Consortium for Advanced Manufacturing Foresights: Defining the Critical Needs of the Advanced Manufacturing Research Community

PROGRAM SOLICITATION
NSF 15-565

National Science Foundation

Directorate for Engineering

National Institute of Standards and Technology

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

July 20, 2015

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 15-1), which is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and, implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Consortium for Advanced Manufacturing Foresights
Defining the Critical Needs of the Advanced Manufacturing Research Community

Synopsis of Program:

Accelerating U.S Advanced Manufacturing (http://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/amp20_report_final.pdf), the October 2104 report to the President produced by the Steering Committee of the Advanced Manufacturing Partnership 2.0 (AMP 2.0) for the President's Council of Advisors on Science and Technology (PCAST), calls for the creation of a technology-focused consortium to provide coordinated private-sector input on national advanced manufacturing technology research and development priorities. This solicitation is to establish the Consortium for Advanced Manufacturing Foresights (the "Consortium") to implement that recommendation. The consortium will inform and promote regular and sustained communication and research coordination across the public and private sectors, provide federal decision-makers with timely access to top university and industry experts, and respond quickly to requests from federal decision-makers for detailed input on nascent opportunities and priorities in manufacturing. These activities will improve the coordination of federal advanced manufacturing technology and research and development strategies. The Consortium will cooperate with the Advanced Manufacturing National Program Office (AMNPO) of NIST, the President's National Science and Technology Council (NSTC), and the U.S. Government Agencies that support advanced manufacturing to help provide the timely information needed to achieve that coordination. NSF is the program lead and is solely responsible for administration of the solicitation and the resulting award. NIST, acting on behalf of the Advanced Manufacturing National Program Office, is the program co-sponsor with NSF and provides financial and administrative support to NSF.

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.

- Bruce Kramer,NSF, 545.01, telephone: (703) 292-5348, email: bkramer@nsf.gov
- Michael F. Molnar,NIST, telephone: (301) 869-1150, email: mike.molnar@nist.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

Anticipated Funding Amount: $3,000,000 to $6,000,000

for 36 months, subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- A Consortium proposal must be submitted by an existing organization that is a consortium or that represents a consortium, with a stake in basic research and education in advanced manufacturing. Such an organization may submit only one Consortium proposal. The consortium is expected to be broad-based, with membership that includes institutions of higher education with strong research track records in advanced manufacturing and other private and public sector organizations, including industry. The submitting organization must be a legal entity eligible to receive federal funding.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

An organization may submit only one Consortium proposal.

Limit on Number of Proposals per PI or Co-PI: 1

An individual may appear as a PI, co-PI, Senior Personnel or Consultant on no more than one Consortium proposal.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **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

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

  July 20, 2015

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: Standard NSF reporting requirements apply

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I. INTRODUCTION

The June 2011 report of the President's Council of Advisors on Science and Technology (PCAST), Report to the President on Ensuring American Leadership in Advanced Manufacturing defines advanced manufacturing as follows:

> *Advanced manufacturing is a family of activities that (a) depend on the use and coordination of information, automation, computation, software, sensing, and networking, and/or (b) make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences, for example nanotechnology, chemistry, and biology. It involves both new ways to manufacture existing products, and the manufacture of new products emerging from new advanced technologies.*

Recommendation #2 of Accelerating U.S Advanced Manufacturing, the October 2104 report to the President produced by the Steering Committee of the Advanced Manufacturing Partnership 2.0 (AMP 2.0) for PCAST, calls for the creation of an Advanced Manufacturing Advisory Consortium to provide coordinated private sector input on national advanced manufacturing technology research and development priorities. The report stresses the importance of effective communication and research coordination between the public and private sectors and access to top industry technologists to federal efforts to advance U.S. strengths in pre competitive manufacturing. It recommends that a continuous mechanism for research coordination across the public and private sectors, with expert input from industry and academia, be established to provide detailed, coordinated input on nascent opportunities and priorities in manufacturing that can shape national U.S. technology priorities and investments at all stages of technology development. It is intended that the Consortium for Advanced Manufacturing Foresights will both coordinate with and serve the Advanced Manufacturing National Program Office (AMNPO) of NIST, the President's National Science and Technology Council (NSTC), and key federal research and development agencies by providing information for formulating and feedback on the federal government's advanced manufacturing research and development priorities, thereby helping to advance the linkage of strategies for advanced manufacturing to an overall R&D strategy.

II. PROGRAM DESCRIPTION

The National Science Foundation (NSF), with support from the National Institute of Standards and Technology (NIST), is calling for the advanced manufacturing research community to unite in the establishment of the Consortium for Advanced Manufacturing Foresights (the "Consortium"). NSF is the program lead and is solely responsible for administration of the solicitation and the resulting award. NIST, acting on behalf of the Advanced Manufacturing National Program Office, is the program co-sponsor with NSF and provides financial and administrative support to NSF. The Consortium will:

- Embrace all fields of advanced manufacturing, including emerging areas and areas overlapping with other disciplines.
- Serve as a catalyst and enabler for and give a voice to the national advanced manufacturing research community in shaping the future of advanced manufacturing.
- Consider issues, challenges and opportunities facing U.S. advanced manufacturing, and source novel and unanticipated perspectives on technology priorities that can inform both the broad advanced manufacturing community and agency work.
- Provide a resource for rapid response expert advice to help inform cross-cutting federal research and development initiatives in advanced manufacturing. It is anticipated that these responses might be provided within from several days for simple informational items to several months for more complex issues.
- Serve as an intermediary for the Administration in soliciting the input of the broader manufacturing community and supply chains on technology strategies.

In fulfilling its roles, the Consortium will:

- Enable the advanced manufacturing community to communicate to a broad audience the myriad ways in which advances in manufacturing will create a brighter future and encourage the alignment of advanced manufacturing research with pressing

national priorities and national challenges.

- Facilitate the generation of visions for advanced manufacturing research and education and communicate them to a wide range of stakeholders.
- Provide flexible mechanisms that allow single or multiple federal agencies to sponsor and participate in studies of specific agency interest.
- Respond to federal agency requests and identify key technology challenges facing the private sector.
- Convene experts from U.S. industry and academia to consider issues, challenges, and opportunities in advanced manufacturing.
- Form focus teams to “deep dive” into particular technology areas.
- Engage experts from the private sector (industry and academia), with the support of and participation from federal agency leadership.
- Provide input to the federal government and engage with advisory committees and groups consistent with law and regulations, as appropriate for a body that is not chartered under the Federal Advisory Committee Act (FACA).

The Consortium may also be tasked with organizing and conducting activities that incorporate community outreach, such as advanced manufacturing national summits or regional workshops. It is expected that Consortium activities will employ, leverage or be co-located with events of other study groups, regional/national trade associations, or professional societies when it is efficient to do so. Activities can also be undertaken in cooperation with Manufacturing Innovation Institutes, to provide focused industry expertise from and visibility to the Institutes.

The following items are outside the Consortium’s scope:

- Assessment of U.S. policy with respect to manufacturing. Such policy recommendations must be rendered by a FACA-compliant advisory committee.
- Coordination of federal agency programs. Such coordination will be provided within the structure of the National Science and Technology Council.
- Funds from this award may not be used for lobbying activities.

Financial support provided under this solicitation is for the base operations of the Consortium only and will be provided by NSF and NIST. While this solicitation will be fully responsive to the mechanisms and structures proposed to implement the desired roles of the Consortium, base support is expected to provide, at a minimum, for:

- Establishment and maintenance of a standing committee that will meet at least two times per year and whose members can be called upon for advice and to support the recruitment, guidance, and oversight of rapid response studies.
- Seed funding for accepting and developing responses to inquiries from federal agencies, offices, councils or working groups.
- The conduct of activities for which the requested response time frame does not allow for the identification of funding sources in advance.
- Operational support, staff and related expenses for management of logistics and the recruitment of experts.

The Consortium will be expected to secure funding for individual studies from interested U. S. Government Agencies, either single or multiple agencies. NSF and NIST will coordinate oversight of the studies with the participation of other interested agencies.

The awardee must maintain and will publish up-to-date accomplishments and activities on a dedicated Consortium website.

III. AWARD INFORMATION

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

Anticipated Funding Amount: $3,000,000 to $6,000,000 for 36 months, subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- A Consortium proposal must be submitted by an existing organization that is a consortium or that represents a consortium, with a stake in basic research and education in advanced manufacturing. Such an organization may submit only one Consortium proposal. The consortium is expected to be broad-based, with membership that includes institutions of higher education with strong research track records in advanced manufacturing and other private and public sector organizations, including industry. The submitting organization must be a legal entity eligible to receive federal funding.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

An organization may submit only one Consortium proposal.

Limit on Number of Proposals per PI or Co-PI: 1

An individual may appear as a PI, co-PI, Senior Personnel or Consultant on no more than one Consortium proposal.

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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.

See Chapter II.C.2 of the GPG for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

For this solicitation, the following supplementary guidance is provided:

Proposers are encouraged to engage the broadest range of stakeholders, including members representing academic,industrial, and other types of organizations.

Project Description

The Project Description section must not exceed 15 pages and must conform with the requirements of the NSF Grant Program Guide, NSF 15-1: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. The **Consortium Management Plan** and **Organizational Structure and Project Staffing** sections described below are included in the Project Description and are included in the 15-page limitation.

Consortium Management Plan: Provide a detailed Consortium management plan, including schedule and milestones, to establish the Consortium as an effective community proxy for the advanced manufacturing research community. Describe the activities the Consortium will undertake to identify and secure funding for promising advanced manufacturing-related studies to enable large-scale, systems-level research in advanced manufacturing and provide plans for education, workforce development, and outreach activities.

Organizational Structure and Project Staffing: Describe the broad-based membership of the consortium, developed to ensure that the broad research interests of the advanced manufacturing community, including academe, government and industry, are represented. Discuss the administrative and organizational structure of the Consortium, including any necessary advisory, administrative and expert support activities, and the Consortium's relationship to the proposing organization. Describe the experience of the submitting institution in managing projects of a similar nature. Describe the relevant qualifications of the PI, Co-PI, and other senior personnel. Describe the roles of subawardees (if any) and consultants (if any).

Supplementary Document: Provide, as a supplementary document, a table that describes the following for each member of the management team, including all subawardees and consultants: name, administrative position/project title, activities assigned, and responsibilities for achievement of key milestones and outcomes. This table does not count towards the 15-page limitation.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

C. Due Dates

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

  July 20, 2015

D. FastLane / Grants.gov Requirements

For Proposals Submitted Via FastLane:

To prepare and submit a proposal via FastLane, see detailed technical instructions 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.

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://www.grants.gov/web/grants/applicants.html. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical 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.

Proposers that submitted via FastLane are strongly encouraged to use FastLane to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

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 *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. 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 strategic objectives 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 must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of 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

Reviewers will be asked to comment explicitly on the issues discussed below, in the context of each proposal's Intellectual Merit and Broader Impacts.

- How well does the submitting organization represent the broad advanced manufacturing research community, particularly the academic and industrial communities?
- Is the organization and management structure sufficient to meet the project goals? Does the submitting organization have experience with similar types of projects? How qualified are the PI(s) and other named personnel to meet the project goals? Are the milestones and associated activities appropriate?
- Does the proposal present a comprehensive and timely approach to gathering and providing critical information and insights on advanced manufacturing? Are the milestones and associated activities appropriate?
- How well does the proposing team understand current U. S. Government advanced manufacturing research, educational and workforce development activities and priorities? Does the plan adequately incorporate those activities and priorities and include effective mechanisms for obtaining input from and consulting with the community?

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.

The review process will employ a panel and may also employ ad hoc reviews and/or reverse site visits if they are needed to obtain additional information.

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will be completed and submitted by each reviewer. ;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 strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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. After an administrative review has occurred, Grants and Agreements Officers perform 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.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, 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.

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 notice, 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 notice; (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 notice. 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 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.

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:

- Bruce Kramer, NSF, 545.01, telephone: (703) 292-5348, email: bkramer@nsf.gov
- Michael F. Molnar, NIST, telephone: (301) 869-1150, email: mike.molnar@nist.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, "NSF Update" is an information-delivery system 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 Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on NSF's website at https://public.govdelivery.com/accounts/USNSF/subscriber/new?topic_id=USNSF_179.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this 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

- **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:

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