
**NIAC CP 99-01**

# CALL FOR PROPOSALS

## 1999 PHASE II ADVANCED AERONAUTICAL/SPACE CONCEPT STUDIES

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| **Proposals Due:** | **May 31, 1999** |

## INTRODUCTION and INVITATION

Normal development of the NIAC advanced concepts will be carried out through issuance of research sub-grants or subcontracts in a two-phased approach. Phase I awards of approximately $50K-$75K will be for 6 months to validate the viability of the proposed concept and definition of major feasibility issues. Phase II award(s) of from $350K-$500K for a period of 18-24 months would study the major feasibility issues associated with cost, performance, development time and key technology issues. Both Phase I and Phase II awards will be competitively selected by the NIAC based on an independent peer review with technical concurrence by NASA.

As a NIAC Phase I grant recipient you are invited to submit a Phase II proposal. Due date for submission of a Phase II proposal in response to this Call for Proposals, CP 99-01, is May 31, 1999. The due date for your Phase I Final Report is 30 days after the completion of your Phase I grant. All Phase I grants issued under CP 98-01 began November 1, 1998 and therefore, the due date for your final report is also May 31, 1999. The receipt of your final report on your Phase I grant is a firm requirement for your Phase II proposal to be considered in this Phase II evaluation cycle. Your final report will be incorporated by reference with your Phase II proposal.

**The primary goal of the Phase II efforts is to provide a sound basis for NASA to consider the concept for a future mission.**

If you are not prepared to submit a Phase II proposal by the deadline of May 31, 1999, you may submit a Phase II proposal in response to future Phase II Call for Proposals and it will be considered with other proposals submitted to that future Call.

**Phase II award(s) will only be made based on a down select from successfully completed Phase I efforts**. **A Phase I effort is only considered to be successfully complete if a written final report has been received by the NIAC. Note that the due date for the final report and for this Phase II Call for Proposals is May 31, 1999.**

The NIAC is functionally independent of NASA and the concepts it selects for government support will be the result of an external review by respected technical experts. A peer review process shall be used to competitively award sub-grants or subcontracts based on proposals with the highest technical merit. The NIAC staff and participants in peer reviews will follow a Conflict of Interest Avoidance Plan developed by the Universities Space Research Association (USRA). All participants will certify as to their adherence to the plan.

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 will be made available through the NIAC web site (http://www.niac.usra.edu). This being the case, the institute actively discourages the use of proprietary data and/or trade secrets (see Appendix A).

## SCOPE

The Phase II efforts supported through the NIAC funding can be the framework for future NASA missions and programs. Advanced concept proposals should be aimed well beyond the evolution of technical challenges that occupy current programs and set new, **revolutionary** directions in aeronautics and space. As a reminder, we are seeking advanced concepts, ***specifically systems and architectures***, that are revolutionary, and which ***will expand our vision of future possibilities***. In the context of the NIAC requirements, successful proposals for advanced concepts will be:

- ***Revolutionary, new and not duplicative of previously studied concepts***
- ***An architecture or system***
- ***Described in a mission context***
- ***Adequately substantiated with a technical description***
- ***Largely independent of existing technology***

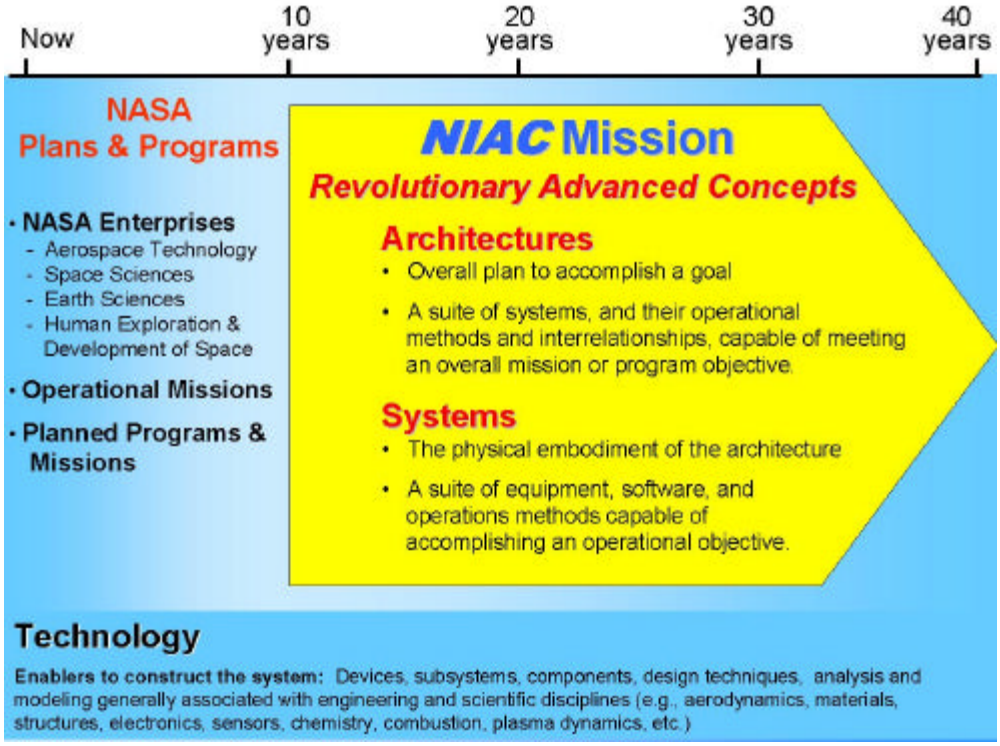


Figure 1: ***NIAC Advanced Concepts Mission***

Figure 1 depicts the relationship between the current NASA programs, technology and the NIAC mission for development of advanced concepts aimed at the time period of 10 to 40 years into the future. The general thrust of the NIAC advanced concepts is to develop revolutionary ideas which have a potential for leaping well past the current plans and can expand the vision of NASA's long-range strategic plans**.** NIAC advanced concepts must be focused on achieving a decision point for implementation of an architecture or system in the time period of 10-40 years into the future. Since these concepts may be largely independent of existing technology, these revolutionary

architectures and systems may provide the rationale and driving force for the identification and focusing of future efforts on critical, enabling technology. **However, the NIAC is not interested in funding technology concepts or technology development which, by their very nature, are narrowly focused on the development and performance of subsystems or components.**

## Additional Background Information

The NASA Strategic Plan and NASA Enterprise Strategic Plans provide valuable background information about the visions of future aeronautics and space programs, and should be considered as a starting point for the development of revolutionary concepts being sought by the NIAC. The proposer should become familiar with the information supplied in the NASA website, http://www.nasa.gov/, which provides valuable insight into the NASA Mission, current activities and future directions.

# INSTRUCTIONS FOR RESPONDING TO NIAC CALL FOR PROPOSALS

## A. General

1. Proposals received in response to a NIAC CP will be used only for evaluation purposes. The NIAC does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to a NIAC CP to be used as the basis for a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

2. A solicited proposal that results in a NIAC award becomes part of the record of that transaction. It is envisioned that the final report will be available to NASA and the public through the NIAC web page; however, information or material that the NIAC and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law.

3. A sub-grant, subcontract or other agreement may be used to accomplish an effort funded in response to a NIAC CP. The NIAC and USRA will determine the appropriate instrument. Subcontracts resulting from NIAC CP's are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement (NFS). Any resultant sub-grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1) and USRA Procurement Policies.

4. The NIAC does not intend to hold formal discussions as part of the award process so proposals should be as complete as possible in the initial submission. However, should a question arise after release of this CP and prior to the proposal due date, questions will be entertained under the following ground rules:

   a. Questions related to CP99-01 should be E-Mailed to the NIAC Director at bob.cassanova@niac.usra.edu. The deadline for submission of questions is one (1) week prior to the proposal due date. No questions will be answered after the deadline.

   b. The Director of NIAC will review the questions and answer by a return E-mail to the proposer.

   c. Any verbal discussions with potential proposers shall be limited to clarification of the requirements set forth in CP99-01.

5. As mentioned in the **Introduction**, the NIAC is chartered to operate as a virtual institute. The NIAC is equipped with the latest office communications systems, electronic technology and staffed at a much lower level than that employed in traditional paper-based operations. This fact necessitates that proposal transmissions in response to this CP conform to the following requirements:

a. The proposer's technical and cost proposal shall be attached as separate files to one E-Mail and sent to phase2@niac.usra.edu. Both proposals shall be converted by the proposer to a portable document format (.pdf) prior to transmission. Information regarding .pdf is located at http://www.adobe.com.

   1) The technical proposal .pdf file name shall be the principal investigator's (see D.2.e.) first initial and last name "_t.pdf" (Example: The principal investigator's name is Thomas Carter. The technical proposal file name is tcarter_t.pdf). If the proposer's computer operating system limits the number of characters to eight (8) in the file name, then use the first initial and up to the first five (5) characters of the last name (Example: tcarte_t.pdf).

   2) Technical proposals converted to .pdf shall not exceed 600 KB in size. Proposers are cautioned against using gratuitous graphics that unduly increase the file size and do not contribute to the technical content of the proposal.

   3) The cost proposal .pdf file name shall contain "_c.pdf" following the principal investigators first initial and last name. (Example: The principal investigator's name is Thomas Carter. The cost proposal file name is tcarter_c.pdf). If the proposer's computer operating system limits the number of characters to eight (8) in the file name, then use the first initial and up to the first five (5) characters of the last name (Example: tcarte_c.pdf).

   4) There is no electronic file size limitation for the cost proposal. However, proposers are cautioned against using gratuitous graphics that unduly increase the file size.

b. Proposals transmitted by any other method, format or size than that specified above shall not be considered by the NIAC for award.

6. To be considered for award, a submission must present a specific area of study containing sufficient technical and cost information to permit a meaningful evaluation. Also, it must not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate research pursuant to a more specific or pending solicitation.

7. Phase I grant final reports must be received on or before the due date for CP 99-01, May 31, 1999, for a Phase II proposal to be considered in this evaluation cycle. Phase I final reports will be incorporated by reference with your Phase II proposal.

8. Proposals submitted in response to CP 99-01 must electronically arrive at the NIAC on or before 12:00 p.m. on May 31, 1999 to be considered in the CP 99-01 cycle. Furthermore, all proposals must be in English and all costs in U.S. dollars.

## B. Schedule and Deliverables

1. Phase II efforts may be proposed with a performance period of 18 to 24 months. The period of performance will commence upon award of the appropriate contractual instrument.

2. Phase II deliverables:

   a. Monthly written status reports to the NIAC Director.

   b. A final written report at the conclusion of the effort.

   c. NIAC Fellow (PI) participation and presentation of a status report at a NIAC Fellows Conference, held once per year in Atlanta, Georgia and at the NIAC Annual Meeting, held once per year in the Washington, DC area.

   d. Copies of any briefings, presentations or professional society technical papers pertaining to the proposed Phase II area of study.

## C. Proposal Content and Format

1. Transmittal Letter or Prefatory Material (1 page maximum):

   a. The legal name and address of the organization and specific division or campus identification, if part of a larger organization.

   b. A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press.

   c. Type of organization: e.g., profit, nonprofit, educational, small business, minority, woman-owned, Historically Black College or University, etc.

   d. Name, telephone number, fax number and E-Mail address of the principal investigator and business personnel who may be contacted during evaluation and negotiation.

   e. Identification of other organizations that are currently evaluating a proposal for the same effort.

   f. Identification of this Call for Proposal by number and title.

   g. Dollar amount requested, desired starting date and duration of project.

   h. Date of submission.

2. Technical Proposal (25 pages maximum):

   a. Abstract

      Include a 150-300 word abstract which will be posted on the NIAC web site if a Phase II contract is awarded. This abstract should address the evaluation criteria in these instructions.

   b. Advanced Concept Description

      This section of the technical proposal shall be a detailed description of the concept to be investigated. It should include objectives and expected significance, relation to the present state of knowledge, and relation to previous work done on the project under the Phase I sub-grant and to related work in progress elsewhere. You may incorporate the related NIAC Phase I sub-grant Final Report by reference. A summary of Phase I results should be included. It is not necessary to repeat detailed information in the Phase II proposal that is contained in the Phase I Final Report except as necessary to assure clarity of continuity and context. The concept description should address the evaluation criteria in these instructions.

   c. Advanced Concept Development Plan

      This section of the technical proposal should outline the advanced concept development plan and a description of analysis methods and procedures. Also, any substantial collaboration with individuals or organizations and the use of consultants should be described. The plan should address the evaluation criteria in these instructions with an emphasis on identifying enabling technologies, pathways for development of a technology roadmap, costing methodology, and potential performance and cost benefits. The plan should also identify a plausible scenario for integrating the concept into a future NASA mission or program.

   d. Management Approach

      In the event large or complex efforts involving interactions among numerous individuals or other organizations are proposed, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described.

   e. Personnel

      The principal investigator (PI) is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. Include a short biographical sketch of the PI, a list of any publications relevant to the proposed concept and any exceptional qualifications. Omit social security numbers and other personal

items that do not merit consideration in evaluation of proposals. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

f. Special Matters

1) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other Government-wide guidelines.

2) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal.

3. Cost Proposal (no page limit, see Appendix B):

a. The cost proposal shall be submitted as a separate proposal from the technical proposal. As applicable, include separate cost estimates for salaries and wages, fringe benefits, equipment, expendable materials and supplies, services, domestic and foreign travel, ADP expenses, publication or page charges, consultants, subcontracts, other miscellaneous direct costs and indirect costs. Do not use separate “confidential” salary pages. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants and technical and other non-professional personnel). Estimate all staffing data in terms of staff-months or fraction of full-time.

b. Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired, purpose and estimated number and lengths of trips planned. Also include basis for indirect cost computation and clarification of other items in the cost proposal that are not self-evident.

c. At the conclusion of your cost proposal section, include a projected total monthly funding profile. The grand total of this monthly funding profile should very closely approximate the total proposed cost in the cost section.

d. Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

4. Classified Material

   Proposals shall not contain any classified material.

## D. Length

A concerted effort should be made to keep proposals as brief as possible, concentrating on substantive material. The maximum technical proposal size is 25 pages. The proposal transmittal letter shall be included with the technical proposal .pdf file and is not included in the technical proposal page count so long as it does not exceed one page in length. The cost proposal has no page limit. The entire proposal must be in a font size that is readable, in a 8.5 by 11 inch format and contain a minimum of 1 inch margins. The technical proposal, after conversion to .pdf format, shall not exceed 600KB in size.

## E. Representations/Certifications

Should a proposal be selected by the NIAC for a Phase II award, the proposer will be supplied the necessary representations/certifications by USRA. The proposer must supply fully executed originals of these representations/certifications prior to award.

## F. Joint Proposals

Where multiple organizations are involved, the proposal must be submitted by only one organization. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards could be made.

## G. Late Proposals

A proposal or modification received after the date specified in this Call for Proposals will not be considered by the NIAC during this proposal cycle.

## H. Withdrawal

The proposer may withdraw their proposal(s) at any time before award. Proposers are requested to notify the NIAC if the proposal is funded by another organization or of other changed circumstances, which dictate termination of the peer review for that particular proposal.

## I. Evaluation Criteria

1. The principle elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's and the NIAC's objectives, intrinsic merit, cost realism and successful performance of work under the Phase I Grant. Specific aspects of these elements are as follows:

a. Does the proposal continue the development of a revolutionary architecture or system in the context of a future NASA mission? Is the proposed work likely to provide a sound basis for NASA to consider the concept for a future mission or program?

b. Is the concept substantiated with a description of applicable scientific and technical disciplines necessary for development?

c. Have the enabling technologies been identified and has a pathway for development of a technology roadmap been adequately described?

d. Has the pathway for development of a cost of the concept been adequately described and are costing assumptions realistic? Have potential performance and cost benefits been quantified?

2. Evaluation of the cost of a proposed effort may include the realism and reasonableness of the proposed cost and available funds.

## J. Selection Process

1. The NIAC Director, based on recommendations from the peer review panels, will make the final selection decision. In all cases, proposals are subject to scientific review by discipline specialists in the area of the proposal.

2. NIAC may elect to schedule a site visit before a selection is made. Site visits will be scheduled in advance with the PI.

3. Other factors to be considered by the NIAC Director in the decision process are:

a. Technical, management and cost performance of the PI during the NIAC Phase I grant period of performance.

b. How well qualified is the proposer (individual or team) to conduct the project?

c. How well conceived and organized is the proposed activity?

## K. Selection for Award

1. Following selections, all proposers will be notified by electronic or postal mail of the decision on their proposal. The NIAC may desire to select only a portion of a proposer's area of study, in which case the proposer will be given the opportunity to accept or decline such partial support.

2. When a proposal is not selected for award, the proposer will be notified. The NIAC will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

3. When a proposal is selected for award, USRA personnel will negotiate the award by the NIAC. The proposal is used as the basis for negotiation. Certain business data may be requested prior to award. USRA will forward a model award instrument and other pertinent information to the awardee at the conclusion of negotiations.

## L. Cancellation of Requirement

The NIAC reserves the right to make no awards under this CP and to cancel this CP. USRA assumes no liability for canceling the CP 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 CP.

# APPENDIX A
## NASA White Paper on Property Rights

Any ideas or concepts generated during performance of a NIAC subcontract fall under either the Patent Rights clause (or New Technology clause for large businesses) or the Rights in Data - General clause, or both.

If the idea or concept has not been developed in sufficient detail to the level of an "invention" that satisfies statutory requirements, then the information or data on that idea falls exclusively under the Rights in Data - General clause and the Government obtains unlimited rights. Unlimited rights means the right of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have others to do so.

If the idea or concept is developed to the point that it satisfies the statutory requirements for obtaining a patent, then the "invention" falls under the Patent Rights clause and the contractor can, at its option, decide to pursue patent protection on that invention. If patent protection is pursued by the contractor, the contractor will own title to the invention, and the Government obtains a minimum government purpose license to use for its purposes, including future procurement. If the contractor decides not to pursue patent protection on the invention; then NASA can, at its option, pursue patent protection. NASA would own title to which NASA can license third parties. Due to the nature of the ideas and concepts to be generated, it was our opinion that most, if not all, of the advanced concepts would not be sufficiently developed to satisfy the patentability requirements.

If the idea or concept is software-related (with actual code creation), it falls under both the Patent Rights clause and the Rights in Data – General clause. Both patent and copyright protection may be established in software. Under the Rights in Data - General clause, NASA does not have to grant the contractor permission to assert claim to copyright in the software if it is the desire of NASA to make the software freely available to the public.

Any ideas generated at private expense and outside the contract that are proposed to be "further developed" under the contract, could be marked by the participant as proprietary or a trade secret. If NASA decides it is acceptable for the Institute to consider and accept proprietary ideas, then that data would be delivered with a notice or legend as "limited rights data" with appropriate restrictions placed on its dissemination. NASA and the NIAC plan to disseminate all technical information reported to the Institute, accepting such limited rights data could restrict such dissemination and is not recommended.

In summary, in the private sector, ideas may be kept as trade secrets. Ideas that reach the level of inventions may also be kept as trade secrets. There is nothing mandating that someone in the private sector select patent protection as the form of intellectual property over a trade secret as the form of intellectual property. However, in the world of Government contracts, there are no trade secrets to ideas or inventions generated under contracts funded by the Government. Data on ideas can be disseminated. Patent protection is available if the idea or concept has been sufficiently developed to satisfy statutory requirements for obtaining a patent. The patent provides its owner with the right to exclude others from making, using and selling the invention, but the idea is fully disclosed in the published patent. Copyright protection, if available, protects the expression of an idea -- not the idea itself.

The Patent Rights Clause (52.227-11) or the New Technology Clause (1852.227-70), where appropriate, must flow down to the NIAC subcontractors. The rights and procedures established by the Rights in Data - General clause (52.227-14) should also flow down, although this is not the data clause used in our standard grant instruments if the Institute decides to use a grant.

# APPENDIX B

## Cost Breakdown Format

| | MONTHS | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | ……..N |
| DIRECT LABOR | | | | |
| TOTAL DIRECT LABOR | | | | |
| OVERHEAD | | | | |
| Fringe Benefits | | | | |
| Overhead | | | | |
| Subcontract | | | | |
| SUBTOTAL DIRECT LABOR | | | | |
| MATERIALS | | | | |
| EQUIPMENT | | | | |
| SUBCONTRACTS | | | | |
| TRAVEL | | | | |
| OTHER DIRECT COSTS | | | | |
| OTHER | | | | |
| TOTAL OTHER DIRECT COSTS | | | | |
| G & A | | | | |
| SUBTOTAL COSTS | | | | |
| FEE | | | | |
| TOTAL PRICE | | | | |