



**National Science Foundation**  
**4201 Wilson Boulevard**  
**Arlington, Virginia 22230**

NSF 09-059

Dear Colleague Letter: for FY 2011 Emerging Frontiers in Research and Innovation Topic Solicitation

**SUBJECT:** Candidate Topic Solicitation for FY 2011 Emerging Frontiers in Research and Innovation.

**DEADLINE:** September 15, 2009

**Dear Colleagues,**

The purpose of this letter is to invite the research community to submit suggestions for topics to be considered for the FY 2011 Program Solicitation of the Office of Emerging Frontiers in Research and Innovation (EFRI). This is not a request for submission of a single research proposal idea but rather of an emerging transformational area of research and innovation. You may submit your ideas by accessing the following website - <http://www.nsf.gov/eng/efri/efri2011/>- and submitting your candidate topic idea along with a one-page description. Please follow the instructions provided. The deadline for submission is **September 15, 2009**.

NSF staff will review submitted candidate topic ideas and plans to invite up to ten submitters to NSF for further discussions on their proposed topic.

**BACKGROUND-** EFRI was established on October 1, 2006, as a result of strategic planning and reorganization of the NSF Directorate for Engineering (ENG). Motivated by the vision of ENG to be the global leader in advancing the frontiers of fundamental engineering research, EFRI serves a critical role in focusing the engineering community on important emerging areas in a timely manner. Each year, EFRI evaluates, recommends, and funds interdisciplinary initiatives at the emerging frontiers of engineering research and innovation. These transformative opportunities may lead to: new research directions; new industries or capabilities that result in a leadership position for the country; and/or significant progress on a recognized national need or grand challenge.

EFRI invests in higher risk opportunities with high potential payoff. Its role is to support research opportunities that would be difficult to fund through the current funding mechanisms of EARly-concept Grants for Exploratory Research (EAGER), typical core program awards, or large research center awards. These frontier ideas cannot be pursued by one researcher or within one field of expertise. They are "frontier" because they not only push the limits of knowledge of one field, but actually overlap multiple fields. The EFRI funding process is designed to both inspire and enable several different experts to work together on one frontier idea.

The EFRI Office continually gathers information for use in deciding what research areas to support. EFRI manages a process of selecting, announcing, and funding new frontier areas annually. This process functions throughout the year, ensuring continual input and feedback from the engineering community on promising future research opportunities. This input comes from such diverse sources as workshops, advisory committees, technical meetings, professional societies, proposals and awards, and NSF Committees of Visitors. From this comprehensive input, ENG identifies, evaluates, and prioritizes those frontier topics that best match the EFRI criteria.

**TOPICS AND AWARDS TO DATE** - In FY 2007 and FY 2008 EFRI funded a total of 24 interdisciplinary proposals in four topic areas. Each proposal was funded at approximately a total of \$2M over four years. You can review these EFRI topics and awards by accessing the EFRI website ([www.nsf.gov/eng/efri](http://www.nsf.gov/eng/efri)). The FY 2009 Award decisions are currently underway. There have been 8

topics that have been chosen for use in EFRI solicitations thus far. The FY 2007 EFRI topics were: 1) Autonomously Reconfigurable Engineered Systems Enabled by CyberInfrastructure (ARES-CI); and 2) Cellular and Biomolecular Engineering (CBE). The FY 2008 EFRI topics were: 1) Cognitive Optimization and Prediction: From Neural Systems to Neurotechnology (COPN); and 2) Resilient and Sustainable Infrastructures (RESIN). The FY 2009 EFRI topics are: 1) BioSensing & BioActuation: Interface of Living and Engineered Systems (BSBA); and Hydrocarbons from Biomass (HyBi). The planned topics for the FY 2010 EFRI solicitation are: 1) Renewable Energy Storage (RESTOR); and 2) Science in Energy and Environmental Design (SEED): Engineering Sustainable Buildings.

You may also find further information on EFRI, as well as broader information on the Engineering Directorate activities, by reviewing the presentations given at the meetings of the Engineering Advisory Committee: <http://nsf.gov/eng/advisory.jsp>.

In order to provide a wider and more direct opportunity for the research community to provide input on selection of topic ideas for FY 2011, NSF ENG is inviting the community to submit their best emerging frontier idea suggestion for consideration by NSF. After review of the suggestions submitted, NSF plans to invite a selected number of the submitters to NSF to present their frontier ideas at NSF.

**YOUR OPPORTUNITY TO CONTRIBUTE: THINK ENGINEERING** - The topic ideas you submit should provide forward-looking views and identify opportunities in emerging frontiers of research and innovation; the topic ideas should not summarize or justify your own ongoing research activities. Note that topics or areas of opportunity should be those that cannot be supported through other programs at NSF. All the information you submit will remain confidential. There will be no formal feedback or evaluation to submitters on their ideas unless they are invited to present their idea to ENG. The information will be reviewed and considered by NSF staff in their process of identifying and selecting frontier topic areas for FY 2011 EFRI solicitation.

**INFORMATION WEBCAST** - The EFRI Office plans to hold an information workshop in mid August 2009 to answer any questions. Details of EFRI webcast will be posted on the EFRI website ([www.nsf.gov/eng/efri](http://www.nsf.gov/eng/efri)).

We thank you in advance for taking the time to submit your emerging frontier ideas to NSF Directorate for Engineering.

**Sincerely,**

Sohi Rastegar  
Director, Office of Emerging Frontiers  
in Research and Innovation  
NSF Engineering Directorate

## IMPORTANT DATES

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<b>Mid Aug</b>	<b>Information Webcast (visit <a href="http://www.nsf.gov/eng/efri">www.nsf.gov/eng/efri</a> for update)</b>
<b>Sep 15</b>	<b>Deadline for submission of EFRI Topic ideas</b> <b>Please submit them at: <a href="http://www.nsf.gov/eng/efri/efri2011/">http://www.nsf.gov/eng/efri/efri2011/</a></b>
Mid Oct	Selected submitters are invited
Mid Nov	Presentations at NSF
April 2010	Final 2011 EFRI Topics are announced at ENG Advisory Committee and posted on the EFRI website <a href="http://www.nsf.gov/eng/efri">www.nsf.gov/eng/efri</a> .