

New NASA Prize Challenges

An opportunity to shape the prize challenges that NASA will offer to America's citizen inventors.

Internal Call for Prize Concept Proposals

July 20, 2009

**Innovative Partnerships Program
National Aeronautics and Space Administration**

Washington, DC

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Background

Innovative Partnerships Program

The Innovative Partnerships Program (IPP) provides leveraged technology for NASA Mission Directorates, Programs and Projects through investments and technology partnerships with industry, academia, government agencies and national laboratories. As one of NASA's Mission Support Offices, IPP supports all four Mission Directorates and has program offices at each of the ten NASA Centers. IPP partnership goals include providing for an increased range of technology solutions, a broadened technology portfolio, improved cost avoidance, accelerated development and maturation of technologies and a larger pool of qualified commercial providers.

Centennial Challenges Prize Program

The IPP Office manages the Centennial Challenges, which is NASA's program to award cash prizes to independent inventors for significant advances in technologies of interest to NASA and the nation. The program encourages innovation throughout the private sector including small businesses and university teams and seeks creative solutions from diverse and unconventional sources. Technology prizes offer an enhanced return on investment for the government. No government funds are expended until the technology advancement is actually demonstrated and the resources that are expended in research and development by competitors are typically many times the value of the prize itself.

For the Centennial Challenges, NASA provides only the prize money and the competitions are managed by external organizations with private funding. NASA does have an important role in oversight and in formulating the challenge, reviewing rules for technical relevance and seeking opportunities with competitors for technology infusion and partnerships. We intend to enhance this NASA role in future challenges.

There are currently six funded Centennial Challenges addressing technology development in the following areas: robotic lunar excavation, high-efficiency aircraft, reusable rocket-powered vehicles, wireless power transmission, super-strength materials and improved astronaut gloves. Some of these competitions may conclude during this current year although several are likely to continue. Prize purses in each challenge range from \$400,000 to \$2,000,000 with appropriated funds that NASA has received for this purpose. The budget request for 2010 and following years includes \$4,000,000 per year for new prize challenges. Additional information on the current set of prize competitions can be found at <http://ipp.nasa.gov/cc>.

Purpose of this Call

The purpose of this Call is to solicit prize concept proposals from engineers, scientists and managers at all levels within NASA. Some selected proposals may be formulated into candidate prize competitions to be announced in this year or in future years, pending availability of prize purse funding. One goal of this call is to identify creative and

compelling prize competitions that truly address the future needs of NASA projects and programs. A second goal is to identify NASA organizations that would consider supporting such competitions in their technical formulation and in the active pursuit of opportunities for technology infusion and creation of new partnerships.

Process

The IPP Office will review the proposals and the most promising ideas will be considered for incorporation into a strategic plan for future challenges. We will seek input from the Mission Directorates and other Headquarters offices for guidance in selecting candidate prize challenges. The criteria for evaluating prize challenge ideas are provided below. The IPP Office may modify or combine submitted proposals with other ideas in creating candidate prize challenges.

Submission of a proposal does not commit any individual or organization to provide future support to a selected prize competition. However, we may contact submitters of promising challenge concepts and other appropriate organizations for further discussions. Our intention is to pursue candidate prize competition for which there is a commitment of support from one or more NASA organizations.

Please note that this call for prize concept proposals is being conducted to identify ideas and potential partners in implementing candidate prize competitions. There is no intention to make awards or grants in connection with any selected ideas or combinations of ideas. However, individuals proposing prize concepts that ultimately lead to prize competitions will receive recognition for their contribution.

Public Outreach

The IPP Office intends to also collect ideas for prize challenges from the general public through a web-based survey that will be located at <http://www.ipp.nasa.gov/cc>. We will post these ideas on our website as a means of stimulating additional ideas both internally and externally. The ideas submitted by the public will be considered in formulating plans for future challenges and we encourage NASA employees to refer to this source of additional ideas when crafting proposals.

Scope

Who may submit proposals?

Any NASA employee or NASA contractor may submit a proposal as an individual or as a member of a group or organization.

What challenge topics can be proposed?

Any idea can be proposed for a prize competition that addresses challenges related to the mission of NASA in aeronautics, exploration, science, or space operations. Crosscutting topics or those that also address related national or global needs are especially valuable. The challenges must require basic and applied research, technology development or prototype demonstrations. Competitions for design studies, proposals, business plans or technical papers are not within the scope of this program.

Although challenge ideas are desired in all of the areas described above there are some areas of particular interest. Those areas are:

- Energy storage related to lunar and planetary surface systems as well as for vehicles for space or Earth
- Storage and transfer of cryogenic fluids
- Laser communications
- Technologies to lower the cost and to encourage the development of commercial space transportation capabilities
- Exploration and operations related to Near-Earth objects
- Research and operations related to the International Space Station
- Habitation systems
- Logistics and packaging for space operations
- Follow-on or enhancements to the existing prize challenges
- Proposed partnerships with other agencies for prize competitions
- Alternatives to cash prizes

How large can the prize purse be?

The total amount of money available for prize purses for all of our competitions may be limited to a few million dollars in the near-term. However, we are interested in prize concept proposals of any scale from a few thousand dollars up to 100 million dollars or more. Competitions with small prize amounts can be successful with the right scope and competitor base. Non-monetary prizes might also be proposed. Much larger prizes might be funded in the future if very compelling large-scale challenges can be identified and so those should be considered as well.

How should proposals be submitted?

The proposal should be submitted following the format and instructions provided below. Employees at NASA Centers should send their proposals simultaneously to the IPP Office representative at their center and the IPP Office at Headquarters. Submitting proposals to the Center IPP representative will ensure center-level cognizance and allow them to facilitate opportunities for combining similar efforts within each center. The Center offices will not conduct any screening or pre-selection of proposals. Employees at NASA Headquarters can send their proposals to the Headquarters IPP Office.

When should proposals be submitted?

For this round of consideration proposals should be submitted as soon as possible but no later than September 18, 2009. This strategic planning process is already ongoing, so proposals will be accepted immediately and early submissions are appreciated. This call may be renewed for additional time periods in the future.

Selection Criteria

The following criteria for selecting candidate prize challenges should be considered in the formulation of proposals.

- Relevant to NASA needs
- Relevant to national and global needs

- One or more NASA organizations are willing to:
 - Provide expertise to guide competition
 - Actively seek technology infusion and partnerships
 - Remain involved through life of the competition
- Potential to enhance commercial development opportunities
- Appropriate subject for prize competition
 - Technically valuable and interesting
 - Solution set not overly constrained – multiple solutions possible
 - High technical risk, high potential payback
 - Appropriate degree of difficulty
 - Requires innovation but achievable by independent teams
 - Appropriate for the prize amount
 - Multiple competitors likely
- Compelling to the public
 - Simple rules
 - Interesting to observe or follow
 - Obvious significance and value
 - Futuristic

Instructions for Submitting Prize Concept Proposals

The proposal shall be limited to **no more than two pages**. The text should be single-spaced, using a 12-point font. Do not include a cover sheet. Do not include photographs or illustrations. The proposal can refer to websites for additional information. Do not include reference pages or any supplemental information.

The proposals should be submitted in a word document attachment to an electronic mail message. Employees at NASA Centers should address the electronic mail message to the IPP Office representative at your center listed near the end of this document and to andrew.j.petro@nasa.gov. Headquarters employees should address the electronic mail message to andrew.j.petro@nasa.gov. Proposals will be accepted immediately and must be received no later than September 18, 2009 for consideration in this fiscal year.

Proposals shall contain the following information, under the headings provided, in the order presented below. We cannot guarantee full consideration of proposals that do not include all items and conform to the requested length and format. Comments below in italics are for explanation only and should not be included in the proposal.

NASA PRIZE CONCEPT PROPOSAL (2009)

Title of Challenge

Please make the title descriptive but concise.

What is the objective of the prize challenge?

Describe what problem the competitors would attempt to solve or the innovation or capability that they would demonstrate.

Which NASA Mission Directorates are likely to benefit?

Indicate one or more of the following: ARMD (Aeronautics Research Mission Directorate), ESMD (Exploration Systems Mission Directorate), SMD (Science Mission Directorate), SOMD (Space Operations Mission Directorate). Describe how they would benefit from the solution, innovation or new capability.

What milestone or performance measurement would determine the winner?

Describe the specific goal that must be attained or the objective measure of success. Will this be a challenge in which the best performer in the field of competitors will win or does a minimum standard have to be surpassed in order to have any winner at all?

What is the format for the challenge?

Would this be an event with multiple competitors in a head-to-head competition? Would it be a first-to-demonstrate competition without a predetermined schedule? Would there be some other format?

What is a suitable cash prize amount or non-monetary reward for the winner?

This question is only intended to help estimate the scope of the envisioned challenge. The actual prize value can be determined later. Non-monetary prizes such as opportunities to use NASA facilities might also be proposed.

What is the timeframe for this challenge?

How much time would you expect to be required for competitors to develop an entry? How much time is required between the announcement of a challenge and a viable competition event or individual attempt? Would the challenge have to occur before any specific date in order to be meaningful?

What type of competitors do you expect?

Indicate whether you expect teams or individuals to compete and if you expect the competitors to include large companies, small companies, student groups or combinations of these types of competitors.

What organization(s) at NASA might provide technical support to the challenge?

This proposal will not obligate any organization to support a prize challenge but the ability to find an appropriate organization for this role will be an important factor in selecting and implementing candidate prize challenges.

What area of NASA's work does this challenge address?

Please list any of the following items that apply.

- *New aviation technology*
- *Air transportation and safety*
- *Launch vehicles*
- *Spacecraft and space vehicles*

- *Planetary science and exploration*
- *Space habitation and health*
- *Working in space, on the moon or on the planets*
- *Space resources and energy*
- *Space station research and operations*
- *Space flight operations and safety*
- *Earth science and observation*
- *Solar science, astrophysics and astronomy*
- *Other _____ (specify concisely)*

Which, if any, national or global needs does this challenge address?

Please list any of the following items that apply or indicate N/A. These are national or global needs beyond NASA's aerospace work.

- *Health*
- *Food or water supplies*
- *Education*
- *Energy*
- *Environment and climate*
- *Transportation*
- *International cooperation*
- *Other _____ (specify concisely)*

Would this challenge possibly enhance commercial opportunities and in what areas?

Please list any of the following items that apply or indicate N/A.

- *Commercial aviation*
- *Private aviation*
- *Commercial spaceflight*
- *New products from space*
- *New business or commercial services in space*

Are there any other agencies or external organizations with a potential interest?

Please list other agencies with a possible interest in this proposed challenge or external organizations that might be partners or sponsors for this proposed challenge. Please indicate if any discussions with these organizations have already occurred.

Proposers

Name of primary point-of-contact:

NASA Center or HQ:

Organization Name:

Email Address:

Phone Number:

Name, organization and email address of additional contributors:

We are requesting the name and contact information for a single point-of-contact for the proposal. Others contributing to the proposal can also be listed. For organization names please provide the full descriptive name rather than organization codes or

numbers. Proposals prepared in partnership between organizations or between centers are definitely welcome.

Date:

Indicate the date that the submission was prepared.

Questions or Comments

If you have any questions or comments on this call for proposals or on the Centennial Challenges prize program please contact Andrew Petro, Program Executive for Innovation Incubator, NASA Headquarters 300 E Street SW, Washington, DC 20546 Phone: 202.358.0310, Email: Andrew.J.Petro@nasa.gov.

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