

Materials Research Science and Engineering Centers

PROGRAM SOLICITATION

NSF 13-556

REPLACES DOCUMENT(S):

NSF 10-568



National Science Foundation

Directorate for Mathematical & Physical Sciences
Division of Materials Research

Preliminary Proposal Due Date(s) (required) (due by 5 p.m. proposer's local time):

August 26, 2013

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

January 10, 2014

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, **NSF 13-1**, was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in **NSF 13-1** apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 14, 2013, must also follow the guidelines contained in **NSF 13-1**.

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, *National Science Foundation's Merit Review Criteria: Review and Revisions*. While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the *Grant Proposal Guide* and the *Award & Administration Guide*.

*Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the *Grant Proposal Guide*.*

The major difference between this solicitation and the previous one (**NSF 10-568**) is the suspension of Materials Interdisciplinary Research Teams (MIRTS) in this competition. In addition, the name Materials Research Science and Engineering Centers (MRSECs) has been retained and materials centers will no longer be called Centers of Excellence for Materials Research and Innovation (CEMRIs).

In accordance with the National Research Council (NRC) Report (The National Science Foundation's Materials Research Science and Engineering Program, Looking Back, Moving Forward - www.nap.edu/catalog.php?record_id=11966), each MRSEC is strongly encouraged to select a limited number of education activities that are consistent with the center size, are effective, leverage participant expertise and interest, and address local and national needs. MRSECs are expected to take greater roles in maintaining the long-term health of the materials research infrastructure in the United States and contribute to a national network of materials research facilities. Recognizing the changing global nature of the science and engineering enterprise, international collaborations for MRSECs are strongly encouraged (but not required).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Materials Research Science and Engineering Center (MRSEC)

Synopsis of Program:

Materials Research Science and Engineering Centers (MRSECs) provide sustained support of interdisciplinary materials research and education of the highest quality while addressing fundamental problems in science and engineering. MRSECs address research of a scope and complexity requiring the scale, synergy, and interdisciplinarity provided by a campus-based research center. They support materials research infrastructure in the United States, promote active collaboration between universities and other sectors, including industry and international institutions, and contribute to the development of a national network of university-based centers in materials research, education, and facilities. A MRSEC may be located at a single institution, or may involve multiple institutions in partnership.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Sean L. Jones, Program Director, 1065 N, telephone: (703) 292-2986, email: sljones@nsf.gov
- Charles Bouldin, Program Director, 1065 N, telephone: (703) 292-4920, email: cbouldin@nsf.gov
- Charles Ying, Program Director, 1065 N, telephone: (703) 292-8428, email: cying@nsf.gov

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

- 47.049 --- Mathematical and Physical Sciences

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 7 to 10

Anticipated Funding Amount: \$25,000,000 The number of MRSEC awards will depend on the quality of the proposals and available funds. An estimate of \$25M will be available for the FY 2014 competition for funding approximately 7-10 MRSEC awards.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Proposals may be submitted by academic institutions in the US with broad programs in materials research and education. Academic institutions, as defined by the GPG, are universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Only one MRSEC preliminary proposal may be submitted by any one organization as the lead organization in this competition. An organization proposing research in several groups should submit a single MRSEC proposal with multiple Interdisciplinary Research Groups (IRGs). A MRSEC proposal must contain a minimum of 2 IRGs and a maximum of 5 IRGs. The IRGs in a center may be topically related, or they may address different topical aspects of materials research. A single center at an organization allows efficient usage of resources, including common infrastructure, and better coordination of education and other activities of the center.

Institutions that were awarded a MRSEC in the FY 2011 competition as the lead institution are **not** eligible to submit a MRSEC proposal as a lead institution in this competition. Existing MRSECs should have the ability to re-prioritize resources and add new participants through, for example, their seed program.

Full MRSEC proposals may be submitted by invitation only.

Limit on Number of Proposals per PI: 1

An individual may be the Principal Investigator (PI) or co-PI for only one preliminary proposal.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **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:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. proposer's local time):
August 26, 2013
- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
January 10, 2014

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.

TABLE OF CONTENTS

Summary of Program Requirements

- I. Introduction
- II. Program Description
- III. Award Information
- IV. Eligibility Information
- V. Proposal Preparation and Submission Instructions
 - A. Proposal Preparation Instructions
 - B. Budgetary Information
 - C. Due Dates
 - D. FastLane/Grants.gov Requirements
- VI. NSF Proposal Processing and Review Procedures
 - A. Merit Review Principles and Criteria
 - B. Review and Selection Process
- VII. Award Administration Information
 - A. Notification of the Award
 - B. Award Conditions
 - C. Reporting Requirements
- VIII. Agency Contacts
- IX. Other Information

I. INTRODUCTION

The nature of materials research demands mechanisms to support interdisciplinary collaboration for the conception and execution of ideas, and for developing the capabilities to sustain our nation's competitiveness in the production of new technology and products based on advances in materials research. Materials Research Science and Engineering Centers (MRSECs) are expected to contribute to the development of a diverse and globally competitive scientific workforce for increased economic competitiveness of the United States.

MRSECs support interdisciplinary and multidisciplinary materials research and education of the highest quality while addressing fundamental problems in science and engineering of a scope and complexity requiring the scale and synergy provided by a campus-based research center. MRSECs require outstanding research quality, intellectual breadth, interdisciplinarity, flexibility in responding to new research opportunities, support for research infrastructure, and they foster the integration of research and education in the materials field. They are expected to have strong links to industry and other sectors, as appropriate, and to contribute to the development of a national network of university-based centers in materials research.

The NSF's mission is to promote and facilitate the progress of science, engineering, and related education in the United States. Its role in supporting research and education is particularly important in creating physical and human resources infrastructure in both traditional and emerging areas. NSF also promotes partnerships, including collaboration with other academic organizations, agencies, industry, national and government laboratories, for projects of mutual interest. International collaborations are also strongly encouraged.

The MRSEC program reinforces NSF's commitment to excellence in interdisciplinary research and education; it is national in scope and significance, requiring coordination of the overall effort among Centers. The MRSEC program complements, but does not substitute for, NSF support for individual investigators, small groups, national user facilities, and instrumentation in materials research.

Information about these centers, current research areas, and the national networks supported by MRSECs can be found at www.mrsec.org. In an effort to preserve balance in the nation's materials research portfolio, topics are sought that solve fundamental, timely and complex materials problems that are intellectually challenging, important to society, and that potentially broaden the current portfolio.

II. PROGRAM DESCRIPTION

Materials Research Science and Engineering Centers are supported by the National Science Foundation to undertake materials research of

a scope and complexity that would not be feasible under traditional funding of individual research projects. The MRSEC program demonstrates NSF's commitment to excellence in interdisciplinary research and education; it is national in scope, encouraging coordination of the overall effort among centers; and it complements, but does not substitute for, NSF support for individual investigators, small groups, national user facilities, and instrumentation in materials research. More information about MRSECs may be found at www.mrsec.org.

A MRSEC may encompass two to five interdisciplinary research groups (IRGs). Each IRG involves several faculty members and associated researchers, addressing a major topic or area, in which sustained support for interactive effort by several participants with complementary backgrounds, skills, and knowledge is critical to progress. The IRGs in a center may be topically related, or they may address different topical aspects of materials research. The center as a whole is expected to be more than the sum of its IRGs, with the synergy arising from its common infrastructure, shared facilities, education and outreach activities, etc.

MRSECs incorporate the following activities to an extent consistent with the size and vision of the center:

- Academic institution-based interdisciplinary materials research of the highest quality: each IRG must have a well-integrated, interdisciplinary research program distinguished by intellectual excellence and driven by a clear vision that could lead to fundamental advances, new discoveries, and/or technological developments that could have national and international significance. Each IRG must show clear benefits of an interdisciplinary and collaborative approach to address a major materials topic or area and the linkages between researchers within the IRG.
- Seed funding: NSF intends to provide flexibility for the center to respond quickly and effectively to new opportunities, and pursue high risk/high impact and transformative research. These may include (but are not limited to): seed support for junior faculty and for investigators changing fields; emerging areas of interdisciplinary research; programs to link the university effort in materials with industry, national laboratories, and other sectors; the development of tools and cyber infrastructure for remote access to instrumentation; and innovative interdisciplinary educational ventures. Seed funding through the center is not intended to provide a substitute for NSF individual investigator funding.
- Promotion of the integration of research and education, and development of effective education/outreach activities that are consistent with the center size, leverage participant expertise and interest, and address local and national needs. Research Experiences for Undergraduates (REU) are required. A center should pursue activities with proven impacts in improving scientific education. It may also experiment with novel approaches as appropriate.
- Fostering increased participation in materials research and education of members of underrepresented groups in science and engineering (e.g., women, African Americans, Hispanics, Native Americans, Pacific Islanders, and persons with disabilities) at all academic levels. A center is strongly encouraged to develop cooperative programs with organization(s) serving predominantly underrepresented groups in science and engineering and/or predominantly undergraduate institutions.
- Development of shared experimental and computational facilities, properly staffed, equipped and maintained, and accessible to users from the center, the broader university community, and other institutions. A goal is to maintain the long-term health of the materials research infrastructure in the United States and contribute to a national network of materials research facilities.
- Promotion of partnerships by supporting a center's active cooperation with industry and international institutions, and other sectors, such as national laboratories, non-profit organizations, and state and local governments, in order to stimulate and facilitate knowledge transfer among the participants and strengthen the links between university-based research and its application.

Each MRSEC has the responsibility to manage and evaluate its own operation with respect to program administration, planning, content and direction. NSF support is intended to promote optimal use of university resources and capabilities, and to provide maximum flexibility in setting research directions, developing cooperative activities with other organizations, and responding quickly and effectively to new opportunities in materials research and education that are important to the nation's needs and technology base.

A center may address any area of research supported by the NSF Division of Materials Research. In addition to research excellence, these centers provide the infrastructure of equipment, education and outreach needed to ensure that the program as a whole meets its objectives and provides for effective coordination within and beyond the center community. Centers are required to contribute to the network addressing common problems and applications. Center shared experimental and computational facilities constitute the Materials Research Facility Network, a network of facilities that help to maintain and advance materials research infrastructure in the United States. More information about the network may be found at www.mrfn.org.

III. AWARD INFORMATION

Individual MRSEC awards are expected to range in size from about \$2 million/year to a maximum of \$5 million/year, depending on the number of IRGs. Awards will be made for an initial duration of up to six years, but the level of funding is contingent on successful progress and upon the outcome of external review. The number of awards will depend on the availability of funds and the quality of proposals received. Any funding provided to existing centers after the initial duration will be based on the submission of a re-competing proposal as described below.

Proposals from existing (re-competing) MRSECs will be evaluated in open competition with new proposals and prior accomplishments will be an important consideration. If a proposal from an existing center is not successful, phase-out support may be provided at a reduced level for up to two additional years under the current award. If a proposal from an existing center is successful, a new cooperative agreement will be awarded for the center.

Awards are based on comprehensive, competitive merit review. Re-competing centers must demonstrate excellence, significant achievements, and organizational and national impact in materials research; substantive accomplishments in the integration of research and education; active and effective collaboration with industry and other sectors, as appropriate; effective development and operation of shared facilities; and measurable success in broadening participation for underrepresented groups. Achievements under prior NSF support are a critical factor when re-competing proposals are considered. The commitment of each center to introducing substantially new research topics and undertaking innovative research will also be important in considering re-competing proposals. The anticipated effective date of new MRSEC awards is September 1, 2014.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Proposals may be submitted by academic institutions in the US with broad programs in materials research and education. Academic institutions, as defined by the GPG, are universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their

faculty members.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Only one MRSEC preliminary proposal may be submitted by any one organization as the lead organization in this competition. An organization proposing research in several groups should submit a single MRSEC proposal with multiple Interdisciplinary Research Groups (IRGs). A MRSEC proposal must contain a minimum of 2 IRGs and a maximum of 5 IRGs. The IRGs in a center may be topically related, or they may address different topical aspects of materials research. A single center at an organization allows efficient usage of resources, including common infrastructure, and better coordination of education and other activities of the center.

Institutions that were awarded a MRSEC in the FY 2011 competition as the lead institution are **not** eligible to submit a MRSEC proposal as a lead institution in this competition. Existing MRSECs should have the ability to re-prioritize resources and add new participants through, for example, their seed program.

Full MRSEC proposals may be submitted by invitation only.

Limit on Number of Proposals per PI: 1

An individual may be the Principal Investigator (PI) or co-PI for only one preliminary proposal.

Additional Eligibility Info:

Academic institutions in the US with broad research and education programs in the area of condensed matter physics, solid state and materials chemistry, materials science and engineering, and related areas of science and engineering may submit **preliminary proposals**.

In order to reduce the burden of proposal writing for the materials research community and the burden of subsequent proposal review and evaluation for reviewers and NSF staff, NSF will accept **full proposals** for MRSECs **by invitation only**, based on the results of the preliminary proposal evaluation.

While more than one organization may participate in a single proposal or preliminary proposal, one organization must accept overall management responsibility for the proposal. A single organization may not be the lead organization in more than one preliminary proposal. An individual may be the Principal Investigator (PI) or co-PI for only one preliminary proposal.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals (required): Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

It is important that preliminary proposals conform to the instructions provided in this solicitation and the *Grant Proposal Guide*. Conformance with all preparation and submission instructions is required. NSF may return without review proposals that are not consistent with these instructions.

I. MRSEC Preliminary Proposals (required):

1. **NSF Cover Sheet** Proposers are reminded to identify this program solicitation number in the program announcement/solicitation block of the NSF Cover Sheet, and to select "Materials Rsch Sci and Eng Cent" from the FastLane organization unit pull-down list. Make sure to select the "Preliminary Proposal" checkbox. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
2. **Project Summary.** The Project Summary of a MRSEC proposal needs to contain the following three components: (a) a rationale for establishing the center and the anticipated synergies encompassing a center; (b) a brief description of the proposed interdisciplinary research groups, including their intellectual merit; and (c) a statement on the broader impacts of the proposed activities such as research, education/outreach, shared facilities, and collaborations. **Limit: 1 page.**
3. **Table of Contents.** Will be generated automatically by FastLane
4. **Project Description:** Include ONLY the following:
 - a. *A list of participating senior investigators* (faculty level and equivalent) by full name, organizational and departmental affiliation, and major role in the proposed center (e.g., IRG 1, IRG 2, education). **Limit: 1 page.**
 - b. *Achievements under recent NSF support.* Collaborative research and education activities funded by NSF should be an emphasis in this section. Current NSF MRSECs must describe research and other achievements under MRSEC support. Collaborative research activities funded by other agencies may be included here as well. In addition, if any PI or co-PI listed on the proposal cover sheet has received NSF funding in the past five years, information on the awards is required; each PI and co-PI who has received more than one award must report on the award most closely related to the proposal. There is no need to list awards of all senior investigators of the proposed center. **Limit: 2 pages.**
 - c. *Introduction.* State rationale and the vision of the MRSEC. In separate paragraphs identify the research, education, and diversity goals of the MRSEC. **Limit: 1 page.**
 - d. *A description of each proposed area of multi-investigator, interdisciplinary group research (a minimum of 2 IRGs and a maximum of 5 IRGs).* List names of faculty-level participants, as well as numbers of undergraduate students, graduate students and postdoctoral associates in each group. Provide a concise description of the long-term research goals and intellectual focus, and outline the planned research activities. The need for an interactive, interdisciplinary approach involving several investigators, and the means of achieving this, should be clearly established. IRGs are sought that solve fundamental, timely and complex materials problems that are intellectually challenging and important to society. **Limit for each IRG: 4 pages.**
 - e. *Other significant activities* include:
 1. *Education, human resource development, and diversity strategic plan.* Describe a limited number of well-chosen education and outreach activities, including a brief description of how the education goals integrate strategically with the research and organizational/partnership opportunities of the center. To allow students from outside the

MRSEC to benefit from the breadth of the MRSEC opportunities, a Research Experiences for Undergraduates (REU) program with at least 50% off campus participation is required. The MRSEC REU program will be funded through the MRSEC award; no separate REU proposal is required. When preparing the budget for the MRSEC REU program, proposers must follow NSF REU budget guidelines; see www.nsf.gov/funding/pgm_summ.jsp?pins_id=5517&org=NSF for specifics. In addition, MRSECs are expected to demonstrate a significant inclusion of underrepresented groups (e.g., women, African Americans, Hispanics, Native Americans, Pacific Islanders, and persons with disabilities) as center participants. Describe the center's strategic plan to broaden participation at all levels, the metrics that will be established to measure progress made, and the desired outcome for the 6 year award period. **Limit: 2 pages.**

2. **Shared facilities.** Briefly describe the existing shared experimental and computational facilities and those that need to be established, and plans for the development of instrumentation. Outline plans for maintaining and operating the facilities, including staffing, provision for user fees, and plans for ensuring access to outside users. Distinguish clearly between existing facilities and those that are still to be developed. Briefly describe proposed contribution to a network of materials research facilities in the United States. **Limit: 1 page.**
 3. **Collaborations with industry, national laboratories, and other sectors.** Describe plans for significant intellectual and resource exchange, cooperation, and partnership with other organizations that may involve academic organizations, industry, international institutions and organizations, national laboratories, non-profit organization, federal, state, and local governments and others. **Limit: 1 page.**
 4. **Leadership, administration and management of the center.** Describe the center management team and provide an outline of the proposed arrangements for the integrated center management structure. In addition, briefly describe the criteria and mechanisms for selecting and evaluating seed projects. **Limit: 1 page.**
- f. **A synopsis of organizational and other support of the proposed center.** Provide a description of the resources that the organization will provide to the project, should it be funded. Resources such as space, faculty release time, faculty and staff positions, capital equipment, access to existing facilities, collaborations, and support for outreach programs should be discussed, but not given as dollar equivalents. **Limit: 1 page.**
- g. **Tables of Requested NSF Support.** For each entry in the table include direct and indirect costs. Column totals must equal the total budget requested from NSF for the period shown. Include major capital equipment under shared facilities. Support for graduate students should normally be included under research, not under education and human resources.

SUMMARY TABLE OF REQUESTED NSF SUPPORT (\$k)				
ACTIVITY	YEAR 1	%	6-YEAR TOTAL	%
IRG 1 (Title)				
IRG 2 (Title) (repeat for each IRG)				
Seed Funding and Emerging Areas				
Total Research (IRGs + Seeds)				
Shared Facilities				
Education and Human Resources				
Collaboration with Industry and Other Sectors				
Administration				
Total		100		100

Participant number table:

PROPOSED NUMBER OF PARTICIPANTS (First 3 Years)			
Number	YEAR 1	YEAR 2	YEAR 3
Faculty-Level Participants			
Faculty Participants Requesting Salary Support			
Postdocs			
Graduate Students			
REU Students			
Technical Support Staff			
Administrative Support Staff			

Complete the following subaward table only if any subaward is proposed:

SUBAWARD (\$k)		
Number	YEAR 1	6-YEAR TOTAL
Subawardee Institution 1		
Subawardee Institution 2 (repeat as needed)		
TOTAL		

5. **References Cited.** List only references cited in the Project Description. A total of 2 pages per IRG allowed (up to 4 for 2 IRG pre-proposals, up to 6 for 3 IRG pre-proposals, etc). See the Grant Proposal Guide (GPG) for format instructions. **Noncompliance with NSF guidelines may result in the preliminary proposal being returned without review.**
6. **Biographical Sketches.** Include a biographical sketch for each faculty-level participant according to GPG guidelines. List full names of collaborators/coauthors within the past 4 years; co-editors within the past 2 years; graduate advisor; postdoctoral advisor; postdoctoral scholars within the past 5 years; and all prior graduate students. See GPG for format instructions. **Noncompliance with NSF GPG guidelines may result in the preliminary proposal being returned without review. Limit: 2 pages for each senior investigator.**

Additional Information:

Suggested Reviewers. Submit a list of individuals who might be suitable to act as impartial reviewers through the Suggested Reviewers function of FastLane. Include their names, affiliations, phone numbers, e-mail addresses, and areas of expertise. PIs can also include a short list of reviewers to be avoided.

Immediately after submission of the preliminary proposal, please send via e-mail to mrsec@nsf.gov the following:

1. An Adobe Acrobat or Microsoft Word file with the filename: preproposal #_institution_COI (replacing institution with university name). A combined list of full names of: collaborators/co-authors within the past 4 years; co-editors within the past 2 years; graduate advisor; postdoctoral advisor; postdoctoral scholars within the past 5 years; and all prior graduate students, for all senior participants in the proposed MRSEC, and (optional) a short list of reviewers to avoid.
2. A Microsoft Excel file with the filename: preproposal #_institution_reviewers. A spreadsheet of suggested reviewers for each IRG with the following 9 columns: last name, first name, middle initial, institution, department, phone number, e-mail address, expertise, IRG(s).

No additional material is required or accepted with the preliminary proposal submission. Budget, Current and Pending Support, and Facilities, Equipment and Other Resources sections are not required or accepted.

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/bfa/dias/policy/docs/grantsgovguide.pdf>). 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.

Important Proposal Preparation Information: FastLane will check for required sections of the proposal, in accordance with *Grant Proposal Guide* (GPG) instructions described in Chapter II.C.2. The GPG requires submission of: Project Summary; Project Description; References Cited; Biographical Sketch(es); Budget; Budget Justification; Current and Pending Support; Facilities, Equipment & Other Resources; Data Management Plan; and Postdoctoral Mentoring Plan, if applicable. If a required section is missing, **FastLane will not accept the proposal.**

Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions. If the solicitation instructions do not require a GPG-required section to be included in the proposal, insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your proposal.

II. MRSEC Full Proposal Preparation Instructions: **A full proposal may be submitted only by invitation.**

The standard Grant Proposal Guide or NSF Grants.gov Application Guide instructions for proposal preparation apply, with the following modifications.

1. **NSF Cover Sheet.** Proposers are reminded to identify this program solicitation number in the program announcement/solicitation block of the NSF Cover Sheet, and to select "Materials Rsch Sci and Eng Cent" from the FastLane organization unit pull-down list. Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. Grants.gov users should refer to Section VI.1.2. of the NSF Grants.gov Application Guide for specific instructions on how to designate the NSF Unit of Consideration. Make sure that the button asking "If This Is A Preliminary Proposal ..." is UNCHECKED; also make sure to enter your preliminary proposal number in the box asking "Show Related Preliminary Proposal Number If Applicable."
2. **Project Summary.** The Project Summary of a MRSEC proposal needs to contain the following three components: (a) a rational for establishing the center and the anticipated synergies encompassing a center; (b) a brief description of the proposed interdisciplinary research groups, including their intellectual merit; and (c) a statement on the broader impacts of the proposed activities such as research, education/outreach, broadening participation, shared facilities, and collaborations. **Limit: 1 page.**
3. **Table of Contents.** Generated automatically by the system.
4. **Project Description.** Include the following:
 - a. *A list of participating senior investigators* (faculty-level and equivalent) by full name, organizational and departmental affiliation, and major role in the proposed center (e.g., IRG 1, IRG 2, education). **Limit: 1 page.**
 - b. *Achievements under recent NSF support.* Collaborative research and education activities funded by NSF should be an emphasis in this section. (Current NSF MRSECs must describe research and other achievements under MRSEC support.) Collaborative research activities funded by other agencies may be included here as well. In addition, if any PI or co-PI listed on the proposal cover sheet has received NSF funding in the past five years, information on the awards is required; each PI and co-PI who has received more than one award must report on the award most closely related to the proposal. There is no need to list awards of all senior investigators of the proposed center. **Limit: 5 pages.**
 - c. *Introduction and strategic plan.* Provide a clear vision for and description of the proposed MRSEC and its potential scientific, technological, and societal impacts. Briefly describe the organizational setting of the center, its proposed scope and organization, activities in research and education and their integration, development of human resources, shared research facilities, collaborative activities with industry, national laboratories, and others. Outline how the MRSEC plans to achieve the goals, the process and metrics used to monitor progress, and the mechanisms of assessment. **Limit: 4 pages.**
 - d. *Interdisciplinary research groups* (a minimum of 2 IRGs and a maximum of 5 IRGs). For each IRG proposed, provide a concise description of the long-term research goals and intellectual focus, and describe the planned research activities in sufficient detail to enable their scientific merit and significance to be assessed. Describe the role and intellectual contribution of each senior participant in the IRG, and briefly outline the resources available or planned to accomplish the research goals (it will be helpful to boldface the name of each senior investigator wherever it occurs). The need for an interactive, interdisciplinary approach involving several investigators, and the means of achieving this, should be clearly established. Place the IRG in the context of the center as a whole, and describe interactions with other groups and organizations. At the beginning of each IRG section in the proposal, name the senior personnel who will participate, and state the proposed number of undergraduate students, graduate students and postdoctoral associates in each group. **Limit for each IRG: 10 pages.**

e. *Other significant activities include:*

1. *Seed funding and emerging areas.* Describe the criteria and mechanisms for selecting and evaluating seed projects. Describe initial seed projects, including names of faculty-level participants and numbers of students and postdocs. **Limit: 3 pages.**
 2. *Education and human resources development.* Describe the education and human resource goals, provide a rationale for those goals, and metrics used to measure desired outcomes for the 6 year period of the award. Describe how the education goals integrate strategically with the research and organizational/partnership opportunities of the center, and management of proposed education activities. To allow students from outside the MRSEC to benefit from the breadth of the MRSEC opportunities, a Research Experiences for Undergraduates (REU) program with at least 50% off campus participation is required. The MRSEC REU program will be funded through the MRSEC award; no separate REU proposal is required. When preparing the budget for the MRSEC REU program, proposers must follow NSF REU budget guidelines; see http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&org=NSF for specifics. **Limit: 3 pages.**
 3. *Diversity strategic plan.* MRSECs are expected to demonstrate a significant commitment to the involvement of underrepresented groups (e.g., women, underrepresented minorities, persons with disabilities) as center participants (MRSEC leaders, faculty participants, undergraduate and graduate students, and postdoctoral associates). Describe the center's strategic plan to broaden participation at all levels, the metrics that will be used to measure progress, and the desired outcome for the 6 year award period. **Limit: 2 Pages.**
 4. *Shared facilities.* Describe the existing shared experimental and computational facilities and those to be established, including specific major instrumentation, and plans for the development of instrumentation. Describe plans for maintaining and operating the facilities, including staffing, provision for user fees, and plans for ensuring access to outside users. Distinguish clearly between existing facilities and those still to be developed. Describe proposed contribution to a network of materials research facilities in the United States. **Limit: 3 pages.**
 5. *Collaboration with industry, national laboratories, and others.* Describe plans for significant intellectual and resource exchange, cooperation, and partnership with other organizations that may involve academic organizations, industry, national laboratories, non-profit organizations, federal, state, and local governments, international organizations, and others. Define the goals of the collaboration; describe the planned activities and expected outcomes. Describe the roles of the senior participants, the mechanisms planned to stimulate and facilitate knowledge transfer, and the potential long-term impact of the collaborations. **Limit: 4 pages.**
 6. *Management.* Describe the plans for administration of the center, including the functions of key personnel and the role of any advisory committee, executive committee, and/or program committee or their equivalent. Describe the procedures and criteria used to select, administer, and evaluate the Interdisciplinary Research Groups and other research programs of the center, including collaborative programs with other groups and organizations. Plans for administering the seed funding, education activity, and shared experimental facilities should be described under items (e.1), (e.2), and (e.4), respectively. **Limit: 2 pages.**
- f. *Organizational and other sector support.* Provide a description of the resources that the organization will provide to the project, should it be funded. Resources such as space, faculty release time, faculty and staff positions, capital equipment, access to existing facilities, collaborations, and support of outreach programs should be discussed, but not given as dollar equivalents. **Limit: 1 page.**
- g. *Publications and patents under prior NSF support.* For re-competing MRSECs only, provide a table listing the total number of papers with MRSEC primary and partial support since 2008; number of these papers with two or more faculty-level participants; number of papers published in each of 10 high-impact journals of center's choice; number of awarded patents, and number of licensed patents. Then list published papers and awarded patents under prior NSF MRSEC support (use bold face to designate each author that is a center faculty participant or equivalent).
- h. *Summary Table of Requested NSF Support.* In tabular form as follows, summarize the overall support levels planned for each of the major activities of the MRSEC. For each entry in the table include direct and indirect costs. Column totals must equal the total budget requested from NSF for the period shown. Include major capital equipment under shared facilities. Support for graduate students should normally be included under research, not under education and human resources.

SUMMARY TABLE OF REQUESTED NSF SUPPORT (\$k)				
ACTIVITY	YEAR 1	%	6-YEAR TOTAL	%
IRG 1 (Title)				
IRG 2 (Title) (repeat for each IRG)				
Seed Funding and Emerging Areas				
Total Research (IRGs + Seeds)				
Shared Facilities				
Education and Human Resources				
Collaboration with Industry and Other Sectors				
Administration				
Total		100		100

Participant number table:

PROPOSED NUMBER OF PARTICIPANTS (First 3 Years)			
Number	YEAR 1	YEAR 2	YEAR 3
Faculty-Level Participants			
Faculty Participants Requesting Salary Support			
Postdocs			
Graduate Students			
REU Students			
Technical Support Staff			
Administrative Support Staff			

Complete the following subaward table only if any subaward is proposed:

SUBAWARD (\$k)		
Number	YEAR 1	6-YEAR TOTAL
Subawardee Institution 1		
Subawardee Institution 2 (repeat as needed)		
TOTAL		

5. **References Cited.** List only references cited in the Project Description. See GPG for format instructions. **Noncompliance with NSF guidelines may result in the proposal not being accepted or being returned without review.**
6. **Biographical Sketches.** Include a biographical sketch for each faculty-level participant according to GPG guidelines. List full names of collaborators/coauthors within the past 4 years; co-editors within the past 2 years; graduate advisor; postdoctoral advisor; postdoctoral scholars within the past 5 years; and all prior graduate students. See GPG for format instructions. **Noncompliance with NSF GPG guidelines may result in the proposal not being accepted or being returned without review. Limit: 2 pages for each senior investigator.**
7. **Budget pages and budget justification.** Complete budget pages for each year of support (1-6). A six-year cumulative budget will be automatically generated by FastLane or Grants.gov. Provide a six-year summary budget justification that may not exceed a total of 3 pages. Provide separate budget pages for the lead institution and for each organization receiving a subaward. Provide a separate budget justification, up to three pages, for each subaward. Do not list personnel with zero support on the budget page; FastLane will not allow proposal submission with personnel listed with zero support.
8. **Current and Pending Support.** List current and pending support for each faculty-level investigator.
9. **Facilities, Equipment and Other Resources.** Upload a document or insert text that states "See Project Description."

Please submit the following Supplemental Documents:

1. **Postdoctoral Researcher Mentoring Plan.** Proposals that request funding for postdoctoral researchers must include a one-page Mentoring Plan in the supplementary documents section otherwise the proposal may not be accepted or may be returned without review. **Limit: 1 page.**
2. **Letters of Commitment.** Include only official letters of commitment with specific commitments of resources from participating organizations. Scan your signed letters and upload into the Supplementary Documents section of FastLane, but do not send originals. For Grants.gov users, supplementary documents should be attached in Field 11 of the R&R Other Project Information Form. **Limit: Total of 5 pages.**
3. **Data Management Plan.** 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. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. See the GPG for further information about the implementation of this requirement or refer to the Division of Materials Research (DMR) Data Management Plan which is available at <http://www.nsf.gov/bfa/dias/policy/dmpdocs/dmr.pdf>.

No additional material is required or accepted with the full proposal submission.

Additional Information:

Suggested Reviewers. Submit a list of individuals who might be suitable to act as impartial reviewers through the Suggested Reviewers function of FastLane. Include their names, affiliations, phone numbers, e-mail addresses, and areas of expertise. PIs can also include a brief list of reviewers to be avoided.

Immediately after submission of the full proposal, please send via e-mail to mrsec@nsf.gov the following:

1. An Adobe Acrobat or Microsoft Word file with the filename: proposal #_institution_COI (replacing institution with university name). A combined list of full names of: collaborators/co-authors within the past 4 years; co-editors within the past 2 years; graduate advisor; postdoctoral advisor; postdoctoral scholars within the past 5 years; and all prior graduate students, for all senior participants in the proposed MRSEC, and (optional) a short list of reviewers to avoid.
2. A Microsoft Excel file with the filename: proposal #_institution_reviewers. A spreadsheet of suggested reviewers for each IRG with the following 9 columns: last name, first name, middle initial, institution, department, phone number, e-mail address, expertise, IRG(s).

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Awards are expected to range in size from about \$2.0 million/year to a maximum of \$5.0 million/year for a MRSEC proposal, depending on the number of IRGs. The budget for the full proposal may not be larger than the preliminary proposal budget.

C. Due Dates

Preliminary Proposal Due Date(s) (required) (due by 5 p.m. proposer's local time):

August 26, 2013

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

January 10, 2014

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. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: 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 for acknowledgement and, if they meet NSF requirements, for review. 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 either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with 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. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as [Exhibit III-1](#).

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years \(FY\) 2011-2016](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission 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 variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which 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.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level,

PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. ([GPG Chapter II.C.2.d.i.](#) contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including [GPG Chapter II.C.2.d.i.](#) , prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

In addition to the National Science Board merit review criteria, MRSEC proposals have additional review criteria. Given competing proposals of essentially equal merit, NSF staff will be responsible for ensuring that the overall program reflects an appropriate balance among research topics and among centers of differing size and complexity. Preliminary proposals will be evaluated in terms of their potential to meet the criteria for full proposals.

MRSEC proposals will be evaluated in terms of the IRGs and of the Center as a whole, using the following additional criteria:

A. Interdisciplinary Research Groups:

- A well integrated, interdisciplinary research program distinguished by intellectual excellence and driven by a clear vision for each interdisciplinary research group leading to fundamental advances, new discoveries, and/or technological developments that could have national and international significance.
- Capability of the investigators, technical soundness of the proposed approach, and adequacy of the resources available or proposed, including instrumentation and facilities.
- Clear benefits of a multi-investigator, interdisciplinary approach to address a major topic or area normally supported by the Division of Materials Research for each IRG; cooperation and interdependence of the investigators within the IRG.

B. The Center as a Whole:

- Organizational setting and rationale for the center. Relationship to existing and planned organizational programs and capabilities in materials research and education; planned intellectual breadth of the proposed program; potential for stimulating interdisciplinary interaction and collaboration; potential for organizational, national, and international impacts.
- Development of effective education/outreach activities that are consistent with the center size; leverage participant expertise and interest; address local and national needs in workforce development; and foster increased participation in materials research and education of members of underrepresented groups in science and engineering at all academic levels.
- Plans to establish and operate shared experimental and computational facilities, properly staffed, equipped and maintained, and accessible to users from the center, the broader academic community, the participating institutions, and other institutions and sectors.
- Plans and potential to develop and maintain active cooperation with industry and other sectors, such as National Laboratories and international institutions; to stimulate and facilitate knowledge transfer among the organizational participants and between the center and other organizations and sectors; and to strengthen the links between university-based materials research and its application and implementation.
- Effective use of seed funding for junior faculty, potentially transformative projects, and/or emerging areas of interdisciplinary materials research.
- Organizational commitments and support. Likely effectiveness of the proposed management plan, including mechanisms for selection of topics and internal allocation of resources, plans for self-evaluation, and plans and potential for maintaining a flexible and innovative program.

B. Review and Selection Process

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

Preliminary MRSEC proposals will be reviewed by panel review, supplemented by *ad hoc* review as needed. Preliminary proposals will be reviewed based on the topical areas of IRGs, thus the IRGs in a MRSEC proposal may be reviewed by different panels if the research areas are dissimilar.

The preliminary proposal review process pays special attention to the merit and potential impacts of each proposed IRG, with the objective that preliminary proposals with excellent IRGs would be invited for full proposals. It is possible that only some of the proposed IRGs in a MRSEC preliminary proposal would be invited for a full MRSEC proposal.

A proposing organization that submits a MRSEC preliminary proposal is encouraged to submit a proposal with IRGs each with well integrated, interdisciplinary research of excellent quality; a MRSEC preliminary proposal with two or more IRGs of lower quality, as determined by the preliminary proposal review, would normally not be invited for a full MRSEC proposal.

Full MRSEC proposals will be accepted by invitation only, based on the pre-proposal reviews. Full proposals will be reviewed by ad hoc review. MRSEC finalists will be selected based on ad hoc reviews of the full proposals. Finalists will come to NSF to make presentations of their proposals to panels of experts (reverse site visits). Updated Current and Pending Support documents for all senior participants will be required at the time of reverse site visits, along with presentation materials, such as slides, PDF files, etc.

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.

Special Award Conditions:

Special award conditions for MRSECs will be within the cooperative agreement.

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 prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following 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 all identified PIs and co-PIs on a given award. 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 Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also 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.

More comprehensive information on NSF Reporting Requirements 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.

Center-specific annual progress reports and continuation requests are required with special formatting for use in MRSEC reports and for longitudinal comparisons. Those additional reporting requirement will be referenced in the cooperative agreement.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Sean L. Jones, Program Director, 1065 N, telephone: (703) 292-2986, email: sljones@nsf.gov
- Charles Bouldin, Program Director, 1065 N, telephone: (703) 292-4920, email: cbouldin@nsf.gov
- Charles Ying, Program Director, 1065 N, telephone: (703) 292-8428, email: cying@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.

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 55,000 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 Arctic 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>

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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