

September 26, 2018

**REQUEST FOR APPLICATION (RFA)
NIST Advanced Materials Center of Excellence**

EXECUTIVE SUMMARY

- **Federal Agency Name:** National Institute of Standards and Technology (NIST), United States Department of Commerce (DoC)
- **Request for Application Title:** Advanced Materials Center of Excellence Renewal
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** 2019-NIST-ADV-MAT-COE-01
- **Assistance Listing (CFDA Number):** 11.609, Measurement and Engineering Research and Standards
- **Dates:** Application must be received no later than 11:59 p.m. Eastern Time, October 31, 2018. Application received after this deadline will not be reviewed or considered. Applications submitted prior to final submission date of October 31, 2018 will be reviewed as they are received.
- **Application Submission Address:** Application must be submitted using Grants.gov.
- **Funding Opportunity Description:** The NIST is soliciting a renewal application from Northwestern University for the Center for Hierarchical Materials Design (CHIMAD), the Advanced Materials Center of Excellence, in which NIST researchers collaborate with interdisciplinary researchers from academia and industry on advanced materials development through innovations in measurement science and in new modeling, simulation, data, and informatics tools.
- **Anticipated Amounts:** NIST anticipates approximately \$5,000,000 per year may be made available to award one (1) multi-year award for up to five (5) years. This award will not be eligible for further renewal.
- **Funding Instrument:** Cooperative Agreement.
- **Eligibility:** The only eligible applicant is Northwestern University.
- **Cost Sharing Requirements:** Cost share is not required for this RFA.

ANNOUNCEMENT

I. Program Description

The statutory authority for the NIST Advanced Materials Center of Excellence is 15 U.S.C. § 272(b)(4), (c)(3) and (c)(8).

The NIST is seeking an application from Northwestern University for the Center for Hierarchical Materials Design (CHIMAD), the Advanced Materials Center of Excellence, in which NIST researchers collaborate with interdisciplinary researchers from academia and industry on advanced materials development through innovations in measurement science and in new modeling, simulation, data, and informatics tools.

Advanced materials are essential to economic security and human well-being, with applications in many industries, including those aimed at addressing challenges in clean energy, national security, and human welfare. Accelerating the pace of discovery and deployment of advanced materials is crucial to achieving global competitiveness in the 21st century. Currently, the time frame for incorporating new classes of materials into applications is remarkably long, typically about 10 to 20 years from initial research to first use. As today's scientists and engineers explore a new generation of advanced materials to solve the grand challenges of the 21st century, reducing the time required to bring these discoveries to market will be a key driving force behind a more competitive domestic manufacturing sector and economic growth. Such a goal of time reduction is the key objective of the Administration's Materials Genome Initiative announced in 2011. The lengthy time frame for materials to move from discovery to market is due in part to the continued reliance of materials research and development programs on scientific intuition and trial and error experimentation. Much of the design and testing of materials is currently performed through time-consuming and repetitive experiment and characterization loops. Significant time reductions may be achieved if some of these experiments could be performed virtually with powerful and accurate computational tools such as those being developed in the Materials Genome Initiative. To accelerate the identification and development of advanced materials, it is necessary to bring together the abilities to design materials with computational tools, to rapidly produce prototype materials, and to measure and assess materials properties and performance.

By combining NIST's expertise and experience in materials science, materials characterization, reference data, and standards with leading research capabilities

for designing, producing, and processing advanced materials, the Advanced Materials Center of Excellence will create a collaborative environment and concentration of scientific and technical capability to accelerate materials discovery and development; provide opportunities to transition new breakthroughs in advanced materials to industry, convene multidisciplinary and multi-sector communities for in-depth discussions; and provide training opportunities for scientists and engineers in materials metrology. This Center of Excellence will contribute to and demonstrate use of the tools and resources developed by the Materials Genome Initiative to create a new era of materials innovation that will serve as a foundation for strengthening domestic industry.

The request for application proposal should demonstrate the applicant's ability to create and manage a world-class research program aimed at broadly accelerating the design, discovery, development and deployment of advanced materials by the nation's academic and industry enterprises. The center should address two broad challenges through a partnership with NIST:

- 1) Foster the development of integrated computational, modeling and other data-driven tools needed to achieve the accelerated development of advanced materials as envisioned in the administration's Materials Genome Initiative, including;
 - the development of new modeling, simulation and other computational tools for materials design,
 - the development of advanced information management systems needed to support the creation and integration of tools for data-driven scientific discovery and engineering of materials,
 - the establishment of standards, infrastructure, and reference databases needed to enable reliable computational-driven materials discovery and optimization, and
- 2) Foster the discovery of revolutionary new materials by academic and industry researchers by leveraging and amplifying access to the world-class, often unique facilities and expertise for materials characterization at NIST including:
 - NIST methods in x-ray and neutron scattering and diffraction tools tailored for the analysis of soft materials, lightweight alloys, and advanced electronics,
 - NIST soft x-ray synchrotron tools for nanoscale-resolved mapping of materials composition and structure
 - NIST advanced microscopy facilities that provide hyperspectral analysis of materials structure and properties
 - NIST expertise and facilities in nanomechanical testing and nanomaterials analysis
 - NIST facilities for combinatorial materials library production and high-

throughput testing.

It is expected that in each of these endeavors the recipient will accelerate the adoption of tools into the advanced manufacturing industry, and that the recipient will establish opportunities for extended collaborations between NIST, lead and partner institutions, and recipient scientists through the Center, employing mechanisms such as staff exchanges, jointly advised graduate students, post-doctoral researchers and senior guest scientists. Refer to <http://www.nist.gov> and www.nist.gov/mqi for more information about NIST and the areas of research collaboration presently available to the Advanced Materials Center of Excellence participants.

II. Federal Award Information

- 1. Funding Instrument:** The funding instrument used in this program will be a cooperative agreement. Where cooperative agreements are used, the nature of NIST's "substantial involvement" will generally include collaboration with the recipient in executing the approved scope of work.
- 2. Multi-Year Funding Policy:** When an application for a multi-year award is approved, funding will usually be provided for only the first year of the project. If a project is selected for funding, NIST has no obligation to provide any additional funding with that award. Continuation of an award to increase funding or extend the period of performance is at the sole discretion of NIST. Continued funding will be contingent upon satisfactory performance, continued relevance to the mission and priorities of NIST, and the availability of funds. Under this RFA, NIST may elect to fully fund an award or to fund an award in accordance with the Multi-Year Funding policy.
- 3. Funding Availability:** NIST anticipates approximately \$5,000,000 per year may be made available to award one (1) multi-year award for up to five (5) years. This award will not be eligible for further renewal.

III. Eligibility Information

Eligible Applicants: The only eligible applicant is Northwestern University.

- 1. Matching funds are not required.**

IV. Application and Submission Information

1. Address to Request Application Package: The application package is available at grants.gov under Funding Opportunity Number 2019-NIST-ADV-MAT-COE-01.

2. Content and Form of Application Submission

a. Required Forms and Documents. The Application must contain the following:

(1) SF-424, Application for Federal Assistance. The SF-424 must be signed by an authorized representative of the applicant organization.

- SF-424, Item 8.d Zip/Postal Code field should reflect the zip code + 4 (##### - ####) format.
- Item 12, should list the RFA number 2019-NIST-ADV-MAT-COE-01.
- SF-424, Item 18, should list the total budget information for the duration of the project.
- The list of certifications and assurances referenced in Item 21 of SF-424 is contained in the SF-424B.

(2) SF-424A, Budget Information - Non-Construction Programs

The budget should reflect anticipated expenses for each year of the project, considering all potential cost increases, including cost of living adjustments. For projects that are five (5) years, the applicant should submit two SF-424A forms. The first SF-424A form should cover the first four (4) years of the project and is the SF-424A form that appears as part of the mandatory forms in the Grants.gov application package. The second SF-424A forms should be submitted to cover year five (5) of the project, and its submission details are found in Section IV.2.a(8). of this RFA.

Do not enter the Grant Program Function or Activity on Line 1 under Column (a), and do not enter the Catalog of Federal Domestic Assistance Number on Line 1 under Column (b).

Use Section B – Budget Categories to reflect the budget breakdown by year. Column (1) should be used for the first year; Column (2) should be used for the second year; Column (3) should be used for the third year; and Column (4) should be used for the fourth year. Use Column (1) from an additional form for the fifth year.

(3) SF-424B, Assurances – Non-Construction Programs

(4) CD-511, Certification Regarding Lobbying. Enter “2019-NIST-ADV-MAT-COE-01” in the Award Number field. Enter the title of the application used in field 15 of the SF-424, or an abbreviation of that title, in the Project Name field.

(5) SF-LLL, Disclosure of Lobbying Activities (if applicable)

(6) Technical Proposal. The Technical Proposal is a word-processed document of no more than thirty (30) pages responsive to the program description (see Section I. of this RFA) and the evaluation criteria (see Section V.1. of this RFA). It should contain the following information:

(a) Executive Summary. An executive summary, describing the Advanced Materials Center of Excellence consistent with the evaluation criteria (see Section V.1. of this RFA). The executive summary should not exceed one (1) single-sided page.

(b) Statement of Work. A statement of work that discusses the specific tasks proposed to be performed, including a schedule of measurable events and milestones, to achieve the goals outlined in Section I. to accelerate the design, discovery, development and deployment of advanced materials by the nation’s academic and industry enterprises. This section will be evaluated according to the **Rationality** and **Technical Merit of Contribution** evaluation criteria (see Section V.1.i and V.1.iii of this RFA).

The Application should describe how the recipient plans to advance R&D in the area of Advanced Materials. Specifically, the application should:

- demonstrate that the recipient has a strong technological vision and research agenda to contribute to the programmatic objective of a new era of materials innovation that will serve as a foundation for strengthening domestic industry;
- describe research focus areas, and plans for evolving new areas (including: scope of work and budget for each proposed project year);
- describe a collaboration model for integrating NIST research and staff into technical focus areas;
- describe a broad engagement plan to determine critical industrial needs that the participants in the Center can address;

- describe new computational, simulation, and informatics tools that will be developed for integration into the Materials Genome initiative; and
- describe plans and metrics for evaluating the outputs of the research effort including links to U.S. industry.

In addition to the description of work envisioned in the renewal period included above, the technical proposal should discuss how the proposed research will build on the successes of the first award period.

(c) Experience (Qualifications), Resource Availability, and Industry Impact. A description of the qualifications and proposed operational or management activities of key personnel who will be assigned to work on the proposed project must be provided, including examples of past experience leading programs similar in nature to those described in this RFA, experience working with state government representatives, industry, academia, independent research organizations, and/or related organizations.

The application should describe how the recipient will manage the funds to support R&D in the area of Advanced Materials. Specifically, the application should:

- describe the resources committed to the proposal, including the quality and quantity of personnel, equipment, and nature of subawards (if any); and
- describe plans that demonstrate meaningful potential for commercialization.

The application should also address:

- How will the research and the management/governance approach be different given lessons learned from the first period?
- What changes, if any, will be made to collaborators and sub-awardees, and why?
- What is the plan for preparing for the end of the award in 5 years? That is, how will the Center ramp down activities or become self-sustaining at the end of the period?

The application should illustrate the technical expertise of the applicant relevant to the application of standards, measurement infrastructure, and computational tools in accelerating the deployment of advanced materials into the economy.

This section will be evaluated according to the **Experience (Qualifications), Resource Availability, and Industry Impact** evaluation criteria (see Section V.1.ii. of this RFA).

(d) Success Metrics. Three or more metrics that indicate whether measurable progress is being made towards programmatic objectives should be described, including links to U.S. industry and the potential for commercialization. Outputs from the Center may be quantified, such as the number and quality of publications, number and types of materials developed, or software or tools developed, number and type of data collected, archived, or made publicly available. Impact metrics may also be proposed, such as industries or companies supported, economic assessments, or consensus standards submitted or approved.

This section will be evaluated according to the **Success Metrics** evaluation criteria (see Section V.1.iv. of this RFA).

(7) Resume(s).

Resumes are required for all key personnel, including the principal investigator/project lead. Awardees are advised that any changes to individuals deemed 'key personnel', including disengagement from the project for more than three months or a 25% reduction of effort, will require prior approval, in writing, by the NIST Grants Officer.

This section will be evaluated in accordance with the **Experience (Qualifications), Resource Availability, and Industry Impact** evaluation criterion (see Section V.1.ii. of this RFA). There are no page limits for resumes. However, any material considered inappropriate for inclusion in a resume (e.g. supplementary text for another section) will be redacted and not provided to the reviewers.

Resumes do not count against the thirty (30) page limit of the Technical Proposal.

(8) Budget Narrative.

The Budget Narrative must provide a detailed breakdown of each of the object class categories as reflected on the SF-424A. The budget justification should address all the budget categories (personnel, fringe benefits, equipment, travel, supplies, other direct costs and indirect costs) for which Federal funds are requested. The written justification should include the necessity and the basis for the cost. Proposed funding levels

must be consistent with the project scope, and only allowable costs should be included in the budget. Information on cost allowability is available in the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200 (<http://go.usa.gov/SBYh>), which apply to awards in this program.

(a) Personnel.

At a minimum, the budget justification for all personnel should include the following: name, job title, commitment of effort on the proposed project in terms of average number of hours per week or percentage of time, salary rate, total direct charges on the proposed project, description of the role of the individual on the proposed project and the work to be performed.

(b) Fringe Benefits.

Fringe benefits should be identified separately from salaries and wages and based on rates determined by organizational policy. The items included in the fringe benefit rate (e.g. health insurance, parking, etc.) should not be charged under another cost category.

(c) Travel.

For travel costs required by the recipient to complete the project, including attendance at any relevant conferences, the budget justification for known travel should include the following: destination; names and number of people traveling; dates and/or duration; mode of transportation, lodging and subsistence rates; and description of how the travel is directly related to the proposed project. For travel that is yet to be determined, please provide best estimates based on prior experience. If a destination is not known, an approximate amount may be used with the assumptions given for the location of the meeting.

(d) Equipment.

Equipment is defined as an item of property that has an acquisition cost of \$5,000 or more (unless the organization has established lower levels) and an expected service life of more than one year. Any items that do not meet the threshold for equipment can be included under the supplies line item. The budget justification should list each piece of known equipment, the cost, and a description of how it will be used and why it is necessary to the successful completion of the proposed project. Please note that any general use equipment (computers, etc.)

charged directly to the award should be allocated to the award according to expected usage on the project. Applicants should provide at least two (2) quotes, if available, for equipment costing \$25,000 or more. If two (2) quotes are not available, please provide a statement as to why two (2) quotes are not available. For equipment purchases yet to be determined provide best estimates based on prior experience.

(e) Supplies.

Supplies are defined as all tangible personal property other than those described in equipment (see Section IV.2.a.(8)(d) of this RFA). Provide a list of each supply necessary for the project, and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the proposed project.

(f) Contracts/Subawards.

Each contract or subaward should be treated as a separate item. Describe the services to be provided and the necessity of the subaward or contract to the successful performance of the proposed project. Contracts are for obtaining goods and services. Subawardees perform part of the project scope of work. For each subaward, applicants must provide budget detail justifying the cost of the work performed on the project.

The Budget Narrative does not count against the thirty (30) page limit of the Technical Proposal.

This section will be evaluated in accordance with the **Experience (Qualifications), Resource Availability, and Industry Impact** evaluation criteria (see Section V.1.ii of this RFA). It will also be reviewed to determine if all costs are reasonable, allocable, and allowable under 2 C.F.R. Part 200 Subpart E, Cost Principles.

(9) Indirect Cost Rate Agreement.

If indirect costs are included in the proposed budget, provide a copy of the approved negotiated agreement if this rate was negotiated with a cognizant Federal audit agency. If the rate was not established by a cognizant Federal audit agency, provide a statement to this effect.

(10) Letters of Commitment. Letters are not included in the page count.

(a) **Letters of commitment to participate, as applicable.** If the applicant's proposal identifies third parties including contractors, subawardees, and/or other collaborators who will participate in the proposed project, effectively forming a team or consortium, then a letter from each, currently known participant, describing its participation should be submitted. Each letter should indicate the organization's willingness to participate and what they will be doing for the project. A letter should be submitted whether or not the organization is receiving Federal funds.

(b) **Letters of Interest, optional.** Letters of interest may be provided from parties who might benefit from the technology or knowledge developed as discussed in the proposed project.

Letters of Commitment will be evaluated in accordance with the **Experience (Qualifications), Resource Availability, and Industry Impact** evaluation criteria (see Section V.1.ii.) of this RFA). Letters of commitment do not count against the thirty (30) page limit of the Technical Proposal.

(11) Data Management Plan.

Consistent with NIST Policy 5700.00¹, *Managing Public Access to Results of Federally Funded Research*, and NIST Order 5701.00², *Managing Public Access to Results of Federally Funded Research*, applicants must include a Data Management Plan (DMP).

The DMP is a supplementary document of not more than two pages that must include, at a minimum, a summary of proposed activities that are expected to generate data, a summary of the types of data expected to be generated by the identified activities, a plan for storage and maintenance of the data expected to be generated by the identified activities, and a plan describing whether and how data generated by the identified activities will be reviewed and made available to the public. As long as the DMP meets these NIST requirements, it may take the form specified by the applicant's institution or some other entity (e.g., the National Science Foundation³ or the National Institutes of Health⁴).

¹<http://www.nist.gov/data/upload/Final-P-5700.pdf>

²http://www.nist.gov/data/upload/Final-O-5701_0.pdf

³<http://www.nsf.gov/bfa/dias/policy/dmp.jsp>

⁴http://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm

All application for activities that will generate scientific data using NIST funding are required to adhere to a DMP or explain why data sharing and preservation are not within the scope of the project.

For the purposes of the DMP, NIST adopted the definition of “research data” at 2 C.F.R. § 200.315(e)(3) (available at <http://go.usa.gov/3sZvQ>). Reasonable costs for data preservation and access may be included in the application.

The sufficiency of the DMP will be considered as part of the administrative review (see Section V.3.a. of this RFA); however, the DMP will not be evaluated against any evaluation criteria. The DMP does not count against the thirty (30) page limit of the Technical Proposal.

b. Attachment of Required Documents

Items IV.2.a.(1) through IV.2.a.(5) above are part of the standard application package in Grants.gov and can be completed through the download application process.

Items IV.2.a.(6) through IV.2.a.(12) must be completed and attached by clicking on “Add Attachments” found in item 15 of the SF-424, Application for Federal Assistance. This will create a zip file that allows for transmittal of the documents electronically via Grants.gov.

c. Application Format

(1) Paper, E-mail and Facsimile (fax) Submissions. Will not be accepted.

(2) Figures, Graphs, Images, and Pictures. Should be of a size that is easily readable or viewable and may be landscape orientation. Any figures, graphs, images, or pictures will count toward the thirty (30) page limit for the Technical Proposal.

(3) Font. Easy to read font (12-point minimum). Smaller type may be used in figures and tables but must be clearly legible.

(4) Page Limits. The Technical Proposal is a word-processed document of no more than thirty (30) pages responsive to the program description (see Section I. of this RFA) and the evaluation criteria (see Section V.1. of this RFA).

(5) Page Limit Excludes: SF-424, Application for Federal Assistance; SF-424A, Budget Information – Non-Construction Programs; SF-424B,

Assurances – Non-Construction Programs; CD-511, Certification Regarding Lobbying; SF-LLL, Disclosure of Lobbying Activities; Resumes of key personnel; Budget Narrative; Indirect Cost Rate Agreement; and Letters of Commitment.

(6) Page size. 21.6 centimeters by 27.9 centimeters (8 ½ inches by 11 inches).

(7) Application language. English.

d. Application Replacement Pages. Applicants may not submit replacement pages and/or missing documents once an application has been submitted. Revisions can only be made by submitting a complete new application that is received by NIST before the submission deadline.

e. Pre-Application. Pre-application will not be accepted under this RFA.

f. Certifications Regarding Federal Felony and Federal Criminal Tax Convictions, Unpaid Federal Tax Assessments and Delinquent Federal Tax Returns. In accordance with Federal appropriations law, an authorized representative of the selected applicant(s) may be required to provide certain pre-award certifications regarding Federal felony and Federal criminal tax convictions, unpaid Federal tax assessments, and delinquent Federal tax returns.

3. Unique Entity Identifier and System for Award Management (SAM)

Pursuant to 2 C.F.R. part 25, applicants and recipients (as the case may be) are required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency, unless otherwise excepted from these requirements pursuant to 2 C.F.R. § 25.110. NIST will not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements and, if an applicant has not fully complied with the requirements by the time that NIST is ready to make a Federal award pursuant to this RFA, NIST may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

4. Submission Dates and Times

Application must be received at Grants.gov no later than 11:59 p.m. Eastern Time, October 31, 2018. NIST will consider the date and time recorded by Grants.gov as the official submission time. Application received after this

deadline will not be reviewed or considered. Paper application will not be accepted.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance from 12:01 a.m. Eastern Time, Saturday October 6, 2018 until Monday, October 8, 2018 at 6:00 a.m. Eastern Time; and from 12:01 a.m. Eastern Time, Saturday October 20, 2018 until October 22, 2018 at 6:00 a.m. Eastern Time. Application cannot be submitted when Grants.gov is closed.

5. Intergovernmental Review

Application under this Program are not subject to Executive Order 12372.

6. Funding Restrictions

Application for product development and/or commercialization are not considered responsive to this RFA. Profit or fee is not an allowable cost.

7. Other Submission Requirements

a. Application must be submitted electronically.

(1) Application must be submitted via Grants.gov at grants.gov.

(a) Applicants should carefully follow specific Grants.gov instructions to ensure that all attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicating an application is received does not provide information about whether attachments have been received. For further information or questions regarding applying electronically for the 2019-NIST-ADV-MAT-COE-01 announcement, contact Leon Sampson by phone at 301-975-3086 or by e-mail at grants@nist.gov.

b. Amendments. Any amendments to this RFA will be announced through Grants.gov and send by email to the administrative contact on the current award.

V. Application Review Information

1. Evaluation Criteria

The evaluation criteria that will be used in evaluating application and assigned weights are as follows:

- i. **Rationality (0 to 20 points).** The clarity and likelihood of success of the applicant's approach to effectively address scientific and

technical challenges relevant to the objectives of the Advanced Materials Center of Excellence.

- ii. **Experience (Qualifications), Resource Availability, and Industry Impact (0 to 30 points).** The extent to which the applicant has access to the necessary facilities and overall support to accomplish project objectives. Factors considered as a whole and not given particular weights within the category include: (1) the degree to which requested resources are appropriate for the proposed project's scope; (2) the quality of organizational resources proposed to be used on the project; (3) the rationality and potential effectiveness of any planned subawards and/or contracts; (4) demonstrated commitment to encouraging and assisting underrepresented participants in the proposed project. (5) plans for staff exchange of extended duration, for example of more than sixty (60) days, between NIST and the applicant, including the type and number of personnel; the rationality and effectiveness of a plan to manage intellectual property (IP) generated during the award period, taking into consideration the information provided in paragraph VII.2.f. of this RFA.
- iii. **Technical Merit of Contribution (0 to 40 points).** The technical merit of the proposed work and the likelihood it will contribute to future breakthroughs in advanced materials. Factors considered as a whole and not given particular weights within the category include: (1) creativity and originality of the proposed approach, (2) plausibility of the technical approach, (3) scope of work, including the number and type of materials and the nature of proposed disciplinary approaches, (4) the magnitude and reach of potential technical outcomes, (5) linkage between the technical outcomes and industry needs as described in the proposal, and (6) degree of integration with NIST programs (consistent with paragraph VII.2.e of this RFA) and capabilities in the areas of advanced materials (see Section I. of this RFA).
- iv. **Success Metrics (0 to 10 points).** The clarity and quality of proposed metrics and mechanisms for evaluating the effectiveness of outputs from the Advanced Materials Center of Excellence, including links to U.S. industry and the potential for commercialization.

2. Selection Factors

The Selection Factors are:

- a. Results of the merit reviewers' evaluations.
- b. The availability of funding.
- c. The extent to which the proposed scope of the research (materials, computational methods, personnel, or equipment) is complementary to the research programs and research goals in these areas at NIST as described at www.nist.gov/mqi.
- d. The relevance to the program as described in Section I. of this RFA.
- e. Whether the project duplicates other projects funded by the Department of Commerce or other Federal agencies.
- f. The results of any independent, objective evaluations of the Advanced Materials Center of Excellence undertaken by NIST.
- g. The results of an overall assessment, consistent with the potential long-term nature and purpose of the program, including programmatic, policy, and responsibility assessments, consistent with Department of Commerce and NIST policies and procedures.

3. RFA Review and Selection Process

- a. **Initial Administrative Review of the Application.** An initial review of the application will be conducted to determine eligibility, completeness, and responsiveness to this RFA and the scope of the stated program objectives. If the Proposal is determined to be ineligible, incomplete, and/or non-responsive, NIST may terminate review.
- b. **Full Review of an Eligible, Complete, and Responsive Application.** If the application is determined to be eligible, complete, and responsive, it will proceed for full reviews in accordance with the review and selection process below:

The application will be reviewed by at least three (3) independent, objective reviewers, knowledgeable in the subject matter of this RFA and its objectives and who are able to conduct a review based on the evaluation criteria (see Section V.1. of this RFA). The reviewers may discuss the proposals with each other, but scores will be determined on an individual basis, not as a consensus.

The Selecting Official, the Associate Director for Laboratory Programs, will make the final recommendation to the NIST Grants Office. The Selecting

Official will take into consideration the results of the reviewers' evaluations and the Selection Factors in Section V.2 of this RFA.

NIST reserves the right to negotiate the budget costs with the applicant, which may include requesting that the applicant remove certain costs. Additionally, NIST may request that the applicant modify objectives or work plans and provide supplemental information required by the agency prior to award. The final approval of selected application and issuance of awards will be by the NIST Grants Officer. The award decisions of the NIST Grants Officer are final.

VI. Additional Information

1. Proposal Replacement Pages

Applicants may not submit replacement pages and/or missing documents once an application has been submitted. Any revisions must be made by submission of a new application by the submission deadline via Grants.gov.

2. Anticipated Announcement and Award Date

Review of Application, selection of successful applicants, and award processing is expected to be completed by December 15, 2018. The earliest start date for awards under this RFA is expected to be January 1, 2019.

3. Additional Information

- a. Safety.** Safety is a top priority at NIST. Employees and affiliates of award recipients who conduct project work at NIST will be expected to be safety-conscious, to attend NIST safety training, and to comply with all NIST safety policies and procedures, and with all applicable terms of their guest research agreement.
- b. Notification if Applicant is Unsuccessful.** If unsuccessful, the applicant will be notified by e-mail and will have the opportunity to receive a debriefing.
- c. Retention of Unsuccessful Application.** Any unsuccessful application would be retained in accordance with the [General Record Schedule 1.2/021](#).

VII. Federal Award Administration Information

- 1. Federal Award Notices.** If successful, the applicant will receive an award package from the NIST Grants Officer.
- 2. Administrative and National Policy Requirements**

- a. **Uniform Administrative Requirements, Cost Principles and Audit Requirements.** Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program. Refer to <http://go.usa.gov/SBYh> and <http://go.usa.gov/SBg4>.
- b. **Department of Commerce Financial Assistance Standard Terms and Conditions.** The Department of Commerce will apply to each award in this program, the Financial Assistance Standard Terms and Conditions in effect on the date of award. The current version, dated March 31, 2017, is accessible at <http://go.usa.gov/xXRxK>. Refer to Section VII. of this RFA, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.
- c. **Pre-Award Notification Requirements.** The Department of Commerce will apply the Pre-Award Notification Requirements for Grants and Cooperative Agreements dated December 30, 2014 (79 FR 78390), accessible at <http://go.usa.gov/hKkR>. Refer to Section VII. of this RFA, Federal Awarding Agency Contacts, Grant Rules and Regulations, for more information.
- d. **Funding Availability and Limitation of Liability.** NIST or the Department of Commerce will not be responsible for application preparation costs under any circumstances, including but not limited to if this program fails to receive funding or is cancelled because of agency priorities. Publication of this RFA does not oblige NIST or the Department of Commerce to award any specific project or to obligate any available funds.
- e. **Collaborations with NIST Employees.** The statement of work should include a statement of collaboration with NIST, a description of the collaboration, and prominently identify the NIST employee(s) involved, if known. Any collaboration by a NIST employee must be approved by appropriate NIST management and is at the sole discretion of NIST. Prior to beginning the merit review process, NIST will verify the approval of the proposed collaboration. Any unapproved collaboration will be stricken from the application prior to the merit review.
- f. **Use of NIST Intellectual Property.** If the applicant anticipates using any NIST-owned intellectual property to carry out the work proposed, the applicant should identify such intellectual property. This information will be used to ensure that no NIST employee involved in the development of the intellectual property will participate in the review process for that competition. In addition, if the applicant intends to use NIST-owned intellectual property, the applicant must comply with all statutes and regulations governing the

licensing of Federal government patents and inventions, described in 35 U.S.C. §§ 200-212, 37 C.F.R. Part 401, 2 C.F.R. §200.315, and in Section C.03 of the Department of Commerce Financial Assistance Terms and Conditions dated March 31, 2017, accessible at <http://go.usa.gov/xXRxK>.

Any use of NIST-owned intellectual property by a recipient of an award under this announcement is at the sole discretion of NIST and will be negotiated on a case-by-case basis if a project is deemed meritorious. The applicant should indicate within the statement of work whether it already has a license to use such intellectual property or whether it intends to seek one.

If any inventions made in whole or in part by a NIST employee arise in the course of an award made pursuant to this RFA, the United States government may retain its ownership rights in any such invention. Licensing or other disposition of NIST's rights in such inventions will be determined solely by NIST and include the possibility of NIST putting the intellectual property into the public domain.

- g. Research Activities Involving Human Subjects, Human Tissue, Data or Recordings Involving Human Subjects Including Software Testing.** Any application that includes research activities involving human subjects, human tissue/cells, or data or recordings from or about human subjects, must satisfy the requirements of the Common Rule for the Protection of Human Subjects ("Common Rule"), codified for the Department of Commerce at 15 C.F.R. Part 27. Research activities involving human subjects that fall within one or more of the classes of vulnerable subjects found in 45 C.F.R. Part 46, Subparts B, C and D must satisfy the requirements of the applicable subpart(s). In addition, any such application that includes research activities on these subjects must be in compliance with all applicable statutory requirements imposed upon the Department of Health and Human Services (DHHS) and other Federal agencies, all regulations, policies and guidance adopted by DHHS, the Food and Drug Administration (FDA), and other Federal agencies on these topics, and all Executive Orders and Presidential statements of policy on applicable topics. (Regulatory Resources: <http://www.hhs.gov/ohrp/humansubjects/index.html> which includes links to FDA regulations, but may not include all applicable regulations and policies).

NIST uses the following Common Rule definitions for research and human subjects research:

Research: A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under

a program which is considered research for other purposes. For example, some demonstration and service programs may include research activities.

Human Subject: A living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual or identifiable private information.

- (1) *Intervention* includes both physical procedures by which data are gathered and manipulations of the subject or the subject's environment that are performed for research purposes.
- (2) *Interaction* includes communication or interpersonal contact between investigator and subject.
- (3) *Private information* includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the identity of the subject is or may readily be ascertained by the investigator associated with the information) in order for obtaining the information to constitute research involving human subjects.

See F (Definitions).

- 1) Requirement for Federalwide Assurance.** If the application is accepted for [or awarded] funding, organizations that have an Institutional Review Board (IRB) are required to follow the procedures of their organization for approval of exempt and non-exempt research activities that involve human subjects. Both domestic and foreign organizations performing non-exempt research activities involving human subjects will be required to have protocols approved by a cognizant, active IRB currently registered with the Office for Human Research Protections (OHRP) within the DHHS that is linked to the engaged organizations. All engaged organizations must possess a currently valid Federalwide Assurance (FWA) on file from OHRP. Information regarding how to apply for an FWA and register an IRB with OHRP can be found at <http://www.hhs.gov/ohrp/assurances/index.html>. NIST relies only on OHRP-issued FWAs and IRB Registrations for both domestic and foreign organizations for NIST supported research involving human subjects. NIST will not issue its own FWAs or IRB Registrations for domestic or foreign organizations.

- 2) Administrative Review.** The NIST Human Subjects Protection Office (HSPO) reserves the right to conduct an administrative review⁵ of all application that potentially include research involving human subjects and were approved by an authorized non-NIST institutional entity (an IRB or entity analogous to the NIST HSPO) under 15 C.F.R. § 27.112 (Review by Institution). If the NIST HSPO determines that an application includes research activities that potentially involve human subjects, the applicant will be required to provide additional information to NIST for review and approval. The documents required for funded proposals are listed in each section below. Most documents will need to be produced during the proposal review process; however, the Grants Officer may allow final versions of certain required documents to be produced at an appropriate designated time post-award. Research involving human subjects may not start until the NIST Grants Officer issues an award explicitly authorizing such research. In addition, all amendments, modifications, or changes to approved research and requests for continuing review and closure will be reviewed by the NIST HSPO.
- 3) Required documents for proposal review.** All application involving human subject research must clearly indicate, by separable task, all research activities believed to be exempt or non-exempt research involving human subjects, the expected institution(s) where the research activities involving human subjects may be conducted, and the institution(s) expected to be engaged in the research activities.
- a. Not research determination.** If an activity/task involves human subjects as defined in the Common Rule, but the applicant participant(s) indicates to NIST that the activity/task is not research as defined in the Common Rule, the following information may be requested for that activity/task:
- (1) Justification, including the rationale for the determination and such additional documentation as may be deemed necessary by NIST to

⁵ Conducting an “administrative review” means that the NIST HSPO will review and verify the performing institution’s determination for research not involving human subjects or exempt human subjects research. In addition, for non-exempt human subjects research, the NIST HSPO will review and confirm that the research and performing institution(s) are in compliance with 15 C.F.R. Part 27, which means HSPO will 1) confirm the engaged institution(s) possess, or are covered under a Federalwide Assurance, 2) review the research study documentation submitted to the IRB and verify the IRB’s determination of level of risk and approval of the study for compliance with 15 C.F.R. Part 27, 3) review and verify IRB-approved substantive changes to an approved research study before the changes are implemented, and 4) review and verify that the IRB conducts an appropriate continuing review at least annually.

review and/or support a determination that the activity/task in the application is not research as defined in the Common Rule.

- (2) If the applicant participant(s) used a cognizant IRB that provided a determination that the activity/task is not research, a copy of that determination documentation must be provided to NIST. The applicant participant(s) is not required to establish a relationship with a cognizant IRB if they do not have one.

NIST will review the information submitted and may coordinate further with the applicant before determining whether the activity/task will be defined as research under the Common Rule in the applicable NIST financial assistance program or project.

- b. Research not involving human subjects.** If an activity/task is determined to be research and involves human subjects, but is determined to be *not human subjects research* (or *research not involving human subjects*) under the Common Rule, the following information may be requested for that activity/task:

- (1) Justification, including the rationale for the determination and such additional documentation as may be deemed necessary by NIST to review and/or support a determination that the activity/task in the application is not research as defined in the Common Rule.
- (2) If the applicant participant(s) used a cognizant IRB that provided a determination that the activity/task is research not involving human subjects, a copy of that determination documentation must be provided to NIST. The applicant participant(s) is not required to establish a relationship with a cognizant IRB if they do not have one.

- c. Exempt research determination with no IRB.** If the application appears to NIST to include exempt research activities, and the performer of the activity or the supplier and/or the receiver of the biological materials or data from human subjects **does not** have a cognizant IRB to provide an exemption determination, the following information may be requested during the review process so that NIST can evaluate whether an exemption under the Common Rule applies (see 15 C.F.R. § 27.101(b), (c) and (d)):

- (1) The name(s) of the institution(s) where the exempt research will be conducted.
- (2) The name(s) of the institution(s) providing the biological materials or data from human subjects.

- (3) A copy of the protocol for the research to be conducted; and/or the biological materials or data from human subjects to be collected/provided, not pre-existing samples (i.e., will proposed research collect only information without personal identifiable information, will biological materials or data be de-identified and when and by whom was the de-identification performed, how were the materials or data originally collected).
- (4) For pre-existing biological materials or data from human subjects, provide copies of the consent forms used for collection and a description of how the materials or data were originally collected and stripped of personal identifiers. If copies of consent forms are not available, explain.
- (5) Any additional clarifying documentation that NIST may deem necessary in order to make a determination whether the activity/task or use of biological materials or data from human subjects is exempt under the Common Rule.

d. Research review with an IRB. If the application appears to NIST to include research activities (exempt or non-exempt) involving human subjects, and the proposed performer of the activity has a cognizant IRB registered with OHRP, and linked to their Federalwide Assurance, the following information may be requested during the review process:

- (1) The name(s) of the institution(s) where the research will be conducted.
- (2) The name(s) and institution(s) of the cognizant IRB(s), and the IRB registration number(s).
- (3) The FWA number of the applicant linked to the cognizant IRB(s);
- (4) The FWAs associated with all organizations engaged in the planned research activity/task, linked to the cognizant IRB.
- (5) If the IRB review(s) is pending, the estimated start date for research involving human subjects.
- (6) The IRB approval date (if currently approved for exempt or non-exempt research).
- (7) If any of the engaged organizations has applied for or will apply for an FWA or IRB registration, those details should be clearly provided for each engaged organization.

If the application includes research activities involving human subjects to be performed in the first year of an award, additional documentation may be requested by NIST during pre-award review for those performers, and may include the following for those research activities:

- (1) A signed (by the study principal investigator) copy of each applicable final IRB-approved protocol.
- (2) A signed and dated approval letter from the cognizant IRB(s) that includes the name of the institution housing each applicable IRB, provides the start and end dates for the approval of the research activities, and any IRB-required interim reporting or continuing review requirements.
- (3) A copy of any IRB-required application information, such as documentation of approval of special clearances (i.e., biohazard, HIPAA, etc.) conflict-of-interest letters, or special training requirements.
- (4) A brief description of what portions of the IRB submitted protocol are specifically included in the application submitted to NIST, if the protocol includes tasks not included in the application, or if the protocol is supported by multiple funding sources. For protocols with multiple funding sources, NIST will not approve the study without a non-duplication-of-funding letter indicating that no other federal funds will be used to support the tasks proposed under the proposed research or ongoing project.
- (5) If a new protocol will only be submitted to an IRB if an award from NIST is issued, a draft of the proposed protocol.
- (6) Any additional clarifying documentation that NIST may request during the review process to perform the NIST administrative review of research involving human subjects. (See 15 C.F.R. § 27.112 (Review by Institution)).

This clause reflects the existing NIST policy and requirements for Research Involving Human Subjects. Should the policy be revised prior to award, a clause reflecting the policy current at time of award may be incorporated into the award.

If the policy is revised after award, a clause reflecting the updated policy may be incorporated into the award.

For more information regarding research projects involving human subjects, contact Anne Andrews, Director, NIST Human Subjects Protection Office (e-mail: anne.andrews@nist.gov; phone: (301) 975-5445.

3. Reporting

- a. **Reporting Requirements.** The following reporting requirements described in Sections A.01, Reporting Requirements, of the Department of Commerce Financial Assistance Standard Terms and Conditions dated March 31, 2017, accessible at <http://go.usa.gov/xXRxK>, apply to awards in this program:

- (1) Financial Reports.** Each award recipient will be required to submit an SF-425, Federal Financial Report on a semi-annual basis for the periods ending March 31 and September 30, and of each year. Reports will be due within 30 days after the end of the reporting period to the NIST Federal Program Officer, Grants Officer and Grants Specialist named in the award documents. A final financial report is due within 90 days after the end of the project period.
- (2) Performance (Technical) Reports.** Each award recipient will be required to submit a technical progress report to the NIST Federal Program Officer, Grants Officer, and the Grants Specialist on semi-annual basis for the periods ending: March 31 and September 30 of each year. Technical progress reports shall contain information as prescribed in 2 C.F.R. § 200.328 (<http://go.usa.gov/xkVgP>) and Department of Commerce Standard Terms and Conditions, Section A.01 (<https://go.usa.gov/xXRxK>). Reports will be due within 30 days after the end of the reporting period. A final technical report shall be submitted within 90 days after the expiration date of the award, and publication citation information as well as links to publicly available data shall be submitted as soon as they become available. If a recipient's Data Management Plan (DMP) has changed since their last submission of a technical progress report, the recipient must include their revised DMP in the next technical progress report following the revision to the DMP. The revised DMP must include all the requirements described in Section IV.3.a.(11) of this RFA.
- (3) Patent and Property Reports.** In accordance with the Uniform Administrative Requirements (see Section VI.2. of this RFA) and other terms and conditions governing the award, the recipient may need to submit property and patent reports.
- (4) Recipient Integrity and Performance Matters.** In accordance with section 872 of Public Law 110-417 (as amended; see 41 U.S.C. 2313), if the total value of a recipient's currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of an award made under this RFA, then the recipient shall be subject to the requirements specified in Appendix XII to 2 C.F.R. Part 200, <http://go.usa.gov/cTBwC>, for maintaining the currency of information reported to SAM that is made available in FAPIIS about certain civil, criminal, or administrative proceedings involving the recipient.

- b. Audit Requirements.** The Department of Commerce Financial Assistance Standard Terms and Conditions, Section D.01.b.1., and 2 C.F.R. Part 200 Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101, require any non-Federal entity (i.e., including non-profit institutions of higher education and non-profit organizations) that expends Federal awards of \$750,000 or more in the recipient's fiscal year to conduct a single or program-specific audit in accordance with the requirements set out in the Subpart. Applicants are reminded that NIST, the Department of Commerce Office of Inspector General, or another authorized Federal agency may conduct an audit of an award at any time.
- c. Federal Funding Accountability and Transparency Act of 2006.** In accordance with 2 C.F.R. Part 170, all recipients of a Federal award made on or after October 1, 2010, are required to comply with reporting requirements under the Federal Funding Accountability and Transparency Act of 2006 (Public Law No. 109-282). In general, all recipients are responsible for reporting sub-awards of \$25,000 or more. In addition, recipients that meet certain criteria are responsible for reporting executive compensation. Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding. Also see the Federal Register notice published September 14, 2010, at 75 FR 55663 available here <http://go.usa.gov/hKnQ>.

VIII. Federal Awarding Agency Contacts

Questions should be directed to the following:

Subject Area	Point of Contact
Programmatic and Technical Questions	James Warren Phone: 301-975-5708 E-mail: james.warren@nist.gov
Technical Assistance with Grants.gov Submissions	Leon Sampson Phone: 301-975-3086 Fax: 301-975-6368 E-mail: grants@nist.gov Or grants.gov Phone: 800-518-4726 E-mail: support@grants.gov

Subject Area	Point of Contact
Grant Rules and Regulations	Husai Rahman Phone: 301-975-4355 Fax: 301-975-6368 E-mail: Husai.rahman@nist.gov

IX. Other Information

1. **Personal and Business Information**

The applicant acknowledges and understands that information and data contained in application for financial assistance, as well as information and data contained in financial, performance and other reports submitted by applicants, may be used by the Department of Commerce in conducting reviews and evaluations of its financial assistance programs. For this purpose, applicant information and data may be accessed, reviewed and evaluated by Department of Commerce employees, other Federal employees, and by Federal agents and contractors, and/or by non-Federal personnel, all of whom enter into appropriate conflict of interest and confidentiality agreements covering the use of such information. As may be provided in the terms and conditions of a specific financial assistance award, applicants are expected to support program reviews and evaluations by submitting required financial and performance information and data in an accurate and timely manner, and by cooperating with Department of Commerce and external program evaluators. In accordance with 2 C.F.R. § 200.303(e), applicants are reminded that they must take reasonable measures to safeguard protected personally identifiable information and other confidential or sensitive personal or business information created or obtained in connection with a Department of Commerce financial assistance award.

In addition, Department of Commerce regulations implementing the Freedom of Information Act (FOIA), 5 U.S.C. Sec. 552, are found at 15 C.F.R. Part 4, Public Information. These regulations set forth rules for the Department regarding making requested materials, information, and records publicly available under the FOIA. Application submitted in response to this Federal Funding Opportunity may be subject to requests for release under the Act. If an application contains information or data that the applicant deems to be confidential commercial information that should be exempt from disclosure under FOIA, that information should be identified, bracketed, and marked as Privileged, Confidential, Commercial or Financial Information. In accordance with 15 CFR § 4.9, the Department of Commerce will protect from disclosure confidential business information contained in financial assistance application and other documentation provided by applicants to the extent permitted by law.