

## **The Grainger Foundation Frontiers of Engineering Grants: A Follow-up Program to the US Frontiers of Engineering Symposium**

Frontiers of Engineering (FOE) is a program of the National Academy of Engineering (NAE) that brings together outstanding young engineers from industry, academia, and government to discuss pioneering technical work and leading-edge research in various engineering fields and industry sectors. Frontiers of Engineering was initiated to provide an opportunity for top-notch engineers to learn about cutting-edge developments in fields other than their own, thereby facilitating collaborative work and the transfer of new approaches and techniques across fields in order to build and sustain US innovative capacity, and to recognize and network the next generation of engineering leaders. The FOE program is supported by The Grainger Foundation as well as government and corporate grants.

### **1.0 ABOUT THE GRAINGER FOUNDATION FRONTIERS OF ENGINEERING GRANTS**

The Grainger Foundation Frontiers of Engineering Grants provide seed funding for US FOE participants who are at US-based institutions to enable further pursuit of important new interdisciplinary research and projects stimulated by the US FOE symposia.

These grants are intended to provide seed money 1) for support of students and post docs in a research effort or technical work, the purchase of equipment, and/or the acquisition of preliminary data that will support competition for larger awards from other sources, or 2) for execution of a discrete technical project of an interdisciplinary nature that will contribute to innovation in a particular area.

Grant proposal examples include (but are not limited to):

-- Two participants have an idea for interdisciplinary research they want to pursue jointly but cannot apply for other funding because there are no preliminary data. The participants apply for a Frontiers of Engineering Grant as seed money to acquire preliminary data in order to compete for larger awards from other sources.

-- A small group of participants wants to follow-up on a topic they discussed at the Frontiers of Engineering meeting at one of the members' labs for a week during a mutually convenient time. They also want to include 2-3 individuals from other disciplines who were not at the conference because their expertise is needed to take the next steps with their discussion. The group requests funding to support the meeting (travel, lodging, food, lab supplies, etc.).

-- Two-to-three participants who met at the symposium want to explore collaboration opportunities related to a topic of interest. They also wish to include another researcher in these discussions. They apply for a Frontiers of Engineering Grant to support travel to each other's labs, to learn more about each other's work, and to explore potential collaboration.

-- Two participants at different institutions want to support a graduate student for a year to begin a new research project in order to make progress and explore a larger collaboration between the groups. They request funding to support the student for a year and his/her travel between the groups.

-- Two participants need equipment, supplies, and part of an intern's time to build a device or system that requires inputs from different disciplines and has the potential for innovative application in a particular area.

### **1.1 Eligibility**

Participants from US-based institutions who attended the September 2016 US Frontiers of Engineering Symposium may apply for these grants. The activities to be supported by a grant can involve non-conference participants, but the two primary applicants must have attended the 2016 US FOE conference. One of the applicants should be identified as the PI (one check will be sent to the PI's institution, which will be the fiscal agent and coordinating institution for the grant). Applicants cannot already be working on a joint project or have worked together previously on a joint project.

### **1.2 Grant Amounts/Terms of Agreement**

Grant requests shall be made for the amount of \$30,000, and two grants will be awarded.

Submission deadline: December 15, 2016. 5 pm Eastern Time.

Award announcement: March 15, 2017

Grant term: The grant term may begin no earlier than April 1, 2017, and end no later than May 31, 2019.

After being notified of the award, the grant recipient's institution must sign and accept the electronic grant agreement, and mail an IRS Form W-9 (available online at [www.irs.gov](http://www.irs.gov)). Checks will then be processed and forwarded to the institution listed in the proposal and grant agreement. A blank sample grant agreement is included as an attachment to this document for your reference. **Changes to the grant agreement will not be accepted (except as noted below). Please do not submit a proposal if your institution is unable to accept the agreement as written. The only change that may be made with prior written approval is a change in applicable law in Article XIV Jurisdiction upon confirmation that the grantee institution is a state entity.**

The agreement will be completed by NAE staff and sent via email to the authorized representative of the grantee institution. Upon receipt of an electronically signed copy of the agreement and a signed IRS Form W-9, a check for the awarded amount will be mailed to the appropriate contact at the grantee's institution.

### **1.3 Taxes**

Grant recipients are solely responsible for determining the tax consequences of The Grainger Foundation Frontiers of Engineering Grants.

### **1.4 Grant Application Review/Timeline**

All grant applications (See 2.0 How to Apply for Frontiers of Engineering Grants) are due by **5:00 pm Eastern Time on December 15, 2016. In order to ensure fairness in the process, late applications will not be accepted.**

The application will be reviewed by a committee beginning early January through February, and the committee will make its selections in early March. All applications will be notified of the status of their application by March 15, 2017.

### **1.5 Reporting Requirements**

The Frontiers of Engineering program seeks to keep reporting requirements to a minimum. A report template will be emailed to all grantees upon conclusion of the grant period, and it must be completed within 60 days. The report template will request up to five pages of discussion on one or more of the following issues:

- How the research or project conducted is transdisciplinary/interdisciplinary.
- The ways in which the research or project contributed to the advancement of the relevant field, as well as the potential technical and societal impact of the research or project.
- How the research or project enabled the grantee to initiate research or technical work in new areas that would not have been pursued if it were not for the Frontiers of Engineering Grant.
- How conducting the research or project has changed the grantee's conceptual and methodological approach to his/her research or technical work.
- How the research or project generated new technical collaborations outside of the grantee's field.
- The effects of the research or project on generating new collaborations with community practitioners and/or policy makers.
- Whether the research or project led to the creation or support of transdisciplinary/interdisciplinary research centers in the grantee's institution.
- Whether the research or project led to the creation of new training programs for students and/or faculty to promote transdisciplinary/interdisciplinary research or technical work and collaboration in the relevant field.
- The publications supported by the grant.
- The conference presentations supported by the grant.
- The doctoral dissertations/master's theses supported by the grant.
- The grant proposals generated by the grant, including a status on whether they are funded, not funded, or under review.

Upon expiration of the grant, a final report of expenditures (up to one page), with the refund of any unexpended balance, must also be submitted within 60 days.

### **1.6 Acknowledgement/Control of Research**

Any papers, books, articles, or other publications resulting from any research supported by the grant should include a suitable acknowledgement reflecting the National Academy of Engineering and The Grainger Foundation Frontiers of Engineering Grants Program contribution to the work. Two (2) copies of all such publications should be sent to the National Academy of Engineering, Frontiers of Engineering Program, 500 Fifth Street, NW, Keck 1040, Washington, DC 20001, or via email to [jhunziker@nae.edu](mailto:jhunziker@nae.edu).

Examples of how researchers might acknowledge support:

- a. This research has been supported by The Grainger Foundation Frontiers of Engineering Grants Program (Grant Number...).
- b. The authors acknowledge funding support from The Grainger Foundation Frontiers of Engineering Grants Program (Grant Number...).
- c. We acknowledge financial support from The Grainger Foundation Frontiers of Engineering Grants Program (Grant Number...).

The grantee agrees to assume the sole responsibility for the research activities conducted using grant funds. The National Academy of Sciences, the National Academy of Engineering Fund, the National Academy of Engineering Frontiers of Engineering Program, The Grainger Foundation, and each of their officers, directors, and agents shall not be responsible for any claims, damages, or liability arising out of grantee's research or technical work performed using grant funds.

### **1.7 Evaluation**

The National Academy of Engineering is committed to including an evaluation component of the Frontiers of Engineering Program to measure the extent of systemic change in the ways in which interdisciplinary research or technical work is fostered, communicated, and funded over both the short and long term. During the course of your grant, and some time thereafter, you may be asked to participate in short telephone interviews, surveys, or other mechanisms to assist these evaluation efforts.

## **2.0 HOW TO APPLY FOR FRONTIERS OF ENGINEERING GRANTS**

### **2.1 Proposal Submission**

Proposal to be submitted electronically to:

Janet Hunziker, Program Director, Frontiers of Engineering, National Academy of Engineering.

Email: [jhunziker@nae.edu](mailto:jhunziker@nae.edu)

## **2.2 Proposal Format**

Proposal should include the following:

1. CONTACT DETAILS OF COLLABORATORS
2. REQUESTED FUNDING: \$30,000
3. TITLE OF PROPOSED PROJECT
4. EXECUTIVE SUMMARY (300 words) Describe the engineering issue that your research or technical work will address, how your project addresses the issue, and why the proposed activity is important for progress in its field.
5. BACKGROUND OF THE SUBJECT AREA OF PROPOSED WORK (500 words) Describe the current state-of-the-art in the field, challenges to progress, how the proposed research or project will address one or more of these challenges, and relevance or impact on society.
6. AIMS OF COLLABORATION (250 words) Describe the objectives of the collaboration and why an interdisciplinary approach is needed.
7. SPECIFIC ACTIVITIES (500 words) Provide details on the activities that will be undertaken, including but not limited to a plan of work with proposed timeline and experimental methods.
8. EXPECTED OUTCOME (150 words) List in bullet format 4-6 expected outcomes of the research or technical work.
9. BRIEF CVs (not more than one page each) of the collaborators
10. BUDGET ALLOCATION

## Frequently Asked Questions

**Q:** Whom do I contact with questions about Frontiers of Engineering Grants?

**A:** Please send an email to [jhunziker@nae.edu](mailto:jhunziker@nae.edu).

**Q:** When is my grant application due?

**A:** All grant applications are due by 5:00 pm Eastern Time on December 15, 2016. In order to ensure fairness in the process, **late applications will not be accepted.**

**Q:** Do I need to get approval from our office of sponsored projects before submitting an application? They already know about the 20% overhead, etc., but do I need to get an approval?

**A:** Approval is not required until the grant is funded. However, since changes to the grant agreement will not be accepted, please ensure the grant agreement is acceptable to your institution prior to submitting a proposal. Please do **not** submit a proposal if your institution is unable to accept the agreement as written.

**Q:** How are the grant proposals reviewed and selected?

**A:** Members of a committee will review and select the grants, and their selections are final. NAE's goals with the Frontiers of Engineering Grants are to fund technically-innovative research and technical work that supports ideas generated at the conference, interdisciplinary collaboration, and student involvement. Proposals will be judged on these criteria, as well as their potential impact (societal, technical, etc.) and overall technical merit.

**Q:** The grant instructions suggest that the maximum overhead for a grant proposal budget is 20%. How does this apply to the grant?

**A:** Overhead is calculated at 20% of the total grant budget. This means for a \$30,000 grant up to \$6,000 can be budgeted for overhead and \$24,000 for direct expenses.

**Q:** My grant will have a co-PI from another organization. When submitting the budget, do we need to submit the entire budget from one institution (and treat the co-PI's portion as a subcontract) or can you take two separate budgets?

**A:** Since grants are awarded to a single institution, only one budget will be accepted. The institution that is awarded the grant will serve as the fiscal agent