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RESEARCH OPPORTUNITIES IN AERONAUTICS – 2013  
(ROA-2013)

NASA RESEARCH ANNOUNCEMENT (NRA): NNH13ZEA001N

SOLICITING BASIC AND APPLIED RESEARCH PROPOSALS

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA) NUMBER: 43.002

ISSUED: December 18, 2012

PROPOSALS DUE

STARTING NO EARLIER THAN January 28, 2013

THROUGH NO LATER THAN September 30, 2013

## RESEARCH OPPORTUNITIES IN AERONAUTICS (ROA) – 2013

### EXECUTIVE SUMMARY

This NASA Research Announcement (NRA), entitled *RESEARCH OPPORTUNITIES IN AERONAUTICS (ROA) – 2013*, solicits foundational research in support of the Aeronautics Research Mission Directorate (ARMD), National Aeronautics and Space Administration (NASA). This NRA covers a variety of topics in aeronautics fundamental research that are being pursued by NASA personnel. Specific research thrusts are outlined in the Appendices. A major focus of this NRA is to encourage collaboration between other organizations and NASA to help achieve specific goals in a variety of foundational aeronautics research programs.

Details for award scope are provided for each project task area listed in the Appendices. Awards will be made as grants, cooperative agreements or contracts, depending on the nature of the proposing organization and/or program requirements. It is anticipated that the majority of awards will be cooperative agreements or contracts due to the expected collaborative nature of the work specified in the technical appendices. Section D of the *NASA Guidebook for Proposers* (<http://www.hq.nasa.gov/office/procurement/nraguidebook>) provides a discussion regarding funding mechanisms. The typical period of performance for an award is three years, although a few programs may specify shorter or longer (maximum of five years) periods. Note that it is generally NASA's policy to conduct research with non-U.S. organizations on the basis of no exchange of funds. Details of the solicited program elements along with any changes or modifications to any of these guidelines will be specified in the descriptions in the Appendices of this solicitation. Proposal due dates are given in Tables 2 and 3 which are located at the end of this NRA.

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## RESEARCH OPPORTUNITIES IN AERONAUTICS (ROA) – 2013

### SUMMARY OF SOLICITATION

#### I. FUNDING OPPORTUNITY DESCRIPTION

##### (a) Strategic Goals of NASA's Research Program

The National Aeronautics and Space Administration's (NASA) Mission,

*To pioneer the future in space exploration, scientific discovery, and aeronautics research,*

draws support from NASA's world-class capability for aeronautical research founded on a tradition of expertise in aeronautical engineering and core research areas. The Aeronautics Research Mission Directorate (ARMD) is responsible for achieving NASA Strategic Goal 4, "Advance aeronautical research for societal benefit". The objectives of ARMD are three fold to meet this Goal: (1) take responsibility for the intellectual stewardship of the core competencies (to include facilities) of aeronautics for the Nation in all flight regimes, (2) establish a technical challenge-based approach to research that enables near-term results while focusing on long-term cutting edge research, and (3) ensure long-term, stable, strategic investment in aeronautics research to benefit both civilian and military applications.

In addition, the ARMD research plans directly support the National Aeronautics R&D Policy and accompanying Executive Order 13419 signed by the President on December 20, 2006 and the National Plan for Aeronautics R&D and Related Infrastructure that was released in December 2007 and updated in February 2010. A Technical Appendix to the National Plan was approved on December 22, 2008, and contains additional technical content on Aeronautics R&D goals and objectives and a preliminary assessment of current relevant Federal Aeronautics R&D activities. Specifically, ARMD conducts high-quality, cutting-edge research that includes foundational research across a breadth of core aeronautics competencies that supports aeronautics and space exploration activities; research in key areas related to the development of advanced aircraft technologies and systems, including those related to aircraft safety, environmental compatibility, and fuel efficiency; systems-level technology assessments in relevant environments; and research that supports the Next Generation Air Transportation System (NextGen) in partnership with the Joint Planning and Development Office (JPDO). In addition, ARMD is pursuing a coordinated approach to managing the Nation's research, development, test, and evaluation (RDT&E) infrastructure with other agencies, particularly the DOD. Additional information about ARMD can be found at <http://www.aeronautics.nasa.gov>.

An important goal of the ARMD NRA is to generate knowledge that can benefit the Nation. Therefore, it is expected that award recipients will publish their work and will

utilize peer-reviewed publications to the greatest practical extent.

Further valuable, in-depth insight into NASA's strategic plan and supporting aeronautical research areas may be found in the *2011 NASA Strategic Plan* available at [http://www.nasa.gov/pdf/516579main\\_NASA2011StrategicPlan.pdf](http://www.nasa.gov/pdf/516579main_NASA2011StrategicPlan.pdf)

The NASA strategic goals from *The 2011 NASA Strategic Plan* are given in Table 1.

#### (b) NASA's Aeronautics Research Mission Directorate Programs

ARMD addresses the above objectives in six programs: the Fundamental Aeronautics Program, the Aviation Safety Program, the Airspace Systems Program, the Integrated Systems Research Program, the Aeronautics Test Program, and the Aeronautics Strategy and Management Program. The Airspace Systems Program will directly address the Air Traffic Management (ATM) research needs of the Next Generation Air Transportation Systems (NextGen) initiative as defined by the Joint Planning and Development Office (JPDO). The Aviation Safety Program will take a proactive approach to safety challenges with new and current vehicles and with operations in the Nation's current and future air transportation system. The Fundamental Aeronautics Program will pursue long-term, cutting edge research in all flight regimes to produce data, knowledge, and design tools that will be applicable across a broad range of air vehicles that fly through any atmosphere at any speed. The Integrated Systems Research Program will conduct research at an integrated system-level on promising concepts and technologies and explore/assess/demonstrate the benefits in relevant environments. The Aeronautics Test Program (ATP) is focused on ensuring a healthy suite of facilities and platforms to meet the nations testing needs including the development of new test instrumentation and test technologies. The Aeronautics Strategy and Management Program provides research and programmatic support that benefits each of the other five ARMD programs. The program efficiently manages directorate functions including: Innovative Concepts for Aviation, Education and Outreach, and Cross Program Operations.

This NASA Research Announcement (NRA) solicits proposals for five of these programs: (1) Fundamental Aeronautics Program, (2) Aviation Safety Program, (3) Airspace Systems Program, (4) Integrated Systems Research Program, (5) Aeronautics Strategy and Management Program. Appendices A-E provide a detailed description for each of the research programs listed above. Each of these appendices is prefaced with an Overview section that provides an introduction to the research program content that all interested applicants to this NRA are encouraged to read. Proposals in response to this NRA should be submitted to the most relevant aeronautics program elements described in Appendices A-E (see also the *Table of Contents* that prefaces this NRA). Table 2 lists these programs in the order of their calendar deadlines for the submission of proposals, while Table 3 lists them in the order in which they appear in the appendices of this NRA. Questions about each specific program should be directed to the Program Officer(s) identified in the *Summary of Key Information* subsection that concludes each program description.

These appendices also provide clarifications or modifications, if any, to the general guidelines contained in this *Summary of Solicitation* for the individual program elements.

(c) References to Unique NASA Capabilities

NASA's Aeronautics Research Mission Directorate uses a variety of specialized test and high-end computational facilities to achieve its mission. Any need for these specific facilities for the proposed research must be explicitly described in the proposal, including the asset, rationale and justification of the need, how it supports the investigation, and when during the proposed period the resource will be required. As evaluation panels review the intrinsic merit of the proposed investigation, they will be asked to consider the realism and reasonableness of the request for unique NASA capabilities and whether it is an appropriate utilization of a highly constrained asset. Proposals selected for funding will be considered for an allocation of the requested NASA resources needed for their investigation, but availability of the resource to support the fully requested level cannot be guaranteed.

(d) 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 the public, astronauts and pilots, the NASA workforce (including employees working under NASA award instruments), and high-value equipment and property.

(e) Availability of Funds for Awards

Prospective proposers to this NRA are advised that funds are not in general available for awards for all of its solicited programs at the time of its release. The Government's obligation to make awards is contingent upon the availability of sufficient appropriated funds from which payment can be made and the receipt of proposals that NASA determines are acceptable for award under this NRA.

(f) Changes from ROA-2011

Proposers should be aware of the following changes in this NRA from ROA-2011.

- The Point of Contact information has changed – see Section VII
- Since no omnibus NRA was released in Fiscal Year 2012, this NRA is being designated as ROA-2013
- Congress has restricted awards involving China as well as awards to certain firms having tax liabilities or federal criminal convictions. Please see Section IV (e).



## II. AWARD INFORMATION

### (a) Funding and Award Policies

The amount of funds expected to be available for new awards for proposals submitted in response to this NRA is given in the *Summary of Key Information* subsection that concludes each program description in the appendices. The number of awards that may be made for each program element is also given in this location. Any deviation from the usual maximum duration for awards of three years will also be noted (some programs may specify only one year for activities of limited scope to as long as five years for extensive, comprehensive studies). While the *Summary of Key Information* provides estimates for the funding and the number of awards, these amounts may vary greatly depending on merit of the proposals submitted and the funding available at the time of selections.

In all cases, NASA's goal is to initiate new awards within 46 days after the selection of proposals is announced for each program. However, this time period may be longer based on the workload experienced by NASA, the availability of appropriated funds, and any necessary post-selection negotiations with the proposing organization(s) needed for the award(s) in question. Regarding this last item, every proposer is especially encouraged to submit full and detailed explanations of the requested budget (see further below) to help expedite the processing of the award should their proposal be selected.

Awards made through this NRA will be in the form of grants, cooperative agreements, or contracts depending on the nature of the work proposed, the submitting organization, and/or the specific requirements for awards given in each program description in the appendices. The type of award to be offered to selected proposers will generally follow the policies in Appendix D.1 of the *NASA Guidebook for Proposers*, although in a few cases only one type of award may be offered as specified in the program description. A NASA awards officer will determine the appropriate award instrument for the selections resulting from this solicitation. Grants and cooperative agreements will be subject to the provisions of the *NASA Grants and Cooperative Agreement Handbook*, hereafter referred to as the *Grants Handbook* (<http://prod.nais.nasa.gov/portals/pl/index.html>) and Appendix D of the *NASA Guidebook for Proposers*. In the case of any conflict, the *Grants Handbook* takes precedence. Contract awards will be subject to the provisions of the Federal Acquisition Regulations (FAR) and the NASA FAR Supplement <http://prod.nais.nasa.gov/portals/pl/index.html>. Depending upon the Technical, Scientific and Research requirements (i.e., by Project or Thrust Area) ARMD may make Multiple Year Awards under this NRA. Multiple Year Awards will be managed in accordance with Appendix D of the *NASA Guidebook for Proposers*.

### (b) Successor Proposals and Resubmissions

Generally, Principal Investigators holding previous awards selected through any of the programs offered through earlier NRAs are welcome to submit "successor" proposals that seek to continue a previously funded line of research (see Section 1.5 of the *NASA Guidebook for Proposers*). However, in order to ensure equitable treatment of all

submitted proposals, NASA does not extend any special consideration to such successor proposals in terms of preferential handling, review, or priority for selection. Note that the instructions regarding successor proposals in the *NASA Guidebook for Proposers* may have changed from past years. Proposers are strongly encouraged to review them.

Applicable proposals that were submitted but not selected for any previous NASA solicitation(s) may be submitted either in a revised or original form. Such submissions will be treated as a new proposal and will be subjected to a full peer review.

Funds provided as a result of instruments awarded under this NRA cannot be applied as contributions under Space Act Agreements that NASA may execute in support of related programs.

### III. ELIGIBILITY INFORMATION

#### (a) Eligibility of Applicants

Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, and not-for-profit institutions. Historically Black Colleges and Universities (HBCUs), Other Minority Universities (OMUs), small disadvantaged businesses (SDBs), veteran-owned small businesses, service disabled veteran-owned small businesses, HUBZone small businesses, and women-owned small businesses (WOSBs) are encouraged to apply. Participation by eligible non-U.S. organizations in this program is welcome but subject to NASA's policy of no exchange of funds, in which each government supports its own national participants and accounts for associated costs (further information on foreign participation is provided in Section 1.6 of the *NASA Guidebook for Proposers*).

Other government agencies, Federally Funded Research and Development Centers (FFRDCs), and NASA Centers are not eligible to submit proposals under this NRA or participate as team members under proposals submitted by eligible entities. NASA Centers will be involved to the extent they are carrying out responsibilities in connection with cooperative agreement or contracts. Additional information on collaboration opportunities may be found in appendices (A-E). Questions regarding NASA roles under cooperative agreements should be sent to the designated Point of Contact listed in the appropriate technical appendix (A-E).

#### (b) Number of Proposals and Teaming Arrangements

There is no restriction on the number of proposals that an organization may submit to this solicitation or on the teaming arrangements for any one proposal. However, each proposal must be a separate, stand-alone, complete document for evaluation purposes. The NRA is structured in a way that facilitates responses to individual subtopic areas. However, some project areas provide special instructions for addressing more than one subtopic in a single proposal. The proposer is responsible for reviewing any additional information that may be provided in project area instructions.

### (c) Cost Sharing or Matching

If an institution of higher education or other not-for-profit organization is selected to receive a grant or cooperative agreement, cost sharing is not required, although NASA can accept cost sharing if it is voluntarily offered (see the *Grants Handbook*, Section B, Provision 1260.123, “Cost Sharing or Matching”). If a commercial organization is selected to receive a grant or cooperative agreement, cost sharing is typically required unless the commercial organization can demonstrate that it does not expect to receive substantial compensating benefits for performance of the work. If this demonstration is made, cost sharing is not required but may be offered voluntarily (see also Section D, Provision 1274.204, of the *Grants Handbook*). See also Section V(a) below.

## IV. PROPOSAL AND SUBMISSION INFORMATION

### (a) Proposal Instructions and Requirements

All information needed to respond to this solicitation is contained in this ROA NRA and in the companion document entitled *Guidebook for Proposers Responding to a NASA Research Announcement* (hereafter referred to as the *NASA Guidebook for Proposers*) located at <http://www.hq.nasa.gov/office/procurement/nraguidebook>. By reference, the 2012 edition of the *NASA Guidebook for Proposers* is incorporated into this NRA, and proposers are responsible for understanding and complying with its procedures for the successful, timely preparation and submission of their proposals. Proposals that do not conform to its standards may be declared noncompliant and rejected without review.

The introductory material, as well as the appendices, of the *NASA Guidebook for Proposers* provide additional information about the entire NRA process, including NASA policies for the solicitation of proposals, guidelines for writing complete and effective proposals, and NASA’s general policies and procedures for the review and selection of proposals and for issuing and managing the awards to the institutions that submitted selected proposals.

Questions regarding this NRA or its program elements should be directed to the cognizant Program Officer listed in the program element’s description. Clarifications or questions and answers will be posted on the relevant program element(s)’s web page(s).

A group of *Frequently Asked Questions* provides additional miscellaneous information about a variety of the NASA proposal and award processes, policies, and procedures. The *Frequently Asked Questions* with general applicability to the majority or all of the solicitation are posted on the ARMD ROA page on NSPIRES. In addition, each Project Element may post additional *Frequently Asked Questions* in their respective pages on NSPIRES.

## (b) Content and Form of the Proposal Submission

### (i) Electronic Proposal Submission

All proposals submitted in response to this ROA NRA must be submitted in a fully electronic form. No hard copy of the proposal will be accepted. Electronic proposals must be submitted by one of the officials at the proposal principal investigator's organization who is authorized to make such a submission; electronic submission by the authorized organization representative (AOR) serves for the proposal as the required original signature by an authorized official of the proposing organization.

Proposers may opt to submit proposals in response to this ROA NRA via either of two different electronic proposal submission systems: either via the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES), the NASA proposal data system (<http://nspires.nasaprs.com>; see Section IV(b)(iv) below), or via Grants.gov (<http://www.grants.gov>; see Section IV(b)(v) below). Proposers are discouraged from submitting the same proposal to both electronic submission systems. NASA plans to use the NSPIRES system to facilitate the review process so all proposals received through Grants.Gov will be transferred into NSPIRES.

Note carefully the following requirements for submission of an electronic proposal regardless of the intent to submit via NSPIRES or Grants.gov.

- Every organization that intends to submit a proposal to NASA in response to this NRA, including educational institutions, industry, and not-for-profit institutions, must be registered in NSPIRES. This applies equally for proposals submitted via Grants.gov, as well as for proposals submitted via NSPIRES. Every organization that intends to submit a proposal through Grants.gov must also be registered in Grants.gov. Registration for either proposal data system must be performed by an organization's electronic business point-of-contact (EBPOC) in the Central Contractor Registry (CCR).
- Any organization requesting NASA funds through the proposed investigation must be listed on the Proposal Cover Page. NASA will not fund organizations that do not appear on the Proposal Cover Page.
- Each individual team member (e.g., PI, co-investigators, etc.), including all personnel named on the proposal's electronic cover page, must be individually registered in NSPIRES. This applies equally for proposals submitted via Grants.gov, as well as for proposals submitted via NSPIRES.
- Each individual team member (e.g., PI, co-investigators, etc.), including all personnel named on the proposal's electronic cover page, must specify an organizational affiliation. The organizational affiliation specified must be the organization through which the team member is participating in the proposed investigation. If the individual has multiple affiliations, then this organization may be different from the individual's primary employer or preferred mailing address.

Generically, an electronic proposal consists of one or more electronic forms, including an electronic cover page and one or more attachments. The attachments contain all sections of the proposal, including the science/technical/management section, as well as all required and allowed appendices; see Section IV(b)(ii) below for further requirements.

Submission of electronic proposals via either NSPIRES or Grants.gov requires several coordinated actions from the proposing organization. In particular, when the PI has completed entry of the data requested in the required electronic forms and attachment of the allowed PDF attachments, including the science/technical/management section, an official at the PI's organization who is authorized to make such a submission, referred to as the authorized organization representative (AOR), must submit the electronic proposal (forms plus attachments). Coordination between the PI and his/her AOR on the final editing and submission of the proposal materials is facilitated through their respective accounts in NSPIRES and/or Grants.gov. Note that if one individual is acting in both the PI and AOR roles, he/ she must ensure that all steps in the process are taken, including submitting the proposal from the organization.

#### (ii) Proposal Format and Contents

All proposals submitted in response to this NRA must include the appropriate required electronic forms available through either of two proposal submission systems, NSPIRES or Grants.gov.

The science/technical/management section and other required sections of the proposal must be submitted as searchable, unlocked PDF files that are attached to the electronic submission using one of the proposal submission systems. Proposers must comply with any format requirements specified in this NRA and in the *NASA Guidebook for Proposers* (e.g. Section 2.3 of the *NASA Guidebook for Proposers*). Only appendices/attachments that are specifically requested in either this NRA or in the *NASA Guidebook for Proposers* will be permitted; proposals containing unsolicited appendices/attachments may be declared noncompliant. Section 2 of the *NASA Guidebook for Proposers* provides detailed discussions of the content and organization of proposals suitable for all program elements in this NRA, as well as the default page limits of a proposal's constituent parts.

Note that some of the program elements in the Appendices of this NRA may specify different page limits for the main body of the proposal; if so, these page limits will be prominently given in the *Summary of Key Information* subsection that concludes each program element description. In the event the information in this NRA is different from or contradictory to the information in the *NASA Guidebook for Proposers*, the information in this NRA takes precedence.

A detailed Work Plan delineating how the Recipient/Awardee will accomplish the Goals and Objectives of the proposed Program, Thrust or Project Area (including applied Research Methodologies, Processes, and Resources, etc.) shall be included as part of the proposal. The Work Plan shall be evaluated in accordance with the requirements set forth in each of the applicable Appendices. For entities seeking contracts, a Statement of

Work (SOW) should be included as part of the proposal for the award of a contract. The SOW should include the following in the order listed: (1) Scope (2) Objectives (3) SOW tasks organized in a Work Breakdown Structure (WBS) (4) Program Schedule & Milestones (5) Measurable metrics, and (6) deliverables, which should be defined and described under the applicable task / WBS portion of the SOW. The SOW does not count against the page limit and should be inserted at the end of the proposal.

If a commercial organization seeks an award of a cooperative agreement that will involve cost sharing (see Section III (c)) or if milestone payments are anticipated, it is requested that a schedule of milestone payments be included in the proposal. The schedule should include a description of the milestone as a performance benchmark as well as the associated amount of funds to be paid or transferred upon successful completion of the milestone. The schedule does not count against the page limit of the proposal (See 1274.204(d) and 1274.908 of the *Grants Handbook*).

Important note on creating PDF files for upload: It is essential that all PDF files generated and submitted meet NASA requirements. This will ensure that the submitted files can be ingested by NSPIRES regardless of whether the proposal is submitted via NSPIRES or Grants.gov. At a minimum, it is the responsibility of the proposer to: (1) ensure that all PDF files are unlocked and that edit permission is enabled – this is necessary to allow NSPIRES to concatenate submitted files into a single PDF document; and (2) ensure that all fonts are embedded in the PDF file and that only Type 1 or TrueType fonts are used. In addition, any proposer who creates files using TeX or LaTeX is required to first create a DVI file and then convert the DVI file to Postscript and then to PDF. See [http://nspires.nasaprs.com/tutorials/PDF\\_Guidelines.pdf](http://nspires.nasaprs.com/tutorials/PDF_Guidelines.pdf) for more information on creating PDF documents that are compliant with NSPIRES. We have noted recent occurrences in which PDF files generated from newer versions of Microsoft Word have not been ingested properly into NSPIRES. PDF files that do not meet NASA requirements cannot be ingested by the NSPIRES system; such files may be declared noncompliant and not submitted to peer review for evaluation. Section 2.3.1 (c) of the *2012 NASA Guidebook for Proposers* describes how to review files generated in NSPIRES to ensure that all text, figures, tables, and required forms are complete and accurate.

### (iii) Additional ROA Requirement for Budget Format

The uniform policy concerning the review of proposals submitted in response to this ROA NRA against the cost evaluation criterion is described in Appendix C of the *NASA Guidebook for Proposers*. Peer reviewers will provide recommendations on the budget summary and budget justification for cost realism and cost reasonableness to ensure that the proposed technical work is feasible. NASA program personnel will conduct the complete evaluation of cost including the detailed budget and budget justification for all relevant factors including cost realism, cost reasonableness, total cost and comparison of the proposed cost to available funds.

In order to allow this division of review responsibilities, NASA will provide limited but sufficient proposal budget information to the peer review (work effort and personnel,

other direct costs including procurements and subawards/subcontracts) while reserving certain proposal budget details for NASA's use (costs of direct labor, indirect costs, total costs).

Therefore, ARMD places additional requirements on the submission of proposals in response to this ROA NRA. Where the requirements in this NRA conflict with requirements and instructions found elsewhere (e.g., in the *NASA Guidebook for Proposers*, NSPIRES instructions, or Grants.gov instructions), the requirements in this NRA have precedence. It is important that all proposers responding to this ROA NRA follow these additional instructions carefully to enable an appropriate evaluation of their proposals.

In addition to the budget summary information provided in the NSPIRES or Grants.gov Cover Page forms, all proposers are required to include more detailed budgets and budget justifications, including detailed subcontract/subaward budgets, in a format of their own choosing in the *Budget Justification*. For this NRA, this additional budget must be divided into three parts: the "*Budget Justification: Narrative*"; the "*Budget Justification: Details*," both as described in Section 2.3.10 of the *NASA Guidebook for Proposers*; and the "*Total Budget*," a requirement specific to this ROA NRA.

The *Budget Justification: Narrative* includes the *Table of Proposed Work Effort* and the description of facilities and equipment, as well as the rationale and basis of estimate for all components of cost including procurements, travel (destination, purpose and number of travelers), publication costs, and all subawards/subcontracts. The *Table of Proposed Work Effort* must include the names and/or titles of all personnel (including postdoctoral fellows and graduate students) necessary to perform the proposed investigation regardless of whether these individuals require funding from the current proposal. The number of person-months each person is expected to devote to the project must be given for each year.

The *Budget Justification: Details* must include the detailed proposed budget including all of the Other Direct Costs and Other Applicable Costs specified in the *NASA Guidebook for Proposers*. For this NRA, the *Budget Justification: Narrative* and the *Budget Justification: Details* should not specify the cost of Direct Labor or any Administrative Costs (e.g., overhead).

While the appropriate award instrument will be determined by the Government, offerors must indicate the assumed type of award used during budget preparation. If a contract is assumed, offerors must indicate the type of contract proposed (i.e. cost plus fixed fee, cost sharing, fixed price, etc.). Note that some topics described in Appendices A-E may specify an expected award type.

The *Total Budget* file must specify the complete set of cost components including all costs discussed in the *Budget Narrative* and *Budget Details*, as well as the Total Estimated Cost, cost of Direct Labor, and Administrative Costs (overhead). The *Total*



*Budget* document will not be provided to the non-government peer review, but will be used by NASA in the evaluation of total cost and comparison of the proposed cost to available funds. Proposers may also choose to include any data they consider to be sensitive financial information in the *Total Budget* file required by this Section of the ROA NRA. However, if any such information is excluded from the *Budget Justification: Narrative* and *Details* sections, a note should be included in the applicable section of the *Budget Justification: Narrative* or *Details* section to clarify where the information is located in the *Total Budget* file.

The required *Budget Justification: Narrative* and *Details* section of the proposal may be incorporated into the proposal document as these will be provided to the peer review (for submission via NSPIRES, the *Budget Justification: Narrative* and *Details* must be incorporated into the single proposal PDF file). Regardless of whether the proposal is submitted via NSPIRES or Grants.gov, proposers to the ROA must provide the *Total Budget* in a file called “totalbudget.pdf,” which is uploaded as a separate attachment in either NSPIRES or Grants.gov.

The peer reviewers only have access to the *Budget Justification: Narrative* and *Details*, and will not have access to the Total Estimated Cost, the cost of Direct Labor, and Administrative Costs (e.g., overhead). Therefore, failure to provide sufficient budget justification and data in the *Budget Narrative* (including the *Table of Proposed Work Effort*) and the *Budget Details*, will prevent the peer review from appropriately evaluating the cost realism of the proposal. A finding by the peer review of “insufficient information to properly evaluate cost realism” will be considered a weakness of the proposal. Inconsistent budget information between these budget descriptions will also be considered a weakness of the proposal.

#### (iv) Submission of Proposals via NSPIRES, the NASA Proposal Data System

Proposals may be submitted electronically via NASA’s master proposal data base system, the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES). In order to submit a proposal via NSPIRES, this NRA requires that the proposer register key data concerning the intended submission with NSPIRES; NSPIRES is accessed at <http://nspires.nasaprs.com>. 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.

It is especially important to note that every individual named on the proposal’s electronic *Cover Page* form (see below) as a proposing team member in any role, including co-investigators and collaborators, must be registered in NSPIRES and that such individuals must perform this registration themselves; no one may register a second party, even the Principal Investigator of a proposal in which that person is committed to participate. This data site is secure and all information entered is strictly for NASA’s use only.

All team members identified on the NSPIRES proposal cover page may indicate their commitment to the proposed work via NSPIRES.



- Each team member will receive an email from NSPIRES indicating that he/she has been added to the proposal and should log in to NSPIRES. Once logged in, the team member should follow the link in the "Reminders and Notifications" section of his NSPIRES homepage, titled "Need Co-I and/or Collaborator Statement of Commitment For: Proposal to Solicitation <<solicitation number>>." On the "Team Member Statement of Commitment -Confirmation" page, the team member should read the commitment language, click the "Accept" button, and then click "OK".
- PI's may monitor the status of team member commitments by examining the "Commitment Confirmed" column on the Team Member page of the NSPIRES proposal cover page record.
- If desired, statements of commitment from team members may be provided as letters attached to the proposal application

All proposals submitted via NSPIRES in response to this NRA must include a required electronic *Cover Page* form that is accessed at <http://nspires.nasaprs.com>. This form is comprised of several distinct sections: a *Cover Page* that contains the identifier information for the proposing institution and personnel; a *Proposal Summary* that provides an overview of the proposed investigation that is suitable for release through a publicly accessible archive should the proposal be selected; and a *Budget Summary* of the proposed research effort. Unless specified in the program description itself, no other forms are required for proposal submission via NSPIRES. See the *NASA Guidebook for Proposers*, Sections 2 and 3, for further details.

The required elements of the proposal, including the science/technical/management section, must be submitted as one or more PDF documents that are attached to the *Cover Page* using the tools in NSPIRES. It is possible that the complete proposal is submitted as a single, searchable, unlocked PDF document, that contains the complete proposal, including the science/ technical/ management section and budget justification (but not the *Total Budget*), assembled in the order provided in the *NASA Guidebook for Proposers* (see Section 2.3) and uploaded using the tools in NSPIRES. The Total Budget must be uploaded as a separate attachment in a file named "totalbudget.pdf". One advantage of submitting the proposal as one PDF document as described above is that it is easier for the proposer to create a table of contents that will be correct. If separate files are uploaded, there may be slight differences in page numbering due to the concatenation process. Any mismatch with the table of contents caused by this process does not impact the evaluation of the proposal.

NSPIRES will provide a list of all elements that make up an electronic proposal, and the system will conduct an element check to identify any item(s) that is (are) apparently missing or incomplete.

Proposers are encouraged to begin their submission process early. Tutorials and other NSPIRES help topics may be accessed through the NSPIRES online 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 E-mail

to [nspires-help@nasaprs.com](mailto:nspires-help@nasaprs.com) or by telephone to (202) 479-9376, Monday through Friday, 8:00 a.m. – 6:00 p.m. Eastern Time.

(v) Submission of Proposals via Grants.gov

NASA also offers proposers the option to utilize Grants.gov to prepare and submit proposals in response to this ROA NRA. Grants.gov allows organizations to electronically find and apply for competitive grant opportunities from all Federal grant-making agencies; it provides a single access point for over 1000 grant programs offered by the 26 Federal grant-making agencies. The U.S. Department of Health and Human Services is the managing partner for Grants.gov.

In order to submit a proposal via Grants.gov, Grants.gov requires that the Principal Investigator download an application package from Grants.gov. Identifying the appropriate application package requires the funding opportunity number for that program; the funding opportunity number may be found in the *Summary of Key Information* subsection that concludes each program description. Proposals submitted via Grants.gov must be submitted by the AOR.

Submitting a proposal via Grants.gov requires the following steps:

- Proposers must still register in NSPIRES even if they submit their proposal through Grants.gov (otherwise proposals cannot be ingested into NSPIRES for review and selection).
- Grant researchers (PIs) do NOT need to register with Grants.gov. To find solicitations, ref. "Find Grant Opportunities" at [http://www.grants.gov/applicants/find\\_grant\\_opportunities.jsp](http://www.grants.gov/applicants/find_grant_opportunities.jsp). Using a Basic Search, enter the Funding Opportunity Number to retrieve the application package all NASA application packages may be found by searching on CFDA Number 43.002.
- Download and install any required Grants.gov software applications or tools.
- Download the application package from Grants.gov at <http://www.grants.gov>.
- Complete the required Grants.gov forms including the SF424 (R&R) Application for Federal Assistance, R&R Other Project Information, R&R Senior/Key Person Profile, and R&R Budget.
- Complete the required NASA-specific forms: NASA Other Project Information, NASA Principal Investigator and Authorized Representative Supplemental Data Sheet, NASA Senior/Key Person Supplemental Data Sheet (this form is only required if there are Senior/Key Persons other than the Principal Investigator), and proposal summary form.
- Complete any NASA program-specific form that is required for the specific program element. This form, which is required by many NRAs, is included as a PDF form within the proposal application package downloaded from Grants.gov. The form, once completed, is attached to the NASA Other Project Information form.

- Create a proposal in PDF including the Science/Technical/Management section and all other required sections. Attach the proposal and any allowed appendices/attachments (also in PDF) to the appropriate Grants.gov form(s).
- Submit the proposal via the authorized organization representative (AOR); the PI may not submit the application to Grants.gov unless he/she is an AOR.

Potential applicants are urged to access Grants.gov site well in advance of the proposal due date(s) of interest to familiarize themselves with its structure and download the appropriate application packages and tools.

Additional instructions for formatting and submitting proposals via Grants.gov may be found in Sections 2 and 3 of the *NASA Guidebook for Proposers*. Instructions for the use of Grants.gov may be found in the *Grants.gov User Guide* at <http://www.grants.gov/assets/ApplicantUserGuide.pdf>.

Instructions for NASA-specific forms and NASA program-specific forms may be found in the application package. For any questions that cannot be resolved with the available on-line help menus and documentation, requests for assistance may be directed by E-mail to [support@grants.gov](mailto:support@grants.gov) or by telephone to (800) 518-4726., Monday through Friday, 7:00 a.m. – 9:00 p.m. Eastern Time.

#### (vi) Notice of Intent to Propose

For most of the programs advertised through this solicitation, a brief Notice of Intent (NOI) to propose is encouraged, but not required, for the submission of proposals to this solicitation. The information contained in an NOI is used to help expedite the proposal review activities and, therefore, is of considerable value to both NASA and the proposer. To be of maximum value, NOIs should be submitted by the proposal principal investigator to NSPIRES, NASA's master proposal data system located at <http://nspires.nasaprs.com>, by the dates given in Tables 2 or 3 below for each program in the Appendices. Note that NOIs may be submitted within NSPIRES directly by the proposal principal investigator; no action by an organization's AOR is required to submit an NOI.

Grants.gov does not provide NOI capability; therefore, NOIs must be submitted via NSPIRES regardless of whether the proposal will be submitted via NSPIRES or Grants.gov. Interested proposers must register with NSPIRES before it can be accessed for use; see Section IV(b)(i) above. Since NOIs submitted after the deadline may still be useful to NASA, late NOIs may be submitted by E-mail as directed in Section 3.1 of the *NASA Guidebook for Proposers*.

#### (vii) Conflict of Interest Check Information

In order to ensure that all proposal evaluations are conducted as fairly as possible, it is important to ascertain whether prospective reviewers may have conflicts of interest that might affect their capacity to function with impartiality. To facilitate the process of

identifying potential conflicts of interest, it is necessary to collect information about the organizations participating in each proposal. A NASA program-specific form will be used to collect this information. This form will be part of a submission to the NSPIRES system. Proposers using Grants.gov will have to ensure that they complete the NASA program-specific form as described in section I(b)(iii). Failure to submit this form via the NSPIRES system may result in the proposal being deemed nonresponsive to the NRA.

(c) Proposal Submission Dates, Time, and Location

For each program in Appendices A through E of this NRA, the electronic proposal must be submitted in its entirety by 11:59 p.m. Eastern Time on the appropriate proposal due date given in Tables 2 or 3 below. All proposals must be submitted electronically using NSPIRES or Grants.gov (see Sections IV(b)(i–v), above).

Proposals that are late will be handled in accordance with NASA’s policy as given in Section (g) of Appendix B of the *NASA Guidebook for Proposers* (also see Sections 3.2 and F.23). Proposals received after the due date may be returned without review. If a late proposal is returned, it is entirely at the discretion of the proposer whether or not to resubmit it in response to a subsequent appropriate solicitation. It is not possible to submit a late proposal electronically via NSPIRES unless the electronic Cover Page was initially created prior to the proposal due date. Late proposals may not be submitted via Grants.gov.

(d) Proposal Funding Restrictions

In addition to the funding restrictions and requirements given in the *NASA Guidebook for Proposers* and the *Grants Handbook*, the following restrictions are applicable to this ROA NRA.

- The estimated funding and number of proposals anticipated to be funded, as shown in the *Summary of Key Information* at the end of each program element, are subject to the availability of appropriated funds, as well as the submission of a sufficient number of proposals of adequate merit.
- The construction of facilities is not an allowed activity for any of the programs solicited in this NRA unless specifically stated. For further information on the allowability of costs, refer to the cost principles cited in the *Grants Handbook*, Section 1260.127.
- Typically travel, including foreign travel, is allowed as may be necessary for the meaningful completion of the proposed investigation, as well as for publicizing its results at appropriate professional meetings.
- Profit for commercial organizations is not allowable under grant or cooperative agreement awards but is allowable under contract awards.
- U.S. research award recipients may directly purchase supplies and/or services from non-U.S. sources that do not constitute research, but award funds may not be used to fund research carried out by non-U.S. organizations. However, subject to export control restrictions, a foreign national may receive remuneration through a NASA award for the conduct of research while employed either full or part time by a U.S. organization (see Section 1.6 of the *NASA Guidebook for Proposers*).

#### e) Restrictions on Awards

As directed by Grant Information Circular 12-01A in connection with issuing new Broad Agency Announcements (e.g., Announcements of Opportunity, NASA Research Announcements, and Cooperative Agreement Notices), grant officers shall add the following paragraph (See Assurance of Compliance – China Funding Restriction paragraph Section iv below) to the current proposal requirements set forth at 14 CFR § 1260.10 (c)(1) so that proposers, by submission of their proposal, represent that they are not China or a Chinese-owned company, and that they will not participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level or at any subrecipient level, whether the bilateral involvement is funded or performed under a no-exchange of funds arrangement.

#### **Assurance of Compliance – China Funding Restriction (DEVIATION FEB 2012)**

(iv) An Assurance of Compliance with The Department of Defense and Full-Year Appropriation Act, Public Law 112-10 Section 1340(a); The Consolidated and Further Continuing Appropriation Act of 2012, Public Law 112-55, Section 539; and future-year appropriations herein after referred to as “the Acts”, whereas:

(1) NASA is restricted from using funds appropriated in the Acts to enter into or fund any grant or cooperative agreement of any kind to participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level and at all subrecipient levels, whether the bilateral involvement is funded or performed under a no-exchange of funds arrangement.

(2) Definition: “China or Chinese-owned Company” means the People’s Republic of China, any company owned by the People’s Republic of China, or any company incorporated under the laws of the People’s Republic of China.

(3) The restrictions in the Acts do not apply to commercial items of supply needed to perform a grant or cooperative agreement.

(4) By submission of its proposal, the proposer represents that the proposer is not China or a Chinese-owned company, and that the proposer will not participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level or at any subrecipient level, whether the bilateral involvement is funded or performed under a no-exchange of funds arrangement.

#### (f) Proposal Requirements for Relevance

Proposals for all NASA sponsored research programs are usually evaluated on three criteria: intrinsic merit, relevance to NASA’s objectives, and cost realism and reasonableness (see Appendix C of the *NASA Guidebook for Proposers*). These criteria may be modified in the Appendices of this NRA. Each program element includes a specific description of how it is relevant to the NASA Strategic Plan. Therefore, unless otherwise stated in the program element, it is not necessary for individual proposals to show relevance to NASA’s broader goals and objectives. The proposal should instead focus on demonstrating relevance by discussing how the proposed investigation addresses the goals and objectives of the specific program element.

Note that this NRA references the strategic goals and objectives in the 2011 NASA Strategic Plan (see Section I(a) and Table 1).

## V. PROPOSAL REVIEW INFORMATION

### (a) Evaluation Criteria

Each proposal will be evaluated by peers of the proposing personnel to assess the proposal's intrinsic scientific and technical merit, its relevance to NASA's stated objectives, and its cost realism and reasonableness. See Appendix C.2 of the *NASA Guidebook for Proposers* for further discussion of these criteria and their relative weights. Some of the projects in the attached Appendices contain additional or tailored evaluation criteria. If any criteria in Appendices A-E conflicts with any other part of the NRA, the criteria identified in the Appendices take precedence over this and other sections of the NRA. The evaluation factors include factors evaluated by peer reviewers, as well as factors evaluated by NASA program personnel. Note the following specific points:

- Some of the programs discussed in the Appendices will provide specific factors, based on the solicited research objectives, which will be considered when evaluating a proposal's technical merits and/or its relevance to program objectives.
- As discussed in Section IV(e) above, relevance will be judged in part by the proposal's focus on specific objectives for the ARMD program element.
- Opinions on a proposal's cost may be offered by peer review (for cost realism and cost reasonableness), but NASA personnel will conduct the complete cost evaluation (for cost realism, cost reasonableness, total cost and comparison to available funds). Proposers must follow the budget format requirements in Section IV(b)(iii).
- The selection official may take program balance into account when selecting proposals for funding.
- Cost sharing is generally not considered as part of the evaluation (see Section III(c) above). However, cost sharing may become a factor at the time of selection when deciding between proposals of otherwise equal technical merits.

### (b) Review and Selection Processes

Review of proposals submitted to this NRA will be consistent with the general policies and provisions given in Sections C.1 through C.4 of Appendix C of the *NASA Guidebook for Proposers*, and selection procedures will be consistent with the provisions of Section C.5 of that document.

Unless otherwise specified, the Program Director responsible for a thrust area is the final Selecting Official. In cases where a conflict of interest exists, the Selecting Official will be designated by the Associate Administrator for Aeronautics.

(c) Partial Awards and Participation with Others

NASA reserves the right to select only a portion of a proposed investigation, usually at a level of support reduced from that requested in the original proposal or may also offer tentative selections in which NASA requests investigators to team in a joint investigation. Additionally, NASA may decide to award an effort for less than the full period of the proposal. In these cases, the proposer will be given the opportunity to accept or decline such selection. If the proposer accepts such an offer, a revised budget and statement of work may be required before funding action on the proposal can be initiated. If the proposer declines the offer of a partial selection, or participation in a joint investigation, the offer of selection may be withdrawn in its entirety by NASA.

(d) Selection Announcement and Award Dates

NASA's stated goal is to announce selections as soon as possible. However, NASA does not usually announce new selections until the funds needed for those awards are approved through the Federal budget process. Therefore, a delay in the budget process for NASA usually results in a delay of the selection date(s). After 150 days past the proposal due date for which a proposal was submitted, proposers may contact the responsible Program Officer listed at the conclusion of that program description in the appendices for the status of the selection activity.

Those proposers not selected will be notified by postal or electronic mail and offered a debriefing consistent with the policy in Section C.6 of the *NASA Guidebook for Proposers*.

(e) Process for Appeals

(i) Ombudsman Program

The NASA Procurement Ombudsman Program is available under this NRA as a procedure for addressing concerns and disagreements. The clause at NASA FAR Supplement (NFS) 1852.215-84 ("Ombudsman") is incorporated into this NRA. The cognizant ombudsman is

Ronald A. Poussard  
Director, Contract Management Division  
Office of Procurement  
NASA Headquarters  
Washington, DC 20546  
Telephone: 202-358-0445.

(ii) Protests

Only prospective offerors seeking contract awards under this NRA have the right to file a protest, either at the Government Accountability Office (GAO) or with the Agency, as defined in FAR 33.101. The provisions at FAR 52.233-2 ("Service of Protest") and NASA FAR Supplement (NFS) 1852.233-70 ("Protests to NASA") are incorporated into

this NRA. Under both of these provisions, the designated official for receipt of protests to the Agency and copies of protests filed with the GAO is

William P. McNally  
Assistant Administrator for Procurement  
Office of Procurement  
NASA Headquarters Mail Stop 5G70  
Washington, DC 20546.

(iii) Requests for Reconsideration

A Principal Investigator (PI) whose proposal has been declined may request an oral debriefing from the Program Officer. Following the debriefing, dissatisfied PIs may submit in writing a Request for Reconsideration to the Selecting Official. Details on this process may be found in Appendix H.3 of the *2012 NASA Guidebook for Proposers*.

VI. AWARD ADMINISTRATION INFORMATION

(a) Notice of Award

Notification of both the selected, as well as the nonselected proposers, will be consistent with the policy given in Section C.5.3 of the *NASA Guidebook for Proposers*. For selected proposers, the offeror's business office will be contacted by a NASA Awards Officer, who is the only official authorized to obligate the Government. For a grant or cooperative agreement, any costs incurred by the offeror in anticipation of an award will be subject to the policies and regulations of the *Grants Handbook* (see Section B, Part 1260.125(e)).

(b) Administrative and National Policy Requirements

This solicitation does not invoke any special administrative or national policy requirements, nor do the awards that will be made involve any special terms and conditions that differ from NASA's general terms and conditions as given in the *Grants Handbook* and the *NASA Guidebook for Proposers*. Please note that it is expected that proposers will comply with Homeland Security Presidential Directive/ HSPD-12. HSPD-12 applicability will be determined during negotiation for award for selected proposals.

(c) Award Reporting Requirements

The reporting requirements for awards made through this NRA will be consistent with Exhibit G of the *Grants Handbook*. Any additional requirements will be specified in the program description.



## VII. POINTS OF CONTACT FOR FURTHER INFORMATION

General questions and comments about the policies of this NRA may be directed to:

Susan Minor  
Deputy Director, Integration and Management Office  
Aeronautics Research Mission Directorate  
NASA Headquarters  
E-mail: [NASA-roa@nasa.gov](mailto:NASA-roa@nasa.gov)

Note: Proposals shall not be submitted to this E-mail address. Proposals shall be submitted electronically as described in Section IV above.

Specific questions about a given program element in this NRA should only be directed to the Program Officer(s) listed in the *Summary of Key Information* subsection that concludes each program description.

No communication concerning this NRA may be made to any other NASA official other than those specifically listed in this NRA.

Inquiries about accessing or using the NASA proposal data base located at <http://nspires.nasaprs.com> should be directed by an E-mail that includes a telephone number to [nspires-help@nasaprs.com](mailto:nspires-help@nasaprs.com) or by calling (202) 479-9376. This help center is staffed Monday through Friday, 8:00 a.m. – 6:00 p.m. Eastern Time.

Inquiries about accessing or using Grants.gov located at <http://www.grants.gov> should be directed by an E-mail to [support@grants.gov](mailto:support@grants.gov) or by calling (800) 518-4726. This customer support contact center is staffed Monday through Friday, 7:00 a.m. – 9:00 p.m. Eastern Time.

## VIII. ANCILLARY INFORMATION

### (a) Announcement of Updates/Amendments to Solicitation

It is possible that additional programmatic information for any of NASA's programs may develop before their proposal due dates. If so, such information will be added as a formal amendment to this NRA as posted at its homepage at <http://nspires.nasaprs.com>. It is the responsibility of the prospective proposer to check this NRA's homepage for updates concerning the program(s) of interest.

Any clarifications or questions and answers that are published will be posted either with the summary ROA NRA information or on the relevant program element(s)'s web page(s) at <http://nspires.nasaprs.com>.

### (b) Electronic Submission of Proposal Information

On-time electronic submission over the World Wide Web is required for every proposal. While every effort is made to ensure the reliability and accessibility of this Web site and to maintain a help center via E-mail and telephone, difficulty may arise at any point on the Internet, including the user's own equipment. Therefore, prospective proposers are urged to familiarize themselves with this site and to submit the required proposal materials well in advance of the deadline(s) of the program(s) of interest. Difficulty in registering with or using a proposal submission system (either NSPIRES or Grants.gov) is not, in and of itself, a sufficient reason for NASA to consider a proposal that is submitted after the proposal due date (see Section IV(c)).

## IX. CONCLUDING STATEMENT

Through this ROA NRA, NASA encourages the participation of the aeronautics communities in its Aeronautics Research Mission Directorate research and technology programs. Comments about this NRA are welcome and may be directed to the point of contact for general questions and comments identified in Section VII above.

Jay Dryer  
Director  
Fundamental Aeronautics Program

Doug Rohn  
Director  
Aviation Safety Program

John Cavolowsky  
Director

Airspace Systems Program

Ed Waggoner

Director

Integrated Systems Research Program

Timothy Marshall

Director

Aeronautics Test Program

Jaiwon Shin

Associate Administrator

Aeronautics Research Mission Directorate

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TABLE 1. NASA STRATEGIC GOALS

TABLE 1A. NASA’S STRATEGIC GOALS

- Strategic Goal 1: Extend and sustain human activities across the solar system.
- Strategic Goal 2: Expand scientific understanding of the Earth and the universe in which we live.
- Strategic Goal 3: Create the innovative new space technologies for our exploration, science, and economic future.
- Strategic Goal 4: Advance aeronautical research for societal benefit.
- Strategic Goal 5: Enable program and institutional capabilities to conduct NASA’s aeronautics and space activities.
- Strategic Goal 6: Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.

TABLE 1B. NASA’S Aeronautics Goals, Objectives, Outcomes

- Strategic Goal 4: Advance aeronautics research for societal benefit.
- Outcome 4.1: Develop innovative solutions and advanced technologies through a balanced research portfolio to improve current and future air transportation.
    - *Objective 4.1.1: Develop advanced technologies to improve the overall safety of the future air transportation system.*
    - *Objective 4.1.2: Develop innovative solutions and technologies to meet future capacity and mobility requirements of the Next Generation Air Transportation System (NextGen).*
    - *Objective 4.1.3: Develop tools, technologies, and knowledge that enable significantly improved performance and new capabilities for future air vehicles.*
  - Outcome 4.2: Conduct systems-level research on innovative and promising aeronautics concepts and technologies to demonstrate integrated capabilities and benefits in a relevant flight and/or ground environment.
    - *Objective 4.2.1: Develop advanced tools and technologies that reduce the technical risk associated with system-level integration of promising aeronautical concepts.*

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 From *The 2011 NASA Strategic Plan*, available at  
[http://www.nasa.gov/pdf/516579main\\_NASA2011StrategicPlan.pdf](http://www.nasa.gov/pdf/516579main_NASA2011StrategicPlan.pdf)

TABLE 2. SOLICITED RESEARCH PROGRAMS (IN ORDER OF PROPOSAL DUE DATES)

APPENDIX	PROGRAM	NOI DUE DATE	PROPOSAL DUE DATE
C.2	NextGen - Concepts and Technology Development (CTD1)	1/28/2013	3/4/2013
E.2	Innovative Concepts for Aviation Project (LEARN1)	6/14/2013	7/30/2013
B.2	System-Wide Safety Assurance Technologies Project (SSAT1)	7/22/2013	8/22/2013

Notes: It is expected that additional project areas will be added in future amendments.

TABLE 3. SOLICITED RESEARCH PROGRAMS (IN ORDER OF APPENDICES A–E)

APPENDIX	PROGRAM	NOI DUE DATE	PROPOSAL DUE DATE
B.2	System-Wide Safety Assurance Technologies Project (SSAT1)	7/22/2013	8/22/2013
C.2	NextGen - Concepts and Technology Development (CTD1)	1/28/2013	3/4/2013
E.2	Innovative Concepts for Aviation Project (LEARN1)	6/14/2013	7/30/2013

Notes: It is expected that additional project areas will be added in future amendments.