

Small Business Innovation Research Program Phase I Solicitation FY-2010 (SBIR)

PROGRAM SOLICITATION

NSF 09-541

REPLACES DOCUMENT(S):

NSF 08-548



National Science Foundation

Directorate for Engineering
Industrial Innovation and Partnerships

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

June 09, 2009

For the Topic Listing Reference Section II. Program Description

REVISION NOTES

- This solicitation will **ONLY** accept proposals for the Small Business Innovation Program (SBIR); a separate Small Business Technology Transfer Program (STTR) solicitation will be released at a later date.
- This solicitation will support projects up to \$150,000.
- The NSF Commercialization History Template **MUST** be used.
- Signed Consultant letters must be uploaded as a part of the budget justification.
- You are strongly encouraged to contact the cognizant program officer to get feedback on your potential project.
- This solicitation will **ONLY** accept a maximum of 4 proposals in total per organization.
- This solicitation has a Phase I Proposal Checklist to be used as a reference guide (this document does not need to be included in the submitted proposal). http://www.nsf.gov/eng/iip/sbir/PhI_Check_List.doc

Proposals not meeting the administrative and technical requirements are not accepted by the SBIR program. The following list highlights key reasons for return without review:

Administrative Items:

- A proposal submitted after 5:00 p.m. (proposer's/submitter's local time) on the deadline date. The "Proposer" is the company and the time zone associated with the company's address will be used to determine if a proposal is late.
- A Project Summary without all required information (reference section A.9.2).
- A Project Description that exceeds 15 pages or does not have all the parts.
- An SBIR proposal with a budget exceeding \$150,000.
- A proposal missing a Company Commercialization History and not on the NSF Template; if the company has certified that it has received previous SBIR/STTR Phase II awards (reference section A.9.9.2).
- A proposal that has documents placed in the "**Additional**" Single Copy Documents module in FastLane.
- Collaborative proposals (defined as simultaneous proposal submissions from different organizations, with each organization requesting a separate award). Note: Small business concerns are encouraged to collaborate with research institutions; however, only one proposal should result.

Technical Issues:

- A proposal must have sufficient commercial potential substance to justify review.
- A proposal must have sufficient technical substance to justify review.
- A proposal must fall within the scope of the topic or subtopic as delineated in the topic or subtopic description.
- A proposal must have research proposed in science, engineering, or education.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Small Business Innovation Research Program Phase I Solicitation FY-2010 (SBIR)

Synopsis of Program:

The Small Business Innovation Research (SBIR) Program stimulates technological innovation in the private sector by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research results, and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses.

Cognizant Program Officer(s):

- Gregory T. Baxter, Program Director, Biotech and Chemical Technologies (BC), telephone: (703) 292-7795, email: gbaxter@nsf.gov
- Cynthia Znati, Program Director, Biotech and Chemical Technologies (BC), telephone: (703) 292-8374, email: cznati@nsf.gov
- Ian M. Bennett, Program Director, Education Applications (EA), telephone: (703) 292-8655, email: ibennett@nsf.gov
- Muralidharan S. Nair, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-7059, email: mnair@nsf.gov
- Errol B. Arkilic, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-8095, email: earkilic@nsf.gov
- Juan E. Figueroa, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-7054, email: jfigueroa@nsf.gov
- William (Bill) G. Haines, Program Director, Nanotechnology, Advanced Materials, and Manufacturing (NM), telephone: (703) 292-7079, email: whaines@nsf.gov
- Cheryl F. Albus, Program Director, Nanotechnology, Advanced Materials, and Manufacturing (NM), telephone: (703) 292-7051, email: calbus@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Other Grant Fixed Amount Awards

Estimated Number of Awards: 175 to 225 (pending availability of funds).

Anticipated Funding Amount: \$30,000,000 for SBIR Phase I (pending the availability of funds).

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

PI Limit:

The primary employment of the Principal Investigator (PI) must be with the small business concern at the time of the award. **A PI must spend a minimum of one calendar month on an SBIR Phase I project.**

Limit on Number of Proposals per Organization: 4

An organization can only submit a total of 4 proposals for this solicitation.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:**
Indirect costs plus fringe benefits are limited to a maximum rate of 150% of direct salaries and wages. (See Section V.A.9.6)
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

June 09, 2009

For the Topic Listing Reference Section II. Program Description

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

The National Science Foundation (NSF), an independent agency of the Federal Government, invites eligible small business concerns to submit Phase I proposals for its FY 2010 Small Business Innovation Research (SBIR) program. NSF will support high quality projects on important scientific, engineering, or science and engineering education problems and opportunities that could lead to significant commercial and public benefit if the research is successful.

The SBIR solicitation is issued pursuant to the authority contained in Public Law 106-554. SBIR policy is provided by the Small Business Administration (SBA) through the SBA Policy Directive.

II. PROGRAM DESCRIPTION

The primary objective of the NSF SBIR Program is to increase the incentive and opportunity for small firms to undertake cutting-edge, high risk, high quality scientific, engineering, or science and engineering education research that would have a high potential economic payoff if the research is successful.

The fundamental mission of NSF is to promote discoveries and to advance education across the frontiers of knowledge in science and engineering. Consistent with that mission, NSF encourages and supports a wide range of proposals from the research and education community and also from the private small business sector. These proposals are reviewed under NSF's merit review criteria, which cover both the quality of research (intellectual or technical merit) and its potential impact on society (broader impacts).

The SBIR program solicits proposals from the small business sector consistent with NSF's mission. The program is governed by Public Law 106-554. A main purpose of the legislation is to stimulate technological innovation and increase private sector commercialization. The NSF SBIR program is therefore in a unique position to meet both the goals of NSF and the purpose of the SBIR legislation by transforming scientific discovery into both social and economic benefit, and by emphasizing private sector commercialization. Accordingly, NSF has formulated broad solicitation topics for SBIR that conform to the high-technology investment sector's interests.

Topics are:

- [Biotech and Chemical Technologies \(BC\)](#)
- [Education Applications \(EA\)](#)
- [Information and Communication Technologies \(IC\)](#)
- [Nanotechnology, Advanced Materials, and Manufacturing \(NM\)](#)

Successful proposers will conduct Research and Development (R&D) on projects that:

1. Provide evidence of a commercially viable product, process, device, or system, and/or;
2. Meet an important social or economic need.

Projects should have the following:

- High potential commercial payback, and,
- High-risk efforts.

Projects may also address:

- Research tools which meet significant commercial market needs, or,
- Applications that result in multipurpose commercially viable functions.

For more in-depth program information please reference the following web site:
<http://www.nsf.gov/eng/iip/sbir/sbirspecs.jsp>.

III. AWARD INFORMATION

Under this solicitation, SBIR Phase I proposals may be submitted for funding up to \$150,000. SBIR Phase I projects run for 6 months. The program expects to make approximately 170 to 250 fixed amount awards. Anticipated funding amount for this solicitation is \$30,000,000 (pending the availability of funds and quality of proposals). Award notification is typically four to six months from the proposal submission deadline date. Awards will have an effective date of January 1, 2010 for proposals submitted on June 9, 2009.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

PI Limit:

The primary employment of the Principal Investigator (PI) must be with the small business concern at the time of the award. **A PI must spend a minimum of one calendar month on an SBIR Phase I project.**

Limit on Number of Proposals per Organization: 4

An organization can only submit a total of 4 proposals for this solicitation.

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

DUNS Number: A DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services. If the proposer does not have a DUNS number, he or she must contact Dun and Bradstreet by telephone at (800) 333-0505 or online at <http://www.dnb.com/us/>. A DUNS number is issued at no charge and is a required data element for submission of a proposal.

Central Contractor Registration (CCR) Requirement: The Federal Funding Accountability and Transparency Act (FFATA) of 2006 (P.L. 109-282) requires agencies to make award and subaward information available for search by the public. Agencies must make award data available beginning January 1, 2008 and subaward data available beginning January 1, 2009.

Please note that registration is required of organizations only. To register in the CCR, go to <http://www.ccr.gov/>. Proposers are advised that it takes approximately two business days to complete the registration process. Failure to complete the CCR registration process prior to proposal submission may impact the processing of an organization's proposal.

Unacceptable objectives: Proposed efforts directed toward systems studies; market research; commercial development of existing products or proven concepts; straightforward engineering design for packaging; laboratory evaluations; incremental product or process improvements; evolutionary optimization of existing products; and evolutionary modifications to broaden the scope of an existing product or application are examples of projects that are not acceptable for SBIR. Projects determined unacceptable will be returned without review to the proposer.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the guidelines specified in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-PUBS (7827) or by e-mail from pubs@nsf.gov.

The following instructions supplement the GPG guidelines.

A.1. Responsiveness to SBIR Program.

A.1.1. Communication with the SBIR Program Manager. A company considering a proposal submission is encouraged to communicate (via email) with the cognizant program officer to help gauge the responsiveness to the solicitation. When contacting the cognizant program officer, please provide a brief 2-3 page executive summary with background on the: 1) company/team including experience with previous SBIR awards, 2) market opportunity, 3) technology/innovation and 4) competition. You may contact the program officer via email at any time before the submission deadline. **Note, however, that communication with the program officer will become increasingly difficult as the deadline nears.**

A.1.2. Designation of Topic and Subtopic. Designate one, and only one, topic and subtopic. The topic names are BC (for Biotech and Chemical Technologies), EA (for Education Applications), IC for Information and Communication Technologies and NM (for Nanotechnology, Advanced Materials, and Manufacturing). The appropriate topic and subtopic **MUST** be identified on the cover sheet and in the Project Summary. A firm may submit separate proposals on different topics and subtopics under this solicitation.

A.2. Phase I Proposal Objectives. An SBIR Phase I proposal must describe the research effort needed to investigate the feasibility of the proposed scientific or technical innovation. The primary objective of the Phase I effort is to determine whether the innovation has sufficient technical and commercial merit for proceeding into a Phase II project. A secondary objective is to assess potential commercial feasibility of the proposed work.

A.3. Phase I Project Requirements. The deliverable at the end of an SBIR Phase I grant is a technical report that summarizes the experimental and theoretical accomplishments of the research proposed. This report serves as the basis for a Phase II proposal.

A.4. Administrative and Technical Screening. All proposals that fail to address the following items will be considered non-responsive and will be returned without review.

Administrative Items:

- A proposal submitted after 5:00 p.m. (proposer's/submitter's local time) on the deadline date. The "Proposer" is the company and the time zone associated with the company's address will be used to determine if a proposal is late.
- A Project Summary without all required information (reference section A.9.2).
- A Project Description that exceeds 15 pages or does not have all the parts.
- An SBIR proposal with a budget exceeding \$150,000.
- A proposal missing a Company Commercialization History and not on the NSF required Template; if the company has certified that it has received previous SBIR/STTR Phase II awards (reference section A.9.9.2).
- A proposal that has documents placed in the "Additional Single Copy Documents" module in FastLane.
- Collaborative proposals (defined as simultaneous proposal submissions from different organizations, with each organization requesting a separate award). Note: Small business concerns are encouraged to collaborate with research institutions; however, only one proposal should result.

Technical Issues:

- A proposal must have sufficient commercial potential substance to justify review.
- A proposal must have sufficient technical substance to justify review.
- A proposal must fall within the scope of the topic or subtopic as delineated in the topic or subtopic description.
- A proposal must have research proposed in science, engineering, or education.

A.5. Marking Proprietary Information. To the extent permitted by law, the Government will not release properly identified and marked technical **and commercially sensitive** data. If the proposal contains proprietary information, check the box at the bottom of the proposal cover page and identify proprietary technical data in the proposal by clearly marking the information and also providing a legend. Typically, proprietary information is marked in the text either with an asterisk at the beginning and end of the proprietary paragraph, underlining the proprietary sections, or choosing a different font type. An entire proposal should not be marked proprietary.

A.6. Human Subjects and Animal Use. Please refer to Chapter II, Sections D.5 and D.6 of the GPG (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Note that in some cases, product testing involves human subjects. In addition to the information in the GPG, please refer to (<http://www.dnb.com/us/>). Look for federal-wide assurances under the Office of Human Research Protection website.

If human subjects Institutional Review Board (IRB) approval is indicated, and it is not in hand at the time of submission, there must be a plan for such approval; a supporting letter regarding IRB approval should be provided under supplementary documents. The approval must be readily attainable within six weeks of informal notification of recommendation for award to ensure continued processing for funding. The small business has three basic options with regard to human subjects review: 1) establish your own IRB (see Office of Human Rights Protection (OHRP) at Health and Human Services (HHS) <http://www.hhs.gov/ohrp/assurances/index.html#registernew>; 2) use the review board of a (usually local) university or research institution, either via consultants to the project, a project subcontract, or directly through its own contacts; and 3) use a commercial company (for a listing, see <http://www.advamed.org/MemberPortal/About/>).

Animal use in funded projects requires approval of the company or collaborating institutions' Institutional Animal Care and Use Committee (IACUC). Please refer to <http://www.aphis.usda.gov/> for additional information.

A.7. Debriefing on Unsuccessful Proposals. When a proposal is declined, verbatim copies of reviews, excluding the names of the reviewers, summaries of review panel deliberations, if any, and a description of the process by which the proposal was reviewed will be available electronically.

A.8. General Requirements

A.8.1 Sample Limitations. Samples, videotapes, slides, appendices, or other ancillary items will not be accepted. Websites containing demonstrations, etc., may be cited in the proposal, but reviewers are not required to access them.

A.8.2 Page Format. Multiple column formats are not accepted. Use the NSF required fonts; reference the GPG - Chapter II Proposal Preparation Instructions (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).

A.9. Required Format.

The required format of a Phase I proposal is described in the following paragraphs. Each proposal submitted to the NSF SBIR program will use the following FastLane Forms:

Cover Sheet

Project Summary

Table of Contents (automatically generated)

Project Description

References Cited

Biographical Sketches

Budgets and Budget Justification (also required for each subaward)

Current and Pending Support

Facilities, Equipment and Other Resources

Supplementary Docs: (placeholder for the following documents -- if applicable)

1. Letter(s) of support for the technology,
2. Company commercialization history (if applicable), and
3. Letter regarding human subjects Institutional Review Board or IACUC approval of animal use.

Single Copy Documents - List of Suggested Reviewers

A.9.1. Cover Sheet and Certification. Complete topic and subtopic fields must be included on the cover sheet. All proposals must be electronically signed. For information regarding electronic signature, reference the [FastLane webpage](#).

A.9.2. Project Summary. An edited version of the Project Summary will be available to the public if a proposal is awarded. The Project Summary should be written in the third person and shall begin as follows: "This Small Business Innovation Research Phase I project...". The summary must have the following components:

1. A summary limited to 200 words addressing the intellectual merits of the proposed activity. No proprietary information should be included in the summary. Include a brief identification of the problem or opportunity, the research objectives, a description of the research, and the anticipated results.
2. A summary limited to 200 words addressing the broader impacts/commercial potential of the proposed activity. Include information on the potential commercial value, societal impact, and enhanced scientific and technological understanding.
3. A listing of key words. The key words or phrases should identify the areas of technical expertise in science, engineering, or education which are to be invoked in reviewing the proposal; and the areas of application that are the initial target of the technology.
4. The topic name and subtopic letter and number. For example if a proposer designated NM/N1, this represents the topic Nanotechnology, Advanced Materials, Manufacturing (NM) and subtopic Nanoelectronics (N1).

A.9.3 Project Description. The project description shall contain the following parts in the following order and cannot exceed 15 pages.

Part 1: Identification and Significance of the Innovation. The first paragraph shall contain a clear and succinct statement specifying the research innovation proposed, and a brief explanation of how the innovation is relevant to meeting a need described in the subtopic narrative.

Part 2: Background and Phase I Technical Objectives. List and explain the key objectives to be accomplished during the Phase I research, including the questions that must be answered to determine the technical and commercial feasibility of the proposed concept. It is important to show how potential customer needs will be met if the research is successful. Therefore, Phase I proposers are strongly encouraged to consider commercial potential as well as the technical challenges of their research.

Part 3: Phase I Research Plan. This section must provide a detailed description of the Phase I research approach. The description must include the following:

- A technical discussion of the proposed concept,
- What is planned and how the research will be carried out,
- The plan to achieve each objective, and
- The sequence of experiments, tests, and computations involved in the measurement of those objectives.

Part 4. Commercial Potential. Proposals must describe a compelling business opportunity to be enabled by the proposed innovation. The information contained within the Commercial Potential section should convey the scope and nature of this business opportunity. This section should briefly describe the current as well as the anticipated market landscape and the resources required to address the opportunity. The goal of this section is to justify, from a market-opportunity perspective, why a Phase I feasibility study should be undertaken.

In preparing the description of the commercial potential, you are strongly encouraged to address the following four sections: market opportunity, company/team, product/competition and revenue/finance. A well crafted Commercial Potential section is typically 3-5 pages in order to address the four sections referenced below.

- The market opportunity - Describe the anticipated target market or market segments and provide a brief profile of the potential customer. What customer needs will be addressed with the innovation? Estimated size of the market being addressed? What barriers to entry exist?
- The Company/Team - What are the origins of the company/team? How many current employees are there? What is the anticipated impact on job creation as a result of this innovation? What is the revenue history, if any, for the past three years? Give a brief description of the experience and credentials of the personnel responsible for taking the innovation to market. How does the background and experience of the team enhance the credibility of the effort; have they previously taken similar products/services to market? Does proposed research mesh with company objectives? How does the proposed technology sit within the company mission?
- Product or technology and competition – How does your product or service sit within the competitive landscape? What is the main competition? What is the value proposition for the product or service enabled by the innovation? How do you plan to protect any IP

- generated from the proposed innovation? What critical milestones must be met to get the product or service to market?
- Financing and revenue model - based upon revenue assumptions, describe how you plan to finance your innovation.

Part 5. Consultants and Subawards/Subcontracts. Keep in mind that an SBIR Phase I project requires a minimum of two-thirds of the research, as measured by the budget, to be performed by the small business concern. The remaining percentage, one-third may be allocated as appropriate to achieve the objectives of the proposed SBIR Phase I project.

Consultant: The services of each consultant must be justified within the context of the proposal. In this section of the proposal, information must be provided on each consultant's expertise, organizational affiliation, and contribution to the project. In addition, each consultant, whether paid or unpaid, must provide a signed statement that confirms availability, time commitment, role in the project, and the agreed consulting rate (not to exceed **\$600 per day**). The maximum consulting rate under this solicitation is \$600 per day (NSF defines a day as 8 hours). This rate is exclusive of any indirect costs, travel, per diem, clerical services, fringe benefits, and supplies.

The signed consultant statements (with the required stated number of days at \$600 per day) must be uploaded as part of the proposal budget justification.

Subaward (also known as the subcontract): If subawards (including contracts, subcontracts and other arrangements) are used for research, describe the tasks to be performed and how these are related to the overall project.

Each subaward must use a separate proposal budget and budget justification, providing details of subaward costs by cost category. Each subawardee budget must be prepared in FastLane. Note - the company/PI submits the subaward budget with the full proposal submission.

Purchases of analytical or other routine services from commercial sources and the acquisition of fabricated components from commercial sources are not regarded as reportable subaward activity. Such items -- routine analytical or other routine services -- should be reported in the Budget under Other Direct Costs/Other.

All research, including subawards and consultancies, must be carried out in the U.S. (See definition of [Place of Performance](#).)

Note: In SBIR proposals, the use of Federally Funded Research and Development Centers (FFRDCs) can only be used as subawardees with a waiver from the Small Business Administration. Additional information relative to FFRDCs may be found at <http://www.nsf.gov/statistics/nsf05306/>. Contact the cognizant SBIR Program Officer for further information on obtaining a waiver.

Part 6. Equivalent or Overlapping Proposals to Other Federal Agencies. A firm may elect to submit proposals for equivalent or overlapping work under other Federal solicitations or may have received or expect to receive other Federal awards for equivalent or overlapping work. The firm must certify on the proposal cover page whether another Federal Agency has received this proposal (or an equivalent or overlapping proposal). In addition, the proposer must inform NSF of overlapping or equivalent proposals and awards as follows: (a) related federal awards (ongoing or completed); (b) proposals that have been submitted under other government solicitations; and (c) anticipated submissions (within the upcoming calendar year) to other agencies of related proposals. For all such cases, the following information is required:

- The name, address and telephone contact of the sponsoring agency to which the proposal was or will be submitted,
- Date(s) of proposal submission(s),
- Title, number, and date of solicitation under which the proposal was submitted or will be submitted,
- Title and performance period of the proposal, and
- Name and title of principal investigator, annual person-months (calendar-months) devoted by any personnel on the equivalent or overlapping project who are participating as PI or senior personnel on this proposal.

If no equivalent or overlapping proposals are under consideration, explicitly state: NONE. NSF will not make awards that duplicate research funded or expected to be funded by other agencies, although in some cases NSF may fund portions of work described in an overlapping proposal provided that the budgets appropriately reduce costs and allocate costs among the various sponsors. **If a proposer fails to disclose equivalent or overlapping proposals as provided in this section, the proposer could be liable for administrative, civil or criminal sanctions.**

A.9.4. References Cited. Provide a comprehensive listing of relevant references, including patent numbers and other relevant intellectual property citations.

A.9.5. Biographical Sketches. (A maximum of 2 pages per person.) Provide relevant biographical information for the Principal Investigator (PI) and key personnel (including consultants and key members of the subaward team).

A.9.6. Budget. The total budget shall not exceed \$150,000 for the SBIR Phase I proposal. Budget line items must be shown in detail in the budget justification.

List the principal investigator and senior personnel by name with their time commitments budgeted in person-months and the dollar amount for the performance period.

The reimbursement rates for consultants are a direct cost that cannot exceed the daily equivalent of the rate paid to an Executive Level IV Federal employee. As of January 2009 that amount is \$600 per day. **The maximum consulting rate under this solicitation is \$600 per day** (NSF defines a day as 8 hours.) Indicate the number of days proposed per consultant. Consultant travel should be shown under the domestic travel category, E-1, but counts as an outsourcing expense.

The budget justification should provide a line by line description of each budget item (including the signed consultant letter); indicate the type of expendable materials and supplies required with their estimated costs as well.

Permanent equipment, patent expenses, and foreign travel are not allowable expenditures. Tuition costs are not considered research or research and development. Accordingly, they are not acceptable costs and should not be included in the budget.

One trip for up to two persons, normally the PI and an individual associated with business operations, to the National Science Foundation to attend a two-day grantee workshop and to discuss the research program with a program officer must be included in the Phase I budget. An explicit statement acknowledging attendance at the grantee workshop is required on the budget justification page. **A good estimate is \$2,000 per person.**

Indirect costs plus fringe benefits is limited to an effective rate of 150% of salaries and wages. The following expenses will not be funded as part of the indirect cost pools:

- Independent Research and Development (IR&D)
- Patent and patent related expenses will not be funded as either a direct or indirect cost
- Sales and marketing expenses
- Business development
- Manufacturing and production expenses

Reasonable fees (estimated profit) will be considered under Phase I. The amount of the fee approved by NSF cannot exceed seven percent (7%) of the total indirect and direct project costs. The proposal bottom line cannot exceed \$150,000 for SBIR Phase I proposals.

Detailed documentation of all budget line items is required and must be documented on the budget justification page.

A.9.7. Current and Pending Support of Principal Investigator and Senior Personnel. This section should provide information about all research to which the principal investigator and other senior personnel either have committed time or have planned to commit time (in the event that other pending projects are supported during the Phase I period of performance), whether salary for the person involved is included in the budgets of the various projects. If none, state NONE.

For all ongoing or proposed projects or proposals that will be submitted in the near future -- but excluding any proposals already cited above in the Equivalent or Overlapping Proposals to other Federal Agencies section -- that involve the Principal Investigator or senior personnel, provide the following information:

- Name of sponsoring organization,
- Title and performance period of the proposal, and
- Annual person-months (calendar months) devoted to the project by the principal investigator and each of the senior personnel.

A.9.8. Equipment, Instrumentation, Computers, and Facilities. Provide a description that specifies the availability and location of significant equipment, instrumentation, computers, and physical facilities necessary to complete the portion of the research that is to be carried out by the proposing firm in Phase I. Purchase of permanent equipment is not permitted in a Phase I project (reference definition of [Permanent Equipment](#)). DO NOT use budget line item D for Phase I proposals.

If the equipment, instrumentation, computers, and facilities for this research are not the property (owned or leased) of the proposing firm, include a statement signed by the owner or lessor which affirms the availability of these facilities for use in the proposed research, reasonable lease or rental costs for their use, and any other associated costs. *Upload images of the scanned statements into this section.*

A.9.9. Supplementary Docs. This section will only contain the following components (if applicable):

A.9.9.1. Letter(s) of Support for Technology (no more than three letters). Letters of support act as an indication of market validation for the proposed innovation and add significant credibility to the proposed effort. Letters of support should demonstrate that the company has initiated dialog with relevant stakeholders (potential customers, strategic partners or investors) for the proposed innovation and that a real business opportunity may exist should the technology prove feasible. The letter(s) must contain affiliation and contact information for the signatory stakeholder.

A.9.9.2. Company Commercialization History. Required for all proposers certifying receipt of Phase II awards on the proposal cover page. All items must be addressed in the example outlined below. Only firms that have received one or more SBIR/STTR Phase II awards from NSF or any other federal agency must submit a company commercialization history. The information must be in the NSF Template. A blank template is available at: <http://www.nsf.gov/eng/iip/sbir/comhist.jsp>.

Firm Name:								
XYX Materials Corporation								
Year Company Founded:								
2000								
Identify any name change your firm has gone through within the past five years:								
None								
List the parent company if you are a subsidiary or a spin-off. List subsidiaries and spin-offs if you are a parent company:								
None								
Percentage of company revenues for each of the past three (3) fiscal years from federal SBIR/STTR funding (includes Phase I and Phase II awards):								
2006: 30%; 2007: 25%; and 2008: 20%								
List each Phase II SBIR/STTR award below and fill out the requested information.								
Grant/ Contract Number	Agency	Project Title	Year of Award	End of Award Period (Date)	Total Amount of Award (including supplements)	Sales, Service and/or Licensing Revenues	Follow-On Federal Funding Amount	Subsequent Private-Sector (Third-Party) Investment Amount
0401223	NSF	Phase II Rapid Prototyping	2004	2006	\$500,000.	\$1,000,000	\$500,000	\$10,000,000
0500123	DOE	Phase II New Materials for Fuel Cells	2005	2007	\$750,000	\$7,000,000	\$0	\$1,000,000
0712345	NASA	Phase II Materials for Harsh Environments	2007	2009	\$750,000	\$1,000,000	\$5,000,000	\$0
TOTALS					\$2,000,000	\$9,000,000	\$10,000,000	\$11,000,000

A.10. Research Topic

The fundamental mission of NSF is to promote discoveries and to advance education across the frontiers of knowledge in science and engineering. Consistent with that mission, NSF encourages and supports a wide range of proposals from the research and education community and also from the private small business sector. These proposals are reviewed under NSF's merit review criteria, which cover both the quality of research (intellectual or technical merit) and its potential impact on society (broader impacts).

The SBIR program solicits proposals from the small business sector consistent with NSF's mission. The program is governed by Public Law 106-554. A main purpose of the legislation is to stimulate technological innovation and increase private sector commercialization. The NSF SBIR program is therefore in a unique position to meet both the goals of NSF and the purpose of the SBIR legislation by transforming scientific discovery into both social and economic benefit, and by emphasizing private sector commercialization. Accordingly, NSF has formulated a broad solicitation topic for SBIR that conforms to the high-technology investment sector's interests.

The four broad topics are:

- [Biotech and Chemical Technologies \(BC\)](#)
- [Education Applications \(EA\)](#)
- [Information and Communication Technologies \(IC\)](#)

Proposers are reminded to identify the program solicitation number (NSF 09-541) in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing: Cost sharing is not required under this solicitation.

Indirect Cost (F&A) Limitations:

Indirect costs plus fringe benefits are limited to a maximum rate of 150% of direct salaries and wages. (See Section V.A.9.6)

Other Budgetary Limitations: See Section V.A. for additional information.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

June 09, 2009

For the Topic Listing Reference Section II. Program Description

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this program solicitation through use of the NSF FastLane system. Detailed instructions regarding the technical aspects of proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

NSF staff also will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

The SBIR program has **additional** criteria which reflect the legislative emphasis of the program and complement the standard NSF review criteria listed above.

"What is the intellectual merit of the proposed activity?"

1. Is the proposed plan a sound approach for establishing technical and commercial feasibility?
2. To what extent does the proposal suggest and develop unique or ingenious concepts or applications?
3. How well qualified is the team (Principal Investigator, key staff, consultants, and subawardees) to conduct the proposed activity?
4. Is there sufficient access to resources (materials and supplies, analytical services, equipment, facilities, etc.)?
5. Does the proposal reflect state-of-the-art in the major research activities proposed? (Are advancements in state-of-the-art likely?)

"What are the broader impacts of the proposed activity?"

1. What may be the commercial and societal benefits of the proposed activity?
2. Does the proposal lead to enabling technologies (instrumentation, software, etc.) for further discoveries?
3. Does the outcome of the proposed activity lead to a marketable product or process?
4. Has the proposer evaluated the competitive advantage of this technology vs. alternate technologies that can meet the same market needs?
5. How well is the proposed activity positioned to attract further funding from non-SBIR sources once the project ends?
6. Can the product or process developed in the project advance NSF's goals in research and education?
7. Has the proposing firm successfully commercialized SBIR or STTR-supported technology where prior awards have been made? (Or, has the firm been successful at commercializing technology that has not received SBIR or STTR support?)

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at

http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

SBIR Phase I and Phase II awards are subject to availability of funds. NSF has no obligation to make any specific number of Phase I or Phase II awards based on a solicitation and may elect to make several or no awards under any specific technical topic or subtopic. SBIR Phase I awards are six month, fixed-price grants and shall not exceed \$150,000. The SBIR Phase II fixed-priced grants typically will not exceed \$500,000 per award. A Phase II award is based on a Phase I award. SBIR Phase II awards normally will be made for a 24-month period of performance. (For information on Phase II, reference Phase II proposal preparation found on the SBIR/STTR web site ([Phase II Award Information](#))). Reasonable fees for profit (not to exceed seven percent of the total direct and indirect costs) will be considered under both phases.

C. Reporting Requirements

The Principal Investigator must submit a final project report to the cognizant Program Officer within 15 days after expiration of a grant.

Failure to provide the required final project report will delay NSF review and processing of any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

The Phase I final report will be due to NSF within **15 days of the expiration of the grant**. A Phase II proposal requires an approved Phase I Final Report to be uploaded as part of the Phase II proposal package.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Gregory T. Baxter, Program Director, Biotech and Chemical Technologies (BC), telephone: (703) 292-7795, email: gbaxter@nsf.gov
- Cynthia Znati, Program Director, Biotech and Chemical Technologies (BC), telephone: (703) 292-8374, email: cznati@nsf.gov
- Ian M. Bennett, Program Director, Education Applications (EA), telephone: (703) 292-8655, email: ibennett@nsf.gov
- Muralidharan S. Nair, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-7059, email: mnair@nsf.gov
- Errol B. Arkilic, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-8095, email: earkilic@nsf.gov
- Juan E. Figueroa, Program Director, Information and Communications Technologies (IC), telephone: (703) 292-7054, email: jfigueroa@nsf.gov
- William (Bill) G. Haines, Program Director, Nanotechnology, Advanced Materials, and Manufacturing (NM), telephone: (703) 292-7079, email: whaines@nsf.gov
- Cheryl F. Albus, Program Director, Nanotechnology, Advanced Materials, and Manufacturing (NM), telephone: (703) 292-7051, email: calbus@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: pubs@nsf.gov
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation



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