

National Aeronautics and Space Administration

Ames Research Center

Office of the Director of New Ventures and Communications

Robotics Alliance Project (RAP)

Robotics Outreach Competition (ROC)

Cooperative Agreement Notice (CAN)

Announcement Number NNA10332111C

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1.0 SUMMARY OF KEY INFORMATION

The NASA Ames Robotics Alliance Project (RAP) invites proposals to this NASA Cooperative Agreement Notice (CAN) to design and administer the NASA Ames Robotics Outreach Competition (ROC). This CAN, NNA10332111C, is the initial announcement of this funding opportunity and is not a modification of a previous announcement.

1.1 IMPORTANT DATES

CAN Release Date: October 4, 2010
Notice of Intent Due: October 12, 2010
Questions Due: October 12, 2010
Proposals Due: October 29, 2010
Anticipated Selection Announcement: December 3, 2010
Anticipated Award Date: January 7, 2010

1.2 AWARD INFORMATION

NASA expects to award one cooperative agreement as a result of this announcement. The estimated value of the award is approximately \$4M per year for a period of five (5) years.

1.3 REFERENCES FOR THIS CAN

All information needed to respond is contained in this announcement. Additional guidance may be found in the following references.

NASA policy regarding the use of grants and cooperative agreements is contained in the *NASA Grant and Cooperative Agreement Handbook*, which can be accessed at http://prod.nais.nasa.gov/pub/pub_library/grcover.htm.

Responding to this announcement requires use of the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) located at <http://nspires.nasaprs.com>. Tutorials, registration assistance, and other NSPIRES help topics may be accessed through the NSPIRES on-line help site at <http://nspires.nasaprs.com/external/help.do>. For any questions that cannot be resolved with the available on-line help menus, requests for assistance may be directed by email to nspires-help@nasaprs.com or by telephone to (202) 479-9376, Monday through Friday, 8:00 a.m. – 6:00 p.m. Eastern Time.

1.4 INQUIRIES

All questions about this announcement must be submitted by email to bethany.a.mcclave@nasa.gov no later than October 12, 2010 so that answers may be obtained and disseminated in a timely manner. Potential proposers are encouraged to submit questions as soon as possible. Questions and responses will be posted on NSPIRES.

2.0 DESCRIPTION OF OPPORTUNITY

2.1 NATIONAL AND AGENCY-WIDE PRIORITIES

"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 who will manage and lead the Nation's laboratories and research centers of tomorrow."

The ROC addresses the critical shortage in Science, Technology, Engineering and Mathematics (STEM) fields that the Nation is facing by providing hands-on robotics competition events while working with engineers and talented faculty from universities and high schools in the U.S. It is the strategic intent of this program that students will be inspired and motivated to pursue degrees that meet NASA's robotics competency requirements.

The issues of educating youth of the 21st century have taken on a new sense of urgency and several recent studies have addressed this pending crisis. The 2007 National Academies of Science report, "Rising Above the Gathering Storm" (http://www.nap.edu/openbook.php?record_id=11463) has stated that the vitality of the United States, which is in large part due to the productivity of a well-trained workforce and the steady stream of scientific and technical innovations they produce, is endangered. The report also states that without high quality, knowledge-intensive jobs and the innovative enterprises that lead to discovery and new technology, our economy will suffer and our citizens will face a lower standard of living.

American schools are far behind their counterparts in other industrialized nations in helping students learn mathematics and sciences. Too often, students are not encouraged to participate in their own learning; they do not work often enough as teams; they have insufficient opportunities for "hands-on" learning and mentoring; and, simply put, the teaching and learning of these subjects is not exciting.

These problems are multiplied in many urban schools, particularly those located in low-income neighborhoods. In these inner city schools, the teacher-to-student ratio is far from ideal, science and laboratory equipment is outdated, and supplies are lacking. Parents may lack sufficient knowledge of science and mathematics to help their children with their studies. As a result, the number of minority students pursuing careers in the sciences and related areas is disproportionately low – although it is clear that a significant part of the nation's future STEM workforce will be drawn from this population. A similar under-representation takes place among female students and workers who are not encouraged to enter these fields. This lack of support and encouragement for careers in science and mathematics is a severe disadvantage nationally, particularly since these fields are among the fastest growing sectors of the economy and offer some of the highest average salaries.

The ROC will provide this support and encouragement with a focus on team problem-solving. The opportunity to work on creative, deadline-driven projects, with mentoring from working

professionals in science and engineering, will excite students. Students will use their knowledge and hands-on skills to develop a working, robotic machine. Their excitement will carry over into their studies, and encourage them to consider future studies and careers in sciences, mathematics, and technology.

The goals of the program are best summed up in a remark by Daniel Goldin, former NASA Administrator, "Every company that manufactures a product, every company that sells or resells something manufactured in this country, every assembly plant, repair shop and production facility...will need similar expertise to that sought by NASA. We believe the students participating in today's competitions will offer much of this expertise. The feedback we get from students and engineers alike is that this is one of the most positive, influential and meaningful experiences of their academic and professional careers." At no time is this sentiment more critical to a nation than now.

While today's science and engineering workforce moves toward retirement, NASA and the aerospace industry seek to recruit motivated, talented, and experienced individuals to further advance innovative science and engineering programs. The next generation of NASA's workforce will come from those who are in middle and high school today, therefore the quality of this cohort's performance will be rooted in the science and engineering education currently available in our schools.

The number one recommendation made by the National Academy of Sciences in "Rising Above the Gathering Storm" was to "increase America's talent pool by vastly improving K-12 science and mathematics education." This report was created to help the nation develop policy and practical recommendations to significantly increase our national achievements in research and advance our economy in this era of intense global competition.

The National Science Board recently stated, "Not since the Soviet Union's launch of the Sputnik satellite—nearly half a century ago—has the need to improve science and mathematics education in America been as clear and as urgent as it is today." Yet it is not science, engineering and mathematics alone that will bring this nation forward. Motivation, imagination, vision, project experience, and a sense of direction are all crucial. The ROC will provide project-based learning that develops the above-mentioned key elements that are so necessary to true technological leadership.

President Obama's vision for NASA is "to foster the development of path-breaking technologies [and] increase the reach and reduce the cost of human spaceflight." He also seeks to "ramp up robotic exploration of the solar system." But how will we develop the new generation of engineers and scientists who would create these advanced technologies? The RAP will engage students in science and technology related fields, and in particular, robotics. This is an important part of the answer.

2.2 NASA ROBOTICS ALLIANCE PROJECT (RAP) OVERVIEW

2.2.1 RAP STRATEGY

NASA will continue to invest in the Nation's future workforce by supporting the country's high school robotics clubs and classes that play a key role in preparing, inspiring, exciting, encouraging, and nurturing the young minds of today. These young people will manage and lead the Nation's laboratories and research centers of tomorrow.

The RAP uses NASA's inspiring mission, unique facilities, and specialized work force, in conjunction with the best emerging technologies, to increase the capabilities of Robotics Engineers entering America's workforce. RAP engages in activities that enhance the public's scientific competence and technical literacy around robotics. The RAP leverages NASA's exciting robotics missions by conducting online courses for college credit. The project supports teachers in the U.S. by establishing a robotics curriculum clearinghouse. The RAP establishes robotics academies at key NASA centers to train undergraduates to become Robotics Engineers. Ultimately, RAP will establish student employment (co-op) positions for these robotics engineering students at NASA centers where such competencies are required. Co-op positions provide an opportunity for students to combine their academic studies with on-the job training and experience, alternating periods of academic study and work. The RAP was established over a 20 year period to increase the innovative talent and technical capability of the graduating Robotics Engineers that will enter NASA's workforce. Carefully planned strategies have been implemented to develop specific competencies. The RAP is ultimately a development pipeline for an advanced Robotics Engineering workforce.

2.2.2 RAP VISION

"To Advance Robotic Space Exploration"

The current vision statement was generated so that the project could look beyond its 20 year mission. In the event that the project is still considered valuable to NASA following mission accomplishment, this vision provides the general theme through which RAP could continue. This vision allows for indirect contributions via the thousands of people that have been empowered by the RAP.

2.2.3 RAP MISSION

"To create a human, technical, and programmatic resource of robotics capabilities to enable the implementation of future robotic space exploration missions."

RAP's mission was launched in 1998. Through the execution of carefully designed goals, the project will be complete in 2019. At that point, program data will be evaluated regarding its impact on America and its potential contribution to future generations. An external committee will review the outputs generated by these completed milestones and the degree to which achieving these metrics produced the desired outcome (see Appendix A – RAP Milestones). The continued

development of this workforce pipeline may be self enabling and self replicating at that point, to the degree that the RAP may no longer be required. Until that time, RAP will continue to develop and encourage the future robotic engineering workforce of America.

2.3 ROBOTICS OUTREACH COMPETITION (ROC)

2.3.1 ROC MISSION

The ROC Mission, to *“motivate Americans using competitive robotics into the Robotics Engineering Pipeline”* was derived largely from Goal RAP-II.

The ROC is a unique self-sustaining outreach program. The ROC must be designed to attract and stimulate a broad-cross section of highly qualified students from a wide array of high schools across the country. The project should encourage the best and brightest students in the United States to enter the robotics engineering workforce pipeline. It will provide participants with hands-on experience with robotics. The ROC will also provide students with exposure to NASA scientists, engineers and program managers working on a range of NASA projects and missions.

Students must receive meaningful training during their experience. Through this program, NASA continues its commitment to attract students into NASA's future workforce. The ROC will provide opportunities to students interested in majoring in Robotics Engineering, as well as other areas related to NASA's science and technology programs.

The ROC supports the overall mission of the RAP, which is to develop the future workforce. The ROC is focused on generating a workforce pipeline that will produce highly educated and the most technically capable Robotics Engineers. To reach this end, the ROC inspires young people to be science and technology leaders by engaging them in exciting, mentor-based programs that build science, engineering and technology skills. The ROC will inspire innovation and foster well-rounded life capabilities, including self confidence, communication and leadership. The RAP will continue to execute other milestones in support of robotic competitions that complement but do not interfere with the focus of the ROC.

2.3.2 SCOPE OF EFFORT

The scope and purpose of the ROC program requires that it be structured to stimulate and support career pursuits in robotics as well as STEM. The successful awardee will design and administer a national, high caliber outreach program, including a high-quality national level robotics competition experience that leverages hands-on experiences in a technical environment.

The following are the ROC Goals as defined in the FY11 RAP Management Plan. The specific objectives and requirements derived from these goals are delineated in Appendix B: ROC Milestones and will constitute, in part, the recipient's responsibilities under a resulting agreement.

ROC-Goals (Level 0)

ROCM-G1	Implement Strategic Design
ROCM-G2	Implement General Guidelines

ROCM-G3	Develop competition that falls within technical specifications
ROCM-G4	Develop robotics competition resource infrastructure
ROCM-G5	Establish Competition Milestones, delivery dates, and metrics
ROCM-G6	Define roles and responsibilities
ROCM-G7	Establish Robotics Competition Formal and Informal Awards
ROCM-G8	Establish Team Requirements for Operation
ROCM-G9	Implement the Registration Mini-Grants
ROCM-G10	Provide supplemental regional event support
ROCM-G11	Support Mentor Retention and Establish Mentor Pipeline
ROCM-G12	Execute Evaluation

2.3.3 NASA PARTICIPATION

NASA, for its part in the awarded cooperative agreement, will provide the following support for the ROC:

- Assign a Project Manager to provide center and agency oversight of the ROC
- Provide access to NASA or other government-owned or operated facilities and equipment, as appropriate
- Support technical design activities
- Develop and maintain the ROC website at NASA Ames, including an electronic application option to support the registration for mini-grants
- Approve mini-grant selections
- Coordinate with ROC to make NASA internship opportunities available to students that have participated with the ROC
- Provide supplemental personnel to support regional event execution
- Provide mentorship to House Teams
- Make available support to all teams via workshops and collaborative online sessions
- Assist with implementation of the ROC evaluation plan
- Ensure the availability and timely allocation of funding to the ROC for project administration

2.4 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.

2.5 FUNDS AVAILABILITY

Funds are not currently available for award under this announcement. The Government's obligation to make an award is contingent upon the availability of appropriated funds from which

payments can be made and the receipt of proposals that NASA determines are acceptable for award under this announcement.

3.0 AWARD INFORMATION

3.1 AWARD TYPE

NASA expects to award a cooperative agreement as a result of this announcement pursuant to § 1260.12(d) in Section A of the NASA Grant and Cooperative Agreement Handbook. The characteristics of the agreement will include those that apply to an education grant (see § 1260.12(c)(2)); however, substantial involvement is anticipated between NASA and the recipient during performance of the contemplated activity.

3.2 NUMBER AND SIZE OF AWARD

NASA expects to award one cooperative agreement to a single institution as a result of this announcement. The estimated value of the award is approximately \$4M per year for a period of five (5) years. Continuation of the cooperative agreement in the second through fifth year is contingent on the availability of funds and NASA acceptance of annual progress reports, indicating continued value to the NASA mission.

3.3 AWARD HISTORY

This requirement is a follow-on to the current NASA grant number NNA06CB50G being performed by FIRST Foundation.

4.0 ELIGIBILITY INFORMATION

4.1 ELIGIBLE PROPOSERS

Participation is open to U.S. educational institutions and other non-profit organizations. Consortia of and partnerships within these institutions and/or organizations are encouraged to apply.

In accordance with Federal statutes and NASA policy, no eligible applicant shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NASA on the grounds of race, color, creed, age, sex, national origin, or disability.

4.2 COST SHARING

Cost sharing is not required if the recipient of the cooperative agreement is a higher education institution or non-profit organization. However, NASA may accept cost sharing if it is voluntarily offered. See the NASA Grant and Cooperative Agreement Handbook, Section B, §1260.123, "Cost sharing or matching," which describes the acceptable forms of cost.

5.0 PROPOSAL AND SUBMISSION INFORMATION

5.1 PREPARING TO SUBMIT A PROPOSAL

All information needed to respond is contained in this announcement. Additional guidance may be found in the following references:

NASA Grant and Cooperative Agreement Handbook –
http://prod.nais.nasa.gov/pub/pub_library/grcover.htm

NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) –
<http://nspires.nasaprs.com>

5.2 USING NSPIRES

Proposals must be submitted electronically via NSPIRES. Potential applicants are urged to access this site well in advance of the proposal due date(s) of interest to familiarize themselves with its structure and enter the requested identifier information.

5.3 NOTICE OF INTENT

A Notice of Intent (NOI) is requested to assist NASA in assessing the possible response to this notice. NOIs are encouraged to be submitted by the proposer to NSPIRES prior to midnight (11:59 pm) Eastern Time on October 12, 2010.

The non-binding NOI must include:

- The name of the submitting organization(s)
- The name, title, regular mail and e-mail addresses, telephone, and fax numbers of the proposed Project Administrator
- The proposal title and executive summary

There is no mechanism to submit an NOI via NSPIRES after the NOI deadline. This information, however, is still valuable to NASA. Please submit a “late” NOI by email to bethany.a.mcclave@nasa.gov.

5.4 SUBMISSION DATES AND TIMES

A complete cover page and all required attachments must be submitted electronically prior to midnight (11:59 pm) Eastern Time on the proposal due date on October 29, 2010. It is the Offeror’s responsibility to ensure the successful submission of a proposal and to ensure that all required parts of the proposal are incorporated. NSPIRES automatically assigns a unique proposal number to each proposal only after it has been successfully submitted. *If no NSPIRES number appears on the Proposal Cover Page, then it has not been submitted finally and correctly through the NSPIRES system.*

In general, late proposals will not be accepted. However, proposals or proposal modifications received after the latest date specified for receipt may be considered if a significant reduction in cost to the Government is probable or if there are significant technical advantages, as compared with proposals previously received.

5.5 REQUIRED CONTENT AND ORGANIZATION

Proposals shall be stand-alone documents and shall not include references to websites or other material needed to either complete or understand the proposal.

The proposal shall be organized according to the order listed below.

Proposal Content	Section and Appendix References
<p>I. Proposal Cover Page: The Proposal Cover Page contains information about the proposal, including the following:</p> <p>Proposal Abstract (Summary) [200-300 words]: Provide a brief description of the project, objectives, method of approach, and outcomes.</p> <p>Budget Figures: Include figures for all years of the proposed program in the spaces provided.</p> <p>Certification Regarding Lobbying, Debarment, Suspension and Other Responsibility Matters: The authorizing organization's signature on the Proposal Cover Page automatically certifies that the proposing organization has read and is in compliance with these certifications. No additional certification is necessary; however, this form is provided for your information in Appendix F.</p>	<p>Electronic Submission – Generated by NSPIRES</p> <p>Appendix D</p>
II. Table of Contents	
<p>III. Proposal Description:</p> <p>1. Program Plan – Provide a detailed description of the proposed ROC program by defining tasks (level 3) within the framework of the requirements (level 2), objectives (level 1), and goals (level 0) identified in Appendix B. Outline the general plan of work, including schedules.</p>	<p>Appendix B: ROC Milestones</p> <p>Section 2.3.2, SCOPE OF EFFORT</p> <p>These three sections shall total no more than 30 pages. Only the first 30 pages will be accepted.</p>

<p>2. Management Plan – Describe the approach and methodology that will be employed in implementing the proposed program, including the personnel management structure (eg. roles and responsibilities, lines of communication both within the team and with the NASA ROC Project Manager). Discuss relevant qualifications, capabilities, and experience of the proposing institution and the proposed management team. Proposers must provide evidence of the capability and experience to provide both the technical and administrative framework required to implement the ROC. The proposal should also indicate clearly any innovative approaches, leveraging of resources, or partnerships.</p> <p>3. Evaluation Plan – Describe how the degree of success in achieving the mission of the ROC program will be evaluated and annual feedback provided to NASA management. The plan should include collection, analysis and reporting of data to address the following measures, at a minimum:</p> <ul style="list-style-type: none"> • Output measures <ul style="list-style-type: none"> ○ Number and diversity of students involved ○ Number and diversity of schools involved • Outcome measures <ul style="list-style-type: none"> ○ Number of students that enter the US industry-related STEM workforce ○ Number of students that enter the government-related STEM workforce ○ Number of students that enter the NASA-related STEM workforce • Efficiency measures <ul style="list-style-type: none"> ○ Percent increase = (ROC students)/ (ROC students +Engineering Base Line) graduating with RE or EE,ME, or CSE with robotic minor ○ Total number of ROC students graduating with RE or EE,ME, or CSE with robotic minor ○ Number of ROC graduates entering the NASA civil service, NASA contractor workforce, Government civil service, or US government contractor workforce. ○ Total number of ROC students graduating in STEM 	
<p>4. Budget – The proposal must contain sufficient cost detail and supporting information to facilitate timely review and award. The proposed cost information should be sufficiently detailed to allow the Government to identify cost elements</p>	

<p>for evaluation purposes. Generally, the Government will evaluate costs in terms of their reasonableness and acceptability. Each category should be explained. The Proposer should exercise prudent judgment since the amount of detail necessary varies with the complexity of the proposal.</p> <p>The required <i>Proposal Cover Page</i> contains a table for the submission of the <i>Budget Summary</i> in accordance with the following format and instructions. A <i>Budget Summary</i> is to be submitted for each year of the proposed effort. NSPIRES will automatically calculate the total for the period of performance. The proposed costs are to be summarized according to the following general categories:</p> <ul style="list-style-type: none"> • Direct Labor (salaries, wages, fringe benefits) itemized by position, including amount of time devoted to the program • Other Direct Costs <ul style="list-style-type: none"> ○ Subcontracts ○ Consultant services ○ Materials and supplies ○ Travel ○ Other (itemized by type, including [as appropriate] mini-grants, awards, etc) ○ Indirect Costs • Total Estimated Costs 	
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***The offeror's proposal will be incorporated by reference into any resulting agreement.**

5.6 REQUIRED FORMAT

Any documents uploaded to NSPIRES must be unlocked, searchable PDF files. The use of PDF bookmarks is encouraged, as it aids in electronic navigation of the file(s).

Text must be in a single column format. Multiple-column text is difficult to review electronically. Fonts must be embedded.

5.7 REQUIRED IDENTIFICATION NUMBERS

Any organization that submits a proposal must have a DUNS Number, CAGE Number, and EIN/TIN. Since NSPIRES proposal data system requires a potential Principal Investigator (or Program

Administrator) to be linked to his or her proposing organization within the system, these numbers are automatically entered in the appropriate fields in the NSPIRES cover page.

5.8 FUNDING RESTRICTIONS

Funds may not be spent on construction or foreign travel.

5.9 OTHER REQUIREMENTS

All proposals must comply with the general requirements of this announcement. Upon receipt, proposals will be reviewed for compliance. This includes:

- Submission of complete proposals on or before the due date
- Submission of a proposal from an eligible Proposer
- Submission of a budget that is within guidelines specified in this announcement and is for a funding period not exceeding five (5) years in duration
- Submission of proposals that meet length requirements

At NASA's discretion, non-compliant proposals may be withdrawn from the review process and returned to the Proposer without further review.

5.10 CANCELLATION OF CAN

NASA reserves the right to make no awards under this announcement in the absence of program funding or for any other reason. NASA assumes no liability (including bid and proposal costs) for cancelling the announcement or for anyone's failure to receive actual notice of cancellation. Should cancellation be necessary, notice will be sent to anyone submitting a NOI and also to the NSPIRES email list.

6.0 PROPOSAL REVIEW INFORMATION

6.1 EVALUATION CRITERIA

Proposals will be evaluated based on the following criteria, *in descending order of importance*:

Mission Focus – NASA will evaluate (i) The degree to which the proposal demonstrates an understanding of the mission of the ROC and awareness of the role of the ROC in the NASA career pipeline; (ii) The degree to which the proposed program fully and specifically addresses ROC goals; (iii) The likelihood that the proposed management plan will lead to effective program implementation aligned with ROC goals, and (iv) The effectiveness of the program evaluation plan for documenting outcomes and demonstrating progress toward accomplishing ROC mission success.

Intrinsic Merit – NASA will evaluate (i) The overall merit of the proposal and/or unique and innovative methods or approaches demonstrated by the proposal; (ii) The offeror's capabilities, related experience, facilities, techniques, or unique combination of these which are integral factors for achieving the proposal's objectives; and (iii) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives. As applicable, the evaluation of intrinsic merit will also include evaluation of the value and clarity of the role of any proposed partnerships. Cost sharing is not part of the evaluation criteria; however cost sharing may affect NASA's evaluation of the intrinsic merit of the proposal.

Cost– NASA will evaluate the degree to which the proposed budget is reasonable and realistic and aligned with the ROC's priorities. NASA will also evaluate the expected efficiency and effectiveness of the program, management, and evaluation plans, including leveraging of available resources. Evaluation of this factor will aid in assessing the offeror's understanding of the magnitude and complexity of the requirements and associated risk.

6.2 REVIEW AND SELECTION PROCESS

Proposals will be evaluated by a merit review process. Reviews may include ad hoc mail reviews, panel reviews by academia, and other subject matter experts as appropriate.

External reviewers will be free of conflicts of interest and broadly representative of the various types of eligible organizations and institutions. The reviewers will assess the proposals based on the criteria outlined above, documenting strengths and weaknesses. Not all strengths and weaknesses are equal.

NASA will determine its final summary evaluation based on the following adjectival scale:

Adjectival Rating	Definition
EXCELLENT	A thorough, and compelling proposal of exceptional merit that fully responds to the objectives of the CAN as documented by numerous or

	significant strengths and with no major weaknesses.
VERY GOOD	A competent proposal of high merit that fully responds to the objectives of the CAN, whose strengths fully out-balance any weaknesses and none of those weaknesses constitute fatal flaws.
GOOD	A competent proposal that represents a credible response to the CAN, whose strengths and weaknesses essentially balance each other.
FAIR	A proposal that provides a nominal response to the CAN but whose weaknesses outweigh any strengths.
POOR	A seriously flawed proposal having one or more major weaknesses that constitute fatal flaws.

The adjectival ratings assigned are labels and not the sole basis for proposal comparison. The selection decision is not based merely on the adjectival ratings, but rather on a tradeoff analysis which compares the strengths and weaknesses of the competing proposals.

6.3 SELECTING OFFICIAL

The Selection Official (SO) for this Cooperative Agreement Notice (CAN) is the Director of New Ventures and Communications Directorate (Code V), NASA Ames Research Center.

6.4 CONFLICT OF INTEREST CHECK INFORMATION

NASA takes seriously its responsibility for ensuring that proposals are treated with the utmost confidentiality and are evaluated fairly and objectively without conflict of interest on the part of the reviewers. Therefore, regardless of the mailing address or website to which an announcement may direct proposals to be sent, it is NASA policy that NASA Civil Service personnel will be in charge of and direct all aspects of the review and selection processes, including the identification and invitation of peer review personnel, in-person monitoring of the deliberations of any peer review panel, and the adjudication of conflicts of interest that may be declared by panel personnel. Also, all non-Government reviewers are prohibited from making unauthorized disclosure of proposal information and evaluation materials and/or information. Government employees who may be involved in the peer review process are bound by Government law and regulation not to make unauthorized disclosure of trade secrets and confidential commercial and financial information contained in proposals.

6.5 SCHEDULE FOR AWARD

For this procurement, NASA anticipates making selections by December 3, 2010. However, this estimate can change, based on the workload experienced by NASA, the availability of funds, and any necessary post-selection negotiations with the proposing organization(s).

7.0 AWARD ADMINISTRATION INFORMATION

7.1 AWARD NOTICES

The notice of award signed by the grant officer is the authorizing document. Any costs incurred by the Proposer in anticipation of an award are at the Proposer's own risk. The award or funding instrument will be a cooperative agreement.

7.2 GRANT OFFICER

The Grant Officer at the NASA Shared Services Center (NSSC) is the awarding official for this CAN.

7.3 ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

The administrative and national policy requirements for this NASA award will be per the NASA Grant and Cooperative Agreement Handbook.

7.4 POST AWARD REPORTING

Post-award reporting requirements will be per Exhibit G in Section A of the NASA Grant and Cooperative Agreement Handbook. In addition to the reporting requirements listed in the NASA Grant and Cooperative Agreement Handbook, the ROC award recipients are required to make an annual report of their activities using the NASA Data Management System, which collects project performance data.

8.0 NASA CONTACTS

Mr. Mark Leon, Manager, Robotics Alliance Project
NASA Ames Research Center
Mail Stop 226-8
Bldg. 226, Room 218
P.O. Box 1
Moffett Field, CA 94035
Mark.J.Leon@nasa.gov

Bethany A. McClave, Contract Specialist
NASA Ames Research Center
Mail Stop 241-1
Bldg. 241, Room 205
P.O. Box 1
Moffett Field, CA
Bethany.A.McClave@nasa.gov

APPENDIX A – RAP MILESTONES

I. RAP GOALS (Level 0 Milestones)

This Robotics Alliance mission will be achieved through the pursuit of four strategic Goals. Also termed as Level 0 Milestones, these goals have been implemented early in the projects life cycle and are intended to produce a community with a strong technical base in robotics engineering competencies. The optimal design is to impact students at an early age and then affect them by each of the four goals as they advance through their education. Exposing students to these goals in a cascading sequence yields the highest probability that they will exit academia with the desired core competencies in robotics engineering. These Goals and their metrics have been gathered for the first ten years and can be reviewed in the "RAP Ten Year Impact Report," due for publication at the end of FY09. The current goals have been marked for completion in five years by 2013 as measured by their output and outcome metrics. These four goals are as follows:

RAP-I: Enroll American support for the advancement of Robotics Technologies required for Extraterrestrial Exploration.

RAP-II: Inspire American high school students to pursue a Bachelor of Science in Robotics Engineering.

RAP-III: Motivate American BSRE undergraduates and graduates to pursue M.S. and Ph.D. degrees in robotics.

RAP-IV: Engage BSRE, MSRE and PhDRE students prior to graduation.

These goals are tracked via their output metrics which are tabulated at the end of each year. Ultimately these outputs will trigger specific behaviors in the target populations causing a specific outcome several years later. Therefore after completing 5 years of project goals it should be possible to gage if RAP will achieve its desired outcome.

II. RAP Goals, Outputs, Outcomes, and Metrics

The Goals will generate specific outputs and the output metrics will be used to determine if the Goal has been met. The outputs from these goals will trigger specific outcomes which will also be judged against their outcome metrics.

Table 1. RAP Goals with Output and Outcome Metrics

Theme	Goals	Output	Output Metric	Outcome	Outcome Metric
Enrolling Robotics Support.	RAP-I: Enroll American support for the advancement of Robotics Technologies required for Extraterrestrial Exploration.	Disseminate exciting and informative multimedia RAP events to civilians annually for 5 years.	Reach 10,000 civilians annually for 5 years reaching a minimum population of 50,000 civilians.	Americans are actively supportive of the Robotics Exploration of Space and all required to that end.	51% of the 500 civilian's surveyed report increased opinion that Robotics Technologies are valuable and necessary.
Inspiring BSRE Pursuit.	RAP-II: Inspire American high school students to pursue a Bachelor of Science in Robotics Engineering.	Conduct a series of Robotics Based competitions across the country designed to inspire students to pursue Robotics Engineering.	Document 200 high school students' commitment to pursue BSRE for 5 years logging a total of 1000 students.	Students will be sufficiently inspired to enter a BSRE program.	60% of the target group surveyed students enroll in BSRE Degree programs.
Motivating MSRE & PhDRE Pursuit.	RAP-III: Motivate American BSRE undergraduates and graduates to pursue M.S. and Ph.D. degrees in robotics.	Document undergraduates and graduates students declaring their commitment to pursue Advanced Robotics Degrees.	Document 50 college students pursuing advanced robotics degrees for 5 years.	Students will be sufficiently inspired to complete a BSRE program and pursue an MS or PhD in RE.	70% of the target group surveyed complete their MS or PhD in robotics engineering.
Engaging Roboticist Interns	RAP-IV: Engage BSRE, MSRE and PhDRE students prior to graduation.	Select undergraduate and or graduates to work at NASA.	Competitively select 10 interns to serve NASA nationwide.	NASA is able to hire the most educated and capable American Roboticists in	90% of the CS TERM employee students brought in are offered CS PERM

				the world.	positions in Robotics.
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III. PROJECTED ANNUAL IMPACT OF GOALS

Over eleven thousand Americans were targeted in FY09. The figure below has RAP Goals vertically and RAP Objectives Horizontally. The central region is the zenith of the projects output making the best and brightest PHD candidates available to work for NASA just prior to their graduation.

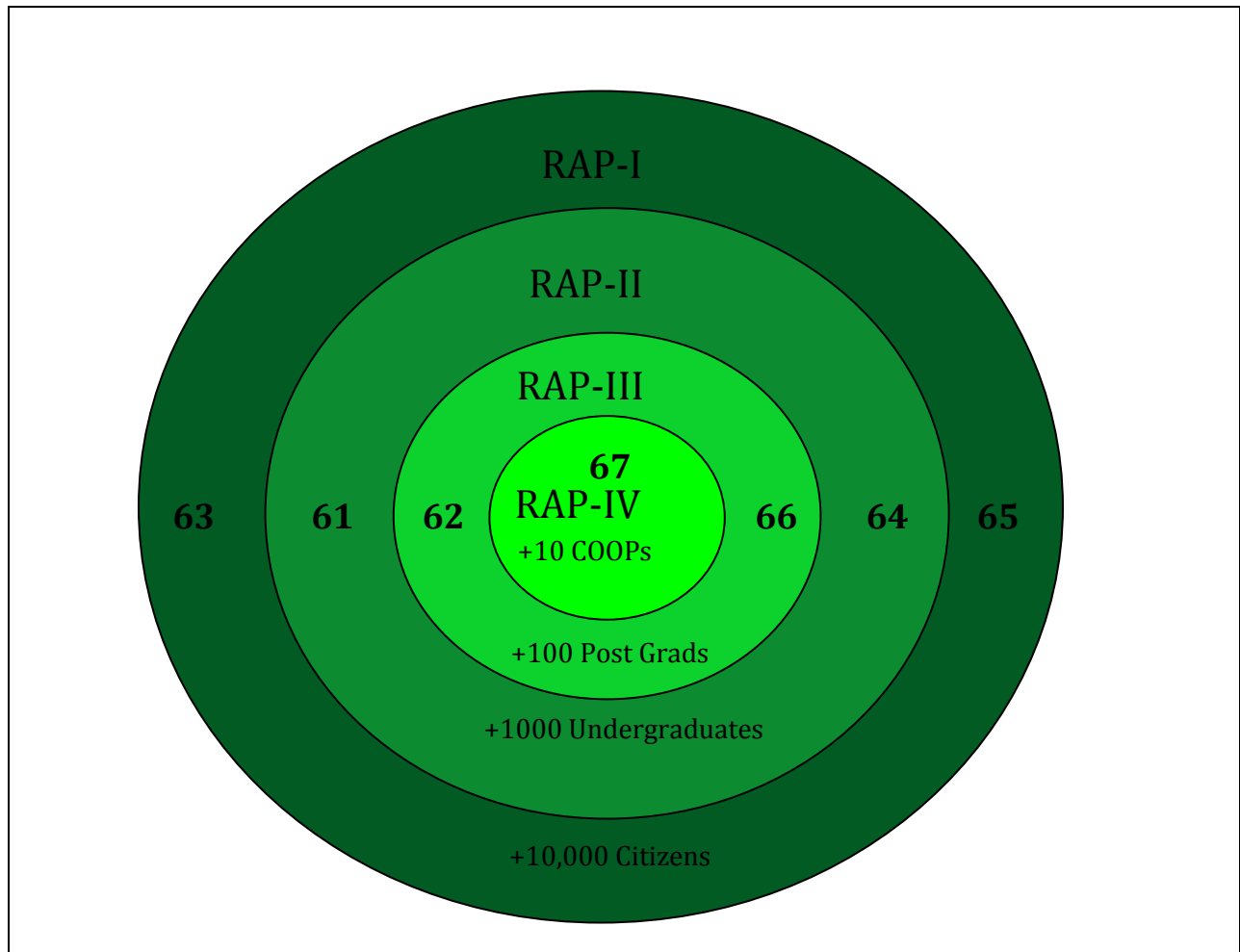


Figure 1. Intended Annual Impact is over 11 thousand Americans

IV. OBJECTIVES (Level 1 Milestones)

The project Objectives, also known as Level 1 Milestones, are delivered on an annual basis. Traditionally there have been between seven and ten Level 1 Milestones required per year.

Table 2. Objectives (Level 1 Milestones)

Level 0 Milestone	Level 1 Milestone
RAP-I: Enroll American support for the advancement of Robotics Technologies required for Extraterrestrial Exploration.	<p>RAP-I-ARC-73: Disseminate and advocate the Robotics Alliance Mission to the public via Broadcast Television, Internet webcasting, the World Wide Web, printed publications, and physical presentations.</p> <p>RAP-I-ARC-75: Develop, strengthen and sustain federal, industrial and academic collaborations to reduce overall cost of implementing the Robotics Alliance Mission.</p>
RAP-II: Inspire American high school students to pursue a Bachelor of Science in Robotics Engineering.	<p>RAP-II-ARC-71: Invest in the workforce pipeline by recruiting students via robotics competitions and engage them in NASA robotics missions leading them to pursue higher education and careers in the robotics Industry</p> <p>RAP-II-ARC-74: Re-instate and Transfer Management of the NASA's Robotics Curriculum Clearinghouse (RCC) supporting the electronic dissemination of quality K-12 curriculum anchored in robotics to an appropriate educational entity.</p>
RAP-III: Motivate American BSRE undergraduates and graduates to pursue M.S. and Ph.D. degrees in robotics.	<p>RAP-III-ARC-72: Leverage academic partnerships using NASA data and technology to produce accredited online robotics courses that motivate the pursuit of advanced education in robotics.</p> <p>RAP-III-HQ-76: Administer NASA's Robotics Academies.</p>
RAP-IV: Engage BSRE, MSRE and PhDRE students prior to graduation.	RAP-IV-ARC-77: Implement the Robotics Alliance Student Internship Opportunity

As the United States begins the second century of flight, the Nation must maintain its commitment to excellence in STEM education to ensure that the next generation of Americans can accept the full measure of their roles and responsibilities in shaping the future. Projects such as the ROC are designed to contribute to the development of the nation's technical workforce in an effort to offer NASA a pool of highly qualified candidates to support its future employment needs. NASA's RAP

achieves this outcome by providing opportunities that lead to employment options in the STEM workforce.

APPENDIX B – ROC MILESTONES

Milestone ROCM-G1

Milestone Number	Goal (LO)
	Objective (L1) Requirement (L2)
ROCM-G1	Implement Strategic Design
ROCM-G1-O1	Create a competition with a generic set of baseline rules making it possible for strong teams to consistently perform in the top third and strategically possible for a new brilliant team to rise to the top.
ROCM-G1-O2	Encourage students to pursue engineering, technology and science related fields in college.
ROCM-G1-O3	Establish a roadmap how the competition leads to college for high school students.
ROCM-G1-O4	Establish General Student Practices that will build strong skills.
ROCM-G1-O4-R1	<i>Develop Competition that will develop skills computer programming</i>
ROCM-G1-O4-R2	<i>Develop Competition that will develop skills in computer animation</i>
ROCM-G1-O4-R3	<i>Develop Competition that will develop skills in web design</i>
ROCM-G1-O4-R4	<i>Develop Competition that will develop skills in entrepreneurship.</i>
ROCM-G1-O4-R5	<i>Develop Competition that will develop skills in fundraising</i>
ROCM-G1-O4-R6	<i>Develop Competition that will develop skills in mechanical and physical principles</i>
ROCM-G1-O4-R7	<i>Develop Competition that will develop skills in motors</i>
ROCM-G1-O4-R8	<i>Develop Competition that will develop skills in pneumatics</i>
ROCM-G1-O4-R9	<i>Develop Competition that will develop skills in public relations</i>
ROCM-G1-O4-R10	<i>Develop Competition that will develop skills in team building</i>
ROCM-G1-O4-R11	<i>Develop Competition that will develop skills in communication</i>
ROCM-G1-O4-R12	<i>Develop Competition that will develop skills in leadership.</i>
ROCM-G1-O4-R13	<i>Develop Competition that will develop skills design reviews.</i>
ROCM-G1-O4-R14	<i>Develop Competition that will develop skills methods that would require the engineering approach at a fundamental level to be successful.</i>
ROCM-G1-O4-R15	<i>Develop Competition that will develop skills error analysis</i>
ROCM-G1-O4-R16	<i>Develop Competition that will develop skills exposure to active and passive measurement tools</i>
ROCM-G1-O4-R17	<i>Develop Competition that will develop skills hands on experience</i>
ROCM-G1-O4-R18	<i>Develop Competition that will develop skills mapping requirements to milestones</i>
ROCM-G1-O4-R19	<i>Develop Competition that will develop skills requirements analysis</i>
ROCM-G1-O4-R20	<i>Develop Competition that will develop skills technical evaluation tools</i>
ROCM-G1-O4-R21	<i>Develop Competition that will develop skills the development logic skills for trouble shooting</i>
ROCM-G1-O4-R22	<i>Develop Competition that will develop accessible engineering challenges for the widest range school environments.</i>
ROCM-G1-O4-R23	<i>Develop Competition that will develop accessible engineering challenges for the widest range of students</i>
ROCM-G1-O4-R24	<i>Generate enhanced student self-esteem</i>

ROCM-G1-O4-R25	<i>Generate student technological literacy</i>
ROCM-G1-O4-R26	<i>Generate student inspiration</i>
ROCM-G1-O4-R27	<i>Focus Students on the main responsibility of designing the robot</i>
ROCM-G1-O4-R28	<i>Focus Students on the main responsibility of modifying the robot</i>
ROCM-G1-O4-R29	<i>Focus Students on the main responsibility of testing the robot</i>
ROCM-G1-O5	Establish student affinity for their high school science and math courses.
ROCM-G1-O6	Establish this competition as the premiere after-school engineering and robotics program in the nation
ROCM-G1-O7	Provide people with an opportunity to contribute back through the existence of an alumni association, organized or unorganized, that actively participates with the teams.

Milestone ROCM-G2

Milestone Number	Goal (LO)
	Objective (L1) Requirement (L2)
ROCM-G2	Implement or General Guidelines
ROCM-G2-O1	Create a competition environment that allows all students to participate independent of their income, ethnicity, or background.
ROCM-G2-O2	Demonstrate growth by expanding the global experience for the students by adding one new regional event per year.
ROCM-G2-O3	Execute a competition that includes key character building elements.
ROCM-G2-O3-R1	<i>Teamwork</i>
ROCM-G2-O3-R2	<i>The production of robotic creations in a high-pressure competitive environment</i>
ROCM-G2-O4	Execute a competition that is comparable to that of high school Basketball athletics.
ROCM-G2-O5	Execute a competition that is exercised across the greater United States ensuring that robotics teams should be able to compete in 80% of the States in the US.
ROCM-G2-O6	Exercise robotics Competitions that generate and average of 20 students or more per team
ROCM-G2-O7	Exercise robotics Competitions with an average of 2000 spectators that attend a Regional Event
ROCM-G2-O8	Exercise robotics Competitions with that maintain an average of 1000 Schools/teams across the entire competition.
ROCM-G2-O9	Require high school students to work in teams with adult mentors to design, build and program robots
ROCM-G2-O10	Require high school complete project with a set of parts with in a set time period of at least 1 month but not to exceed 2 months.
ROCM-G2-O11	Produces a standard kit of parts that includes materials that are used in the design, test and construction of their robots.
ROCM-G2-O12	Produces a standard kit of parts that includes various motors, sensors, shafts, bearings, pulleys, a radio control system and other materials.
ROCM-G2-O13	Regional events should be strategically located to provide easy access, reduce travel by teams to other states or cities, and to maximize attendance by family members, friends, teachers, and community members.

Milestone ROCM-G3

Milestone Number	Goal (LO)
	Objective (L1) <i>Requirement (L2)</i>
ROCM-G3	Develop competition that falls within technical specifications
ROCM-G3-O1	Exercise robotics competitions that utilize a Real Time Radio Control Mode with a range of up to Range 20 Meters using 802.11)
ROCM-G3-O2	Exercise robotics competitions that utilize an autonomous control mode of periods greater than 10 sec.
ROCM-G3-O3	Exercise robotics Competitions that utilize Robot weighing over 40 Kilograms and with a volume greater than 0.8 cubic meters

Milestone ROCM-G4

Milestone Number	Goal (LO)
	Objective (L1) <i>Requirement (L2)</i>
ROCM-G4	Develop robotics competition resource infrastructure.
ROCM-G4-O1	Continue to reduce total cost of parts and travel.
ROCM-G4-O2	Develop strategies to recruit, train, recognize and retain team leaders and technical leaders.
ROCM-G4-O3	Enroll corporate America to providing support.
<i>ROCM-G4-O3-R1</i>	<i>Industrial financial commitment</i>
<i>ROCM-G4-O3-R2</i>	<i>Industrial long term commitment</i>
<i>ROCM-G4-O3-R3</i>	<i>Industrial Machine Shop resources</i>
<i>ROCM-G4-O3-R4</i>	<i>Industrial Mentor capability</i>
<i>ROCM-G4-O3-R5</i>	<i>Partner high school robot teams with academia.</i>
<i>ROCM-G4-O3-R6</i>	<i>Partner high school robot teams with government.</i>
<i>ROCM-G4-O3-R7</i>	<i>Partner high school robot teams with industry.</i>
ROCM-G4-O4	Establish deeper relationships across unrelated communities and provide a common ground through which strong alliances may be formed.
ROCM-G4-O5	Establish mentorship
<i>ROCM-G4-O5-R1</i>	<i>Develop expanded online training and new resources for all teams, mentors, and volunteers.</i>
<i>ROCM-G4-O5-R2</i>	<i>Establish a Mentor Process that provides students with experiences that give them the desire to solve problems through scientific and technological innovation.</i>
<i>ROCM-G4-O5-R3</i>	<i>Establish a process that maps students to industry professionals, engineering professors from academia, and Engineering Professionals from the US Government.</i>
<i>ROCM-G4-O5-R4</i>	<i>Establish corporate policies that contribute to the student community through the technical and creative talent of their employees.</i>
ROCM-G4-O6	Exercise robotics Competitions where there is sufficient density of events in the country that any school could participate without having to incur excessive travel costs greater than \$1000/student within CONUS.
ROCM-G4-O7	Generate an environment where social capital within a community is built and maintained.
ROCM-G4-O8	Implement a new, decentralized business model that emphasizes volunteer-led

	team and sponsor recruitment at the community level.
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Milestone ROCM-G5

Milestone Number	Goal (LO)
	Objective (L1) Requirement (L2)
ROCM-G5	Establish Competition Milestones, delivery dates, and metrics
ROCM-G5-O1	Establish Competition phases and events
<i>ROCM-G5-O1-R1</i>	<i>Championship Event</i>
<i>ROCM-G5-O1-R2</i>	<i>Competition Phase</i>
<i>ROCM-G5-O1-R3</i>	<i>Fund Raising Phase</i>
<i>ROCM-G5-O1-R4</i>	<i>Kick Off Event</i>
<i>ROCM-G5-O1-R5</i>	<i>Mini-grant Application Phase</i>
<i>ROCM-G5-O1-R6</i>	<i>Off Season Rest & Recruitment for next year.</i>
<i>ROCM-G5-O1-R7</i>	<i>Post Competition Scrimmages</i>
<i>ROCM-G5-O1-R8</i>	<i>Preseason Scrimmages</i>
<i>ROCM-G5-O1-R9</i>	<i>Robot Design and Manufacturing Phase</i>
<i>ROCM-G5-O2</i>	<i>Execute a competition that contains elimination based matches such as Wrestling or Tennis.</i>
<i>ROCM-G5-O2</i>	<i>Execute a competition that includes key character building elements.</i>
<i>ROCM-G5-O2-R1</i>	<i>Testing strategies</i>
<i>ROCM-G5-O2-R2</i>	<i>Time to celebrate achievements</i>
<i>ROCM-G5-O2-R3</i>	<i>Intense work</i>
<i>ROCM-G5-O2-R4</i>	<i>Opportunity to learn from others</i>
<i>ROCM-G5-O3</i>	Implement a minimum of 40 regional events annually producing winners that qualify to compete at the world championship.
<i>ROCM-G5-O4</i>	Provide for the uplink from the kick-off location in order for NASA to provide the video over NASA TV and video streaming over NASA's network.
<i>ROCM-G5-O5</i>	At the time of the Competition Initiation each year teams will assemble at key location to receive their kit of parts.
<i>ROCM-G5-O6</i>	Each year a Kick-Off should be conducted to reveal a new game, thus keeping the annual challenge an equal opportunity for every team.
<i>ROCM-G5-O7</i>	It is recommended that the championships occur no later than the end of May such that it occurs before the end of the school year.
<i>ROCM-G5-O8</i>	Numerous locations should be selected around the country to support the annual game début where teams can pick up their kit of parts.
<i>ROCM-G5-O9</i>	Provide for the uplink from the championship location to NASA to broadcast to NASA TV and stream video over the internet.
<i>ROCM-G5-O10</i>	The competition season should officially begin no sooner than 1 month after all High Schools have begun their high school year.
<i>ROCM-G5-O11</i>	The competition year should be composed of regular cycles that are understood by participants who engage with the competition.
<i>ROCM-G5-O12</i>	The general structure of the robotic competition should encourage off-season workshops, local competitions, and community outreach.
<i>ROCM-G5-O13</i>	Web sites should be established to support the distribution of the annual game rules.

Milestone ROCM-G6

Milestone Number	Goal (LO)
	Objective (L1) <i>Requirement (L2)</i>
ROCM-G6	Define roles and responsibilities
ROCM-G6-O1	Develop Roles and Responsibilities for the Student Team Officers
ROCM-G6-O2	Define Roles and Responsibilities for the adults
<i>ROCM-G6-O2-R1</i>	<i>Adult Team Mentors</i>
<i>ROCM-G6-O2-R2</i>	<i>Adult Team Supporters</i>
<i>ROCM-G6-O2-R3</i>	<i>Team Advisors to facilitate the creative design process</i>
<i>ROCM-G6-O2-R4</i>	<i>Team Advisors to help develop the milestones for the manufacturing process</i>
ROCM-G6-O3	Define roles and responsibilities for the educational institution
<i>ROCM-G6-O3-R1</i>	<i>Schools</i>
<i>ROCM-G6-O3-R2</i>	<i>Teachers</i>
ROCM-G6-O4	Develop Roles and Responsibilities for Corporate Sponsors

Milestone ROCM-G7

Milestone Number	Goal (LO)
	Objective (L1) <i>Requirement (L2)</i>
ROCM-G7	Establish Robotics Competition Formal and Informal Awards
ROCM-G7-O1	Establish formal awards
<i>ROCM-G7-O1-R</i>	<i>Awards for the team that best exemplifies and fulfills the spirit and mission of Robotics.</i>
<i>ROCM-G7-O1-R1</i>	<i>Certificates for completing competition</i>
<i>ROCM-G7-O1-R2</i>	<i>Company-sponsored awards</i>
<i>ROCM-G7-O1-R3</i>	<i>First place awards</i>
<i>ROCM-G7-O1-R4</i>	<i>internships</i>
<i>ROCM-G7-O1-R5</i>	<i>Other awards as appropriate</i>
<i>ROCM-G7-O1-R6</i>	<i>Passing robot entrance qualifications</i>
<i>ROCM-G7-O1-R7</i>	<i>Scholarships</i>
<i>ROCM-G7-O1-R8</i>	<i>Second place awards</i>
<i>ROCM-G7-O1-R9</i>	<i>Special category awards</i>
<i>ROCM-G7-O1-R10</i>	<i>Technical awards</i>
ROCM-G7-O2	Establish Informal Awards
<i>ROCM-G7-O2-R1</i>	<i>Academic acknowledgement</i>
<i>ROCM-G7-O2-R2</i>	<i>Community acknowledgements</i>
<i>ROCM-G7-O2-R3</i>	<i>Government acknowledgement</i>
<i>ROCM-G7-O2-R4</i>	<i>Professional acknowledgements</i>
<i>ROCM-G7-O2-R5</i>	<i>Recognition by the media</i>
<i>ROCM-G7-O3</i>	Strategically design competition such that students participating on robotics teams will have more individual scholarship opportunities.
<i>ROCM-G7-O4</i>	Strategically design competition such that students will have opportunities for summer employment and/or internships from sponsoring companies.
<i>ROCM-G7-O5</i>	Utilize Competitions where teams are allowed into the championships by placing in regional competitions or by achieving special awards.

Milestone ROCM-G8

Milestone Number	Goal (LO) Objective (L1) <i>Requirement (L2)</i>
ROCM-G8	Establish Team Requirements for Operation
ROCM-G8-O1	Build awareness of by routing team resources into marketing, public relations and awareness-raising initiatives.
ROCM-G8-O2	Require teams to review the suite of social, economic, and systemic problems that face our country.
ROCM-G8-O3	The competition should establish a major requirement for teams to achieve financial sustainability.
ROCM-G8-O4	The competition should establish a major requirement for teams to acquire additional major sponsors.

Milestone ROCM-G9

Milestone Number	Goal (LO) Objective (L1) <i>Requirement (L2)</i>
ROCM-G9	Implement the Registration Mini-Grants.
ROCM-G9-O1	Provide at least 200 “Registration Mini-Grants” to cover event Registration fees and have four objectives:
ROCM-G9-O2	Implement Team Sustaining Grants, which are designed to allow legacy teams to continue one more year despite severe financial challenge.
ROCM-G9-O3	Implement House Team Grants, which are designed to support one or more teams local to and mentored by a NASA facility and provide additional funds to support these NASA sponsored teams.
ROCM-G9-O4	Implement Regional Event Challenge Grants, which are designed to generate the required team base in areas where new regional events are being implemented.
ROCM-G9-O5	Implement Program Growth Grants, which are designed to help grow the general program and augment the number of overall teams that are able to participate.
ROCM-G9-O6	Implement Registration Mini-Grant Review Process

Milestone ROCM-G10

Milestone Number	Goal (LO) Objective (L1) <i>Requirement (L2)</i>
ROCM-G10	Provide supplemental regional event support.
ROCM-G10-O1	New Event Support for new regionals during their first three years of operation to be issued funds on an annually reduced schedule such as 100% for year 1, 75% for year 2 and 25% for year 3.
ROCM-G10-O2	Legacy Event Support is designed to allow any NASA facility that annually contributes funding their local regional event this grant as a funding mechanism.

Milestone ROCM-G11

Milestone Number	Goal (LO) Objective (L1) <i>Requirement (L2)</i>
ROCM-G11	Support Mentor Retention and Establish Mentor Pipeline
ROCM-G11-O1	Develop Team Practices that monitor, maintain, and rejuvenate participating engineers and professors.
ROCM-G11-O2	Establish Mentor Qualification Process to insure that industry professionals are either prepared or trained to work well with students in a collaborative, milestone oriented positive fashion.
ROCM-G11-O3	Execute a competition that recruits mentors role models for teams.
ROCM-G11-O4	Monitor and manage the treatment of the adult mentors, advisor, and supporter to insure that the team can maintain homeostasis without burning out.
ROCM-G11-O5	Stimulating creativity for the participating engineers and professors.

Milestone ROCM-G12

Milestone Number	Goal (LO) Objective (L1) <i>Requirement (L2)</i>
ROCM-G12	Evaluation
ROCM-G12-O1	Calculate the percent of the entire competition that NASA funds and the number of students impacted by scholarships, and regional support.
ROCM-G12-O2	Collect meaningful data that demonstrates the impact on students, schools, sponsors and communities.
ROCM-G12-O3	Conduct intensive evaluations of the competition that demonstrate their continued high impact and effectiveness.
ROCM-G12-O4	Demonstrate that the competition has a visible impact on, businesses, the community, schools, students, and the student team members.
ROCM-G12-O5	Document evidence of that the students associated with the competition are the top candidates to receive university scholarships.
ROCM-G12-O6	Document evidence of academic endorsement
ROCM-G12-O7	Evaluate the institutional effectiveness
ROCM-G12-O8	Exercise robotics Competitions that demonstrates empirical data competition is motivating students.
ROCM-G12-O9	Measure the effectiveness of the competitions best practices.
ROCM-G12-O10	Track Student, mentors and volunteer statistics.
ROCM-G12-O11	Validate that competition is motivating students to pursue careers in engineering that would not have otherwise done so.

APPENDIX C: PERSONAL IDENTITY VERIFICATION OF GRANT/COOPERATIVE AGREEMENT PERSONNEL

In accordance with the requirements of Provision §1260.35, Investigative Requirements, which states in part that Recipients needing access to a NASA Center, facility, or computer system, or to NASA technical information shall comply with the requirements of this provision and shall ensure that individuals needing such access shall provide the personal background and biographical information requested by NASA. Provision §1260.35 is hereby further defined that Recipients shall comply with the PIV Card Issuance Procedures below.

PIV Card Issuance Procedures in accordance with Grant and Cooperative Agreement Handbook § 1260.35 Investigative Requirements (January 2004) FIPS 201 Appendix A graphically displays the following procedure for the issuance of a PIV credential.

VI.D.1 Step 1:

The grantee or recipient submits a formal letter that provides a list of the names of individuals (applicants) who require access to a federally-controlled facility or access to a Federal information system to the cognizant NASA technical officer. In the case of a foreign national applicant, approval through the NASA Foreign National Management System (NFMMS) must be obtained for the visit or assignment before any processing for a PIV credential can take place. Further, if the foreign national is not under a grant or cooperative agreement where a technical officer has been officially designated, the foreign national will provide the information directly to their visit/assignment host, and the host sponsor will fulfill the duties of the technical officer mentioned herein. In each case, the

letter shall provide notification of the grant, cooperative agreement, or foreign national's full name (first, middle and last), social security number (SSN) or NASA Foreign National Management System Visitor Number if the foreign national does not have a SSN, and date and place of birth. If the applicant has a current satisfactorily completed National Agency Check with Inquiries (NACI) or an equivalent or higher degree of background investigation, the letter shall indicate the type of investigation, the agency completing the investigation, and date the investigation was completed. Also, the letter must specify the risk/sensitivity level associated with the position in which each applicant will be working (NPR 1600.1, §4.5 is germane). Further, the letter shall also acknowledge that applicants may be denied access to NASA information or

information systems based on an unsatisfactory background investigation/adjudication. After reviewing the letter for completeness and concurring with the risk/sensitivity levels, the technical officer/host must forward the letter to the Center Chief of Security (CCS). The CCS shall review the OPM databases (e.g., DCII, PIP, et al.), and take appropriate steps to validate the applicant's investigation status. Requirements for a NACI or other investigation shall be initiated only if necessary. Applicants who do not currently possess the required level of background investigation shall be directed to the e-QIP web site to complete the necessary background investigation forms online. The CCS shall provide to the

technical officer/host information and instructions on how to access the e-QIP for each grantee, recipient or foreign national employee requiring access.

VI.D.2. Step 2:

Upon acceptance of the letter/background information, the applicant will be advised that in order to complete the investigative process, he or she must appear in-person before the authorized PIV registrar and submit two forms of identity source documents in original form. The identity source documents must come from the list of acceptable documents included in Form I-9, Employment Eligibility Verification, one of which must be a Federal or State issued picture identification. Fingerprints will be taken at this time. The applicant must appear no later than the entry on duty date. When the applicant appears, the registrar will electronically scan the submitted documents; any document that appears invalid will be rejected by the registrar. The registrar will capture electronically both a facial image and fingerprints of the applicant. The information submitted by the applicant will be used to create or update the applicant identity record in the Identity Management System (IDMS).

VI.D.3. Step 3:

Upon the applicant's completion of the investigative document, the CCS reviews the information, and resolves discrepancies with the applicant as necessary. When the applicant has appeared in person and completed fingerprints, the package is electronically submitted to initiate the NACI. The CCS includes a request for feedback on the NAC portion of the NACI at the time the request is submitted.

VI.D.4 Step 4:

Prior to authorizing physical access of a grantee or recipient to a federally-controlled facility or access to a Federal information system, the CCS will ensure that a check has been performed with the National Crime Information Center (NCIC) and Interstate Identification Index. In the case of a foreign national, a national check of the Bureau of Immigration and Customs Enforcement (BICE)

database will be performed for each applicant. If this process yields negative information, the CCS will immediately notify the technical officer/host of the determination regarding access made by the CCS.

VI.D.5. Step 5:

Upon receipt of the completed NAC, the CCS will update IDMS from the NAC portion of the NACI and indicate the result of the suitability determination. If an unsatisfactory suitability determination is rendered, the technical officer will advise the grantee or recipient that the applicant is being denied physical access to all federally-controlled facilities and Federal information systems. Based on a favorable NAC and NCIC/III or BICE check, the CCS will authorize the issuance of a PIV federal credential in the Physical Access Control System (PACS) database. The CCS, based on information provided by the technical officer/host, will determine what physical access the applicant should be granted once the PIV issues the credential.

VI.D.6. Step 6:

Using the information provided by the applicant during his or her in-person appearance, the PIV card production facility creates and instantiates the approved PIV card for the applicant with an activation date commensurate with the applicant's start date.

VI.D.7. Step 7:

The applicant proceeds to the credential issuance facility to begin processing for receipt of his/her federal credential. The applicant provides to the credential issuing operator proof of identity with documentation that meets the requirements of FIPS 201 (DHS Employment Eligibility Verification (Form I-9)) documents. These documents must be the same documents submitted for registration. The credential issuing operator will verify that the facial image, and optionally referenced finger print, matches the enrollment data used to produce the card. Upon verification of identity, the operator will locate the employee's record in the PACS database, and modify the record to indicate the PIV card has been issued. The applicant will select a PIN for use with his or her new PIV card. Although root data is inaccessible to the operator, certain fields (hair color, eye color, etc.) may be modified to more accurately record the employee's information. The applicant proceeds to a kiosk or other workstation to complete activation of the PIV card using the initial PIN entered at card issuance.

1A non-PIV government identification badge, including the NASA Photo Identification Badge, MAY NOT BE USED for the original issuance of a PIV vetted credential.

ALTERNATIVE FOR APPLICANTS WHO DO NOT HAVE A COMPLETED AND ADJUDICATED NAC AT THE TIME OF ENTRANCE ON DUTY (EOD)

Steps 1 through 4 shall be accomplished for all applicants in accordance with the process described above. If the applicant is unable to appear in person until the time of entry on duty, or does not, for any other reason, have a completed and adjudicated NAC portion of the NACI at the time of entrance on duty, the following interim procedures shall apply.

If the documents required to submit the NACI have not been completed prior to EOD, the applicant will be instructed to complete all remaining requirements for submission of the investigation request. This includes presentation of I-9 documents and completion of fingerprints, if not already accomplished. If the applicant fails to complete these activities as prescribed in NPR 1600.1 (Chapters 3 & 4), it may be considered as failure to meet the conditions required for physical access to a federally-controlled facility or access to a Federal information system, and result in denial of such access.

Based on favorable results of the NCIC, the applicant shall be issued a temporary NASA identification card for a period not-to-exceed six months. If at the end of the six month period the NAC results have not been returned, the agency will at that time make a determination as to whether an additional extension will be granted for the temporary identification card.

Upon return of the completed NAC, the process will continue from Step 5.

APPENDIX D: COMPLIANCE CERTIFICATIONS

By signing the proposal cover page generated by NSPIRES, the Authorizing Official of the submitting institution certifies compliance with the Federal laws and regulations regarding nondiscrimination, lobbying, and debarment and suspension, as described below. No additional certification document is required.

Nondiscrimination

CERTIFICATION OF COMPLIANCE WITH THE NASA REGULATIONS PURSUANT TO NONDISCRIMINATION IN FEDERALLY ASSISTED PROGRAMS

The (Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant ") hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1972, as amended (20 U.S.C.1681, ET SEQ.) (Title IX) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and the Age Discrimination Act of 1975 (42 U.S.C. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign on behalf of the Applicant.

CERTIFICATIONS, DISCLOSURES, AND ASSURANCES REGARDING LOBBYING AND DEBARMENT & SUSPENSION

A. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 14 CFR Part 1271, as defined at 14 CFR Subparts 1271.110 and 1260.117, with each submission that initiates agency consideration of such applicant for award of a Federal contract, grant, or cooperative agreement exceeding \$100,000, the applicant must certify that:

- 1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- 2) If any funds other than appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit a Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

B. GOVERNMENT-WIDE DEBARMENT AND SUSPENSION

As required by Executive Order 12549, and implemented at 14 CFR 1260.510, for prospective participants in primary covered transactions, as defined at 14 CFR Subparts 1265.510 and 1260.117-

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
- 1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;
 - 2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of

embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.