ERC Planning Grants
Program Solicitation NSF 18-549

Webinar

April 16, 2018

Webinar Outline

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Reminder

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NAE Report Recommendation

"The recommendations in this report do not call for a wholesale dismantling of the existing ERC program; rather the committee believes it is important to ***build upon the existing strengths of the ERCs*** *by framing them to address the biggest* ***challenges society faces*** *both today and in the decades to come."*

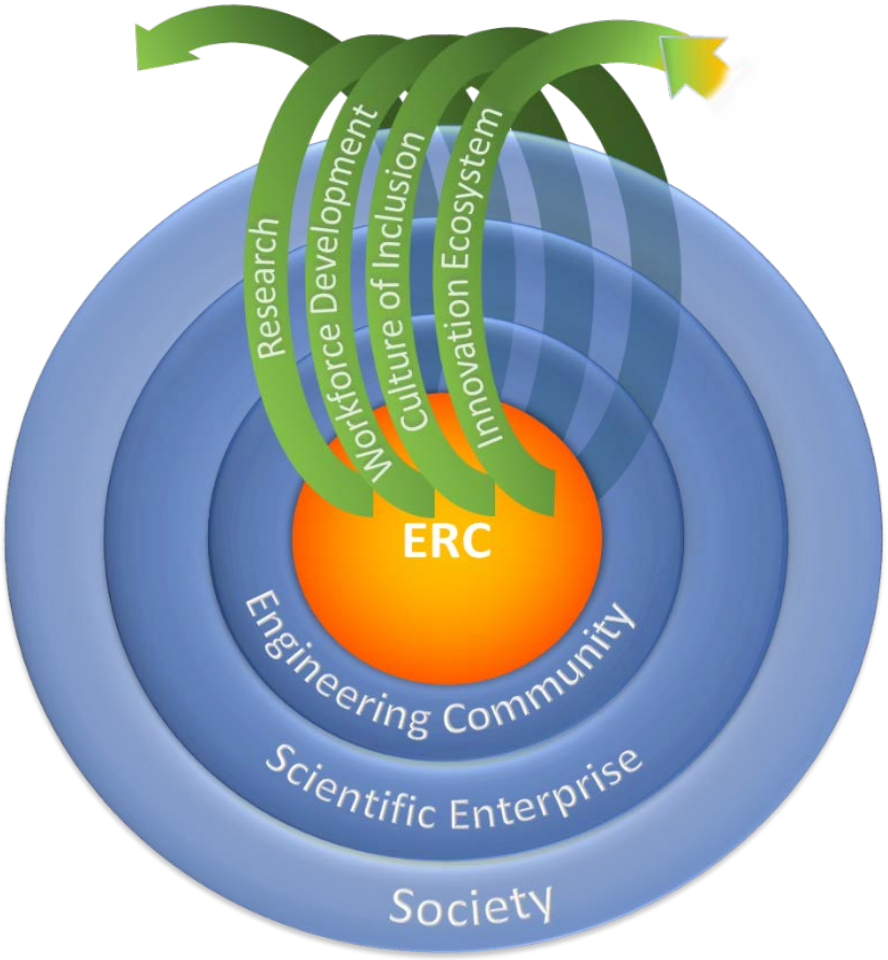
Integrated ERC Program Goals

- Create an inclusive culture to integrate scientific discovery with technological innovation through transformational engineered systems research and education

- Build partnerships with industry and practitioners to strengthen the innovative capacity of the U.S. in a global context

- Produce diverse engineering graduates who are creative innovators in a global economy

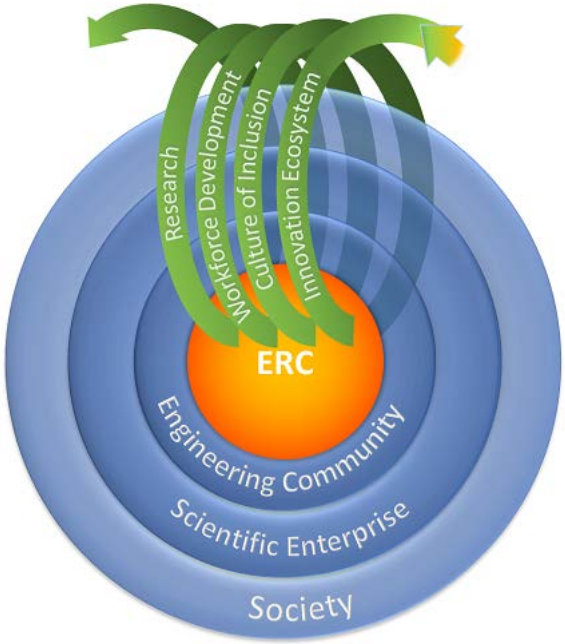
New ERC Program Model



- 4 interconnected **foundational components**
  - Research
  - Workforce Development
  - Innovation Ecosystem
  - Culture of Inclusion
- Three layers of **impact**
  - Engineering Community
  - Scientific Enterprise
  - Society

ERC Program Overview

- NSF is interested in using ERCs to develop engineered systems, which, if successful, will have a high **societal impact**.
- The complexity of **convergent** endeavors underscores the importance of purposeful **team formation**, including **effective leadership/ management**, and the development and nurturing of **stakeholder communities**.



ERC Program Overview:
Societal Impact

- **Societal Impact** represents opportunities and challenges that may be addressed through advances in engineering research and innovation for the benefit of society at large.
- Potential **societal impact** should be relevant and complex, and not limited to any specific schema of grand challenges

ERC Program Overview:
Convergence

- **Convergence** is an approach to problem solving that cuts across disciplinary boundaries.
- It deeply integrates knowledge, tools, and ways of thinking from life/health sciences, physical, mathematical, and computational sciences, engineering disciplines, and beyond to form a comprehensive synthetic framework for tackling scientific and societal challenges that exist at the interfaces of multiple fields.
- **Convergent** engineering is a deeply collaborative, team-based engineering approach for defining and solving important and complex societal problems (NAE, 2017).
- **Convergent** research has the strong potential to lead to transformative solutions or new fields of study.

ERC Program Overview:
Stakeholder Community

- **Stakeholder Community** includes all parties who may contribute to the ERC or may be impacted by the ERC along its value chain and its capacity-building responsibilities.
- **Stakeholders** can include but are not limited to:
  - Relevant researchers across partner institutions with complementary research and education expertise;
  - Industry leaders who can guide the innovation effort;
  - Partners for innovation, education, workforce development, and diversity;
  - Beneficiaries of the ERC outcomes (community members, users, customers, patients, and policy-makers, et al.)
  - Students (graduate and undergraduate)

ERC Program Overview:
Team Formation

- **Team Formation** is the process by which all necessary disciplines, skills, perspectives, and capabilities are brought together.
- Successful teams are interdependent, multidisciplinary, and diverse and can work and communicate effectively even when geographically dispersed.
- **Team formation** includes strategies to overcome barriers to effective, dynamic teaming, including the integration of members with different areas of expertise, different vocabularies and ways of approaching problems, different understanding of the problems to be addressed, and different working styles.

ERC Program Overview:
Effective Leadership/Management

- **Effective Leadership/Management** describes the skills needed by ERC leaders including intellectual vision and leadership, effective management of center activities, successful entrepreneurial experience, a track record of delivering results, and the ability to communicate clearly and effectively with diverse audiences, such as team members, sponsors, partners, host institutions, stakeholders, press and media, and the public.
- **Effective ERC leadership and management** teams may, for example:
  - Empower all team members to contribute regardless of status and power differences;
  - Establish a culture of deep collaboration and inclusion;
  - Build consensus around goals and problem definition;
  - Facilitate communication to ensure a common understanding;
  - Resolve conflicts and build trust.

ERC Planning Grants Goals

- In response to a study from the National Academies of Sciences, Engineering, and Medicine, the ERC program is piloting a planning grant opportunity in advance of the next ERC solicitation.
- The Planning Grants for ERC solicitation is a mechanism for increasing capacity across the engineering academic community to develop ideas, facilitate team formation, and foster stakeholder community networks.
- As a result of planning grant activities, potential ERC teams should be better equipped to carry out center-scale **convergent** engineering research with large societal impact.

ERC Planning Grant:
Program Description

Proposers funded through this solicitation may use the funding to organize catalytic activities that can help crystallize the engineering research theme and strengthen the following four areas:

1. Societal impact
2. Convergence
3. Stakeholder community, and/or
4. Team formation, including effective leadership/management.

ERC Planning Grant:
Award Information

- The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals, NSF merit review criteria, and solicitation-specific review criteria.
- The planning grant is for one year and the proposed budget for each planning grant should not exceed $100,000.
- The maximum number of awards is 30 to 40.

ERC Planning Grant:
Eligibility Information

- Institutions:
  - Proposals may be submitted by two- and four-year Institutions of Higher Education (IHE) (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.
- Principal Investigators:
  - Engineering faculty whose main appointment is in an engineering school/college.
- Limit of Number of Proposals:
  - Per Institution: There are no restrictions or limits
  - Per PI or Co-PI: An individual may be listed as a PI or Co-PI on only one planning grant proposal.
- No Collaborative Proposals will be accepted

ERC Planning Grant:
Proposal Preparation Instructions (1)

- Proposers may opt to submit proposals in response to this Program Solicitation via *Grants.gov* or via the NSF FastLane system.
- *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).
- *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.*

ERC Planning Grant:
Proposal Preparation Instructions (2)

Planning grant proposals must contain the items listed below and adhere strictly to the specified page limitations.

- **Title of Proposed Project**: The title should begin with "Planning Grant: Engineering Research Center for" followed by the rest of the title and the Center acronym.
- **Project Description** (maximum 6 pages total). In addition to separate sections labeled "Intellectual Merit" and "Broader Impacts" as required by the PAPPG, the Project Description must contain specific sections (see next slide).
- **Budget**
- **References Cited**
- **Biographical Sketches**

ERC Planning Grant:
Proposal Preparation Instructions (3)

- **Project Description** (maximum 6 pages total):
  1. ***Currently Planned Proposing Team*:** The description must start with a table that has four columns: (1) Name of the PI or co-PIs, (2) Institution, (3) Department(s), and (4) Most Relevant Field(s) of Expertise.
  2. ***Targeted Societal Impact***: Describe the specific societal impact(s) that the intended ERC will potentially target.
  3. ***Rationale***: Make the case for why an ERC is appropriate and why a convergent research approach is needed for the targeted societal impact. Identify some key, enabling ideas that will be built upon. Describe the intellectual approach and qualifications for carrying out the proposed strategies.
  4. ***Expected Benefits***: What would the planning grant enable for your team that isn't currently in place?
  5. ***Stakeholder Community***: Describe the proposed strategies that will be used to better understand and engage the stakeholder community most appropriate for your ERC. The stakeholder community should be identified with consideration of all key components of the ERC.
  6. ***Team Formation***: Describe the proposed strategies that will be used to identify and bring together the best team, including effective leadership/management, to address engineering challenges for the targeted societal impact.
  7. ***Planning Procedure***: Please describe in detail how you will use this planning grant.
  8. ***Anticipated Impacts***: What aspects of the proposed approach would be most likely to change as a result of the activities described in this planning grant? Where do you see the planning grant having the most impact? What are the anticipated impacts of the activities listed in the previous section?

ERC Planning Grant:
Merit Review Criteria (1)

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria, **Intellectual Merit** and B**roader Impacts**.

- **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.

ERC Planning Grant:
Merit Review Criteria (2)

Additional Solicitation Specific Review Criteria

In addition to the standard NSF Intellectual Merit and Broader Impacts Criteria, reviewers will be asked to consider the following questions:

- Is the proposed strategy appropriate for developing a potential ERC including all **four foundational components** defined above?
- Is a **convergent** research approach needed for the targeted **societal impact**?
- Are the proposed strategies for engaging and developing the **stakeholder community** appropriate?
- Are the proposed strategies for **team formation** and developing the **ERC management structure** appropriate?
- Does the proposal clearly identify what will change/improve as a result of the planning grant activities?

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