

NASA Institute for Advanced Concepts STUDENT FELLOWS PRIZE

Call For Proposals

The NASA Institute for Advanced Concepts (NIAC) seeks to identify creative and innovative students who possess an extraordinary potential for developing advanced concepts in the fields of aeronautics, space and the sciences.

Each Student Fellow will receive a total of \$9,000 for the Academic year 2007-2008.

NIAC intends for these awards to benefit talented individuals who have shown extraordinary originality and dedication in their academic pursuits and a marked capacity for self-direction. We seek exceptional creativity, and the promise for important future advances based on a track record of significant accomplishment, and potential for the fellowship to facilitate subsequent creative work.

Eligibility

- Applicant must be in a U.S. institute of higher education
- Applicant must be eligible to work in the United States
- Applicant must apply no later than their junior year of college

For more details on the NIAC Student Fellows Prize and how to apply, go to www.niac.usra.edu/students/call.html.

Due Date: April 16, 2007

Minority, female and disadvantaged students are encouraged to respond to this Call For Proposals.

I. Introduction

Maximizing humankind's potential here on Earth and beyond challenges modern thinkers and researchers to consider fresh approaches to aeronautics, spaceflight, exploration and colonization of off-world environments. Governmental agencies like NASA recognize the need to identify innovative yet scientifically credible concepts in order to lay the groundwork for ambitious and far-reaching missions. To address this need for NASA, the Universities Space Research Association (USRA) founded the NASA Institute for Advanced Concepts (NIAC) (<http://www.niac.usra.edu>).

For the last nine years, NIAC has served as an incubator for revolutionary new ideas. Systems and architectures have been developed for flight inside and outside of the Earth's atmosphere, exploration of other planets, understanding the Earth and the Earth's solar system environment, and significant expansion of our knowledge of the cosmos. By supporting innovative and visionary concepts aimed decades into the future, NIAC-funded research affects our interpretation of and appreciation for near-term aerospace challenges. As an independent institute external to NASA, NIAC provides a visible, recognized and high-level entry point for outside thinkers and researchers.

With this Call, NIAC seeks to identify creative and innovative students who possess an extraordinary potential for developing advanced concepts in the fields of aeronautics, space and the sciences. The NIAC intends for these awards to benefit talented individuals who have shown extraordinary originality and dedication in their academic pursuits and a marked capacity for self-direction. Students receiving these funds will be designated as a NIAC Student Fellows.

We seek exceptional creativity, and the promise for important future advances based on a track record of significant accomplishment, and potential for the fellowship to facilitate subsequent creative work. The Prizes are intended to augment the Student Fellows' development through fostering mentoring, networking, and creativity. Each Prize provides an opportunity for Student Fellows to exercise responsibility in project management. By allowing flexibility in how Student Fellows may use the Prize funds, the NIAC encourages its Student Fellows to pursue their own creative, intellectual, and professional inclinations.

II. Structure of Awards

Each Student Fellow will receive a total of \$9,000 for the Academic year 2007-2008. Funds will be directly disbursed to the Student Fellow in four increments: September 2007, December 2007, March 2008, and upon submission of the final report. Student Fellows have the flexibility to use the funds as needed to advance their concept development, with the caveat that they must also be used to fund travel and hotel expenses for themselves and a mentor to two meetings, one in October, 2007 (location to be announced), and the other in Atlanta, GA in March 2008. Student Fellows are responsible for all taxes related to receipt of these funds.

From a fiscal standpoint, apart from the requirement that Student Fellows budget for travel to the two NIAC meetings noted above, expenditure of the prize money is not

constrained. Student Fellows may feel free to purchase materials and supplies, such as a computer; pay tuition or fee bills; or other incidental expenses. From the intellectual/professional standpoint, we encourage Student Fellows to tap a broad array of sources in the development of their concept, for example industrial partners as well as academic partners. These awards will be competitively selected by the NIAC based on an independent review by qualified experts. Student Fellows may use their prize money to augment other resources available to them, such as the funding resources of an academic investigator.

III. Deliverables

Deliverables assure progress in development of an advanced concept. Awarding of increments of the prize money will depend upon demonstration of attaining certain milestones:

1. Presentation of a poster at the October 2007 NIAC Annual Meeting.
2. Delivery of a short progress report by November 30, 2007.
3. Delivery of a short progress report by February 28, 2008.
4. Delivery of a 25-minute presentation at the March 2008 Fellows meeting.
5. Delivery of a final report by May 15, 2008.

IV. Requirements for Eligibility

- Student must be matriculated in a US institution of higher education.
- Student must be eligible to work in the United States.
- Student must apply no later than their junior year of college.
- Student must identify a mentor/advisor associated with their degree program.
- In addition, students who choose to develop their concept in an industrial setting must also identify an industrial mentor.

Previous winners of the Prize are not eligible to re-apply.

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V. Scope of NIAC Student Fellows Prize Program

A revolutionary concept may be characterized by one or more of the following attributes:

- The genius is in the generalities, and not the details.
- The new idea illuminates a pathway towards a significant expansion of knowledge.
- It inspires others to produce useful science and further elaboration of the fundamental idea.
- It triggers a transformation of intuition.
- Revolutionary paradigm shifts are often simple, elegant, majestic, beautiful and are characterized by order and symmetry.

The NIAC encourages potential Student Fellows to focus their thoughts and stretch their imagination decades into the future in an aggressive pursuit of concepts that will “leap-frog” the evolution of current aerospace systems and can be the framework for future NASA missions and programs. The NIAC advanced concepts must be focused on achieving a decision point for implementation of an architecture or system in the 10-40 year timeframe. While the NIAC seeks concepts that stretch the imagination, these concepts should be based on sound scientific principles.

Student advanced concept proposals should be aimed well beyond the evolution of technical approaches that occupy current programs and set new, revolutionary directions that can offer the prospect of significant and dramatic advances in aeronautics and space. We are seeking advanced concepts that are revolutionary, and which will expand our vision of future possibilities and may inspire a paradigm shift in our approach to the challenges of aeronautics and space. In the context of the NIAC requirements, successful proposals for advanced concepts will be revolutionary, new and not duplicative of concepts previously studied by NASA.

The NIAC is specifically NOT interested in concept development efforts that, for example, would:

- Be solely to perform basic research experiments on fundamental processes or theoretical derivations with no connection to an overall advanced concept.
- Accomplish an incremental system development, technology demonstration, or other supporting development program that is closely linked to an existing NASA program or mission and would be a near-term progression of the existing program or mission;
- Be solely based on technically unsubstantiated science fiction;

VI. Evaluation of Proposal

Proposals for the NIAC Student Fellows Prize will be evaluated in the context of the following qualities:

- Revolutionary character of the technically credible advanced concept.
- Organization and clarity of presentation.
- Evidence of creativity and originality in student’s technical accomplishments.
- Student’s potential for future technical creativity and revolutionary approach in development of the proposed advanced concept.
- Potential for the prize to enhance the student’s independent creativity.

VII. Disclosure

All interested parties need to be aware that the NIAC intends to publicly make available the results of all funded advanced concept studies. Final reports generated as a result of NIAC funded concept development and briefings given by NIAC Student Fellows at NIAC sponsored meetings will be made available to the public on the NIAC website. The NIAC attracts revolutionary ideas from a greatly expanded community and will create a

dynamic interchange of competing future options. This interchange is a completely open debate and discussion.

VIII. Format of Proposal

Only electronic proposals submitted in accordance with the following instructions will be considered for the NIAC Prize.

Transmittal Email

The transmittal email should contain pertinent information about you such as your name, address, telephone number, email address, concept title, the name of the institution you are attending and your current class year (freshman, sophomore, etc.). This email shall have as attachments a separate file for your proposal, academic mentor letter of endorsement file and if required, industrial mentor letter of endorsement file.

The transmittal email and attendant files are to be sent to niacstudents@niac.usra.edu. Proposals submitted in response to this call must electronically arrive at the NIAC on or before 23:59 April 16, 2007 EST to be considered in this proposal review cycle.

Proposal

Your proposal should not exceed ten pages. The entire proposal must be in a font size that is readable, in an 8.5 by 11 inch format and contain a minimum of 1 inch margins. The proposal must be submitted in a portable document format (.pdf) file and that .pdf file size shall not exceed 500KB.

Proposal should include within the 10-page limit:

- Introduction and relevance (an overview of the proposal of your concept including the potential impact on future space missions, not to exceed one page).
- Description of the proposed advanced concept, including background and the current approaches to the problem you are addressing.
- Discussion of approaches for implementing the concept (brief roadmap to the future).
- Study plan describing how you are going to execute and manage the study.
- Bibliography of key references related to your endeavor.
- In addition, please provide a section describing your current studies and career objectives, with particular examples of past and present technical, creative activities (not to exceed two pages).

Letter(s) of Endorsement:

In order for a proposal to be accepted, it must contain at a minimum an academic mentor letter of endorsement. The letter(s) will be submitted in a separate .pdf file along with the proposal file in the transmittal email. There is no file size limit for a letter(s) of endorsement. However, each letter must contain sufficient mentor related information (mentor name, address, telephone number, email address, etc.) to potentially allow the NIAC to verify its contents. Letters of endorsement are not a part of the 10 page proposal limit.

Academic Mentor Letter of Endorsement:

Each proposal must include a letter of endorsement from your academic mentor. This advisor is expected to provide guidance and oversight with the assurance that the student's prize research does not interfere with their progress through the degree program.

Industrial Mentor Letter of Endorsement:

In addition, those students proposing a concept to be developed in an industrial setting must also include a letter of endorsement from an industrial mentor. This industrial mentor will facilitate the student's ability to work in the industrial setting.

Questions and further background:

Questions about the Prizes can be sent to niacstudents@niac.usra.edu. Past and present Student Fellows work can be found at <http://www.niac.usra.edu/students/winners.html>

IX. Cancellation of this Call for Proposals

NIAC reserves the right to make no awards under this Call and to cancel this Call. USRA assumes no liability for canceling the Call or for any entity's failure to receive actual notice of cancellation. USRA will assume no responsibility for costs incurred by any individual or organization in the preparation of a proposal in response to this Call.