & Beckett, M, 2009 American Youth Policy Forum 2006).

- Interest and engagement must be cultivated and maintained for students to enter and persist in STEM careers (Maltese & Tai, 2009).
Early exposure to and excitement about STEM careers are also important factors in the eventual pursuit of a STEM career (Tai, Liu, Maltese, & Fan, 2006).

J.1.1.5 Plan of Operation/Expected Outcomes

An MAA site is designed to improve the learning process, increase retention and reduce attrition of historically underrepresented and underserved populations in STEM. It is critical that MAA sites incorporate learning activities, which are novel and stimulatory in nature to keep students interested and involved. Therefore, the long-range outcome of this activity is to improve the educational experience of historically underserved and underrepresented populations participating in the MAA.

The expected MAA Outcomes include:

- Increased understanding of STEM content and NASA Missions
- Creation of a seamless pipeline to enable students in grades K-12 to successfully advance through challenging STEM courses
- Increased interest in pursuing additional STEM knowledge
- Increased family participation in STEM experiences
- Increased awareness of NASA STEM careers
- Increased involvement in follow-on NASA and STEM activities at a similar or more advanced level
- Increase in number of historically underserved and underrepresented students selecting a STEM major for post-secondary study

Site Operations

Although the MAA can be unique to each site, the implementation requires a replication process of well-established academic activities. The activities should be organized to meet unique needs of the local community. Local additions to the core MAA activities should be linked to current state and district curriculum frameworks such as STEM.

The MAA should be linked to area private sector business and industries involved in STEM. The design of the MAA must augment its curriculum with opportunities for career exploration and counseling and include enrichment activities, such as field trips, guest speakers, and interaction and/or mentoring with scientist and engineers, peer support groups, math and science fairs and competitions and/or tutoring. The design must involve parents and include activities that strengthen family support of STEM education.

Historically, each SEMAA site was encouraged to serve a minimum of 625 students per year. Sites were also required to generate adequate funding to enhance and sustain operations beyond NASA funding.
The students who participate in the MAA should represent, but shall not be limited to, the target groups from the historically underrepresented and underserved groups in the STEM fields. Please see definitions for underrepresented and underserved in the Glossary.

**MAA Sessions**

Proposers for an MAA site should consider three models for operation: a Saturday model, an in-school model, and an after school model. Selected sites may elect to use either model of operation. A full MAA K-12 grade academic activity could propose to offer the following programs:

- **Academic Program**
  - Each activity for K-2nd graders **shall** be at least five (5) weekly sessions with the last session to be a recognition activity.
  - Each activity for grades 3-12 **shall** be for eight (8) weekly sessions with the eighth session being a recognition activity.
  - Each weekly session **shall** be at least three (3) hours in duration.

- **Summer Program**
  - K-12th grade students, four one week (five-day) sessions, with different students participating each week
  - Each daily session is to be at least three (3) hours in duration

MAA site operations require extensive curriculum developed for each grade level (see sample listing at the end of the Appendix). Participants usually meet on Saturdays or after school for up to three (3) hours during which time participants are involved in “hands on/mind on activities.” Additionally, an MAA site:

- Offers professional development to instructors before program implementation and ongoing support as needed.
- Offers parents and guardians access to information and training designed to increase their ability to assist their children with math and science activities and the use of technology.
- Presents workshops and seminars geared at increasing parental involvement in the student learning experience.
- Delivers extended learning opportunities which are designed to strengthen the national STEM pipeline by increasing student exposure and interest in STEM subjects and careers. The extended learning activities will utilize both NASA and non-NASA STEM-related educational programs and activities.
- Sponsors educational outreach activities and opportunities for individuals throughout the region to increase interest in and exposure to STEM subjects and careers.
Personnel Responsibilities
NASA currently considers the MAA Site Director, AEL Coordinator, and Family Café Coordinator as key personnel. One individual may serve in multiple roles. At a minimum, proposers shall have a Site Director position identified to provide overall leadership and interaction with NASA.

Site Director
- Responsible for the overall leadership, administration and evaluation of educational programs and products involved with NASA MAA programming.
- Provides visionary and contemporary leadership for the delivery of high-impact educational programs, products and applied research as designed and provided by NASA.
- Assists MAA personnel in identifying the most effective and efficient means to deliver priority research-based information and programs to our diverse clientele and stakeholders.
- Responsible for the overall direction, coordination, and evaluation of the MAA office, and carries out supervisory responsibilities for MAA staff in accordance with the organization’s policies and applicable state and federal laws.
- Responsible for day-to-day management of the MAA budgets and ensuring that all applicable institutional and NASA rules, as well as state and federal guidelines, are followed in the utilization of such funding.
- Requires a minimum of a Master’s Degree in Education or a closely related field.

AEL Coordinator
- Responsible for planning, developing and delivering contemporary programs based on NASA curricula and relating to STEM education.
- Responsible for conducting a comprehensive STEM education program based on existing NASA curricula.
- Provides programmatic leadership in the delivery and evaluation of the AEL component of the MAA classroom program and other technology-related educational endeavors involving the AEL.
- Works collaboratively with the Site Director, Family Café Coordinator, and the Classroom Instructors to deliver effective programs, with built in evaluation components, to promote technology programming with youth and their families.
- Responsible for the technical management, supervision, and upkeep of the respective AELs including ensuring that all equipment is maintained in a manner suitable for use by students, their families, and other engaged stakeholders.
- Reviews all equipment, supplies, and the physical location to check for any operations or safety concerns.
• Requires a minimum of a Bachelor’s Degree in Education, Technology, or a closely related field.

Family Café Coordinator
• Provides leadership to the Family Café component.
• Works collaboratively with a team of MAA professionals and volunteers to provide dynamic program leadership for their local program.
• Supports the three (3) main educational programs of the Family Café including Family Focus Groups, Family Nights, and Home-Based Family Initiatives.
• Facilitates hands-on activities, conducting workshops, identifying guest speakers, and helping to lead roundtable discussions of family members designed to engage them in their youth’s STEM education.

Classroom Instructors
• Certified teacher or pre-service education student in his or her junior or senior year of college.

J.2 AWARD INFORMATION

J.2.1 Award Value
Subject to Congressional appropriation of sufficient funds, and NASA’s receipt of proposals of adequate merit, NASA expects to select anywhere between 10 to 16 proposals for award. Individual award values will range from $100,000 - $160,000 for year one and year two. Year three sites will receive between $80,000 - $100,000 to ensure sustainable operations.

NASA may elect to offer selection of only a portion of a proposed project, usually at a level of support that is reduced from that requested in the original proposal. NASA may also offer tentative selections in which NASA requests proposers to team on a joint project. Additionally, NASA may award an effort for less than the full duration of the proposal. In these instances, the proposer will have the opportunity to accept or decline such a selection. If the proposer accepts such an offer, a revised budget and statement of work may be required before NASA can initiate funding action on the proposal. If the proposer declines the offer of a partial selection or participation in a joint proposal, NASA may withdraw the offer of selection in its entirety.

J.2.2 Period of Performance

An MAA may be proposed for up to three (3) years in duration. NASA funding beyond the first year is based on a satisfactory annual evaluation of documented progress; compliance with data reporting, applicable regulations and laws, and other program requirements; fulfillment of fiduciary responsibilities; and the availability of appropriated funds. Continuation of funding may be reduced if cost reporting indicates a significant level of unexpended funds remaining, and if NASA determines that performance has been unsatisfactory.
J.2.3 Partnerships and Collaboration

NASA encourages (but does not require) proposers to obtain funding through partnerships and other resources outside of NASA. Specifically, proposers may demonstrate significant collaborations with other institutions including other MSIs, government agencies, members of the National Space Grant College and Fellowship Program, community colleges, industry, museums, NASA visitor centers, youth-serving organizations, non-profits, and/or other entities in order to increase student involvement, leverage significant sources of additional funding, and/or to obtain essential services that are not available at the proposer’s institution. Proposers are highly encouraged to identify and form partnerships with institutions interested in participating in the dissemination of programs, strategies, and materials.

It is anticipated that proposals will leverage both existing internal and external NASA networks in order to impact the greatest number of MSIs. For example, two (2) or more MSIs may wish to partner and combine strengths, resources, and complementary disciplines in order to offer a more robust experience. In addition, a MSI might consider collaborating with a national STEM organization that together fosters more experience and expertise. When teaming is considered, the lead MSI should receive not less than 60 percent of the proposed budget. If teaming with NASA partners is considered, NASA resources can be received as in-kind support in the proposal; however, funding cannot be allocated for NASA field centers in the budget.

J.2.4 Sustainability

Education investments leverage and achieve sustainability through their intrinsic design and the involvement of appropriate local, regional, and or national partners in their design, development, or dissemination. As appropriate, key aspects of the activity should be replicable, scalable, and demonstrate potential for continuation beyond the period of direct NASA funding.

Selectees are required to develop a sustainability plan to enhance local activity operations beyond NASA funding.

J. 3 ELIGIBILITY INFORMATION

J.3.1 Proposing Institutions

Institutions
All proposals must originate from a minority-serving U.S. college or university, designated and listed by the U.S. Department of Education as a Minority Serving Institution, or MSI (see http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html). Any arrangement or agreement to have the fiscal management and/or administration of the award performed by a third party is between the awardee and the third party, e.g., an affiliated Board of Regents, University System or Foundation. Institutions not meeting these criteria are encouraged to partner with colleges or universities that satisfy the requirements.

Limit on Number of Proposals per DUNS
Eligible organizations shall submit only ONE (1) lead proposal per any type of DUNS number.
Eligible organizations that have multiple and/or different DUNS numbers shall submit no more
than one lead proposal from each different DUNS number. If an eligible organization submits
more than one lead proposal using the same DUNS number without a qualifying +4DUNS, then
none of the proposals will be evaluated.

**Site Director/Principal Investigator**
Every institution submitting a proposal in response to this opportunity shall designate a single
individual, Site Director/Principal Investigator (PI), who will be responsible for the quality and
direction of the entire proposed effort and for the use of all awarded funds.

### J.4 PROPOSAL AND SUBMISSION INFORMATION

**J.4.1 Proposal Submission**

All information needed to respond to this announcement is contained in this Appendix, the
EONS announcement, the [NASA Grant and Cooperative Agreement Manual](https://prod.nais.nasa.gov/pub/pub_library/srba), and the 2014 NASA Guidebook for Proposers.

Note: If the information contained in this Appendix conflicts with any other documents, the
information in this Appendix takes precedence.

**J.4.2 Request for ‘Notice of Intent’**

Institutions planning to prepare a proposal package for the MAA are required to submit a Notice
of Intent (NOI) to propose. NOIs assist NASA in assessing the response to this CAN and to
determine the expertise required for the proposal review panel. NOIs should be submitted by the
Principal Investigator (PI) in NSPIRES by April 14, 2015, 11:59 p.m. Eastern Time. Interested
proposers must register with NSPIRES before it can be accessed for use.

Since NOIs submitted after the deadline may still be useful to NASA, NASA will accept late
NOIs. However, NASA strongly encourages proposers to submit NOIs by the deadline.

See section 5.5 of the EONS NRA for requirements and instructions on submitting a NOI.

The NOI must include:

1. Name of the lead institution
2. College/University Minority Designation
3. Experience in hosting K-12 STEM Engagement activities
4. Name, title, regular mail or e-mail address, telephone, and fax number of proposed Site
   Director and other designated key personnel

**J.4.3 Pre-proposal Teleconference**

A pre-proposal teleconference will be held before proposals are due. Prospective proposers are
requested to submit any written questions no later than seven (7) business days before the
teleconference so that NASA will be able to cover as much information as possible during the
meeting. An opportunity to ask questions and solicit clarification will be provided at the teleconference.

NASA plans to post written questions and answers and teleconference charts to the NSPIRES website. An opportunity to ask questions and solicit clarification will be provided during the meeting.

Interested proposers should register in NSPIRES and sign up for notification emails to receive advance notice of this teleconference. Refer to the MAA solicitation page on NSPIRES for schedule information and connection details.

J.5 PROPOSAL EVALUATION AND SELECTION

J.5.1 Proposal Review Criteria

The principle elements for proposal evaluation are the following: Intrinsic Merit, Relevance to NASA Objectives, and Budget/Cost. Please review the following specific criteria for MAA ELO awards.

J.5.1.1 Intrinsic Merit (30 percent)

Evaluation of Intrinsic Merit considers the following sub-elements. The proposer must address these criteria to demonstrate the capability of the institution, staff, faculty, collaborators, and targeted students to achieve successful outcomes for the proposed activity.

a. Management Plan

- Demonstrates clear goals and objectives that are aligned with NASA, the Office of Education, and the institution where the MAA is awarded.
- Presents a clearly organized and workable management plan for achieving educational goals and objectives, and includes clear lines of communication with NASA.
- Presents a realistic schedule/timeline or other description of how activity goals, objectives and major milestones will be met. Includes a feasible timeline per proposed activity year and milestones or benchmarks for success.
- Provides details of the organizational structure including the Site Director/Principal Investigator and the appropriate office at the lead institution that is ultimately responsible for the overall performance of the MAA.
- Clearly identifies key personnel and details the roles and responsibilities of such personnel.
- Provides a plan to identify certified instructors with appropriate grade level and content experience.
- Identifies all customers (internal and external); specifies their needs and how the needs will be addressed.
• Presents a clear strategy to provide professional development and ongoing support to instructional staff.

b. Recruitment and Retention Plan

• Presents understanding of the unique challenges faced by the target population(s) in the STEM areas.
• Provides evidence of ability to attract and retain students from target populations; give selection criteria and procedures; and provide demographic profile of the community being served.
• Provides the expected number of student participants. Historically SEMAA sites reach on average 1,253 students per year.

c. Partnership and Sustainability Plan

• Provides clear plan that addresses operation of MAA beyond NASA funding.
• Identifies resources or funding capabilities that are in place or will be pursued via the following entities: institutional support, federal or state agencies, contracting opportunities, etc.
• Provides a multi-year plan demonstrating the process to acquire resources to sustain activity. Also indicates the likelihood that these resources will be in place.
• Identifies all long-term relationships that have been established, or will be established to ensure that the MAA will sustain educational programming.
• Provides clear plan for the establishment of partner relationships with local schools, school districts, local businesses, industries, providers of informal education, and youth serving organizations.

J.5.1.2. Relevance to NASA (40%)

Evaluation of Relevance to NASA considers the following educational relevance and scientific relevance.

The proposer must adequately and clearly define how the activity proposes to address the following criteria:

a. Scientific Relevance:

• Provides evidence that the activity utilizes NASA’s unique contributions to science, engineering, technology, and exploration.
• Offers innovative methods, approaches, and concepts to engage students in other NASA activities.
• Provides evidence proposed effort cultivates diversity and extends access to existing NASA content.
b. Educational Relevance:

- Provides clear and feasible activity goals and objectives that are aligned with NASA’s Education goals and objectives as described in the 2014 NASA Strategic Plan, and the multi-year performance goal and annual performance indicator, and with the CoSTEM priority.

- Proposed effort offers innovative methods, approaches, and concepts to deliver the MAA meeting the following objectives:
  - Increase the number of targeted students interested in careers in STEM.
  - Provide skills to parents to work with and encourage their children in STEM.
  - Involve community groups, business, industry, museums and educational and professional organizations through mentoring, field trips and guest speakers.
  - Engage students in participatory activities such as hands-on-learning, research, use of advanced technology, peer support groups, and mentoring relationships with professionals working in the STEM fields.

- Proposed effort builds on lessons learned and/or best practices of past education and/or research and learning activities.

J.5.1.3. Budget/Cost (20 percent)

Proposers must clearly describe how the proposed budget is appropriate. Proposals must include a detailed implementation/costing plan with a clear narrative that demonstrates how funds requested will be fully utilized during each year of the grant award period.

The following sub-elements will be considered in the evaluation of the **Budget/Cost**:

- Clarity of alignment between the proposal narrative and budget.
- Budget is adequate, appropriate, reasonable and realistic for all partners including education, NASA, and evaluation expertise.
- Budget demonstrates effective use of funds in which outcomes justify total costs.
- All budget line items are explained and justified.
- Budget addresses the distribution of funds among the following items: Personnel, Staff Benefits, Consultants, Equipment, Aerospace Education Laboratory, Advertising, Printing; Business, Meeting Expenses, Material and Supplies, Postage, Travel, Training, and In-Kind Support.

J.5.1.4 Evaluation Plan (10 percent)

Proposers must adequately describe their process to obtain qualitative and quantitative data and identify clearly defined indicators that can be utilized to track student progress and quality of MAA infrastructure and programming by addressing the following:
• Describe an appropriate evaluation plan/process in place to document outcomes and demonstrate progress toward achieving objectives of proposed education activities. The forms of evaluation should be based upon reputable models and techniques that are appropriate to the content and scale of the MAA. Evaluation methods should also provide useful information on the effectiveness and/or impact of the proposed cooperative agreement, and how improvements will be implemented based on evaluation evidence.

• Identify an internal or external evaluator that will develop plans for an evaluation approach; develop or identify tools or processes for data collection; carry out evaluation tasks; conduct analysis; and provide formative and summative feedback to the project leadership throughout the life cycle of the award.

• Describe how feedback from institutional staff, faculty, and students, collaborators, partners and stakeholders will be obtained and utilized to improve proposed activities.

J.5.2. Review and Selection Process

Proposals will be evaluated by a merit review process composed of the applicants’ peers (government and non-government), including technical, education and evaluation experts, who have been screened for conflicts of interest. The number and significance of strengths and weaknesses for each of the four criteria (Intrinsic Merit, Relevance to NASA, Budget/Cost) and their sub-elements will be used to evaluate the proposals.

Awards will be made to those proposals determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. In addition, awards may be made to proposals determined to be selectable regardless of the proposal’s overall rating. At the end of the selection process, each proposing organization will be notified of its status (selection or non-selection). NASA will provide debriefings to proposers that request one.

Proposals will be evaluated through a combined online and panel review process. Proposers are expected to provide sufficient detail to enable evaluation by persons who are knowledgeable of, but not necessarily specialists in the proposed subject area. The reviewers may include personnel from NASA, other government agencies, industry, and universities. Award decisions will be made following a panel review of all the proposals. The panel will make final recommendations to the NASA selection official. The Selection Official for the MAA awards is Joeletta Patrick, MUREP Manager, NASA Headquarters, or her designee.

In evaluating the proposals, NASA will assign the following ratings:

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<th>Adjectival Rating</th>
<th>Definition</th>
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<tr>
<td>Excellent</td>
<td>A comprehensive and thorough proposal of exceptional merit with one or more significant strengths. No deficiency or significant weakness exists.</td>
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Very Good  A proposal having no deficiency and which demonstrates over-all competence. One or more significant strengths have been found, and strengths outbalance any weaknesses that exist.

Good  A proposal having no deficiency and which shows a reasonably sound response. There may be strengths or weaknesses, or both. As a whole, weaknesses not offset by strengths do not significantly detract from the Proposer’s response.

Fair  A proposal having no deficiency and which has one or more weaknesses. Weaknesses outbalance strengths.

Poor  A proposal that has one or more deficiencies or significant weaknesses that demonstrate a lack of overall competence or would require a major proposal revision to correct.

J.6 AWARD ADMINISTRATION INFORMATION

J.6.1 Cooperative Agreement Award Reporting Requirements

The reporting requirements for award recipients under the MAA will be consistent with Exhibit E, NASA Grant and Cooperative Agreement Manual, 8.0 Appendix. (https://prod.nais.nasa.gov/pub/pub_library/srba/), Appendix F.27 in the Guidebook for Proposers and may include the following:

Within one month (30 days) after award receipts shall:

- Submit a descriptive MAA abstract for the NASA.gov website.
- Submit a management plan with associated timeline and milestones.

Within three months (90 days) after award recipients shall:

- Submit an updated evaluation plan with input from the evaluator and Office of Education Infrastructure Division.

Recipients shall submit an annual progress report each year no later than 60 days prior to the anniversary date of the project start date. The report, at a minimum, will document the following:
1. Project activities over the period of performance of the award;
2. Project accomplishments measured against the proposed goals and objectives;
3. Evidence of how project activities have furthered stakeholder priorities;
4. Extent to which collaborations and/or partnerships have evolved; and
5. Plan of activities for the next year.

Recipients shall submit a final report with summary information within 90 days of the end of the award.

J.6.2 Summary of MAA Grantee Responsibilities
1. Recipients of the MAA award will assume primary responsibility for implementing, operating, and managing the activity as described in their original proposal and as modified in subsequent continuation proposals.

2. The MAA recipient shall appoint a Site Director supported by this Agreement. If the Site Director to be named is different from the individual identified in the proposal, the NASA MAA Manager shall be notified in writing. The Grant Officer will issue a formal modification to the Agreement to reflect the change.

3. The recipient shall submit monthly progress reports by the 10th day following the end of the prior month. For example, the progress report for September will be due by October 10th. If the 10th falls on a weekend or federal holiday, the recipient shall submit the report by the close of the next business day. Each year, the recipient will also submit a continuation proposal no later than 60 days prior to the anniversary date of the project start date. These reports will be submitted by e-mailing the POC listed in the summary of key information at the end of this Appendix.

4. The lead institution, in concert with the MAA Site Director, is responsible for the financial management of the MAA as specified in the basic award notice under the terms and conditions issued by NASA and in 14 Code of Federal Regulations (CFR) sections 1260.26 and 1260.160. Failure to comply with the terms and conditions of an award can result in NASA terminating the award.

5. Final Report: A final report, in lieu of an annual report, will be due within 90 days of the expiration date of this Agreement.


7. The MAA Site Director shall submit one copy of the project’s annual report via email to the NASA Shared Service Center (NSSC). All project reports and plans shall also be submitted to the following entities via email or alternative electronic format:
   - NASA MAA Manager
   - Other individuals identified by the MSI

8. NASA may add additional requirements during the cooperative agreement period of performance to achieve broader MAA or NASA Education objectives.

   **J.6.3 Office of Education Metrics**

Recipients are required to utilize all data collection tools and complete all assigned data entry tasks for the NASA OEPM system. NASA’s Office of Education and/or the MAA Management will communicate training and data collection tasks.
Recipients may also be required to respond to data calls at NASA’s Office of Education’s request. It is critical for all recipients to develop tracking methods or databases on project activities in order to respond to potential data calls in a timely manner. MAA management will provide additional communications and guidance regarding data calls and activity tracking. Recipients shall ensure that the project has the appropriate staff and resources to be able to facilitate data collection activities and complete tasks required for OEPM reporting by required due dates.
### J.6.4 Summary of Key Information

| Total available annual budget for MAA | ~ $1.9M per year  
Individual award values will range from $100,000 - $160,000 for year one and year two. Year three, sites will receive between $80,000 - $100,000 to ensure sustainable operations. |
| Number of new awards pending adequate proposals of merit | ~10-16 |
| Start date | 2-4 months from selection announcement |
| Duration of awards | Up to 3 years |
| Award Type | Cooperative Agreement |
| MAA Pre-proposal Conference | Check the NSPIRES website for date and connection details. |
| Due date for Notice of Intent to propose (NOI) | April 14, 2015, 11:59 pm Eastern Time |
| Due date for proposals | June 11, 2015, 11:59 pm Eastern Time |
| Page limit for the central Scientific-Educational-Management section of proposal | 15 pp; see also Chapter 2 of the 2014 NASA Guidebook for Proposers |
| Detailed instructions for the preparation and submission of proposals | See the NASA Guidebook for Proposers at http://www.hq.nasa.gov/office/procurement/nraguidebook |
| Submission medium | Electronic proposal submission is required via NSPIRES or grants.gov; no hard copy will be accepted. See Chapter 3 of the NASA Guidebook for Proposers. |
| Web site for submission of proposal via NSPIRES | http://nspires.nasaprs.com/ (help desk available at nspires-help@nasaprsc.com or (202) 479-9376 from 8 am to 6 pm Eastern Time on weekdays.) |
| Web site for submission of proposal via grants.gov | http://grants.gov (Contact Center is available by email at support@grants.gov, or by calling 1-800-518-4726 and via website at https://grants-portal.psc.gov.) |
| Selection Official | Joeletta Patrick, MUREP Manager  
NASA Headquarters  
Washington, DC 20546 |
| NASA point of contact concerning this activity | Darlene Walker, NASA MAA Activity Manager  
NASA Glenn Research Center, MS 7/4  
Cleveland, OH 44135  
Email: darlene.s.walker@nasa.gov |
J.6.5 Glossary of Terms

**Experiential Learning Opportunities (ELO):** Increase learners’ involvement, knowledge, comprehension and application of learning in one or more STEM subjects/disciplines. They involve inquiry-based/project-based learning approaches designed to the level of the learner to inspire, engage, and educate them while progressively being challenged. ELO activities enable learners to acquire knowledge; understand what they have learned; and apply that knowledge through inquiry-based/project-based activities.

**Principal Investigator (PI):** The individual(s) a research organization designates as having an appropriate level of authority and responsibility for the proper conduct of the research, including the appropriate use of funds and administrative requirements such as the submission of scientific progress reports to the agency.

**STEM Engagement (SE):** Activities designed to engage learners' from the K-12, Higher Education, and Informal Education communities to increase their involvement and interest in STEM, educate them on the value of STEM in their lives, and positively influence the perception of their ability to participate in STEM.

**Underrepresented:** Populations that are not present in the STEM professions relative to the size of the population at large. Refers to racial and ethnic populations as well as women and persons with disabilities.

**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 arena, “underserved” has typically referred to women and persons with disabilities.
# ROLES AND RESPONSIBILITIES OF MAA STAFF

<table>
<thead>
<tr>
<th>Staff Position / Name</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| **Site Director**     | • Site Director of the NASA MAA Activity /Manages NASA MAA data.  
                        • Recruits, trains, supervises and evaluates teachers, Parent Coordinator and volunteers.  
                        • Promotes and markets the program and assists in the preparation of grant applications to fund planned programs.  
                        • Manages student registration, purchasing of program supplies and inventory.  
                        • Manages the NASA MAA students, program classes and events.  
                        • Manages the evaluation of the program by students, parents and teachers.  
                        • Prepares the program budget and monitors expenses and program reports.  
                        • Participates in teleconferences and meetings  
                        • Coordinates special events/field-trips for participants.  
                        • Works collaboratively with internal and external stakeholders. |
| **Coordinator**       | • Oversees maintenance of the AEL and MAA equipment.  
                        • Schedules the use of the AEL/ facilitates instruction  
                        • Collects data for operations  
                        • Organizes aerospace themed fieldtrips for students  
                        • Assists with the professional development of MAA classroom teachers.  
                        • Assist with the promotion and marketing of the activity ; and special activities. |
| **Coordinator**       | • Promotes/markets sustained family involvement.  
                        • Provides parents/caregivers with relevant parenting and STEM education information  
                        • Researches and presents information to parents/caregivers on other STEM related programs.  
                        • Manage all aspects of the MAA Family Involvement component (Family Focus Group, Family Nights, Home-based Family Initiatives)Develop & Monitor Family Involvement Program Budget Develop Workshops agenda and Activities  
                        • Recruits volunteers & guest speakers/presenters,parents/adult family members  
                        • Order Workshop Materials/Food  
                        • Facilitate Family Involvement Activities/ assist w/fieldtrips logistics  
                        • Serve as Parent/Caregiver Liaison  
                        • Assist w/planning and implementation of recognition programs & special events. |
| **Classroom Instructors** | • Provide MAA classroom instruction  
                        • Record attendance |
<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Living and Working in Space: Exploration of dressing and traveling to the moon as astronauts</td>
</tr>
<tr>
<td>Grade 1</td>
<td>Living and Working in Space: Introduction to the moon and the stars related to human space travel</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Living and working in Space: Identifying the solar system; food, shelter and matter (air) in space</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Living and Working in Space: Space travel and the biological effects on astronauts, in depth exploration of the planetary characteristics, and introduction to the International Space Station</td>
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<tr>
<td>Grade 4</td>
<td>Jet Planes and Winged Things: Aerospace concepts, forces of flight, and principles of flight</td>
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<tr>
<td>Grade 5</td>
<td>Living and Working in the International Space Station: Eating and working in space, global exploration, theory of orbital motion, and gravity factors</td>
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<tr>
<td>Grade 6</td>
<td>The Moon: Exploration of living and topographic features of the moon</td>
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<tr>
<td>Grade 7</td>
<td>On to Mars!: Exploring science fiction, discovering Mars: the red planet and the rover, and life beyond earth</td>
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<tr>
<td>Grade 8</td>
<td>Looking Beyond Earth: Characteristics of the sun and an exploration of how it impacts the earth; understanding infra-red energy, seasons, the spectroscope, telescopes: the Hubble, and astronomical concepts</td>
</tr>
<tr>
<td>Grade 9-12</td>
<td>Microgravity and the exploration of NASA-unique scientific research including flight, climate change, biological studies of the body in space, and site specific focuses</td>
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</tbody>
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