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Industry-University Cooperative Research Centers Program (IUCRC)

PROGRAM SOLICITATION
NSF 17-516

REPLACES DOCUMENT(S):
NSF 16-504

National Science Foundation

Directorate for Engineering
  Industrial Innovation and Partnerships

Directorate for Computer & Information Science & Engineering

Directorate for Geosciences

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

January 03, 2017

April 19, 2017

Third Wednesday in April, Annually Thereafter

October 18, 2017

Third Wednesday in October, Annually Thereafter

Full Proposal Target Date(s):

February 28, 2017

June 21, 2017

Third Wednesday in June, Annually Thereafter

December 20, 2017

Third Wednesday in December, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

The following changes have been made to the solicitation.

This solicitation now has TARGET DATES for full proposals. This means that full proposals are expected to be submitted by the target date. Anyone requiring some additional time must contact one of the IUCRC program directors for approval to submit after the target date to ensure that the proposal will be considered in the current panel competition.

Eligibility criteria for submission of a full proposal have been revised. Non-binding preliminary proposals are now required before the submission of a full proposal. Submitters will receive feedback from program staff indicating either "encourage" or "discourage". An "encourage" finding generally indicates that the proposal appears to be responsive to the IUCRC Program Guidelines and is a candidate for further development relative to the IUCRC solicitation. A "discourage" finding generally indicates that the project is typically not responsive to the IUCRC Program, or has serious conceptual flaws and requires further development for an IUCRC submission. The feedback provided pursuant to the preliminary proposal is advisory only; submitters of both "encouraged" and "discouraged" preliminary proposals are eligible to submit full proposals.

Language has been added to Section I: "Introduction" to clarify NSF's goals for the Program. Specifically, NSF aims to help the formation of nationwide Centers that are new and that address industry needs not already covered by existing IUCRCs or other industry/university consortia/centers. Principal Investigators (PIs) should review the IUCRC Center Directory found on the Program's webpage to identify potential overlaps prior to proposing a new Center. In the event of a potential overlap, PIs should consider joining the already existing IUCRC.

Description of eligibility for Phase II and Phase III has been clarified under Section Eligibility Information: "Eligibility to submit a Phase II or Phase III Site renewal proposal is dependent upon that Site in the Center having satisfactorily completed the previous Phase award. This includes demonstrating meeting the minimum membership and membership fees requirements and being in compliance with IUCRC Program requirements under the current IUCRC award. This criteria does not apply to new Sites proposing to join existing Phase II and Phase III Centers."

Description of eligibility of a University's related organizations under Section II: "Program Description/Industrial Support" has been clarified. Any entity in any way financially affiliated with any of the Universities that are part of an IUCRC can be a paying member of that Site/Center. The entity's membership fee does not count towards the minimum membership requirement for the Site/Center, but is considered Program Income. Examples are University's Foundations, University's subsidiaries, etc."

Length of the Project Description for a Site Proposal to join/form/renew an Industry/University Cooperative Research Center is now limited to 15 pages.

Sites seeking to form a new IUCRC or to renew to Phase II or Phase III may have common sections related to the description of the Center (up to 5 pages of the Project Description), but each proposal must be Site specific.

Specific instructions have been added for proposed Sites/Centers that have potential geoscience relevance. PIs are required to discuss with the GEO Topic Specific IUCRC Program Director(s) and relevant Program(s) in the Directorate for Geosciences prior to submission of the preliminary proposal. Both project summary and project description in full proposals must include text that mentions which Division(s) and Program(s) in the Directorate for Geosciences are relevant to the Site/Center and how the pre-competitive research proposed by the Site/Center will enhance that Division(s) and Program(s) scientific mission.

Under Section III: "Award Information":

- Evaluators are now called "assessment coordinators"
- Description of the eligibility to request additional funding for a subsequent phase has been modified. The additional requested amount is equivalent to half of the total in-cash only (not in-kind equivalent) membership fees collected in excess of the required minimum during the current operating Phase (excluding any University financially affiliated membership and/or cash contributions to the Site/Center), not to exceed $50,000 per Site, per year.

Under Section V: "Proposal Preparation and Submission Instructions/Full Proposal Preparation Instructions:"

- Language has been added to clarify that proposals from multiple Sites seeking to form a new IUCRC or to renew to Phase II or Phase III may have common sections related to the description of the Center (up to five pages of the Project Description), but each proposal must be Site specific and must discuss the value brought by the Site to the Center.
- Under "(2) Guide to Submission of a Site Proposal to join/form an Industry/University Cooperative Research Center"
  - Instructions on how to title proposals have been added
  - Proposal Format - Center Proposal - Supplementary Documents:
    - Under item B, references to other Sections of the solicitation have been corrected, and language has been added to clarify the requirement for Sites seeking a renewal to Phase II or Phase III
    - A Memorandum of Understanding (MOU) among all the Center's Sites participating in the IUCRC is required. The MOU describes how Sites plan to operate the Center, share administrative and managerial responsibilities and their costs, handle the collection of the membership fees and the distribution across sites based on the Industry Advisory Board (IAB) allocation of projects, and the arrangement among the University Financial Offices for the annual certification of the collected membership fees and their sources at each Site. This MOU must be posted on the public portion of the Center Website.
    - Description of NSF funds usage under Budget Sheet has been clarified.
    - Supplementary documents for Sites adding to an existing Center, and Sites seeking to renew to Phase II and Phase III have been modified. Sites must include the bylaws in use by the Center.

Under Section VII. "Award Administration Information/Subsection C. "Reporting Requirements", the description of the "Certification of membership" has been clarified. Certifications for centers that are collecting membership fees centrally by one of the IUCRC's Sites must report fees and their sources at each Site consistent with the Memorandum of Understanding (MOU) among all the Center's Sites and with NSF award budget periods.

An existing Center in year 2 or 3 of the current Phase that wishes to transfer to the new funding model can do so by submitting proposals (one per existing Site) that clearly demonstrate that all Sites under the umbrella of the existing Center have been meeting the new model requirements since the last reporting period. Proposals will be reviewed using the same review criteria listed in Section VI.A. Merit Review Principles and Criteria. If successful, and subject to availability of funds, those Centers/Sites will receive a new award for the reminder of the Center's current Phase. All future increments on current Centers/Sites' awards will be withheld and current awards ended at the anniversary of the current increment. In the event a grantee has unexpended program income remaining at the end of the grant, it must be remitted to NSF by crediting costs otherwise chargeable against the grant. If it is not possible to record the credit via ACM$, the excess program income must be remitted to NSF electronically or by check payable to the National Science Foundation. Instructions have been added under Section V: "Proposal Preparation and Submission Instructions/Full Proposal Preparation Instructions:/(2) Guide to Submission of a Site Proposal to join/form an Industry/University Cooperative Research Center/Proposal Format - Center Proposal".

New Sites planning to join existing Centers operating under the previous solicitation model must meet the requirements of this solicitation.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 18-1), which is effective for proposals submitted, or due, on or after January 29, 2018.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Industry-University Cooperative Research Centers Program (IUCRC)

Synopsis of Program:

The Industry-University Cooperative Research Centers (IUCRC) program develops long-term partnerships among industry, academe, and government. The Centers are catalyzed by an investment from the National Science Foundation (NSF) and are primarily supported by industry Center members, with NSF taking a supporting role in the development and evolution of the Center. Each Center is established to conduct research that is of interest to both the industry members and the Center faculty. An IUCRC contributes to the nation's research infrastructure base and enhances the intellectual capacity of the engineering and science workforce through the integration of research and education. As appropriate, an IUCRC uses international collaborations to advance these goals within the global context.

Cognizant Program Officer(s):

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

- Prakash Balan, IUCRC Program Director, Director for Engineering, telephone: (703) 292-5341, email: pbalan@nsf.gov

- Andre W. Marshall, telephone: (703) 292-8050, email: awmarsha@nsf.gov

- Dmitri Perkins, IUCRC Program Director, Directorate for Computer & Information Science & Engineering, telephone: (703)292-7096, email: dperkins@nsf.gov

- Barbara Ransom, GEO Topic-Specific IUCRC Program Director, Directorate for Geosciences, telephone: (703) 292-7792, email: bransom@nsf.gov

- Ann C. Von Lehmen, telephone: (703) 292-4756, email: avonlehm@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.079 --- Office of International Science and Engineering
- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 10

2 to 8 full center awards and 4 to 6 planning grant awards annually.

Anticipated Funding Amount: $20,500,000

Funding is subject to the availability of funds. Anticipated funding includes continued annual support and supplemental requests for existing IUCRCs.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

The PI at any institution participating in an IUCRC proposal must be a tenured faculty member. Waivers for non-tenured personnel or non-faculty personnel may be requested when petitioned by the PI's supervisor (Chairman of the Department or the Dean) in advance of the Preliminary Proposal. The PI must act as the initial Site director. A PI can only have one active IUCRC Site award at any given time.

Awardees of planning grants to establish new IUCRCs must complete their planning grant workshops (with NSF Program Director representation) before submitting Phase I proposals.

Eligibility to submit a Phase I Site proposal to establish a new IUCRC is dependent upon the PI of that Site in the Center completing the following activities:

- Participation/attendance at the NSF-sponsored boot camp (see Section III. Award Information) - NSF will reimburse the Site director for travel expenses. This does not apply to Sites joining established Centers.

- Successful fulfillment of the planning grant requirements of a planning grant award (see Section V. Proposal Preparation and Submission Instructions). Exception applies; please see subsection 2 "Guide to Submission of a Site proposal to join/form an Industry/University Cooperative Research Center" for details.

Limit on Number of Proposals per Organization:

There is no limit to the number of proposals an eligible Institution may submit to this program, as long as each proposed Site belongs to a different IUCRC.

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

PIs and Co-PIs can only submit one proposal per submission period.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- **Full Proposals:**

    - Full Proposals submitted via FastLane: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
    - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
    - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:**

Membership fees received by the Center are considered program income. At least 90% of the IUCRC program income must be used to support direct costs of the research, and up to 10% may be used to support indirect costs. See Special Award Conditions.

- **Other Budgetary Limitations:**

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

    January 03, 2017

    April 19, 2017

    Third Wednesday in April, Annually Thereafter

    October 18, 2017

    Third Wednesday in October, Annually Thereafter

- **Full Proposal Target Date(s)**:

    February 28, 2017

    June 21, 2017

Third Wednesday in June, Annually Thereafter

December 20, 2017

Third Wednesday in December, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions:

Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements:

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

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I. INTRODUCTION

The Industry-University Cooperative Research Centers (IUCRC) Program strives to develop long-term partnerships among industry, academe and government to promote research programs of mutual interest, contribute to the nation's research infrastructure base, enhance the intellectual capacity of the engineering or science workforce through the integration of research and education, and facilitate technology transfer. The IUCRC program seeks to achieve these goals by:

- Leveraging NSF funds with industry to support graduate students performing industrially relevant pre-competitive research;
- Expanding the innovation capacity of our nation's competitive workforce through partnerships between industries and universities; and
- Encouraging the nation's research enterprise to remain competitive through active engagement with academic and industrial

leaders throughout the world.

Proposals for IUCRCs addressing any precompetitive research areas identified among the science and technology priorities for the nation are welcome and will be fully considered. To meet national needs, multi-university IUCRCs are preferred to single-university IUCRCs because multi-university Centers contribute to an increased research base as well as to increased interaction among Center participants. The Centers are catalyzed by an investment from NSF with primary support derived from the private and public sector. NSF takes a supporting role in the development and evolution of the IUCRC, providing a framework for membership and operations as well as requirements derived from extensive Center experience and evaluation.

NSF invests in nationwide Centers that do not overlap in research foci with existing IUCRCs. PIs should review the IUCRC Center Directory found on the Program's webpage https://www.nsf.gov/eng/iip/iucrc/ for potential overlaps prior to proposing a new Center. In the event of a potential overlap, the PIs should consider joining the already existing IUCRC. NSF's goal is to help the formation of centers that are new and that address industry needs not already covered by existing IUCRCs or other industry/university consortia/centers.

As appropriate, NSF encourages international collaborations that advance these goals within the global context.

II. PROGRAM DESCRIPTION

A comprehensive range of disciplines and skills is often necessary to address research issues of interest to industry, and thus it is often necessary to form a consortium of universities to achieve a critical mass of interdisciplinary research capabilities for the formation of an IUCRC. The NSF encourages multiple universities to come together to form an IUCRC, with each university constituting a Site of the Center. The Center is a "virtual" entity, with a defined leadership spanning the Center's constituent Sites.

An Institution that wants to be part of a Center applies to become an NSF IUCRC Site. Upon award, this Site will become part of the Center. If this is the only Site within the Center, then it will be a single Site IUCRC with the corresponding membership obligations. If there are additional Sites that are or can be part of the Center, then the new Site will be part of a multi-Site IUCRC.

The first stage in forming an IUCRC involves the successful completion of an IUCRC planning grant. Planning grants for Site additions to existing IUCRCs may be waived by NSF, provided the proposed research Site meets the minimum membership and financial requirements and has the approval of the leadership of the existing IUCRC.

Upon successful completion of the Planning Grant, the proposed Site of the Center submits an application to join the Center in its current Phase. New IUCRCs start at Phase I that lasts five years. This initial five year period of support allows for the development of a strong partnership between the academic researchers and interested industrial and government parties. A significant amount of the Center's financial support is expected to come from industrial, state, and other funds. As a Center progresses, it is likely to have increased opportunities for funding from additional firms, other federal agencies and laboratories, and state and local governments; thus, increasing the leverage of NSF funds. After five years, Sites within Centers that continue to meet the IUCRC Program requirements may request support for a second five-year (Phase II) period. Phase II grants allow Centers to continue to grow, and to leverage and diversify their memberships and research portfolio during their Phase II period. After ten years, Sites within Centers may apply for a third five-year (Phase III) period. Phase III awards are provided for Centers that demonstrate significant impact on industry research as measured through robust and sustained membership, student impact, annual reports, site visits, and adherence to IUCRC requirements. Centers are expected to be fully supported by private and public partners after fifteen years as an IUCRC.

All Sites within a Center may apply for a Phase II (years 6 through 10 of the Center) grant if each Site meets the Phase II minimum requirements specified in the solicitation as well as having satisfactorily completed the Phase I grant.

All Sites within a Center may apply for a Phase III (years 11 through 15 of the Center) grant if each Site meets the minimum Phase III requirements specified in the solicitation as well as having satisfactorily completed the Phase II grant.

A Site joining an existing Center will apply for the current Phase of the Center. For example, if a Center is in Phase II, the Site can only apply to join that Center provided it meets the minimum Phase II requirements specified in the solicitation. Similarly, if a Center is in Phase III, the Site can only apply to join that Center provided it meets the minimum Phase III requirements. New Site awards are limited to the remaining duration of the Phase of the Center (for example, if founding Sites of the Center were awarded three years prior to a new Site coming onboard, the new Site will receive funds for only the two years that remain in the duration of that Phase).

Requirements of an IUCRC

An IUCRC has the following characteristics:

- A strong partnership within and among the universities, industry, and other organizations participating in the IUCRC;
- A research scope unique among IUCRCs that represents the shared interests of the Center and the industry sector it serves;
- Center goals and objectives and a research roadmap for achieving them defined in collaboration with the Center membership;
- A membership of private and public sector organizations that direct and fund the shared pre-competitive research portfolio of the Center;
- A leadership team consisting of the Site directors, the Chair of the Industry Advisory Board (IAB), and a Center director;
- An organization formed by the leadership team, a diverse team of faculty and students and the IAB;
- A cooperative operational model for the Center that is consistent with IUCRC complete list of requirements found on the NSF IUCRC webpage https://www.nsf.gov/eng/iip/iucrc/;
- A process based on IUCRC Requirements for the engagement of members in the cultivation, selection, funding, and guidance of research projects. This includes two meetings a year at which projects are reviewed, research findings are presented, and new projects are selected;
- Graduate student involvement in high-quality pre-competitive research projects, thus developing students who are knowledgeable in industrially relevant research;

- A single membership agreement, for all members across all Sites forming the Center, through which intellectual property developed by the IUCRC is shared (see the Membership Agreement Template at https://www.nsf.gov/eng/iip/iucrc/sample_agreement_form2014.jsp; including the Addendum for Associations and Institutes)
- An effective plan that outlines how the Center will grow, recruit new members, retain existing members, and build relationships that attract companies to invest in the Center's research; and
- Formal evaluation of the industry and university interaction conducted by NSF that includes input received from an independent assessment coordinator who is assigned and funded by NSF.

Note: Members of an IUCRC are non-academic eligible members as specified below under Industrial Support, who have signed the membership agreement for the IUCRC, have paid their dues, and attend the bi-annual meetings of the Centers. Academic institutions that want to join the IUCRC can become Sites of the Center, but not members.

An IUCRC has the following structure/requirements:

Center Management and Operation:

- A director for each Site, who is the PI associated with the NSF Site award. If the Site director changes, a PI-change request must be filed by the institution and approved by NSF, to ensure continued compliance with NSF award requirements.
- An academic leadership team comprised of the Site directors and a Center director. The Center director will be appointed by the academic leadership team and will either be chosen from among the Site directors or be an experienced faculty member from one of the Sites. The academic leadership team is responsible for the growth and success of the Center. The designated Center director oversees all operating and management aspects of Center operations. Site-directors manage their respective university researchers and research projects and collaborate with the other Sites within the Center.
- An Industrial Advisory Board (IAB) comprised of representatives of public and private paying members, with an elected Chair, that reviews and decides all research activities funded totally or in part by membership fees and approves Center bylaws;
- A University Policy Committee for each Site comprised of individuals from the Institution Administration that facilitates the operation of the Site/Center while ensuring compliance with the policies of their respective universities. This Committee shall not have any overlap with the members of the Center Academic leadership team;
- A uniform and consistent policy for handling memberships and member privileges across all Sites of the IUCRC;
- A collaborative and participative research environment;
- Graduate and other student involvement;
- An effective strategy for broadening participation of underrepresented groups in science and engineering.

  Note: If any member of the academic leadership team is found ineffective in the management of his/her Site and/or the overall Center, the IAB in consultation with the University Policy Committee, members of the leadership team and NSF can recommend a change in leadership to the awardee Organizations in order to ensure Center success.

Industrial Support:

- Members of the IAB may be industrial firms, organizations including non-profits, and non-NSF Federal agencies.

  Note: Organizations that are part of a divisionally structured/decentralized corporation, company or Federal agency count as distinct individual members (for example: Army CERDEC and Army Research Lab; or a division within a company focusing on chemicals and another division within the same company focusing on information technology). Supporting evidence to this effect must be included with the annual membership certification, if applicable.

- Members can be:

  Full members - with full membership rights who financially support the Center.

  Associate members - memberships with reduced rights commensurate with their financial support for the Center.

  Note: Members can buy multiple memberships and contribute membership fees to more than one Site in any given IUCRC. However, no member shall exceed the maximum of two memberships worth of votes, no matter how many Sites they support or membership fees they contribute across the Center.

- Membership fees must be in cash and are paid directly to the institutions, unless the NSF awards a supplement funded through another Federal Agency. In-kind membership fees are acceptable if approved by the IAB, but cannot be counted towards the minimum membership requirement.

- Membership fee requirement levels (per Site) are:

  Sites in a multi-university Center:

  Phase I: a minimum of $150,000 in-cash (no in-kind cash equivalent) annually and 3 distinct full members.

  Phase II: a minimum of $200,000 in-cash (no in-kind cash equivalent) annually and 4 distinct full members.

  Phase III: a minimum of $250,000 in-cash (no in-kind cash equivalent) annually and 5 distinct full members.

  Single University Center in any Phase: a minimum of $400,000 in-cash (no in-kind cash equivalent) annually with a minimum of eight distinct full members.

  Note: The minimum membership requirement by a Site is met with in-cash memberships only (no in-kind cash equivalent can be applied towards the minimum). To assure potential economic as well as scientific impact, IUCRCs are encouraged to have companies comprise the majority of the Center members.

  Note: The same member may purchase memberships at multiple Sites within a Center. However, the member will only be counted as one full or associate member at one site within the center.

Note: A Company for which any faculty involved in the Center is the founder, president, a key officer or a majority shareholder can be a member but its membership does not count towards meeting the minimum membership requirement for that Site. It is incumbent on the faculty involved in this company to ensure compliance with the conflict of interest policies of his/her respective Institution, and to ensure that the IAB is aware of such conflicts as well.

Note: Any entity in any way financially affiliated with any of the Universities that are part of an IUCRC can be a paying member of that Site/Center. The entity's membership fee does not count towards the minimum membership requirement for the Site/Center, but is considered Program Income. Examples are University's Foundations, University's subsidiaries, etc.

- Membership fee must be collected individually, by each site, or centrally, as determined by Center's leadership team and consistent with a memorandum of understanding with all Center's Sites. However, an Awardee Authorized Organizational Representative within the Sponsored Research Office must provide to NSF in each Site's annual report an annual certification of membership fees collected and their sources which are credited to each Site as evidence of meeting their award's terms and conditions.

- Center policies should meet NSF requirements for the Membership Agreement with respect to membership fees and rights, intellectual property and publications (Membership agreement Template https://www.nsf.gov/eng/iip/iucrc/sample_agreement_form2014.jsp).

  Below is an example of how memberships count for a Center with two Sites a $50,000 full membership fee and how the memberships and membership fees translate to votes for project selection during an IAB meeting.

  Site A: Company A paying $50,000 in membership fees counts as one full distinct member and has one vote; Company B paying $100,000 in membership fees counts as one full distinct member and has two votes; Company C paying $150,000 in membership fees counts as one full distinct member and has two votes; and, Company D paying $25,000 counts as half distinct member and has half a vote.

  Site B: Company A paying $50,000 in membership fees receives one additional vote; Company B paying $50,000 remains with just two votes; Company E paying $50,000 counts as one full distinct member and has one vote; Company F paying $100,000 counts as one full distinct member and has two votes

  Thus, in this particular example, Site A has 3.5 distinct members and membership fees totaling $325,000 in cash, Site B has 2 distinct members and membership fees totaling $250,000 in cash.

Other requirements of an IUCRC include reporting and evaluation:

- IUCRC Sites are required to submit reports as specified in Section VII. Award Administration Information, Subsection C. Reporting Requirements.
- IUCRCs have an independent assessment coordinator assigned by NSF. This person's role is to provide NSF with an external independent assessment of Center activities and progress, and collect NSF-required Center data. Centers are required to provide all necessary data and materials to the Center assessment coordinator in a timely fashion, so that the assessment coordinator can fulfill his/her responsibilities.

All Centers and their associated Sites must comply with IUCRC Requirements found on the NSF IUCRC Program's webpage https://www.nsf.gov/eng/iip/iucrc/.

International partnerships:

Collaboration with international research entities can advance IUCRC goals within the global context. An established IUCRC may submit a supplement request for collaborative work with an international research entity constituting the formation of an international Site of the IUCRC. These supplements are to be used for travel and coordination across the various Sites within the U.S. and the international Site. These supplements are only supported for one year at a time. In order to continue the international collaborative partnerships, the IUCRC must submit a supplement request each year that outlines the outcomes and benefits realized by the international partnership in the prior award period. In addition, the supplement request must articulate clearly the plans for the coming year, and must contain evidence of the continued interest by the IAB in the international partnership. An IUCRC must demonstrate strong adherence to IUCRC program management principles amongst its US-based Sites before applying for this supplement.

Any request to establish an IUCRC international collaboration should seek guidance and pre-approval from the Cognizant IUCRC Program Officer prior to submission of an international supplement request.

Each IUCRC is limited to one supplement per year per country to support an international Site.

Supplements to enhance IUCRC goals in training and education

To advance IUCRC goals within the education mission, an IUCRC may request individual supplements to support research experiences for undergraduate students (REU), veterans (VRS), and teachers (RET) involved in Center research activities. Additional information is found under Section III: "Award Information".

III. AWARD INFORMATION

The support of the NSF-appointed assessment coordinator is managed independently by NSF.

Planning Grant Awards for New Centers and Sites - Standard Grant

The award amount for a planning grant seeking to establish a new IUCRC is $15,000 per academic institution with a 12-month duration. The $15,000 is for all applicable planning expenses including travel to the IUCRC "boot camp" and is inclusive of applicable Indirect Costs. The IUCRC "boot camp" informs planning grant awardees about the planning process, the IUCRC model, member recruitment strategies and Center operations that are consistent with IUCRC requirements.

Full Center Awards - Continuing or Standard Grant

Multi-Site IUCRC proposals are given preference over single Site IUCRC proposals. For successful IUCRC proposals, NSF provides up to 15 years of funding, in three Phases. Each Phase has a duration of five years (or less for Site additions to an existing Center). NSF support is intended to augment the support that a Center receives from industry and other sponsors. IUCRC support is available for Centers and their affiliated Sites that fully meet the IUCRC operational and membership requirements.

NSF uses the following funding formula:

Phase I - First Five Year Center Award
Site meeting minimum membership requirement receives $150,000 annually from NSF.

Phase II - Second Five Year Center Award
Site meeting minimum membership requirement receives $100,000 annually from NSF.

Phase III - Third Five Year Center Award
Site meeting minimum membership requirement receives $50,000 annually from NSF.

Phase I and Phase II Sites that exceed minimum membership requirements during their five years of operations (or less for any Sites added to existing IUCRCs) are eligible to request additional funding for the subsequent Phase. The additional requested amount is equivalent to half of the total in-cash only (not in-kind cash equivalent) membership fees collected in excess of the required minimum during the current operating Phase (excluding any University financially affiliated membership and/or cash contributions to the Site/Center), not to exceed $50,000 per Site, per year.

Example: If a Phase I Site receives $1,200,000 in cash membership fees over a five year period ($450,000 over the minimum membership fees), the Site will then be eligible to receive an additional $225,000 at the time of the Phase II renewal ($45,000 per year) Similarly, if a Phase II Site receives $1,200,000 in cash membership fees over a five year period ($200,000 over the minimum membership fees), the Site will be eligible to receive an additional $100,000 at the time of the Phase III renewal ($20,000 per year).

NSF funds should be used towards management and operations of the IUCRC. Each Site of an IUCRC is expected to use the NSF funds to participate in the administrative and managerial costs of the overall IUCRC and of its Site and/or to take on some of those responsibilities and cover the costs. If any NSF funds are used to conduct research, they must be in line with the goals of the Center and directed only towards pre-competitive research projects approved by the IAB.

Membership fees received by the Center and Sites are considered program income. At least 90% of the IUCRC program income must be used to support direct costs of the research, and up to 10% may be used to support indirect costs.

Continued NSF support is contingent upon fulfilling BOTH operational AND membership requirements of an IUCRC. NSF may withhold future continuing grant increments (*CGIs*) and adjust the award end date for any Site that does not meet these requirements in the first year of any Phase, or twice within any ward period.

International IUCRC Support

To advance IUCRC goals within the global context, an IUCRC may receive a $25,000 supplement annually for an international Site. These funds are to be used for expenses related to the international activity including support for research visits by IUCRC Site director(s), other faculty, students and junior researchers. No NSF funds are to be used by non-U.S. based participants.

International supplemental funding is allowed in all years, including Year 1.

Additional Supplemental opportunities

To advance its training and education mission, an IUCRC in good standing may request supplements for research experiences for undergraduate Students (REU), up to a maximum of $8,000 per student, veterans (VRS), up to a maximum of $10,000 per student, and teachers (RET), up to a maximum of $10,000 per teacher. No supplement should be submitted without prior approval of the cognizant IUCRC program officer. Requests should be received no later than April 30th each year and are subject to budget availability. No REU, VRS, or RET supplement requests will be accepted between May 1st and September 30th of each year.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

The PI at any institution participating in an IUCRC proposal must be a tenured faculty member. Waivers for non-tenured personnel or non-faculty personnel may be requested when petitioned by the PI's supervisor (Chairman of the Department or the Dean) in advance of the Preliminary Proposal. The PI must act as the initial Site director. A PI can only have one active IUCRC Site award at any given time.

Awardees of planning grants to establish new IUCRCs must complete their planning grant workshops (with NSF Program Director representation) before submitting Phase I proposals.

Eligibility to submit a Phase I Site proposal to establish a new IUCRC is dependent upon the PI of that Site in the Center completing the following activities:

- Participation/attendance at the NSF-sponsored boot camp (see Section III. Award Information) - NSF will reimburse the Site director for travel expenses. This does not apply to Sites joining established Centers.

- Successful fulfillment of the planning grant requirements of a planning grant award (see Section V. Proposal Preparation and Submission Instructions). Exception applies; please see subsection 2 "Guide to Submission of a Site proposal to join/form an Industry/University Cooperative Research Center" for details.

Limit on Number of Proposals per Organization:

There is no limit to the number of proposals an eligible Institution may submit to this program, as long as each proposed Site belongs to a different IUCRC.

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

PIs and Co-PIs can only submit one proposal per submission period.

Additional Eligibility Info:

Eligibility to submit a Phase II or Phase III Site renewal proposal is dependent upon that Site in the Center having satisfactorily completed the previous Phase award. This includes demonstrating meeting the minimum membership and membership fees requirements and being in compliance with IUCRC Program requirements under the current IUCRC award. This criteria does not apply to new Sites proposing to join existing Phase II and Phase III Centers.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

Proposed Centers and Sites that have potential geoscience relevance should be discussed with the GEO Topic Specific IUCRC Program Officers and relevant Programs in the Directorate for Geosciences for guidance and approval prior to submitting a Preliminary Proposal.

Submitters will receive feedback from program staff indicating either **encourage** or **discourage**. An **encourage** finding generally indicates that the proposal appears to be responsive to the IUCRC program guidelines and is a candidate for further development relative to the IUCRC solicitation. A **discourage** finding generally indicates that the project is typically not responsive to the IUCRC program, has serious conceptual flaws and requires further development as an IUCRC submission. The feedback provided pursuant to the preliminary proposal is advisory only; submitters of both "encouraged" and "discouraged" preliminary proposals are eligible to submit full proposals.

Submission of a Preliminary Proposal is required to be eligible to submit a Full Proposal. Preliminary proposals must be submitted, via FastLane, by 5 p.m. proposer's local time on the due date for preliminary proposals.

Preliminary proposals are started in the same way as new full proposals.

- Proposers must be sure to check the box "If this is a preliminary proposal then check here" in the middle of the cover sheet.

This box appears on the cover sheet template just under the section labeled "Previous NSF Award." Check the box to indicate that you are submitting a preliminary proposal and then submit the three pieces (cover sheet, project description, and one biographical sketch) as detailed below.

Each Institution must submit its own Preliminary Proposal.

Required components of the preliminary proposal are given below. Page limitations given here will be strictly enforced. Proposers should review the most current NSF Proposal & Award Policies & Procedures Guide (PAPPG) for specific information on signatures and format for the required sections.

The preliminary proposal should consist of three elements: cover sheet, project description, and bio-sketch. No other sections are required or should be included in the preliminary proposal.:

1. **Cover Sheet.** The PI and all Co-PIs should be indicated. The budget indicated on the Cover Sheet should be the overall project budget total anticipated for the full proposal. The Project Title on the Cover Sheet should be "**IUCRC Pre-proposal [P**lanning or Phase I or Phase II or Phase III] [Site Name]: Center for [AREA] [Center Acronym]; where [Site Name] is the name of the Institution, and [AREA] is the research area.
2. **Project Description (2-page limit).** Start the Project Description with:
   - **Project title;**
   - **Project type** (Planning, Planning for Site Addition, Phase I, Phase II or Phase III renewal, Phase I/II or III Site Addition)**;**

Depending on the Project type, the Project Description must address the following (there should be no attachments or supplemental documents):

Planning for a new IUCRC	1. Mission and vision of the proposed Center 2. Fit of the Center within the industry and university collaborative scope 3. Economic relevance of the research area 4. Analysis of possible overlap/synergy with other IUCRCs, and description of Center uniqueness 5. Description of the already formed academic partnership (unless single Site) 6. List of potential research thrust areas 7. List of prospective members identified with number of members already contacted, of letters of interest received and anticipated 8. Brief description of proposing Institution capabilities and resources contributed to the Center with number of faculty supporting the research efforts 9. For any proposed Site or Center with geoscience relevance, name of the Program Officer(s) and the Program(s) in the Directorate for Geosciences that were consulted regarding submission of the preliminary proposal. **Note: Items 1-6 above are common in the pre-proposals submitted by Sites that are part of the same IUCRC.**
Planning for Site addition to an existing IUCRC	1. Fit with the mission and vision of the existing Center 2. Analysis of the value the Site and its members add to the existing IUCRC and its research scope 3. Economic relevance of the research area of the Site 4. List of proposed new research thrust areas 5. List of prospective members identified with number of members already contacted, of letters of interest received and anticipated 6. Brief description of Site capabilities and resources including faculty supporting the research efforts complementing existing Center strengths
Phase I IUCRC	1. Brief description of Institution capabilities, facilities and resources contributed to the Center by the Site with number of faculty supporting the research efforts 2. List of members that have provided financial commitment letters to date and those anticipated to arrive by the deadline 3. Brief summary of planning meeting outcome with a description of what changed and why with respect to the mission and vision of the Center, composition of the Center in terms of Sites, personnel, research thrust areas, etc **Note: Item 3 above is common in the pre-proposals submitted by Sites that are part of the same IUCRC.**
Phase II and Phase III IUCRC renewal	Communicate financial status of the overall Center in the current operating year with a breakdown showing data for each Site in the Center. Renewing Sites should preferably exceed the membership threshold for the phase for which the renewal is being requested. In addition, briefly describe 1. Site's accomplishments during the current Phase, 2. Site's contribution to overall Center operation and management, 3. Site's impact on Center's members
Phase I/II or III Site Addition to an existing IUCRC	1. Brief summary of planning meeting outcome with a description of what changed and why with respect to the mission and vision of the Site, and composition of the Site in terms of personnel, research thrust areas, etc 2. If NSF waived the planning meeting, provide a description of what mechanism/process was used in lieu of the planning meeting to align the new Site to needs of new and existing IAB members 3. List of members that have provided financial commitment letters to date and anticipated ones by the deadline

	4. Brief description of Institution capabilities, facilities and resources including faculty supporting the research efforts, complementing existing Center strengths.

3. **Biographical Sketch (2-page limit)**. A biographical sketch is required for the PI on the proposal.

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

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

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

When multiple universities (i.e. Sites) apply to form a new IUCRC, each Site that wants to be part of this new Center must submit a full individual proposal.

Sites seeking to form a new IUCRC or renew to Phase II or Phase III may have common sections related to the description of the Center (up to 5 pages of the Project Description), but each proposal must be Site specific and must discuss the value brought by the Site to the Center.

For Sites or Centers with geoscience relevance, both the project summary and the project description in any proposal must include text that mentions which Divisions and Programs in the Directorate for Geosciences are relevant to the Site/Center and how the pre-competitive research proposed by the Site/Center will enhance that Division(s) and Program(s) scientific mission.

1. **Guide to Submission of a Planning Proposal for an Industry-University Cooperative Research Center**

   Planning grants are used to plan the joint industry and university research agenda and to determine the feasibility and viability of developing a Center or for adding a Site to an existing Center

   Proposal Format

   A planning grant proposal is submitted as a full proposal. The title for the proposal must be headed as "Planning IUCRC [Site Name]: Center for [AREA]" where [Site Name] is the name of the Institution, and [AREA] is the research area for which the Center is being proposed.

   PLANNING GRANTS THAT ARE SUBMITTED AS PRELIMINARY PROPOSALS, NOT FULL PROPOSALS, WILL BE RETURNED WITHOUT REVIEW.

   Project Summary

   As specified in Chapter II, Section C.2.b of the NSF PAPPG, the Planning Grant proposal must contain a one-page summary of the proposed project. The Project Summary consists of (1) overview, (2) a statement on the intellectual merit of the proposed activity, and (3) a statement on the broader impacts of the proposed activity. Proposals that do not contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts will not be accepted by FastLane or will be returned without review.

   Project Description (limited to 15 pages) should include:

   A. Planning Grant Objective
      - Objective - brief statement of the planning grant's objective
      - Strategy - how the stated objective will be met
      - Potential members - list of members who have expressed interest or are likely to join the proposed Site and description of the Site and Center's recruitment plan
      - Planning meeting arrangements including:
         - Proposed location;
         - Meeting format and organization;
         - Summary of responsibilities of staff and presenters (reference to supplementary document B); and
         - Summary of meeting agenda (reference to supplementary document D).
   B. Proposed Center/Site Description

Provide a full description for the envisioned Center/Site that serves as a blueprint for action. This section should include:

- An analysis of the industry sector for which the proposed Center/Site plans to focus; how that industry affects the nation's economic health; and its research interests and needs, especially in those areas of research that could be considered appropriate for the proposed Center
- A description of the Site's capabilities to conduct research addressing industrial needs within the overall framework of the IUCRC
- A description of the proposed Center's expected policies, guidelines, organizational structure, and operational procedures within the IUCRC framework
- A plan for addressing broadening participation of underrepresented groups in science and engineering
- A discussion of the pre-competitive research projects the Site proposes to address with a one-page description for each envisioned research project covering:
  - experimental plan and a discussion of its industrial relevance and appropriateness for the Center;
  - project objectives;
  - proposed first year and end of project deliverables;
  - proposed experimental plan;
  - determination of milestones and time to completion; and
  - determination of annual and total cost to completion including involved personnel.

C. Proposed Planning Grant Outcomes:

Expectations from the conclusion of a planning grant meeting:

- PIs send executive summaries of all potential pre-competitive research projects to all prospective Center members;
- Each prospective member is asked to rank the research projects showing what came out of the planning meeting based on each member's priorities;
- Each prospective company sends back a prioritized list of the research projects to the PIs;
- PIs sort through and identify the top research projects with the most interest among the members;
- PIs report back the titles of these highest priority research projects and the Sites proposing the projects to all potential members and to NSF in the annual report;
- Site PIs list the top 3 projects for their Site in the full Site proposal and include the project evaluation reports (Level of Interest and Feedback Evaluation - LIFE meeting summary) from the planning meeting;
- If awarded, these industry-vetted research projects effectively form the foundation of the proposed project set presented at the first Industrial Advisory Board (IAB) meeting.

Planning grant proposals should clearly articulate how the above expectations will be achieved during the planning meeting.

Please note that per guidance in the PAPPG, the Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts". This section should provide a discussion of the broader impacts of the proposed activities. Place this section at the end of the Project Description but within its 15 page limit.

Budget Sheet

Support is generally for travel, an industry planning meeting, associated meeting publications, and faculty time. No funding can be used to support the participation of prospective members. All line items in the proposed budget must be justified.

Supplementary Documents:

Include these required planning grant documents in the "Supplementary Documents" section of FastLane (For Grants.gov users, supplementary documents should be attached in Field 12 of the R&R Other Attachments.):

A. **Proposed Center(Sites) marketing plan** showing target industry or market segmentation, proposed marketing activities (including promotion and advertising), pricing structure, and membership variations;
B. **Staffing plan with a responsibility matrix** showing the roles that the proposed Center director, Site directors, and other researchers will have in performing this planning study;
C. **Membership agreement for industry partners** in accordance with the IUCRC sample agreement at https://www.nsf.gov/eng/iip/iucrc/sample_agreement_form.jsp) and an appropriate sample Membership Agreement for Associations and Institutes (if any) at https://www.nsf.gov/eng/iip/iucrc/. Universities submitting planning grant proposals seeking to join existing Centers must have their membership agreement forms aligned with the one in use at the Center;
D. **Draft agenda** for the meeting consistent with IUCRC Requirements (https://www.nsf.gov/eng/iip/iucrc/plan_implement_center.jsp);
E. **Potential Center member letters** (9 letters minimum per institution in a multi-institution Site, 16 letters for a single institution Center) from potential organization members noting that the Center's concept and proposed research agenda have the potential for receiving support from that organization and that they would consider joining if the Center were formed. Care should be taken to identify the Site associated with each member letter;
F. **Letter of evidence that the proposed research thrusts do not overlap with those of existing IUCRCs, if addressed in NSFs response to the precursor pre-proposal**. Evidence is usually a letter from the Center Director of a Center that appears to have an overlap, in full or in part, with the new Center being proposed. A new Center is considered viable if there is limited research focus and members overlap with an existing Center. This evidence is not required when a Site is joining an existing Center;

Site addition to an existing Center:

G. **Letter of support from the Center Director and IAB Chair** of the existing Center. Letter should clearly articulate the value of the new Site and the vetting process the new Site underwent to determine this value;
H. **Awardee Organizational Authorized Representative (AOR) within the Sponsored Research Office (SRO) signed membership certification that provides evidence of the financial status of the existing Center, with**

breakdown by existing member Sites;

Data Management Plan must describe plans for data management and sharing of the products of research consistent with IUCRC operation, or assert the absence of the need for such plans in compliance with NSF PAPPG requirements.

Planning Grant proposals missing any of the required supplementary documents with the specified content described above will be considered not responsive and will be returned without review.

2. **Guide to Submission of a Site Proposal to join/form an Industry-University Cooperative Research Center**

To be eligible to submit a full Site Phase I proposal, either to form a new Center or to join an existing Center, a Site must have been awarded a planning grant (unless planning requirement was waived by NSF). In addition, the Site must submit a Preliminary-Proposal indicating its interest in submitting a Site Phase I proposal.

Note: The requirement for a planning grant proposal for Site addition to an existing Center, may be waived by NSF provided the proposed research Site meets the minimum membership requirements and has the approval from the academic leadership team and the IAB to join an existing Center. In instances where planning meetings have been waived by NSF, proposals must clearly spell out the mechanism/process used to align the proposed Site(s) to the needs of new and existing IAB members, and the process used to identify industry-vetted research projects that appear in the proposal(s).

Site proposals to transition to the next Phase of the IUCRC require the successful completion of prior Phase awards, which includes meeting memberships and membership fees requirements as well as demonstrating Site's adherence to IUCRC Program's requirements.

The title for the proposal must be: "[Phase] IUCRC [Site Name]: Center for [AREA]" where [Phase] is the requested Phase, [Site Name] is the name of the Institution, and [AREA] is the research area for which the Center is being proposed.

Proposal Format

A Phase I proposal should reflect how the Site will bring value to the unique combination of the proposed Center's research interests, capabilities, and potential for working with industry.

A Phase II or Phase III proposal should show Site outcomes and continuing plans for the realization of its potential through application of IUCRC Requirements and achievement of Center goals and objectives. These features should be discussed in sufficient detail to facilitate review in accordance with the IUCRC Program requirements.

Proposals by Sites that are part of existing Centers awarded under the old IUCRC funding model and in year 2 or 3 of their current Phase that wish to transfer to the new IUCRC Program funding model (introduced with solicitation NSF 16-504) must clearly demonstrate that all Sites under the umbrella of the existing Center have been meeting the new model requirements - including minimum membership requirements - since the last reporting period. Sites should also show plans for the continuing realization of their potential through application of IUCRC new model requirements and achievement of Center goals and objectives.

Project Summary

As specified in Chapter II, Section C.2.b of the NSF PAPPG, the proposal must contain a summary of the proposed project not more than one page in length. The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. Proposals that do not contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts will not be accepted by FastLane or will be returned without review.

For Site proposals to create or join an IUCRC, the overview section of the project summary should include a brief description of the proposed Site addition to the Center, other Sites involved, and scope of the research program.

Project Description

The following narrative outline is recommended for the project description. This narrative shall not be longer than 15 pages.

    A. *Project Overview (three-page limit)*

        In no more than three pages, describe the technical focus of and need for the new IUCRC. Describe the technical area, the targeted industry, the industrially relevant research required, the expertise and resources that will be used to address this need and the fit of the proposed Site within the IUCRC. For Phase II and Phase III renewals, describe how these have evolved over the life of the Site, to date, and have been impacted by the Center.

    B. *Site Structure and Operations within the overall IUCRC framework*

        Proposers must discuss the following in their proposals:

- Available facilities and infrastructure;
- Center leadership, including Site Director's background, qualifications, and management capability;
- The Center membership agreement including (one agreement per Center):
  - Intellectual property policies in accordance with the Bayh-Dole Act that permit non-exclusive, royalty-free licenses for industrial Center members and the possibility of exclusive, royalty-bearing licenses;
  - Publication delay policies; and
  - The membership structure of the Center, as well as the role of members in the Center and the specific benefits of membership categories.
- Potential issues that might hinder the Site and Center and what steps could be taken to minimize those risks;

- IUCRC policies and operations including process for project proposal cultivation, project selection, and project monitoring, and plans for the Site and for the Center to meet IUCRC evaluation criteria; and
- The composition of the University Policy Committee for the Site.

C. *Research Plan*

Envisioned Projects - describe each envisioned pre-competitive research project that was vetted during the planning meeting in up to three pages each that includes:

- Project objectives;
- Proposed team (management and staff) with plans to address broadening participation;
- Proposed deliverables;
- Project duration, milestones, and annual proposed deliverables;
- Determined business or industry need;
- Description of the available research facilities; and
- Determination of the time to completion and cost.

Please note that per guidance in the PAPPG, the Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts". This section should provide a discussion of the broader impacts of the proposed activities. Place this section at the end of the Project Description but within its 15 page limit.

Budget Sheet

The proposal should include:

- A proposed budget expenditure for NSF funds for each of the five years of Site operation and a five-year summary budget with budget justifications included for all line items. Support is generally for Center support staff, faculty time, costs associated with Industry Advisory Board (IAB) meetings, marketing material and meetings related publications, travel for site personnel including students to IAB meetings when not hosted at home institution and for member recruitment.

Supplementary Documents

The following information should be added to the "Supplementary Documents" section of FastLane (For Grants.gov users, supplementary documents should be attached in Field 12 of the R&R Other Attachments).

A. **Membership agreement for industry partners** in accordance with the IUCRC sample agreement at https://www.nsf.gov/eng/iip/iucrc/sample_agreement_form.jsp) and an appropriate sample Membership Agreement for Associations and Institutes (if any) at https://www.nsf.gov/eng/iip/iucrc/.
B. **A list of participating members at the Site and their letters of financial commitment**. It is imperative to include commitment letters from potential members that meet the requirements of Section II. "Program Description". Each letter of commitment should contain the following language Should {Center Name} be selected by NSF for funding, {Company Name} commits to joining {Center Name} as a full/associate member at the membership level of ${amount}, pending clarification of intellectual property implications and availability of funds on an annual basis. Other language in the commitment letters are left to the discretion of the potential member. Proposals failing to meet the minimum levels of memberships and membership fees (in cash only) as outlined in Section II. "Program Description/Industrial Support" will be returned without review. For the submission of a new Center, care should be taken to identify the Site associated with each member letter, and to demonstrate that each Site fulfills minimum financial and memberships requirements. Sites seeking renewal to Phase II or Phase III must include letters of financial commitment of new members, and continue commitment from existing industry members.
C. **List of collaborations with additional institutions** (outside the IUCRC, if applicable).
D. **List of key participants to the Site** and other participating individuals, noting diversity. The list should identify institutional and departmental affiliation or discipline, and should include biographical information on the Site director and all key faculty members or other individuals from participating institutions who will be directly involved in the development, operation, and evaluation of the Site. The list of publications for these individuals should be limited to the five most relevant to the proposed research.
E. **Letter of evidence that the proposed research thrusts do not overlap with those in existing Centers, if this was addressed in their pre-proposal** response. Evidence is usually a letter from the other Center director that their research thrust does not significantly duplicate other IUCRC efforts. This evidence is not required when joining an existing Center as a research Site.
F. **Site's contribution to Center marketing plan** showing target industry or market segmentation, proposed marketing activities (including promotion and advertising), pricing structure, and membership variations.
G. **Site's contribution to Center budget outlook** with anticipated growth and cash-flow for the five years, with a break down by Sites in the Center.
H. **A Memorandum of Understanding (MOU)** among all the Center's sites. The MOU describes how Sites plan to operate the Center, share administrative and managerial responsibilities, handle the collection of membership fees and the allocation based on IAB selection of research projects, and the arrangement among the Awardee Authorized Organizational Representatives within the Sponsored Research Offices for the annual certification of the collected membership fees and their sources at each Site. This MOU must be posted on the public portion of the Center Website.

Site addition to an existing Center:

I. **Letter of support from Center Director and IAB Chair** of existing Center clearly articulating the value proposition of the new Site and the vetting process the new Site underwent for addition to the center.
J. **Office of Sponsored Research (SRO) signed membership certification** as evidence of financial status of existing Center, with breakdown by existing member Sites.
K. **Bylaws in use by the Center.**

Phase II/III Sites:

I. **SRO signed membership certification** compiled for the five years of current operating Phase.
J. **Bylaws in use by the Center.**
K. **List of Sites key accomplishments** (key structural data provided annually to assessment coordinator by Center) during its prior phase(s) including but not limited to:
- Number of publications per year;
- Number of students (trained in the Center) graduated each year and hired by the members;
- Number of patents generated per year;
- Spin-offs and technology transferred to member companies (e.g. increased R&D efficiencies, improved or new processes, improved or new products, and spillover benefits to technology adopters);
- Outcomes of REU, RET and VRS supplements (if any) received by the Center in its current Phase.
L. **Assessment coordinator's report** (for final year of current operating Phase).

Phase III Sites:

M. **Strategy to bring Center to self-sustainability within 5 years**.

Data Management Plan must describe plans for data management and sharing of the products of research consistent with IUCRC operation, or assert the absence of the need for such plans in compliance with NSF PAPPG requirements.

Proposals missing any of the required items listed above will be considered not responsive and will be returned without review.

International IUCRC Supplement

International Site supplemental requests must include a:

- Plan to interact with the international research Site;
- Description of the proposed research projects;
- Description of the infrastructure that is in place to enable collaboration;
- Evidence that the international research entity has adequate partner funding in place to support the proposed projects;
- Formal agreement between the foreign and U.S.-based Site that replicates the provisions for IP, copyrights, publication delays, and similar issues identified in the IUCRC membership agreement; and
- Letter from the IUCRC IAB that endorses the international collaboration and proposed research projects.

Additional supplemental opportunities

Supplement requests for REU, RET, and VRS must follow the guidelines for supplement requests spelled out in the respective calls:

REU https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund

RET https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505170

VRS https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf14124

Supplements must clearly articulate the involvement of students, veterans and teachers in Center activities.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Membership fees received by the Center and Sites are considered program income. At least 90% of the IUCRC program income must be used to support direct costs of the research, and up to 10% may be used to support indirect costs. See Special Award Conditions.

C. Due Dates

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

  January 03, 2017

  April 19, 2017

  Third Wednesday in April, Annually Thereafter

  October 18, 2017

  Third Wednesday in October, Annually Thereafter

- **Full Proposal Target Date(s)**:

February 28, 2017

June 21, 2017

Third Wednesday in June, Annually Thereafter

December 20, 2017

Third Wednesday in December, Annually Thereafter

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: https://www.fastlane.nsf.gov/a1/newstan.htm. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www.grants.gov/web/grants/applicants.html. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in PAPPG Exhibit III-1.

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

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by

investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

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

2. Merit Review Criteria

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

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

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

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

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

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

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and

mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

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

Additional Solicitation Specific Review Criteria

Evaluation

Preliminary Proposal will be considered by NSF staff based on the economic importance of the research area, the depth and breadth of the proposed Center's research, the readiness of the team/Site, the adherence to IUCRC Program's requirements and whether the proposed research overlaps other IUCRCs.

Site Planning grant proposals and full proposals will be competitively reviewed by Ad hoc Review and/or Panel Review, and/or Internal NSF Review. The proposals will be subject to the NSF merit review criteria and the additional criteria given below.

- The envisioned Site and the overall Center are consistent with the defining characteristics and operational requirements of an IUCRC.
- There is enough potential university support, faculty, and facilities involved to build a viable Site within the framework of the Center.
- The planning study will effectively focus on the research interests of an industry that is in a position to support the Site and therefore the Center, so that it could meet the requirements to submit a Site proposal.
- The planning study will effectively use IUCRC operational requirements for structuring and operating the envisioned Site and Center.
- The Site and the Center have an effective marketing plan to develop a strong contingent of firms and sufficient member support to be successful and meet the IUCRC criteria.
- The Site and the Center overall propose to develop a research program that does not duplicate that of an existing IUCRC Center and/or Site (see http://www.iucrc.org/centers.jsp for potential overlap).
- The proposal requires cross-disciplinary and cross-departmental participation where appropriate to the research envisioned.
- The NSF reviewers will consider the extent to which there is evidence that the Site will meet the "Requirements of an IUCRC" as described in Section II. Program Description.
- For IUCRCs involving international collaborations, reviewers will consider: mutual benefits, true intellectual collaboration with the foreign partner(s), benefits to be realized from the international partner's expertise and specialized skills, facilities, Sites, and/or resources of the international counterpart, and active research engagement of U. S. students and early-career researchers, where such individuals are engaged in the research.
- Phase II and Phase III Site proposals will be reviewed as to the Site's previous achievement of NSF's broader impacts, significance and impact of Site's previous research, and efforts of the Site and overall Center in communicating with the public and all Center members.

B. Review and Selection Process

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

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer and/or panel. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

Special Award Conditions:

This special award term supersedes in its entirety Article 27, Program Income, of the Grant General Conditions.

Program income is defined at 2 CFR 200.80. Program income received or accruing to the grantee during the period of the grant is to be retained by the grantee, added to the funds committed to the project by NSF, and thus used to further project objectives. The grantee has no obligation to NSF with respect to program income received beyond the period of the grant. The grantee also shall have no obligation to NSF with respect to program income earned from license fees and royalties for copyrighted material, patents, patent applications, trademarks, and inventions produced under a grant (see PAPPG Chapter VIII.D.4). However, Patent and Trademark Amendments (35 USC 18) shall apply to inventions made under a grant. See also FAQ 200.307.1 of the Frequently Asked Questions for The Office of Management and Budget's Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 CFR § 200 regarding Fees and Royalties and Bayh-Dole.

NSF hereby clarifies that for the purposes of the IUCRC Program, "project" has always been defined as IUCRC Center research activities. On an annual basis, each Site must demonstrate how such funds have been used to further project objectives.

Membership fees received by the Center and Sites are considered program income. At least 90% of the IUCRC program income must be used to support direct costs of the research, and up to 10% may be used to support indirect costs.

Efforts should be made to avoid having unexpended program income remaining at the end of the grant. In the event a grantee has unexpended program income remaining at the end of the grant, it must be remitted to NSF by crediting costs otherwise chargeable against the grant. If it is not possible to record the credit via ACM$, the excess program income must be remitted to NSF electronically or by check payable to the National Science Foundation.

The amount of indirect costs for NSF funds should be calculated by applying the current negotiated indirect cost rate(s) to the approved base(s).

Prior to the start of each funding period, the Program will review each Site on a number of renewal criteria including the following:

1. Attendance of all stakeholders at the bi-annual IAB meetings
2. Meeting membership requirements noted below
3. Timely submission of comprehensive annual reports to the NSF
4. The degree of collaboration amongst Center Sites;
5. The extent to which the marketing plan is being pursued;
6. The extent to which the industry/university collaborations are growing;
7. The extent to which the industrial research program is developing; and
8. The extent to which technology transfer is occurring from the Center to one or more members of the Center.

Membership fee requirement levels (per Site):

Sites in a multi-university Center:
Phase I: a minimum of $150,000 in cash (no in-kind cash equivalent) annually and 3 distinct full members.
Phase II: a minimum of $200,000 in-cash (no in-kind cash equivalent) annually and 4 distinct full members.
Phase III: a minimum of $250,000 in-cash (no in-kind cash equivalent) annually and 5 distinct full members.

Single University Center in any Phase: a minimum of $400,000 in-cash (no in-kind cash equivalent) annually with a minimum of eight distinct full members.

Note: Minimum membership requirement by a Site is met with in-cash memberships only (no in-kind cash equivalent can be applied towards minimum). To assure potential economic as well as scientific impact, IUCRCs are encouraged to have companies comprise the majority of Center members.

Note: A Company for which any faculty involved in the Center is the founder, president, a key officer or a majority shareholder can be a member but its membership does not count towards the minimum membership requirement. It is incumbent on the faculty involved in this company to ensure compliance with the conflict of interest policies of his/her respective Institution, and to ensure that the IAB is aware of such conflicts as well.

Note: Any entity in any way financially affiliated with any of the Universities part of an IUCRC can be a paying member of that Site/Center. The entity's membership fee does not count towards the minimum membership requirement for the Site/Center, but is considered Program Income. Examples are University's Foundations, University's subsidiaries, etc.

Note: The same member may purchase memberships at multiple Sites within a Center. However, the member will only be counted as one full or associate member at one Site within Center.

Continued NSF support is contingent upon fulfilling BOTH operational AND membership requirements of an IUCRC. NSF may withhold future continuing grant increments (*CGIs*) and adjust the award end date for any Site that does not meet these requirements in the first year of any Phase, or twice within any award period.

If the review is satisfactory, the Program Director may recommend support for the next period of the continuing award.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

The Site annual report is used as a basis for assessing annual performance and determining continued funding. Incomplete reports are not accepted by NSF.

The complete annual report contains information on the IUCRC Site's research goals met and anticipated for next year, collaborations with other universities (if applicable), major accomplishments, communications and decision making (how does the Center interact and communicate with Center members, how are the research programs planned and selected, periodic updates of the IUCRC Directory at https://www.nsf.gov/eng/iip/iucrc, etc.)

The Annual Report contains information on the IUCRC Site and of the overall Center:

1. Activities and Findings
2. Products
3. Participants
4. Impacts
5. Special requirements:
     1. Assessment Coordinator report
     2. Center Director report
     3. SRO Membership certification.

Please follow reporting instructions found on research.gov or on the IUCRC Webpage: https://www.nsf.gov/eng/iip/iucrc/.

Please make sure to enter content of your report in the various sections. You may upload PDF files with images, tables, charts, specific research project updates, etc., in support of each section. The SRO-signed membership certification for the reporting period compiled using the SRO Membership Certification Template and the Assessment Coordinator Report must be uploaded under "Special Requirements". "Participants" must list all individuals who contributed to the Center activities for the performing period, including students, postdocs, companies, etc. Outcomes should describe impacts generated by the Center including but not limited to students graduated and hired by the member companies, technology transferred to member companies, etc.

Assessment Coordinator's report
Assessment Coordinators are expected to produce an annual report that incorporates information obtained via participant observation, surveys of faculty and industry, and exit interviews. Additional information about the Assessment Coordinator's role, responsibility and data gathering instruments can be found at https://www.nsf.gov/eng/iip/iucrc/ under the "Assessment Coordinators" Link. Awardees are

required to provide NSF requested necessary information to their Assessment Coordinator. Complete list of the information is found on the IUCRC webpage https://www.nsf.gov/eng/iip/iucrc/.

Center Director's report
The Center Director is expected to provide a brief (5 pages maximum) annual report on the state of the overall Center, assessing the current health and targeted growth of the Sites, faculty participation rates and overall satisfaction with Center activities amongst the students and faculty as well as the impact within the institutions. Director's report must be uploaded with each Site annual report

Certification of Membership
The certification is the form SRO Membership Certification Template compiled by the University Sponsored Research Office (SRO) handling the IUCRC Site that affirms the execution of membership agreements and details the receipts of annual cash and in-kind membership fees or other program income. Membership fees reported are the ones for which the membership agreement was fully executed and paid during the NSF reporting period. Certifications for centers that are collecting membership fees centrally by one of the IUCRC's Sites must report fees and their sources at each Site consistent with the Memorandum of Understanding (MOU) among all the Center's Sites.

IUCRC Directory Reporting
IUCRCs are required to provide accurate and up -to-date information that NSF can use for the online IUCRC directory at http://www.iucrc.org/centers. Instructions for updating and reporting web Site information can be found at https://www.nsf.gov/eng/iip/iucrc/directory/instructions.jsp.

VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Prakash Balan, IUCRC Program Director, Director for Engineering, telephone: (703) 292-5341, email: pbalan@nsf.gov

- Andre W. Marshall, telephone: (703) 292-8050, email: awmarsha@nsf.gov

- Dmitri Perkins, IUCRC Program Director, Directorate for Computer & Information Science & Engineering, telephone: (703)292-7096, email: dperkins@nsf.gov

- Barbara Ransom, GEO Topic-Specific IUCRC Program Director, Directorate for Geosciences, telephone: (703) 292-7792, email: bransom@nsf.gov

- Ann C. Von Lehmen, telephone: (703) 292-4756, email: avonlehm@nsf.gov

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188

  FastLane Help Desk e-mail: fastlane@nsf.gov.

  Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on NSF's website.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

Related Programs:

Sources for additional information:

- Visit https://www.nsf.gov/eng/iip/iucrc/ for information on unsolicited proposal submissions, interagency transfers, MIPRs, and for all forms and other general information about the IUCRC program.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at https://www.nsf.gov

Location:	2415 Eisenhower Avenue, Alexandria, VA 22314
For General Information (NSF Information Center)**:**	(703) 292-5111
TDD (for the hearing-impaired):	(703) 292-5090
To Order Publications or Forms:	
Send an e-mail to:	nsfpubs@nsf.gov
or telephone:	(703) 292-7827
To Locate NSF Employees:	(703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Alexandria, VA 22314

National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (703) 292-5090 or (800) 281-8749

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