Opportunities for Currently NSF Supported and Self-Sustaining, Graduated Engineering Research Centers to Partner with Small Businesses (ERC & SBIR)

PROGRAM SOLICITATION
NSF 10-617

National Science Foundation

Directorate for Engineering
Engineering Education and Centers
Industrial Innovation and Partnerships

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. proposer's local time)*:*

November 30, 2010

Last Tuesday in November, Annually Thereafter

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

February 07, 2011

First Monday in February, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 11-1, was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in NSF 11-1 apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 18, 2011, must also follow the guidelines contained in NSF 11-1.

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG)* Chapter II.C.2.g(xi) for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: http://www.nsf.gov/bfa/dias/policy/dmp.jsp. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Important Information Pertaining to this Solicitation

Currently NSF supported and self-sustaining, graduated Engineering Research Centers (ERCs) in the Classes of 1990 and later are eligible to apply to this solicitation ONLY if the proposed research involves participation of an already-established small R&D firm that meets the "small business" eligibility requirements of the Small Business Innovative Research (SBIR) program, or is an active or a "graduated" Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Phase I or Phase II grantee, regardless of the agency providing support.

In addition, active or graduated SBIR/STTR Phase II NSF awardees are eligible to apply to the solicitation ONLY if the proposed research involves an ongoing NSF supported ERC or a self-sustaining, graduated ERC in the Classes of 1990 and later.

A self-sustaining graduated Engineering Research Center (ERC), for the purpose of this solicitation, is one that is defined as an ERC in the Classes of 1990 or later that is financially self-sustaining and retains ERC key features. This would include any ERC from earlier classes that was reestablished for a new term of NSF support through an ERC competition. The determination of whether or not a graduated ERC is self-sustaining was made through a survey of graduated ERCs. Only those ERC in the Classes of 1990 and later that responded to this survey and were determined to be self-sustaining and retaining ERC key features may apply to this solicitation. The results of that survey, "Post Graduation Status of Engineering Research Centers - 2010," can be found at: http://www.erc-assoc.org/topics/6-nsf-policies.html. The list eligible ERCs can be found in the Appendix.

The definition of a "graduated" SBIR/STTR Phase I or Phase II grantee differs from that of a "graduated" ERC. The "graduated" SBIR/STTR grantee has had an award that was successfully completed within the previous *five years* of the proposal deadline date.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Opportunities for Currently NSF Supported and Self-Sustaining, Graduated Engineering Research Centers to Partner with Small Businesses (ERC & SBIR)

Synopsis of Program:

This opportunity aims to enable currently supported NSF Engineering Research Centers (ERC) that are in the Classes of 2003-2008 and recently graduated, self-sustaining ERCs to benefit from the role of small firms in carrying out research to speed the translation of research results into commercial products and for small businesses to benefit from the innovative and leading-edge research performed at Engineering Research Centers (ERCs). These centers have pushed the boundaries of knowledge across a broad spectrum of technology fields while transferring a continuous stream of cutting-edge enabling and systems technologies to the market place through their industrial partners and spin-off start-up firms.

Proposals are invited from the institutions with the 13 ongoing ERCs and the 22 recently graduated, self-sustaining ERCs in the Class of 1990 or later to perform collaborative research with ongoing and graduated SBIR/STTR Phase I and Phase II awardees funded by any agency and other small R&D firms.

Proposals may also be submitted by NSF supported ongoing and graduated SBIR/STTR Phase II awardees who will collaborate with an ongoing or recently graduated, self-sustaining ERC for the purposes outlined in the solicitation.

A self-sustaining graduated Engineering Research Center (ERC), for the purpose of this solicitation, is one that is defined as an ERC in the class of 1990 or later that is financially self-sustaining and retains ERC key features. Self-sufficiency was determined through a survey of graduated ERCs. This would include any ERC from earlier classes that was reestablished for a new term of NSF support through an ERC competition. The results of that survey, "Post Graduation Status of Engineering Research Centers - 2010," can be found at: http://www.erc-assoc.org/topics/6-nsf-policies.html. A list of currently NSF supported and self-sustaining graduated ERCs eligible to compete can be found in the Appendix.

The goals of this effort are to:

1. Speed the translation of ERC-generated research and technology advances to the marketplace and engage students more directly in the innovation process though collaboration between an ERC and a small R&D firm, and
2. Strengthen the research capacity of the small R&D firm or SBIR/STTR awardee to speed the entry of its innovation into the marketplace and broaden its portfolio of marketable products through collaboration with an ERC.

The result will be the creation of a mutually beneficial research and commercialization platform that joins ERCs and small R&D firms or SBIR/STTR companies. This platform will establish a partnership upon which the ERC and the firm can collaborate in the future and ERC students can learn about the innovation process.

Cognizant Program Officer(s):

- Rathindra DasGupta, IIP Program Officer for NSF- Supported SBIR/STTR Firms, telephone: (703) 292-8353, email: rdasgupt@nsf.gov
- Deborah J. Jackson, EEC Program Director for ERC PIs, telephone: (703) 292-7499, email: djackson@nsf.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 10 to 15

Anticipated Funding Amount: $3,400,000 pending availability of funds. Each partnership consists of (1) one lead active or self-sustaining, graduated Engineering Research Center and one small business as a sub-contractor or (2) one lead graduated NSF or currently NSF-supported SBIR/STTR grantee with one active or self-sustaining, graduated ERC as a sub-contractor. The combined total award would be up to $200,000, with a duration of one or two years. The ERC PI and the small firm's PI should budget to include travel to attend a one-day workshop to be held in the Arlington, VA area.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- **Option 1: Eligibility for ERC Initiated Collaborations**: Active or self-sustaining, graduated ERC initiated collaborations - with any already-established small R&D firm that meets the "small business" eligibility requirements as defined by the SBIR program (including active or graduated SBIR/STTR Phase I and Phase II grantees supported by any agency).

  Institutions with NSF-funded ERCs with ***active*** awards in the Classes of 2003-2008, or self-sustaining, graduated ERCs, listed in the Appendix, are eligible to apply directly to the Engineering Research Centers program for Option 1. A self-sustaining, graduated ERC is one that is defined as an ERC in the Classes of 1990 or later that is financially self-sustaining and retains ERC key features. This would include the two ERCs in the Class of 2000, even if they are operating on brief no-cost extensions. A list of self-sustaining, graduated ERCs is provided in the Appendix.

  Option 2: Eligibility for SBIR/STTR Initiated Collaborations: Active or graduated NSF SBIR/STTR Phase II initiated collaborations - with either an active or a self-sustaining, graduated ERC

  Only active or graduated NSF SBIR/STTR Phase II and Phase IIB awards are eligible to directly apply to

this solicitation under Option 2. An active SBIR/STTR awardee is one with an NSF award, which has not yet expired. The "graduated" NSF supported SBIR/STTR has had an award that was successfully completed within the previous *five years* of the proposal deadline date. In addition, the company is only eligible to apply when an ***active or self-sustaining, graduated*** ERC listed in the Appendix participates in the collaborative research project.

A potential list of SBIR/STTR members can be viewed using the NSF award search tool at http://www.nsf.gov/awardsearch/tab.do?dispatch=4 and confining the search to Element Code 5373 or 1591 for awards. Details about the award and PI are viewable by clicking on the award number.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 3

Institutions with eligible ERCs can endorse up to three proposals submitted by ERC faculty. For an ERC, however, there is no limit on the number of Option 2 proposals in which the ERC is a subawardee.

Institutions with faculty from ERC-A can only partner with small business-A to submit a single proposal. This does not preclude other faculty from ERC-A from also submitting a partnership proposal with a different small business company. In addition, a small business firm cannot submit the same project with two different centers. The projects must be substantially different from a proposed project with another ERC.

Multiple proposals from PIs from an ERC with the same R&D firm or the same NSF supported SBIR/STTR company will be returned without review. Likewise, proposals will be returned without review if the small R&D firm or the SBIR/STTR company allows the same project to partner with multiple ERCs. In addition, proposals will be returned without review if submitted by the PI from a non SBIR/STTR firm or an SBIR/STTR firm supported by another agency.

Limit on Number of Proposals per PI: 2

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. 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.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

- **Letter of Intent Due Date(s) *(required)*** (due by 5 p.m. proposer's local time)***:***

  November 30, 2010

  Last Tuesday in November, Annually Thereafter

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

  February 07, 2011

  First Monday in February, Annually Thereafter

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: Standard NSF award conditions apply.

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

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I. INTRODUCTION

This opportunity is open to institutions with currently supported Engineering Research Centers (ERC) or self-sustaining, graduated ERCs in the classes of 1990 or later to partner with experienced R&D firms that meet the small business eligibility requirements, or with active or graduated Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Phase I or Phase II grantees (supported by any agency) that have successfully completed their SBIR/STTR awards within the previous five years. Institutions with eligible ERCs can submit a research proposal that includes a subcontract to an established R&D firm, an active or a graduated SBIR/STTR Phase I or Phase II awardee. The formation of these partnerships should help ERCs push the boundaries of knowledge across a broad spectrum of technology fields while transferring a continuous stream of cutting-edge enabling and systems technologies to the marketplace through their small business partners who work at the leading edge of technology.

In addition, this opportunity enables PIs from NSF supported ongoing or recently graduated SBIR/STTR Phase II awards to partner with ongoing or recently graduated ERCs for the purposes outlined in this solicitation.

This opportunity will complement activities in the ERC programs to leverage the successes of small R&D firms and/or SBIR/STTR grantees. It is designed to directly help U.S. small businesses to compete by helping them to address their research needs. ERCs act as a catalyst to provide the research that small business immediately needs to further help make it successful and competitive.

II. PROGRAM DESCRIPTION

The SBIR/STTR program stimulates entrepreneurship in this country through government support for research in small business. These small firms often need additional research to commercialize their products and/or services. One method of providing this needed research is by enabling small businesses to collaborate with an ERC.

The National Science Foundation-sponsored ERCs are interdisciplinary, multi-university centers located at universities all across the United States, each in close partnership with industry. Each ERC provides an environment in which academe and industry collaborate in pursuing strategic advances in complex engineered systems and enabling systems-level technologies that have the potential to spawn whole new industries or to radically transform the product lines, processing technologies, or service delivery methodologies of current industries. Activity within ERCs lies at the interface between the discovery-driven culture of science and the innovation-driven culture of engineering and industry. The centers provide the intellectual foundation for industry to collaborate with faculty and students on resolving generic, long-range challenges, producing the knowledge needed for steady advances in technology and their speedy transition to the marketplace.

The proposed funding request must be centered on research that is mutually beneficial to the ERC and small R&D firms or SBIR/STTR Phase I or Phase II awardees. Thus, it will serve the following dual purposes:

1. Speed the translation of ERC-generated research and technology advances to the marketplace and engage students more directly in the innovation process though collaboration between an ERC and a small R&D firm, and
2. Strengthen the research capacity of the small R&D firm or SBIR/STTR awardee to speed the entry of its innovation into the marketplace and broaden its portfolio of marketable products through collaboration with an ERC.

The result will be the creation of a mutually beneficial research and commercialization platform that joins ERCs and small business companies in this effort and establishes a model upon which the ERC and the firm can collaborate in the future.

Prospective small R&D firms and SBIR/STTR Phase I or II subcontractors should contact an ERC of interest, defined in the Appendix, to learn more about that center's scope of research, its membership agreement, the members of its Industrial Advisory Board (IAB) and the research areas of interest of the center's faculty, researchers, and graduate students. Current information on ERCs can be found at http://www.erc-assoc.org.

Prospective ERC PIs can view a potential list of NSF SBIR/STTR members using the NSF award search tool at http://www.nsf.gov/awardsearch/tab.do?dispatch=4 and confining the search to Program Element Code 5373 or 1591 for awards made in the last five years. Details about the award and PI are viewable by clicking on the award number.

Prospective ERC PIs can view a potential list of SBIR/STTR partners supported by other agencies using the award search tool available at these agencies.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 10 to 15

Anticipated Funding Amount: $3,400,000 pending availability of funds. Each partnership consists of (1) one lead active or self-sustaining, graduated Engineering Research Center and one small business as a sub-contractor or (2) one lead graduated NSF or currently NSF-supported SBIR/STTR grantee with one active or self-sustaining, graduated ERC as a sub-contractor. The combined total award would be up to $200,000, with a duration of one or two years. The ERC PI and the small firm's PI should budget to include travel to attend a one-day workshop to be held in the Arlington, VA area.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- **Option 1: Eligibility for ERC Initiated Collaborations**: Active or self-sustaining, graduated ERC initiated collaborations - with any already-established small R&D firm that meets the "small business" eligibility requirements as defined by the SBIR program (including active or graduated SBIR/STTR Phase I and Phase II grantees supported by any agency).

  Institutions with NSF-funded ERCs with ***active*** awards in the Classes of 2003-2008, or self-sustaining, graduated ERCs, listed in the Appendix, are eligible to apply directly to the Engineering Research Centers program for Option 1. A self-sustaining, graduated ERC is one that is defined as an ERC in the Classes of 1990 or later that is financially self-sustaining and retains ERC key features. This would include the two ERCs in the Class of 2000, even if they are operating on brief no-cost extensions. A list of self-sustaining, graduated ERCs is provided in the Appendix.

  Option 2: Eligibility for SBIR/STTR Initiated Collaborations: Active or graduated NSF SBIR/STTR Phase II initiated collaborations - with either an active or a self-sustaining, graduated ERC

  Only active or graduated NSF SBIR/STTR Phase II and Phase IIB awards are eligible to directly apply to this solicitation under Option 2. An active SBIR/STTR awardee is one with an NSF award, which has not yet expired. The "graduated" NSF supported SBIR/STTR has had an award that was successfully completed within the previous *five years* of the proposal deadline date. In addition, the company is only eligible to apply when an ***active or self-sustaining, graduated*** ERC listed in the Appendix participates in the collaborative research project.

  A potential list of SBIR/STTR members can be viewed using the NSF award search tool at http://www.nsf.gov/awardsearch/tab.do?dispatch=4 and confining the search to Element Code 5373 or 1591 for awards. Details about the award and PI are viewable by clicking on the award number.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 3

Institutions with eligible ERCs can endorse up to three proposals submitted by ERC faculty. For an ERC, however, there is no limit on the number of Option 2 proposals in which the ERC is a subawardee.

Institutions with faculty from ERC-A can only partner with small business-A to submit a single proposal. This does not preclude other faculty from ERC-A from also submitting a partnership proposal with a different small business company. In addition, a small business firm cannot submit the same project with two different centers. The projects must be substantially different from a proposed project with another ERC.

Multiple proposals from PIs from an ERC with the same R&D firm or the same NSF supported SBIR/STTR company will be returned without review. Likewise, proposals will be returned without review if the small R&D firm or the SBIR/STTR company allows the same project to partner with multiple ERCs. In addition, proposals will be returned without review if submitted by the PI from a non SBIR/STTR firm or an SBIR/STTR firm supported by another agency.

Limit on Number of Proposals per PI: 2

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(required):*

A Letter of Intent (LOI) is required to facilitate the NSF review process. The letter should be submitted via FastLane no later than the LOI deadline specified in this solicitation. The LOI allows NSF to screen the proposals with respect to eligibility requirements, to categorize the proposals, and to identify conflicts-of-interest to prepare for the proposal review processes. Follow these steps for

the LOI preparation and submission:

Submit information for your LOI through Fast Lane under these categories **only (note the character limits, which include spaces, as stated below):**

- Project Title: The Project Title should reflect the focus of the proposed collaboration.
- Synopsis: (maximum of 2,500 characters in this section): Provide brief statements of the vision and goals of the proposed collaboration at a sufficient level of detail to understand the proposed collaboration.
- Participants (maximum of 255 characters in this section): Identify the key ERC participants including their ERC institutional affiliations.
- Point of Contact for NSF Inquiries
- Project PI Information
- Participating Organizations: Include names and addresses (city, state, country) for the ERC and Industry Partners

Special Letter of Intent Preparation Instruction:

- Submission of multiple Letters of Intent is allowed.
- Participants and Participating Organizations are required when submitting Letters of Intent.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 0 and Maximum of 4 Other Senior Project Personnel are allowed
- A Minimum of 1 and Maximum of 5 Other Participating Organizations are allowed
- Submission of multiple Letters of Intent is allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained 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) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number 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.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

Option 1: Institutions with eligible ERCs will submit a single proposal that details the research responsibilities of both the ERC and the small R&D firm or a SBIR/STTR Phase I or Phase II company. The small R&D firm or the SBIR/STTR grantee will be a subcontractor. The subawardee budget to the small R&D firm must be a minimum of 30% or a maximum of 60% of the total award amount. The title of the proposal must start with “ERC – Small Business:” The proposal must state if the small business partner is an active or graduated SBIR/STTR Phase I or Phase II awardee.

Option 2: The active SBIR/STTR Phase II company will submit a single proposal that details the research responsibilities of both the ERC and the SBIR/STTR Phase II company. The ERC grantee will be a subcontractor. If the grantee is an NSF STTR Phase II company, the subawardee budget to the ERC must be a minimum of 30% or a maximum of 60% of the total award amount. If the grantee is an NSF SBIR Phase II company, the subawardee budget to the ERC must not exceed 50% of the total award amount. The title of the proposal must start with "ERC - Small Business:" The proposal must state if the ERC is an active or graduated awardee.

Option 1 and Option 2: Each partner organization must submit its own detailed budget and *all* line items in the budget must be justified. The company president or the CEO must submit a letter of endorsement that indicates the value of the research partnership to the small business while describing how the small business will contribute to the ERC. The letter must be included in the Supplemental Document section of the proposal as indicated below.

Include the following in the supplementary documentation:

- Endorsement letter from both the ERC Center Director and the SBIR/STTR or small R&D firm president or CEO
- Biographies of the SBIR/STTR or small R&D firm PI and senior staff (not to exceed 2 pages total)
- Organization chart of the SBIR/STTR or small R&D firm
- Biographies of the ERC PI and co-PI (not to exceed 2 pages total)
- Post-doc mentoring plan (if post-docs are proposed)

Proposals not following these instructions will be returned without review. Proposals will be peer reviewed by a panel of experts or by mail review.

The 15-page narrative of the proposal will contain the following sections:

1. Vision of the project;

2. Justification as to why it is both translational research that rests on research carried out by the ERC during its NSF-supported phase and research that strengthens the capacity of the firm to broaden its portfolio of marketable products (the research may have been supported by direct financial support provided through the ERC's budget to the PI or by an associated or sponsored project where support went directly to the PI and the project was reported as a part of the ERC;

3. Research plan including testbeds;

4. Expected deliverables; and

5. Management Plan, team, milestone chart, commercialization potential (see section on additional review criteria).

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

C. Due Dates

- **Letter of Intent Due Date(s)** ***(required)*** (due by 5 p.m. proposer's local time)***:***

  November 30, 2010

  Last Tuesday in November, Annually Thereafter

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

  February 07, 2011

  First Monday in February, Annually Thereafter

D. FastLane / Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://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.

- **For Proposals Submitted Via Grants.gov:**

  Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

  Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

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.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

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:

For Option 1 and Option 2 Proposals. Because the purpose of this solicitation is to help translate ERC generated advancements into the commercial marketplace and speed the commercialization of NSF supported SBIR/STTR innovations to the marketplace, the additional review criteria emphasize those aspects of the standard NSF intellectual merit and broader impact criteria that are related to translation of knowledge rather than to scientific discovery. In addition to the standard NSF review criteria, the following review criteria will be used:
Commercialization Potential

- The extent to which the proposer understands and has evaluated the potential market for the proposed technology to be transferred;
- The extent to which the proposer benchmarked the innovation versus existing products that meet the same market needs;
- The extent to which the proposed activity positions the firm to attract further funding from SBIR and/or non-SBIR sources once the project ends;
- The degree to which the proposal demonstrates an effective strategy for translating/speeding the technology innovation to the marketplace;
- The degree to which the innovation presents a compelling value proposition i.e. strong need or market-pull and breadth of potential commercial impact for the innovation; and
- The degree to which the intellectual property issues are effectively addressed vis-a-vis the firm and university involved and there is sufficient protection to move the product to market and attain at least a temporal competitive advantage.

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 nsfpubs@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.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report will delay NSF review and processing of any future funding increments as well as 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 annual and 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 project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

Option 1. At the end of every six months, the ERC PI must submit an integrated report encompassing contributions by both small business and ERC researchers. This report must be submitted via email, on behalf of the partnership to the EEC Program Directors listed in this solicitation. The report should be limited to ten pages.

The final report must address contributions by both the small business and ERC researchers.

Option 2. At the end of every six months, the SBIRC PI must submit an integrated report encompassing contributions by both small business and ERC researchers. This report must be submitted via email, on behalf of the partnership to the Program Officer for NSF-Supported SBIR/STTR firms listed in this solicitation. The report should be limited to ten pages.

The final report must address contributions by both the small business and ERC researchers.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Rathindra DasGupta, IIP Program Officer for NSF- Supported SBIR/STTR Firms, telephone: (703) 292-8353, email: rdasgupt@nsf.gov
- Deborah J. Jackson, EEC Program Director for ERC PIs, telephone: (703) 292-7499, email: djackson@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

Please contact the above individuals only for further information about this opportunity.

When using FastLane, call the FastLane Help Desk at 1-800-673-6188 or e-mail: fastlane@nsf.gov for user support. The FastLane Help Desk answers general technical questions related to the use of the FastLane system.

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.

Please visit the Engineering Research Center Association at

http://www.erc-assoc.org/topics/6-nsf-policies.html
for a list of active participating Engineering Research Centers.

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: nsfpubs@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
Arlington, VA 22230

X. APPENDIX

Biotechnology and Health Care

Ongoing NSF-supported ERCs

- **Synthetic Biology ERC**, University of California, Berkeley in partnership with Harvard University, the Massachusetts Institute of Technology, Prairie View A&M University (HBCU), and the University of California, San Francisco, Class of 2006
- **Quality of Life ERC**, Carnegie Mellon University in partnership with the University of Pittsburgh, Class of 2006
- **ERC for Revolutionizing Metallic Biomaterials**, North Carolina A&T State University (HBCU) in partnership with the University of Cincinnati and the University of Pittsburgh, Class of 2008
- **ERC for Structured Organic Particulate Systems,** Rutgers University in partnership with New Jersey Institute of Technology, Purdue University, and the University of Puerto Rico-Mayaguez (MSI)**,** Class of 2006
- **Biomimetic MicroElectronic Systems ERC,** University of Southern California in partnership with Caltech and the University of California, Santa Cruz, Class of 2003

Self-sustaining ERCs

- **Engineering of Living Tissues,** Georgia Tech and Emory University 1998 to 2008 (self-sustaining)
- **Computer-Integrated Surgical Systems and Technology,** Johns Hopkins University -, 1998 to 2008 (self-sustaining)
- **Biotechnology Process Engineering,** MIT. 1985 and 1995 to 2005 (self-sustaining)
- **Biofilm Engineering,** Montana State University, 1990 to 2001 (self-sustaining)
- **Bioengineering Educational Technologies,** Vanderbilt University, 1999 to 2007 (self-sustaining)
- **Engineered Biomaterials,** University of Washington, 1996 to 2007 (self-sustaining)

Design and Manufacturing

Self-sustaining ERCs

- **Environmentally Benign Semiconductor Manufacturing,** University of Arizona, 1996 to 2006 (self-sustaining)
- **Advanced Engineering of Fibers and Films,** Clemson University -1998 to 2008 (self-sustaining)
- **Particle Engineering,** University of Florida, 1994 to 2006 (self-sustaining)
- **Systems Research,** University of Maryland, 1985 & 1994 to 1997 (self-sustaining)
- **Reconfigurable Manufacturing Systems,** University of Michigan, 1996 to 2007 (self-sustaining)

Energy, Sustainability, and Infrastructure

Ongoing NSF-supported ERCs

- **ERC for Biorenewable Chemicals**, Iowa State University in partnership with Rice University, the University of California, Irvine, the University of New Mexico (MSI), the University of Virginia, and the University of Wisconsin-Madison, Class of 2008
- **ERC for Compact and Efficient Fluid Power,** University of Minnesota in partnership with Georgia Institute of Technology, Purdue University, the University of Illinois at Urbana-Champaign, and Vanderbilt university**,** Class of 2006
- **ERC for Future Renewable Electric Energy Delivery and Management,** North Carolina State University in partnership with Arizona State University, Florida State University. Florida A&M University (HBCU), Missouri University of Science and Technology, Class of 2008
- **Smart Lighting ERC,** Rensselaer Polytechnic Institute in partnership with Boston University and the University of New Mexico (MSI), Class of 2008

Self-sustaining ERCs

- **Multidisciplinary Center for Earthquake Engineering Research** University at Buffalo, 1997 to 2007 (self-sustaining)
- **Pacific Earthquake Engineering Research Center,** University of California at Berkeley, 1997 to 2007 (self-sustaining)
- **Mid-America Earthquake Engineering Research,** University of Illinois at Urbana-Champaign, 1997 to 2007 (self-sustaining)

Micro/Optoelectronics, Sensing, and IT

Ongoing NSF-supported ERCs

- **ERC for Integrated Access Networks,** University of Arizona in partnership with the California Institute of Technology, Norfolk State University (HBCU), Stanford University, Tuskegee University (HBCU), the Universities of California at Berkeley, San Diego, and Los Angeles, and the University of Southern California, Class of 2008
- **ERC for Extreme Ultraviolet Science and Technology,** Colorado State University in partnership with the University of Colorado, Boulder and the University of California, Berkeley, Class of 2003
- **ERC for Collaborative Adaptive Sensing of the Atmosphere**, the University of Massachusetts-Amherst in partnership with Colorado State University, the University of Oklahoma, and the University of Puerto Rico-Mayaguez (MSI), Class of 2003
- **ERC on Mid-Infrared Technologies for Health and the Environment,** Princeton University in partnership with the City University of New York, Johns Hopkins University, Rice University, Texas A & M University, and the University of Maryland - Baltimore County, Class of 2006

Self-sustaining ERCs

- **Neuromorphic Systems Engineering,** California Institute of Technology, 1995 to 2005 (self-sustaining)
- **Data Storage Systems,** Carnegie Mellon, 1990 to 2001 (self-sustaining)
- **Microelectronics Packaging,** Georgia Tech, 1995 to 2005 (self-sustaining)
- **Computational Field Simulation, Mississippi State University,** 1990 to 2001 (self-sustaining)
- **Subsurface Sensing and Imaging Systems,** Northeastern University, 2000 - 2010 (self-sustaining)
- **Wireless Integrated MicroSystems,** University of Michigan, 2000 - 2010 (self-sustaining)
- **Integrated Media Systems,** University of Southern California, 1996 to 2006 (self-sustaining)
- **Power Electronics Systems,** Virginia Polytechnic Institute, 1998 to 2008 (self-sustaining)