



National Science Foundation  
4201 Wilson Boulevard  
Arlington, Virginia 22230

NSF 10-070

## Dear Colleague Letter: 2012 EFRI Topic Ideas

**SUBJECT: Seeking Community Input for Topic Ideas for FY 2012 Emerging Frontiers in Research and Innovation.**

**DEADLINE: September 30, 2010.**

The purpose of this letter is to invite the research community to submit suggestions for topics to be considered for the FY 2012 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://nsf.gov/eng/efri/efri2012/> and submitting your candidate topic idea along with a one-page description. Please follow the instructions provided. The deadline for submission is **September 30, 2010**.

**INFORMATION WEBCAST: SEPTEMBER 16, 2010:** The EFRI Office plans to hold an information webcast on September 16, 2010 to answer any questions related to this letter. Details of this EFRI webcast will be posted on the EFRI website (<http://www.nsf.gov/eng/efri>) a few days prior to the webcast.

**BACKGROUND:** EFRI was established to serve 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 manages the process for identifying, selecting, implementing, and funding new frontier research areas annually. The EFRI Office is perpetually gathering information for use in deciding future research areas to support. This process operates continually throughout the year, ensuring input and feedback from the engineering community on promising upcoming research opportunities. This input comes from such diverse sources as workshops, advisory committees, proposals and awards, technical meetings, and professional societies as well as the individual engineering researchers. From this comprehensive input, ENG identifies, evaluates, and prioritizes those frontier topics that best match the EFRI criteria.

In order to provide a wider and more direct opportunity for the research community to provide input on selection of topic ideas for FY 2012, NSF ENG is inviting the community to submit their best emerging frontier idea suggestion for consideration by NSF.

**YOUR OPPORTUNITY TO CONTRIBUTE:** 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 simply 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. NSF staff will review submitted candidate topic ideas in consultation with external experts. NSF plans to invite up to ten submitters to NSF for further discussions on their proposed topic. Those submitters selected to present their frontier idea suggestions at NSF will be notified by mid- December and invited to come to Arlington, VA on Jan 11 or 12, 2011.

**TOPICS AND AWARDS TO DATE:** In FY 2007, FY 2008, and FY 2009, EFRI funded a total of 44 interdisciplinary proposals in six 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 (<http://www.nsf.gov/eng/efri>). 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 were: 1) BioSensing & BioActuation: Interface of Living and Engineered Systems (BSBA); and Hydrocarbons from Biomass (HyBi). The FY 2010 Award decisions are currently underway. The topics for the FY 2010 EFRI solicitation were: 1) Renewable Energy Storage (RESTOR); and 2) Science in Energy and Environmental Design (SEED): Engineering Sustainable Buildings. The FY 2011 topics have been announced. They are: 1) Engineering New Technologies based on Multi-cellular and Interkingdom Signaling (MIKS) and 2) Mind, Machines, and Motor Control (M3C). See EFRI website for full details. 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>.

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:**

- September 16, 2010** Information Webcast (visit <http://www.nsf.gov/eng/efri> for update)
- September 30, 2010** Deadline for submission of EFRI Topic ideas  
Please submit them at: <http://www.nsf.gov/eng/efri/efri2012/>
- Early December, 2010 Selected submitters are invited
- January 11-12, 2011 Selected Presentations at NSF
- April, 2011 Final 2012 EFRI Topics are announced at ENG Advisory Committee and posted on the EFRI website <http://www.nsf.gov/eng/efri>.