AMENDMENT No.4 TO THE NASA RESEARCH ANNOUNCEMENT (NRA) ENTITLED “RECOVERY ACT - RESEARCH OPPORTUNITIES IN AERONAUTICS – 2009 (ROA-2009),” NNH09ZEA001N, RELEASED April 13, 2009

The following changes are made to:
- Updated Table of Contents
- Summary of Solicitation: Table 2
- Summary of Solicitation: Table 3
- Appendix A-4 (Recovery Act Funds)

Summary of Solicitation Table 2 and Table 3 are updated

New proposal and NOI due dates in place for the Topics Appendix A-4.

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>PROGRAM</th>
<th>NOI DUE DATE</th>
<th>PROPOSAL DUE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-3</td>
<td>Integrated Intelligent Flight Deck Project (IIFDT1)</td>
<td>4/29/09</td>
<td>5/28/09 (see Note 1 below)</td>
</tr>
<tr>
<td>C-2</td>
<td>NextGen Airspace Project (AS1)</td>
<td>6/16/09</td>
<td>7/16/09</td>
</tr>
<tr>
<td>A-2</td>
<td>Subsonic Fixed Wing Project (SSFW1) (Recovery Act Funds) – “N+2 Advanced Low NOx Combustor Technologies”</td>
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</tr>
<tr>
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<td>Subsonic Rotary Wing (SRW1)</td>
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</tr>
</tbody>
</table>

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

Note 1: It is expected that additional project areas will be added in future amendments.

For the Integrated Intelligent Flight Deck Technologies Project (IIFDT1), the due date for the first round of evaluations is May 28, 2009. To be considered in the first round of evaluations, proposals must be received by 11:59 p.m. Eastern Time on the due date as described in Section IV(c). It is expected that the majority, and perhaps all, of the available funds will be allocated during this first round of evaluations. However, the topics in this section will remain open until July 27, 2009 in case funding still remains after the first round of evaluations. A note will be posted on the ROA page on NSPIRES if funds are expended and no further reviews are expected. Proposers who decide to wait until after the first round of evaluations do so at their own risk.
### TABLE 3. SOLICITED RESEARCH PROGRAMS (IN ORDER OF APPENDICES A-E)

<table>
<thead>
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A-4: Supersonics (Recovery Act Funds)

1. American Recovery and Reinvestment Act (ARRA) Requirements

NASA intends that funds provided through the American Recovery and Reinvestment Act (ARRA) of 2009 are likely to be utilized for the first year of performance for most of the selected proposals. In order to provide additional transparency of the use of these funds, all recipients of ARRA funds are required to adhere to additional reporting requirements. The Terms and Conditions provided in the ROA NRA (#NNH09ZEA001N) are applicable to this Recovery Act Funded Appendix. For Recovery Act Funded Appendices, the Terms and Conditions applicable to NNH09ZEA001N are augmented by the following Recovery Act specific Provisions:

- FAR Clauses (applicable to any contracts awarded from the NRA) - FAR Clause 52.204-11, 52.215-2, Alt 1, and 52.203-15.

- Grant and Cooperative Agreement Provisions (applicable to any Cooperative Agreements awarded from the NRA) may be accessed at the following site: http://ecfr.gpoaccess.gov/cgi/t/text/textidx?c=ecfr&tpl=/ecfrbrowse/Title02/2cfr176_main02.tpl

- General Recovery Act Information can be accessed at: http://www.whitehouse.gov/omb/recovery_default/

Proposers are encouraged to become familiar with the reporting requirements and ensure that the appropriate processes and budget to execute these requirements are included for first year deliverables of any proposal that may be funded through the ARRA.

2. Project Overview

The Supersonics Project is aligned with the ARMD principles of maintaining intellectual stewardship of aeronautical core competencies for the nation in the supersonic flight regime and of focusing research in areas that are appropriate to NASA’s unique capabilities. The Project supports the Fundamental Aeronautics Program strategy of developing systems level multidisciplinary capabilities for supersonic civilian and military applications.

The Supersonics Project is a broad-based effort designed to develop knowledge, capabilities and technologies that support vehicles that fly in the supersonic speed regime with a focus on eliminating the efficiency, environmental and performance barriers to practical supersonic cruise vehicles. The Project has identified a set of key Technical Challenges that are barriers to success for this vehicle type. These are:

- Efficiency Challenges
Supersonic Cruise Efficiency
Light Weight, Durable Airframes and Engines for Supersonic Cruise Temperatures
- Environmental Challenges
  Airport Noise Reduction
  Sonic Boom Modeling
  High Altitude Emissions Reduction
- Performance Challenges
  Aero-Propulso-Servo-Elastic (APSE) Analysis and Design
- Multidisciplinary Design, Analysis and Optimization Challenges
  (Understanding and exploiting the interactions of all these supersonic technology challenges is the key to the creation of practical design.)
  Systems Integration, Assessment and Validation
- Flight Research & Validation
  Flight Validation and Test Technique Development

In this solicitation, the Supersonics project is seeking proposals in the Sonic Boom Modeling Technical Challenge to further investigate Auralization of Sonic Booms Transmitted into Buildings, Community Response to Low-amplitude Sonic Booms, and Sonic Boom Focusing. For a more detailed overview of the Supersonics project efforts, please refer to:

- http://www.aeronautics.nasa.gov/nra_ref_docs.htm

For a more detailed description of the current Supersonics Project tasks and associated milestones that are relevant to this NRA solicitation please refer to the following documents under the “Other Documents” section of NSPIRES for this solicitation:

- Sonic Boom Modeling Task Plan

3. Description of Solicited Research

Topic A.4.1 - Sonic Boom Modeling

NASA anticipates investing approximately $1M/year in this topic over the next several years. Between three (3) and four (4) awards may be made for the subtopics listed in this topic, covering a period of performance of 2-3 years. Additional subtopics may be released in subsequent solicitations. The Recovery Act Funds cover only the 1st year of performance, and any option or renewal periods will be funded with non-recovery act funds.

Successful supersonic civil aircraft must be capable of supersonic flight over land. However, the sonic boom that occurs when aircraft travel at speeds greater than sound is perhaps the most significant environmental barrier to supersonic commercial flight. In the near term, the Supersonics project is emphasizing understanding and overcoming this barrier, both through the development of approaches to reducing sonic boom noise and
improving understanding of the impact of these reduced noise booms.

Existing knowledge of the impact of sonic booms on the community is based primarily on experiments conducted during the 1960s (Concorde and the U.S. Supersonic Transport (SST) Program) and the 1980s (NASA’s High Speed Research (HSR) Program). In the former work, it was concluded that high-amplitude sonic booms (Concorde ~2 psf) were clearly unacceptable to a large segment of the population, and overland flight was prohibited. Although much progress was made in modeling the sonic boom and its effects during HSR, the boom levels achieved were still unacceptably loud.

The Supersonics project is developing technologies that potentially will lower the boom to acceptable levels. There is very little data on the effects of such booms, and the project therefore has adopted a three-pronged approach to studying the atmospheric effects, transmission into structures, and human reaction to these booms.

The ability to model sonic boom propagation from the aircraft to the ground is necessary, with all relevant physical phenomena included in such models. This will enable the accurate prediction of sonic boom levels on the ground under realistic atmospheric conditions and for all flight conditions. In addition, in order to fully understand human reaction to low-intensity shaped sonic booms, it is necessary to be able to predict the transmission of booms into buildings. Both interior noise levels and structural vibration are of interest since both are important characteristics of the indoor environment. Finally, subjective laboratory and field studies are critical to understanding and developing prediction models for human response to low-intensity shaped sonic booms.

**Subtopic A.4.1.1 – Auralization of Sonic Booms Transmitted into Buildings**

**Objective:**
An efficient, validated computer-based simulation tool is sought to auralize sonic booms transmitted into residential houses and larger buildings, where time domain indoor sound pressures, which are suitable for use as stimuli in psychoacoustic testing, are synthesized. Tool development and validation proposed under this NRA shall focus on defining models of the indoor soundscape that results from the modally dense, linear transmission of mid- to high-frequency sound through partitions of typical US residential houses ensonified by a sonic boom, including walls, windows, doors, and roof/attic spaces. For the purposes of this NRA, the frequency range of interest is from about 40 Hz up to about 6000 Hz. The tool shall also be suitable for auralizing the linear transmission of sonic booms into other commonly occupied spaces such as office buildings, big box stores, and other large buildings common to the suburban and metropolitan United States, where structural and indoor acoustic modal densities are high even at low frequencies. This NRA solicitation excludes studies of rattle and other contact-induced noise sources.

**Relevant NASA Milestones:**
SUP.08.02.003 Validated High-frequency Building Response/Transmission Model
SUP.08.02.004 Validated Full-frequency Model for General Structures
Approach:
Tools developed under this NRA topic shall focus on auralizing the transient indoor sound resulting from sonic boom ensonification of residential houses and larger, commonly occupied buildings. Auralization methods implemented in the desired tool shall include physics-based synthesis of the sound transmission through, and indoor radiation from, the building partitions. To that end, one acceptable approach would be to implement the auralization methods in terms of linear filters that model each component in the sound propagation path from outside to inside, which, through superposition and convolution, could be used to represent a single outdoor-to-indoor impulse response function. Proposals incorporating other approaches are also welcomed. Any tools developed under this NRA shall be suited to analyzing the range of residential housing construction types found in the United States. Inputs to the desired simulation tool shall include, but are not limited to:

- The general design specifications of the walls, windows, and other building partitions.
- The floor plan of the building identifying the partition locations and types and building geometry.
- Specifications of the indoor acoustic characteristics necessary to account for the effects of absorbing and diffusing surfaces on the reverberation of the indoor acoustics.
- The incident azimuth and elevation of the sonic boom.
- Amplification and attenuation effects resulting from diffraction of the sonic boom around the structure.

A database that can be used to model typical wall construction and window types found in residential housing in different areas in the United States shall be developed and incorporated into the simulation tool. Experimental validation of the tool shall be included as a task in proposals. Validation of the tool can be performed using existing and/or newly proposed experimental datasets of sound transmission through buildings or sub-assemblies. Several possible datasets that could be used for validation are:

- Vibroacoustic data collected in two residential houses on Edwards Air Force Base by NASA\textsuperscript{1,2}
- Vibroacoustic data collected in two larger office buildings on Edwards Air Force Base that will be instrumented and tested by NASA in September 2009
- Vibroacoustic data collected on a small structure that was built and tested under a past NRA award\textsuperscript{3}
- Data from subsonic aircraft flyover studies
- Data from transmission loss studies of building partition assemblies

Outcome:
A computer-based simulation tool shall be developed and delivered to the government. The main user interface and any newly developed analysis capability shall be primarily coded in MATLAB. If use of commercially available codes are proposed for subtasks such as, but not limited to, geometry generation, mesh generation, or numerical simulation or as a computational solver, subroutines shall be written in MATLAB to:

- Generate the required input to the commercial code or codes based on inputs to
the main user interface defined in the Approach section above

- Parse the output of the commercial codes into a format usable by MATLAB to generate the desired outputs of the tool defined in the paragraph below

The use of commercial codes and the costs for procurement, if needed, shall be identified in proposals, and use during the period of performance shall be included in proposed budgets. Both source code and compiled binaries that are either newly developed or modified in the performance of this NRA shall be delivered to the government. In addition, a theoretical manual documenting the code and a user’s manual shall be delivered to the government.

Outputs of the tool shall be an outdoor-to-indoor impulse response function that can be convolved with any arbitrary outdoor sonic boom to yield a time accurate auralization of the corresponding indoor sound. Thus, a database of outdoor-to-indoor impulse response functions could be developed by the end user to represent the range of indoor soundscapes that could be expected across the United States resulting from overland flight of an arbitrary, shape optimized supersonic aircraft. Proposers shall demonstrate the capability to develop such a database using the tools developed under this NRA call.

**Estimated Level of Effort:**
Two to three years at $200K to $300K per year. Proposals should have specific yearly objectives with measurable metrics toward achieving the proposer’s goal. It is anticipated that 1-2 awards will be made for this subtopic.

**References:**

**Subtopic A.4.1.2 – Community Response to Low-amplitude Sonic Booms**

**Objective:**
Evolving aircraft design methods have indicated the feasibility of dramatically reduced levels of sonic boom relative to past and current supersonic vehicles. Thus there is the potential for commercial overland supersonic flight, but that is currently forbidden by regulations in the U.S. and elsewhere. In order to inform policy-making and regulation, information is needed on community residents’ response to sonic booms that are representative of future “low-boom” vehicles.
Useful information can be obtained via the use of simulation methods, but ultimately it is necessary to study community residents’ responses to real sonic booms experienced in their homes. There are two opportunities to perform such research; one is afforded by a unique diving flight maneuver utilizing a NASA F-18 aircraft that enables low-amplitude N-waves to be placed on a ground area of small geographical extent, and the second is the future construction of a prototype/demonstrator low-boom vehicle.

The objective of this subtopic is the design and execution of an experiment to gather data relating the annoyance of community residents to sonic boom exposure consisting of multiple low-boom events generated by existing aircraft. This experiment will serve as a pilot test for future experiments using a purpose-built low-boom vehicle.

Relevant NASA Milestones:
SUP.08.03.002 Validated Psychoacoustic Model for Indoor/Outdoor Listening

Approach:
The primary purpose of this subtopic is the identification, development, and execution of an experimental approach that will enable the assessment of future “low-boom” vehicles. The experiment shall acquire data of sufficient quantity and quality so that the subsequent analyses enable a thorough evaluation of the methods used, data acquired, and analysis methods employed. The effectiveness of the test methodology for community response testing shall be demonstrated.

It is anticipated that future efforts, beyond the scope of this solicitation, will involve a naïve community (i.e. no previous experience with sonic booms). This will likely present some unique issues that may affect the design of the experiment. The proposed effort shall identify such issues, including the identification of strategies to minimize transient/adaptation effects associated with the introduction of a new noise source to a community. Previous community noise studies may be a source of information to evaluate these transient/adaptation effects.

Components of the experimental design that shall be addressed include: noise exposure (levels and numbers of sonic booms), number of participants and their selection, and data acquisition methods (both subjective and acoustical). Questionnaire design should enable comparisons to be made with results from previous sonic boom and community noise surveys. Survey instruments should be pre-tested and survey methodologies developed in sufficient detail to provide the material necessary to secure OMB approval for data collection from the general public in future experiments (refer to http://www.whitehouse.gov/omb/inforeg_statpolicy/#guidance).

NASA will provide the F-18 aircraft and operations support. Furthermore, it is anticipated that the experiment will be conducted using a military housing area, most likely Edwards Air Force Base. The diving flight maneuver enables a range of N-wave overpressures from about 0.2 to 0.8 psf to be placed on a small area. Since this is intended to be a pilot test for an eventual low-boom vehicle experiment it may also be assumed that the number of booms per day will be less than 10. The duration of the
experiment is expected to be no more than 2 or 3 weeks, with flights occurring during daytime weekday hours.

This solicitation is not intended to fund the development of noise measurement instrumentation. Instrumentation used in the experiment shall be limited to that which is readily available.

**Outcome:**
- Complete documentation of selected approach, including experimental design and data acquisition methods
- Complete documentation of pilot study including data analysis and comparisons with relevant previous work
- Assessment of pilot study and recommendations for follow-on experiment in a naïve community

**Estimated Level of Effort:**
Two years at $250K to $400K per year, with the higher range appropriate during the year of community testing. Proposals should have specific yearly objectives with measurable metrics toward achieving the proposer’s goal. It is anticipated that 1 award will be made for this subtopic.

**Reference:**

**Subtopic A.4.1.3 – Sonic Boom Focusing**

**Objective:**
Acceleration or maneuvering of a supersonic aircraft can create a focused sonic boom, with amplitude much greater than that of the boom generated under cruise conditions. The focused boom due to maneuvers is avoidable but the one due to acceleration in the vicinity of Mach 1 is not, and thus its impact must be assessed as an element of the overall acceptability of supersonic overland flight. Sonic boom focusing in the context of low-boom aircraft designs has yet to be studied. Although aircraft designed for a shaped, low-intensity cruise boom are expected to favorably affect focused boom levels, little definitive information is available. The objective of this subtopic is to verify methods used to model focused boom waveforms for low-boom aircraft designs and to perform an experimental validation of the modeling methods.

**Relevant NASA Milestones:**
SUP.08.04.002 Validated Sonic Boom Propagation Model

**Approach:**
Existing models of sonic boom propagation shall be used to predict focused boom waveforms on the ground, given pressure fields from both existing traditional and conceptual low-boom aircraft, under a range of realistic atmospheric conditions. Predictions of focused boom ground signatures from more than one model are desired, and results shall be analyzed and compared. Evaluation of the models regarding their ability to model focused booms resulting from operation of shape-optimized aircraft shall be performed. Proposers shall identify input data requirements for the models chosen for evaluation. If necessary, NASA will provide appropriate configuration data for representative traditional aircraft and conceptual low-boom designs.

Experiments for validation of focused boom predictions shall be planned and executed. NASA government-furnished equipment can include the focused boom flights using F-18 aircraft, ground transducers and acquisition systems, meteorological systems, and aircraft speed and location data. Because low-boom aircraft do not yet exist, the flights will consist of a traditional military supersonic aircraft flying with linear acceleration at a constant heading. Thus the experimental results will be used to validate the models for the case of a traditional aircraft. Ground transducer requirements and layouts shall be determined for the anticipated focal zone. Equipment that can be provided include: up to twenty-four Brüel & Kjaer Type 4193 microphones with preamps, six four-channel NEXUS signal conditioners, forty G.R.A.S. model 40AQ microphones with model 26CA preamps, four 500' LEMO cables, twelve 300' LEMO cables, eight 100' LEMO cables, up to 288 data acquisition channels of National Instruments PXI-4472B data acquisition hardware, and five meteorological systems (temperature, relative humidity, wind speed and direction, solar radiation, and rainfall).

Analysis of experimental data and comparisons with model predictions shall be conducted. Strengths and weaknesses of existing models shall be identified. Recommendations for improvements to the models should be included, as appropriate.

Outcome:
• Documentation of focus boom prediction models and their comparison for a range of aircraft, flight, and atmospheric conditions
• Complete documentation of experimental study, analysis of results, and detailed comparisons to predictions
• Assessment of focus boom prediction models and recommendations for model improvements

Estimated Level of Effort:
Two years at $250K to $400K per year. Proposals should have specific yearly objectives with measurable metrics toward achieving the proposer’s goal. It is anticipated that 1 award will be made for this subtopic.

4. Programmatic Considerations
The technical section of the proposal must clearly describe how the goals and objectives accomplish the intent for the use of Recovery Act funds by indicating how the project will preserve and/or create jobs and promote economic recovery.

Awards will take the form of contracts or cooperative agreements with award duration ranging from two (2) to three (3) years based on the scope of work. The research progress will be assessed on an annual basis to ensure that adequate progress is being met. The proposal should provide a separate work plan and cost for each year, and must identify definitive objectives with a deliverable and measurable metrics for each year of the proposed work. NASA may choose to make a partial award (i.e., the award may be for a scope and/or duration less than the total proposed). Entities seeking contracts should consult section IV.b.v of the ROA description for further information about the content and format of the SOW that is to be included in the proposal.

There will be a kick-off meeting at the beginning of the award period. NASA technical officers and experts will conduct annual reviews, which will include an oral report by the principal investigator and a written report that documents approach and results that is to be delivered 30 days prior to the anniversary date of the award. The written and oral reports will be used to evaluate progress and to decide whether to continue, continue with modifications, or discontinue specific research efforts. The meetings for the oral reports will be held at one of the NASA centers, and must be attended by at least the principal investigator.

A written final report that completely documents the approach and all results is required at the end of the completed effort. Annual oral presentations made as part of an open technical exchange meeting for purposes of technology transfer and knowledge dissemination will be expected. Software developments and/or enhancements should be developed in modular form and be contained in appropriate computer file formats.

The technical section of the proposal is the most important for selection. The proposal must make a strong connection to the technical challenges as outlined in the Supersonics project overview. It must address a particular topic, identified from the above section. It should clearly describe the background and objectives of the proposed research; provide detail of the analytical/experimental approaches to be considered; the level of effort to be employed; the anticipated results; and the contribution of the work to supersonic aircraft technology in the United States. It should address the selection criteria described in Section 5 of this Appendix.

Work conducted under these awards will be an important part of the Supersonics Project of Fundamental Aeronautics. The intent of the NRA process is to foster strategic relationships between NASA and the awarded institutions for research and development of technologies important to NASA. Therefore, interaction with NASA researchers may be anticipated while performing work under these awards. Bidders can include as part of the proposal visits of appropriate length to a NASA Center for the purpose of coordinating the proposed work with corresponding efforts by NASA researchers.

5. Evaluation Criteria and Basis for Award
The evaluation criteria in Appendix B, Part (i) and Appendix C, paragraph C.2 of the “Guidebook for Proposers Responding to a NASA Research Announcement - 2009” are superseded by the following.

Evaluation factors include factors evaluated by peer review as well as factors evaluated by NASA program personnel. The principal elements considered in evaluating a proposal are its relevance to NASA’s objectives, technical merit, effectiveness of the proposed work plan, and its cost. The failure of a proposal to be rated highly in any one of these elements is sufficient cause for the proposal to not be selected.

(1) Relevance (weight 30%): Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to the specific objectives and goals given in the solicitation to which the proposal is submitted.

The evaluation process will also consider the importance of the work to the project’s primary objectives of advancing knowledge and understanding of the fundamental physics unique to the proposed flight regime, contributing to the development of a validated physics-based multidisciplinary design and analysis tool(s) for enabling air vehicles with innovative capabilities to fly as designed.

(2) Technical Merit (weight 40%): Overall scientific or technical merit of the proposal, including unique and innovative methods, approaches, or concepts. Evaluation will also include: credibility of technical approach, including a clear assessment of primary risks and a means to address them; proposer’s capabilities, related experience, facilities, techniques, or unique combination of these which are integral factors for achieving the proposal's objectives; and qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives. The selection process will also assess the proposal against the state-of-the-art.

(3) Effectiveness of the Proposed Work Plan (weight: 25%): Comprehensiveness of work plan, effective use of resources (including possible teaming arrangements to leverage expertise, available materials and/or tools to increase cost effectiveness), management approach, and proposed schedule for meeting the objectives. Milestones with measurable metrics toward achieving the proposer’s goal must be provided, with a minimum of one metric per year. Proof-of-concept demonstrations are encouraged. Tangible deliverables at the end of the effort are desirable. Annual oral presentations made as part of an open Technical Exchange Meeting for purposes of technology transfer and knowledge dissemination will be expected. Documentation of approach and results in form of NASA contractor reports is required. A clear statement of what intellectual property is expected to be publicly available at the conclusion of the work is required. It is our intent to share all knowledge developed under this solicitation; thus, any restrictions to that objective will cause a lower score in this area.

In addition, the evaluation of Work Plans will consider how the proposer intends to meet ARRA requirements for the first year of the proposed effort with at least one measurable
milestone, and a written report as a deliverable at the end of the first year of performance.

(4) Proposed Cost (weight: 5%) Evaluation of the cost of a proposed effort shall include the realism and reasonableness of the proposed cost, and the comparison of that proposed cost to available funds. Low cost, while desirable, does not offset the importance of realism and reasonableness of the proposed budget. Review panels evaluate cost realism and reasonableness; however, comparison of the proposed cost to available funds is performed by NASA program personnel.

Budgets for ARRA funded activities will be evaluated for costing by the end of the first year of performance. NASA expects disbursement of ARRA funds within 3 months after these funds have been costed.
## 6. Summary of Key Information

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected annual program budget for new awards</td>
<td>$1M annually. The Recovery Act Funds cover only the 1\textsuperscript{st} year of performance, and any option or renewal periods will be funded with non-recovery act funds.</td>
</tr>
<tr>
<td>Number of new awards pending adequate proposals of merit</td>
<td>~3-4 (for the current solicitation)</td>
</tr>
<tr>
<td>Maximum duration of awards</td>
<td>Award periods will vary from 1-3 years based on the technical work proposed.</td>
</tr>
<tr>
<td>Due date for Notice of Intent to propose (NOI)</td>
<td>See Tables 2 and 3 in the Summary of Solicitation of this NRA.</td>
</tr>
<tr>
<td>Due date for proposals</td>
<td>See Tables 2 and 3 in the Summary of Solicitation of this NRA.</td>
</tr>
<tr>
<td>NASA strategic objective(s) which proposals must state and demonstrate</td>
<td>Every proposal must address one or more strategic goals or strategic outcomes from Table 1. See also Sections I(a) and IV(e) in the Summary of Solicitation of this NRA.</td>
</tr>
<tr>
<td>General information and overview of this solicitation</td>
<td>See the Summary of Solicitation of this NRA.</td>
</tr>
<tr>
<td>Page limit for the central Science-Technical-Management section of</td>
<td>20 pages max.; see also Chapter 2 of the Guidebook for Proposers-2009</td>
</tr>
<tr>
<td>proposal</td>
<td></td>
</tr>
<tr>
<td>Submission medium</td>
<td>Electronic proposal submission is required; no hard copy is required. See also Section IV in the Summary of Solicitation of this NRA and Chapter 3 of the NASA Guidebook for Proposers-2009.</td>
</tr>
<tr>
<td>Web site for submission of proposal via NSPIRES</td>
<td><a href="http://nspires.nasaprs.com/">http://nspires.nasaprs.com/</a> (help desk available at <a href="mailto:nspires-help@nasaprs.com">nspires-help@nasaprs.com</a> or (202) 479-9376)</td>
</tr>
<tr>
<td>Expected award type</td>
<td>Awards will be in the form of Contracts or Cooperative Agreements dependent upon the nature of the proposed work.</td>
</tr>
<tr>
<td>Funding opportunity number</td>
<td>NNH09ZEA001N-SUP1</td>
</tr>
<tr>
<td>NASA points of contact</td>
<td>Email questions to: <a href="mailto:FA_Supersonics@nasa.gov">FA_Supersonics@nasa.gov</a> Written responses will be posted on-line. Peter G. Coen - Principal Investigator Dr. Louis Povinelli - Project Scientist Kestutis C. Civinskas - Project Manager Thomas M. Wallett – Project NRA Manager Procurement POC: Merrill, Melissa, <a href="mailto:melissa.a.merrill@nasa.gov">melissa.a.merrill@nasa.gov</a></td>
</tr>
</tbody>
</table>