10/27/2016

ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY (FFO)
NIST Consortium for Semiconductor and Future Computing
Research Grant Program

EXECUTIVE SUMMARY

- **Federal Agency Name:** National Institute of Standards and Technology (NIST), United States Department of Commerce (DoC)
- **Funding Opportunity Title:** NIST Consortium for Semiconductor and Future Computing Research Grant Program
- **Announcement Type:** Initial
- **Funding Opportunity Number:** 2017-NIST-CSFC-01
- **Catalog of Federal Domestic Assistance (CFDA) Number:** 11.609, Measurement and Engineering Research and Standards
- **Dates:** Applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, January 13, 2017. Applications received after this deadline will not be reviewed or considered. Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance at these times (all times are in Eastern Time): from 12:00 a.m. Saturday, November 19, 2016 until 6:00 a.m. Monday, November 21, 2016; and also from 12:00 a.m., Saturday, December 17, 2016 until 6:00 a.m. December 19, 2016. Applications cannot be submitted when Grants.gov is closed. NIST expects to complete its review, selection of successful applicants, and award processing by February 2017. NIST expects the earliest start date for awards under this FFO to be March 30, 2017.

  Applicants are strongly urged to read Section IV.2.b., Attachment of Required Application Documents, found on pages 11 and 12 of this FFO, with great attention. Applicants should carefully follow the instructions and recommendations regarding attachments and using Grants.gov's Download Submitted Applications feature to check that all required attachments were contained in their submission. Applications submitted without the required documents will not pass the Initial Administrative Review, described in Section V.3.a. of this FFO.

  When developing your submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the electronic System for Award Management (SAM.gov); (2) the free annual registration process in the SAM.gov (*see* Section IV.3. and Section IV.6.a.(2) of this FFO) often takes between three and five business days and may take as long as two weeks; (3) submitters of

electronic applications are required to have a current registration in Grants.gov; and (4) applicants using Grants.gov will receive email notifications over a period of up to two business days as the application moves through intermediate systems before the applicant learns via a validation or rejection notification whether NIST has received the application. (*See* http://www.grants.gov for full information on application and notification through Grants.gov). Please note that a federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.

- **Application Submission Address:** Applications must be submitted using Grants.gov.

- **Funding Opportunity Description:** NIST is soliciting proposals for financial assistance from eligible applicants to support basic research, in a consortium-based setting, focused on the long-term research needs of industry in the area of future computing and information processing. There is a critical need for scientific and engineering advances in novel computing paradigms with long-term impact on the semiconductor, electronics, computing, and defense industries. The proposed activities should advance the physical and materials aspects of future computing technologies with a focus on alternatives that provide low latency, low energy per operation, improved data/communication bandwidth, and higher clock speed. Activities should include innovative research in devices, circuits, architectures, metrology or characterization to enable future computing paradigms. Applicants should create mechanisms for extended collaboration with NIST researchers.

- **Anticipated Amounts:** NIST anticipates making one (1) multi-year award of up to $3,200,000 in the first year and up to $3,700,000 in subsequent years, for a total award period of up to 5 years. To account for the anticipated funding levels, the applicant shall propose a base program of up to $2,500,000 in the first year and $2,700,000 in subsequent years to fund consortium and university-based research (*see* description of such research in Section. I. of this FFO). For the remaining budget, the applicant shall also propose an engagement mechanism of up to $700,000 in the first year and up to $1,000,000 in subsequent years to enable mutually agreed upon collaborative research between the consortium or university researchers and NIST (for example, by supporting post-doctoral researchers for specific projects located at NIST). Because the collaborative efforts will be mutually agreed upon after the award is made, such efforts may not be fully realized in any given year. Note that all budget documents must reflect the full amount of Federal funds requested for any given year.

- **Funding Instrument:** Cooperative agreement.

- **Who Is Eligible:** Accredited institutions of higher education and non-profit organizations located in the United States and its territories. An eligible organization is expected to create a consortium or be part of an existing consortium as described in Section I. Program Description, of this FFO.

- **Cost Sharing or Matching:** The Program requires a non-Federal cost share of 25 percent of the yearly total allowable project costs.

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FULL ANNOUNCEMENT TEXT

I. Program Description

The statutory authority for the National Institute of Standards and Technology (NIST) Consortium for Semiconductor and Future Computing Research Grant Program is 15 U.S.C. § 3705. For purposes of 15 U.S.C. § 3705, the Consortium established under this FFO constitutes a Cooperative Research Center. Under this authority, NIST supports cooperative technological innovation activities of industry and universities and development of the generic research base, which may result in significant economic and strategic benefits to the United States.

Semiconductors are the foundation of information technology and have made possible the Internet, online businesses, and social media—connecting people and information across the face of the globe. Semiconductors are one of America's top exports, totaling $42 billion in 2015 according to Semiconductor Industry Association (SIA) [1]. In 2014,

[1] SIA, EXPORTS, "Start Here" (2016) http://www.semiconductors.org/clientuploads/Industry%20Statistics/It%20All%20Starts%20Here%20-%20Exports%20Start%20Here%20-%20revised%20061316.pdf

U.S. semiconductor companies generated $173 billion in sales, and over 1 million American jobs are made possible by the semiconductor industry[2].

One area where a clear long-term technological challenge resides is in the development of future high-performance computing technology. The semiconductor industry will soon approach the limits of existing complementary metal oxide semiconductor (CMOS) technology, as atomic-scale barriers limit the density of components that can be placed on a single chip. The semiconductor industry is well aware of this barrier, and through the International Roadmap for Devices and Systems (IRDS) has identified research on post-CMOS computing technologies as a high priority[3]. In particular, the field of nanoscale electronics (often referred to as nanoelectronics) presents a number of promising research alternatives.

NIST seeks research and development (R&D) partnerships that promote directed basic research at universities focused on the long-term research needs of industry in specific technological sectors important for U.S. economic competitiveness.

NIST seeks to support a program carried out by the recipient to create or build upon an existing consortium that involves the participation of commercial, academic, non-profit, and/or government organizations to address the technical challenges identified by industry, as highlighted in the IRDS. These challenges include the characterization and measurement techniques needed to develop novel nanoelectronic technologies that can demonstrate advantages over CMOS in power, density, performance, or cost. These technologies should include device, circuit, and architecture approaches in achieving the goals of high performance at low power. Non-conventional devices can include logic, memory, architecture, and processing. The program is expected to leverage Federal financial support with that of other partners from industry to fund research at universities. The recipient is expected to create a process for the review, selection, award and monitoring of research awards to universities to be made by the consortium in support of addressing the technical challenges associated with nanoscale electronics and the development of non-conventional, low-power technologies which can outperform CMOS in the next decade.

The technical scope of the consortium should explore fundamentally new approaches to low-energy devices and technologies which can outperform traditional CMOS technologies. Topics of interest include (1) Fundamental devices and circuits research to enable these future computing paradigms; (2) Novel high-performance computing paradigms, beyond conventional CMOS devices and classical architectures; and (3)

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[2] SIA, Rebooting the IT revolution (2015)
https://www.semiconductors.org/clientuploads/Resources/RITR%20WEB%20version%20FINAL.pdf

[3] IRDS (formerly ITRS) Roadmap (2015)
http://www.semiconductors.org/clientuploads/Research_Technology/ITRS/2015/0_2015%20ITRS%202.0%20Executive%20Report%20(1).pdf (2016, in progress)
http://standards.ieee.org/develop/indconn/irds/index.html

Innovative metrology and characterization to enable materials research, manufacturing and benchmarking.

Applicants must be a single legal entity that will act as the recipient of any Federal funds, and be responsible for managing the agreement on behalf of the other consortium members. As required in Section IV.2.a.(6)(c) of this FFO, applicants applying for funding must: provide details on the membership of the consortium; show that the consortium has a shared technological vision and will addresses the long-term (10-15 years) basic research needs of industry; describe the mechanism used by the consortium to determine research focus areas and disburse funding (including: scopes of work and budgets for each proposed project year, how availability of funds will be announced, who will be eligible to receive funding, what evaluation criteria will be applied to proposals, a description of the selection process, and mechanisms for avoiding conflict of interest); and detail the amount and type of industry support available for university-based research in terms of funds, personnel, and equipment available. Detailed evaluation criteria are provided below in Section V.1. of this FFO.

As part of the jointly-pursued activities under a cooperative agreement, NIST will be involved in the project selection and funding decisions of the consortium, both in the form of technical expertise and as an equal and contributing partner on the consortium's steering body. NIST will also provide technical expertise and the opportunity for research collaborations focused on specific research issues related to the metrology and characterization of nanoscale components.

As required in Section IV.2.a.(6)(c).ix. of this FFO, the applicant must create an engagement plan that describes the mechanisms for enabling cooperative research activities between consortium members or university researchers and NIST. Engagement could include opportunities for graduate or post-graduate researchers from university partners to carry out research at NIST in collaboration with NIST scientists and engineers. The recipient will collaborate with the NIST Program Coordinator in selecting undergraduate/graduate students and post-doctoral fellows to potentially participate in collaborative research, pending available funding. In accordance with the procedures proposed by the recipient and included in the cooperative agreement, the NIST Program Coordinator anticipates working with staff from NIST to approve candidate undergraduate/graduate students and post-doctoral fellows selected by the recipient. Consistent with 15 U.S.C. § 278g-1(c), applicants are encouraged to promote the participation of underrepresented minorities in any research conducted under an award pursuant to this FFO.

II. Federal Award Information

1. **Funding Instrument.** The funding instrument that will be used is a cooperative agreement. The nature of NIST's "substantial involvement" will generally be collaboration between NIST and the recipient organization on the scope of work. NIST will also be involved in the project selection and funding decisions of the consortium, both in the form of technical expertise and as an equal and contributing partner on the consortium's steering body.

2. **Multi-Year Funding Policy.** When a proposal for a multi-year award is approved, funding will usually be provided for only the first year of the program. If a project is selected for funding, NIST has no obligation to provide any additional funding in connection 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 the Program, and the availability of funds.

   Prior to the end of the award period, NIST may undertake a review of the Recipient's performance to determine whether future funding should be awarded on a non-competitive basis in the form of an Institutional Award, with the intent of fostering a long-term partnership between NIST and the Recipient.

3. **Anticipated Amounts**. NIST anticipates making one (1) multi-year award of up to $3,200,000 in the first year and up to $3,700,000 in subsequent years, for a total award period of up to 5 years. To account for the anticipated funding levels, the applicant shall propose a base program of up to $2,500,000 in the first year and $2,700,000 in subsequent years to fund consortium and university-based research. For the remaining budget, the applicant shall also propose an engagement mechanism of up to $700,000 in the first year and up to $1,000,000 in subsequent years to enable mutually agreed upon collaborative research between the consortium or university researchers and NIST (for example, by supporting post-doctoral researchers for specific projects located at NIST). Because the collaborative efforts will be mutually agreed upon after the award is made, they may not be fully realized in any given year. Note that all budget documents must reflect the full amount of Federal funds requested for any given year.

4. **Number of Awards**. NIST anticipates making one (1) multi-year award to an eligible recipient.

III. Eligibility Information

1. **Who Is Eligible.** Accredited institutions of higher education and non-profit organizations located in the United States and its territories. An eligible organization is expected to create a consortium or be part of an existing consortium as described in Section I., Program Description, of this FFO.

2. **Cost Sharing or Matching.** Non-Federal cost sharing of 25 percent of the yearly total allowable project costs is required. Cost sharing does not include unallowable/ineligible costs. Proposals that do not provide for the required non-Federal cost sharing will be considered non-responsive and will not receive further review.

   All non-Federal cost share contributions require a letter of commitment signed by an authorized official from each source.

Cost sharing is that portion of the costs not borne by the Federal Government. The applicant's share of the expenses may include cash, services, and third party in-kind contributions, as described at 2 C.F.R. § 200.306. The source and detailed rationale of the cost share, including cash, full- and part-time personnel, and in-kind donations must be documented in the budget tables and Budget Narratives submitted with the application and will be considered as part of the review under the evaluation criteria found in Sections V.1.b.(5) and V.1.b.(7).

As with the Federal share, non-Federal cost sharing will be made a binding part of the award and will be subject to audit if the project receives funding.

IV. Application and Submission Information

1. **Address to Request Application Package.** The application package is available at www.grants.gov under Funding Opportunity Number 2017-NIST-CSFC-01.

2. **Content and Format of Application Submission**

   a. Required Forms and Document

   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 12, should list the FFO number 2017-NIST-CSFC-01.
   - SF-424, Item 18, should list the total Federal budget amount requested for the entire project.
   - For SF-424, Item 21, the list of certifications and assurances is contained in the SF-424B.

   (2) **SF-424A, Budget Information - Non-Construction Programs.** The budget should reflect anticipated expenses for the project, considering all potential cost increases, including cost of living adjustments. The Grant Program Function or Activity on Line 1 under Column (a) should be entered as "Measurement and Engineering Research and Standards". The Catalog of Federal Domestic Assistance Number on Line 1 under Column (b) should be entered as "11.609".

   These sections of the SF-424A should reflect funds for the first year of the award: Section A; Section B; Section C; and Section D. The budget estimate for the second year through fifth year of the award should be entered in Section E, field 16, column (b) through column (e), respectively. Further details about this form can be can be found at: http://www.grants.gov/web/grants/form-instructions/sf-424a-instructions.html

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

(4) **CD-511, Certification Regarding Lobbying.** Enter "2017-NIST-CSFC-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 document of no more than 15 pages responsive to the Program Description (*see* Section I. of this FFO) and the evaluation criteria (*see* Section V.1. of this FFO). The Technical Proposal should contain the following information:

(a) **Executive Summary**. An executive summary of the proposed consortium-based research program, consistent with the evaluation criteria (*see* Section V.1. of this FFO). This document must not include any proprietary or sensitive business information as NIST may make it available to the public after awards are issued. **The Executive Summary must not exceed one (1) single-sided page and counts toward the page limit of the Technical Proposal**.

(b) **Statement of Work and Potential Impact of the Results.** A statement of work that discusses the specific tasks proposed to be performed, including a schedule of measurable events and milestones. This section should be the primary, but not only, means by which the proposal will be evaluated according to the Rationality and Technical Merit of Contribution evaluation criteria (*see* Sections V.1.a. and V.1.c. of this FFO).

(c) **Consortium Description, Qualifications and Experience of Key Personnel, Resources Availability and Collaboration Engagement Plan.** A description of the consortium and its composition, 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 working with state government representatives, industry, academia, independent research organizations, and/or related organizations. Proposals should also describe how the consortium will manage the funds to support R&D in the area of post-CMOS semiconductor and future computing research. Specifically, proposals must:

i. describe the membership of the consortium and demonstrate past performance in effectively managing multiple R&D research projects in a consortium-based setting, providing a summary of the past consortium's work and accomplishments;

ii. show that the consortium has a shared technological vision and will address the long-term (10-15 years) basic research needs of industry;

iii. describe the mechanism used by the consortium to determine research focus areas, select awardees, and disburse funding (including: scopes of work and budgets for the base program in

each proposed project year, a willingness to fund research on multiple alternative approaches in working with various state, industry, and other sources, how availability of funds will be announced, who will be eligible to receive funding, what evaluation criteria will be applied to proposals in terms of merit and relevance to industry needs, description of the selection process, and mechanisms for avoiding conflict of interest);

iv. describe the amount and type of industry support available for university-based research in terms of funds, personnel, and equipment available;

v. describe plans and metrics for evaluating the outputs of the funded proposals and impacts of the consortium (such as industries or companies supported, or economic assessments);

vi. describe plans for industry involvement with university researchers that demonstrate meaningful impact on industry;

vii. describe plans for management and evaluation of its activities, including an intellectual property plan (which should address members of the consortium and potential subtier agreements), potential geographic aspects of the program, such as working with regional innovation clusters; the role of small and mid-sized firms, which is encouraged; and any potential effects upon competition of the activities proposed;

viii. describe the applicant's consideration of the following issues: the continuing participation, advice, financial support, and other contributions from the private sector; the potential contribution of the activities proposed to productivity, employment, and economic competitiveness of the United States; and a means to place the activities proposed, to the maximum extent feasible, on a self-sustaining basis;

ix. describe the applicant's plan and mechanism for enabling engagement in mutually agreed upon collaborative research by consortium members or university researchers with NIST (including the budgets for the collaborative research program in each proposed project year). Engagement could include opportunities for graduate or post-graduate researchers from university partners to carry out research at NIST in collaboration with NIST scientists and engineers. The recipient will collaborate with the NIST Program Coordinator in selecting undergraduate/graduate students and post-doctoral fellows to potentially participate in collaborative research, pending available funding. In accordance with the procedures proposed by the recipient and included in the cooperative agreement, the NIST Program Coordinator anticipates working with staff from NIST to approve candidate undergraduate

or graduate students and post-doctoral fellows proposed by the recipient;

x. describe the breadth and technical expertise of the consortium members relevant to the application of fundamental device, circuits and metrology research to enable future computing technologies; and

xi. describe how the consortium will fairly evaluate research proposals from university researchers inside and outside the original membership of the consortium.

This section should be the primary, but not only, means by which the proposal will be evaluated according to the *Experience (Qualifications) and Resources Availability; Involvement of Industry, and Collaboration Plan* evaluation criteria (*see* Sections V.1.b., V.1.d. and V.1.e. of this FFO).

(7) **Budget Narrative.** (This does not count toward the page limit). There is no set format for the Budget Narrative; however, it should provide a detailed breakdown of each of the object class categories as reflected on the SF-424A. In addition, identify the source, type (i.e., cash or third party in-kind contribution), and amount of all non-Federal cost share contributions.

(8) **Letters of Commitment for Non-Federal Cost Sharing.** Letters of commitment from all sources of the non-Federal cost sharing are required. Letters of commitment must specify the type(s) (cash and/or in-kind) and amount of cost share to be provided by that source. Letters of commitment do not count toward the page limit. General "letters of support" are not required and will be counted toward the page limit for the Technical Proposal if included in the proposal. A summary listing of this support is allowed but will count toward the page limit. It is inappropriate for any Federal employee to provide critique or feedback on project ideas, etc., and it is also inappropriate to ask Federal employees for a letter of support.

(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. If the successful applicant includes indirect costs in the budget and has not established an indirect cost rate with a cognizant Federal audit agency, the applicant will be required to obtain such a rate in accordance with the Department of Commerce Financial Assistance Standard Terms and Conditions (http://go.usa.gov/hKbj).

Alternatively, in accordance with 2 C.F.R. § 200.414(f), applicants that have never received a negotiated indirect cost rate may elect to charge indirect costs to an award pursuant to a de minimis rate of 10 percent of modified total direct costs (MTDC), in which case a negotiated indirect cost rate agreement is not required. Applicants proposing a 10 percent de minimis rate pursuant

to 2 C.F.R. § 200.414(f) should note this election as part of the budget and budget narrative portion of the application.

(10) **Data Management Plan**. In accordance with the Office of Science and Technology Memorandum for the Heads of Executive Departments and Agencies of February 22, 2013[4], Increasing Access to the Results of Federally Funded Scientific Research, and as implemented through NIST Policy 5700.00[5], Managing Public Access to Results of Federally Funded Research, and NIST Order 5701.00[6], *Managing Public Access to Results of Federally Funded Research*", applicants should 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 Foundation[7] or the National Institutes of Health[8]).

All applications 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 FFO); however, the DMP will not be evaluated against any evaluation criteria.

b. Attachment of Required Documents

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[4] https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

[5] http://www.nist.gov/data/upload/Final-P-5700.pdf

[6] http://www.nist.gov/data/upload/Final-O-5701_0.pdf

[7] http://www.nsf.gov/bfa/dias/policy/dmp.jsp

[8] http://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm

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.(10) 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.

Applicants should carefully follow specific Grants.gov instructions at www.grants.gov to ensure the attachments will be accepted by the Grants.gov system. ***A receipt from Grants.gov indicates only that an application was transferred to a system. It does not provide details concerning whether all attachments (or how many attachments) transferred successfully.*** Applicants using Grants.gov will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency's electronic system has received its application.

Applicants are strongly advised to use Grants.gov's Download Submitted Applications option to check that their application's required attachments were contained in their submission.

After submitting the application, follow the directions found in the Grants.gov Online Users Guide (http://go.usa.gov/cjaEh). Click first on Applicants; then click on Applicant Actions; go then to the "Check My Application Status" option, and choose Download Submitted Applications.

If any, or all, of the required attachments are absent from the submission, follow the attachment directions found above, resubmit the application, and check again for the presence of the required attachments.

Applicants can track their submission in the Grants.gov system by following the procedures at the Grants.gov site (http://go.usa.gov/cjamz). It can take up to two business days for an application to fully move through the Grants.gov system to NIST.

NIST uses the Tracking Numbers assigned by Grants.gov, and does not issue Agency Tracking Numbers.

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.

(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 Limit.** The Technical Proposal for Applications is limited to fifteen (15) pages. Resumes are excluded from the page count. Resumes are limited to

two pages each. Letters of Commitment and the Data Management Plan are also excluded from the page count.

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

(6) **Application language.** English.

d. Application 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 that must be received by NIST by the submission deadline.

e. Pre-Applications. There are no pre-applications with this FFO.

f. Certifications Regarding Federal Felony and Federal Criminal Tax Convictions, Unpaid Federal Tax Assessments and Delinquent Federal Tax Returns. In accordance with the Federal appropriations law in effect at the time of award, 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.

g. 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 FFO, 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.

3. Submission Dates and Times. Applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, January 13, 2017. Applications received after this deadline will not be reviewed or considered. Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance at these times (all times are in Eastern Time): from 12:00 a.m. Saturday, November 19, 2016 until 6:00 a.m. Monday, November 21, 2016; and also from 12:00 a.m., Saturday, December 17, 2016 until 6:00 a.m. December 19, 2016. Applications cannot be submitted when Grants.gov is closed. NIST expects to complete its review, selection of successful applicants, and award processing by February 2017. NIST expects the earliest start date for awards under this FFO to be March 30, 2017.

When developing your submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the electronic System for Award Management (SAM.gov); (2) the free annual registration process in the SAM.gov (*see* also Sections IV.2.g. and IV.6.a.(2) of this FFO) often takes between three and five business days and may take as long as two weeks; (3) applicants are required to have a current registration in Grants.gov; and (4) applicants using Grants.gov will receive email notifications over a period of up to two business days as the application moves through intermediate systems before the applicant learns via a validation or rejection notification whether NIST has received the application. (*See* http://www.grants.gov for full information on application and notification through Grants.gov.). Please note that a federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.

4. **Intergovernmental Review.** Applications under this Program are not subject to Executive Order 12372.

5. **Funding Restrictions.** Applications for product development and/or commercialization are not considered responsive to this FFO. Profit or fee is not an allowable cost.

6. **Other Submission Requirements**

   a. Applications must be submitted electronically. Applications must be submitted via Grants.gov at www.grants.gov.

   (1) 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 2017-NIST-CSFC-01 announcement, contact Christopher Hunton by phone at 301-975-5718 or by e-mail at grants@nist.gov.

   (2) Applicants are strongly encouraged to start early and not wait until the approaching due date before logging on and reviewing the instructions for submitting an application through Grants.gov. The Grants.gov registration process must be completed before a new registrant can apply electronically. If all goes well, the registration process takes three to five business days. If problems are encountered, the registration process can take up to two weeks or more. Applicants must have a valid unique entity identifier number and must maintain a current registration in the Federal government's primary registrant database, the System for Award Management (https://www.sam.gov/), as explained on the Grants.gov Web site. *See also* Section IV.3. of this FFO. After registering, it may take several days or longer from the initial log-on before a new Grants.gov system user can submit an application. Only individuals authorized as organization representatives will be able to submit the application, and the system may need time to process a submitted application. Applicants should save and print the proof of submission they receive from Grants.gov. If problems occur while using

Grants.gov, the applicant is advised to (a) print any error message received and (b) call Grants.gov directly for immediate assistance. If calling from within the United States or from a U.S. territory, please call 800-518-4726. If calling from a place other than the United States or a U.S. territory, please call 606-545-5035. Assistance from the Grants.gov Help Desk will be available around the clock every day, with the exception of Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays. For assistance using Grants.gov, you may also contact support@grants.gov.

(3) To find instructions on submitting an application on Grants.gov, Applicants should refer to the "Applicants" tab in the banner just below the top of the www.grants.gov home page. Clicking on the "Applicants" tab produces two exceptionally useful sources of information, Applicant Actions and Applicant Resources, which applicants are advised to review.

Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency's electronic system has received its application. Closely following the detailed information in these subcategories will increase the likelihood of acceptance of the application by the Federal agency's electronic system.

Applicants should pay close attention to the guidance under "Applicant FAQs," as it contains information important to successful submission on Grants.gov, including essential details on the naming conventions for attachments to Grants.gov applications.

All applicants should be aware that adequate time must be factored into applicants' schedules for delivery of their application. Applicants are advised that volume on Grants.gov may be extremely heavy leading up to the deadline date.

The application must be both received and validated by Grants.gov. The application is "received" when Grants.gov provides the applicant a confirmation of receipt and an application tracking number. If an applicant does not see this confirmation and tracking number, the application has not been received. After the application has been received, it must still be validated. During this process, it may be "validated" or "rejected with errors." To know whether the application was rejected with errors and the reasons why, the applicant must log in to Grants.gov, select "Applicants" from the top navigation, and select "Track my application" from the drop-down list. If the status is "rejected with errors," the applicant may still seek to correct the errors and resubmit your application before the deadline. If the applicant does not correct the errors, the application will not be forwarded to NIST by Grants.gov.

Refer to important information in Section IV.3. Submission Dates and Times, to help ensure your application is received on time.

b. Amendments. Any amendments to this FFO will be announced through Grants.gov. Applicants may sign up on Grants.gov to receive amendments by e-mail or may request copies from Stephanie Shaw by e-mail to: stephanie.shaw@nist.gov.

V. Application Review Information

1. Evaluation Criteria. The evaluation criteria that will be used in evaluating proposals, consistent with Section I., Program Description, and Section IV.2.a.(6)., Technical Proposal, of this FFO, are as follows:

a. Rationality (0 to 15 points). Reviewers will evaluate the coherence of the applicant's approach and the extent to which the applicant effectively addresses scientific and technical challenges relevant to the NIST Consortium for Semiconductor and Future Computing Research Grant Program, as described in Section I. of this FFO. Factors considered as a whole and not given particular weights include:

(1) the degree to which the applicant demonstrates a clear understanding of the scientific and technical challenges, proposed approach, and goals of the Program; and

(2) the clarity and coherence of the applicant's overall approach to leverage an appropriate consortium to effectively address scientific and technical challenges relevant to the objectives of the Program.

b. Experience (Qualifications) and Resources Availability (0 to 30 points). Reviewers will evaluate 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 the applicant has demonstrated its ability to effectively manage and evaluate multiple R&D projects in a consortium-based setting, based on but not limited to a review of the summary of the past consortium's work and accomplishments;

(2) the degree to which requested resources are appropriate for the proposed project's scope;

(3) the potential effectiveness of the applicant's plan to manage and evaluate multiple R&D projects in a consortium-based setting;

(4) the rationality and potential effectiveness of any planned subawards and/or contracts;

(5) the plan to obtain and/or leverage additional or external resources or support;

(6) the rationality and potential effectiveness of planned proposed collaborations with other stakeholders through the consortium, taking into account regional considerations, if proposed; and

(7) the types of costs submitted for applicant's contribution to the budget. Proposals that demonstrate support for R&D in terms of (in order of priority) direct grants for research, salary support for scientists, or access to equipment will receive a higher score than proposals that count overhead or other administrative costs as a part of the consortium's contribution.

c. Technical Merit of Contribution (0 to 35 points). Reviewers will evaluate the potential technical effectiveness of the proposed work and the value it would contribute to future breakthroughs in semiconductor and computing technology. This includes assessing the applicant's plans for metrics for evaluating the outputs of the funded proposals. Factors considered as a whole and not given particular weights include:

(1) the innovativeness of the technical approach;

(2) the plausibility of the technical approach;

(3) the merit and reasonableness of the scope of work;

(4) the magnitude and reach of potential technical outcomes;

(5) the linkage between the technical outcomes and industry needs as described in the program description; and

(6) the clarity and quality of proposed metrics and mechanisms for evaluating the effectiveness of outputs from the consortium and funded proposals, including links to U.S. industry.

d. Involvement of Industry (0 to 10 points). Reviewers will evaluate the extent to which the applicant demonstrates strong and active involvement of industry, including small and mid-sized commercial firms, in establishing priorities for research directions and evaluating the consortium's potential impact on industry.

e. Collaboration Plan (0 to 10 points). Reviewers will evaluate the extent to which the applicant's proposed engagement plan establishes a mechanism for the consortium to effectively collaborate with NIST in mutually agreed upon cooperative activities, as described in the Program Description (*see* Section I. of this FFO).

2. Selection Factors. The Selecting Official shall select proposals for award based upon the rank order of the proposals, and may select a proposal out of rank based on one or more of the following selection factors:

a. The availability of Federal funds.

b. Whether the project would duplicate other projects funded by DoC or other Federal agencies.

c. The applicant's history of performance under current or previous Federal financial assistance awards

3. **Review and Selection Process**

   a. **Initial Administrative Review of Proposals.** An initial review of timely received proposals will be conducted to determine eligibility, completeness, and responsiveness to this FFO and the scope of the stated program objectives. Proposals determined to be ineligible, incomplete, and/or non-responsive may be eliminated from further review. However, NIST, in its sole discretion, may continue the review process for an application that is missing non-substantive information, the lack of which may easily be rectified or cured.

   b. **Full Review of Eligible, Complete, and Responsive Proposals.** Proposals that are determined to be eligible, complete, and responsive will proceed for full reviews in accordance with the review and selection processes below:

      (1) **Evaluation/Review and Ranking.** Each proposal will be reviewed by at least three (3) independent, objective reviewers, knowledgeable in the subject matter of this FFO and its objectives and who are able to conduct a review based on the evaluation criteria (*see* Section V.1. of this FFO). The reviewers may discuss the proposals with each other, but scores will be determined on an individual basis, not as a consensus. Reviewers will submit scores for each evaluation criterion along with written comments to the Selecting Official. Based on the average of the reviewers' scores, a rank order will be prepared and provided to the Selecting Official for further consideration.

      (2) **Selection.** The Selecting Official, who is the NIST Associate Director for Laboratory Programs or designee, will then select and recommend funding recipients to the Grants Officer based upon the rank order, written comments, and the selection factors (*see* Section V.2. of this FFO).

      Prior to making a selection recommendation to the NIST Grants Officer for final award determination, the Selecting Official will consult with the NIST Director, who must make the following findings under 15 U.S.C. § 3705(c) regarding the proposed recipient:

         (a) consideration has been given to the potential contribution of the activities proposed in the project to productivity, employment, and economic competitiveness of the United States;

         (b) a high likelihood exists of continuing participation, advice, financial support, and other contributions from the private sector;

         (c) the host university or other nonprofit institution has a plan for the management and evaluation of the activities proposed within the particular project, including:

            i. the agreement between the parties as to the allocation of patent rights on a nonexclusive, partially exclusive, or exclusive license basis to and inventions conceived or made under the auspices of the project; and

            ii. the consideration of means to place the project, to the maximum extent feasible, on a self-sustaining basis;

(d) suitable consideration has been given to the university's or other nonprofit institution's capabilities and geographical location; and

(e) consideration has been given to any effects upon competition of the activities proposed under the project.

NIST reserves the right to negotiate the budget costs with the applicant that has been selected to receive an award, 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. NIST also reserves the right to reject a proposal where information is uncovered that raises a reasonable doubt as to the responsibility of the applicant. NIST may select part, some, all, or none of the applications, or part(s) of any particular application. In some cases, NIST may ask applicants to consider combining projects. The final approval of selected applications and issuance of awards will be by the NIST Grants Officer. The award decisions of the Grants Officer are final.

4. **Federal Awarding Agency Review of Risk Posed by Applicants.** After applications are proposed for funding by the Selecting Official, the NIST Grants Management Division (GMD) performs pre-award risk assessments in accordance with 2 C.F.R. § 200.205, which may include a review of the financial stability of an applicant, the quality of the applicant's management systems, the history of performance, and/or the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

   In addition, prior to making an award where the total Federal share is expected to exceed the simplified acquisition threshold (currently $150,000), NIST GMD will review and consider the publicly available information about that applicant in the Federal Awardee Performance and Integrity Information System (FAPIIS). An applicant may, at its option, review and comment on information about itself previously entered into FAPIIS by a Federal awarding agency. As part of its review of risk posed by applicants, NIST GMD will consider any comments made by the applicant in FAPIIS in making its determination about the applicant's integrity, business ethics, and record of performance under Federal awards. Upon completion of the pre-award risk assessment, the Grants Officer will make a responsibility determination concerning whether the applicant is qualified to receive the subject award and, if so, whether appropriate special conditions that correspond to the degree of risk posed by the applicant should be applied to an award.

5. **Anticipated Announcement and Award Date.** Review of Applications, selection of successful applicants, and award processing is expected to be completed by February 2017. The earliest start date for awards under this FFO is expected to be March 30, 2017.

6. **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, attend NIST safety training, comply with all NIST safety policies and procedures, and comply with all applicable terms of their guest research agreement.

   b. **Notification to Unsuccessful Applicants.** Unsuccessful applicants will be notified by email.

   c. **Retention of Unsuccessful Applications.** All electronic applications, whether successful or unsuccessful, are stored indefinitely in the NIST Grants Management and Information System.

   d. **Protection of Proprietary Information.** When an application includes trade secrets or information that is commercial or financial, or information that is confidential or privileged, it is furnished to the Government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Applicants should clearly mark as "proprietary" any information contained in their applications that they believe is a trade secret or otherwise protected proprietary business information. Without assuming any liability for inadvertent disclosure, NIST will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the Government's right to use the information if it is obtained from another source.

VI. Federal Award Administration Information

1. **Federal Award Notices.** Successful applicants will receive an award package from the NIST Grants Officer. The award cover page, i.e., CD-450, Financial Assistance Award is available at http://go.usa.gov/SNMR.

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 the Financial Assistance Standard Terms and Conditions dated December 26, 2014, accessible at http://go.usa.gov/hKbj, to this award. Refer to Section VII. of this FFO, Federal

Awarding Agency Contacts, Grant Rules and Regulations, if you seek the information at this link and it is no longer working or 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 FFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you seek the information at this link and it is no longer working or you need more information.

d. **Collaborations with NIST Employees**. The overall engagement plan required in Section IV.2.a.(6)(c).ix. of this FFO will describe the collaboration among consortium members and between the consortium and NIST. If, however, an applicant proposes collaboration with a specific NIST employee, the statement of work and the engagement plan should include a statement of this intention, a description of the collaboration, and prominently identify the NIST employee(s) involved, if known. Any collaboration by a specific 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. Any collaboration with an identified NIST employee that is approved by appropriate NIST management will not make an application more or less favorable in the competitive process.

e. **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 D.03 of the DoC Financial Assistance Terms and Conditions dated December 26, 2014, found at http://go.usa.gov/hKbj.

   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.

3. Reporting

a. **Reporting Requirements.** The following reporting requirements described in Sections A.01 Performance (Technical) Reports and B.02 Financial Reports of the DoC Financial Assistance Standard Terms and Conditions dated December 26, 2014, http://go.usa.gov/hKbj 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 periods ending March 31 and September 30 of each year. Reports will be due within 30 days after the end of the reporting period to the NIST 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 Grants Officer and the NIST Federal Program Officer on a semi-annual basis for the periods ending March 31 and September 30 of each year. Reports will be due within 30 days after the end of the reporting period. A final technical progress report shall be submitted within 90 days after the expiration date of the award. Technical progress reports shall conform to the requirements in 2 C.F.R. § 200.328 (http://go.usa.gov/xkVgP) and Department of Commerce Standard Terms and Conditions, Section A.01 (http://go.usa.gov/hKbj).

(3) **Patent and Property Reports.** From time to time, and in accordance with the Uniform Administrative Requirements (*see* Section VI.2. of this FFO) 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 FFO, 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. 2 C.F.R. Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101 requires any non-Federal entity (*i.e.*, including non-profit institutions of higher education and other 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 DoC 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 (Pub. L. 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.

4. Award Management and Public Engagement

a. Publication and Technology Transfer. Each award recipient is expected to present the results of their work in appropriate professional literature and conferences in order to make the findings broadly available. Data supporting any findings or conclusions shall be made available in a manner consistent with the Data Management Plan.

VII. Federal Awarding Agency Contacts

Questions should be directed to the following contact persons:

Subject Area	Point of Contact
Programmatic Questions	Jason Boehm Phone: 301-975-8678 E-mail: jason.boehm@nist.gov
Technical Questions	Carl Williams Phone: 301-975-2220 E-mail: carl.williams@nist.gov
Technical Assistance with Grants.gov Submissions	Christopher Hunton Phone: 301-975-5718 Fax: 301-975-8884 E-mail: grants@nist.gov Or Grants.gov Phone: 800-518-4726 E-mail: support@grants.gov
Grant Rules and Regulations	Dean Iwasaki Phone: 301-975-8449 Fax: 301-975-8884 E-mail: dean.iwasaki@nist.gov