



National Science Foundation  
WHERE DISCOVERIES BEGIN

*April 14, 2011*

# **FY 2011 REPORT EMERGING FRONTIERS IN RESEARCH AND INNOVATION**

## **NSF COMMITTEE OF VISITORS (COV)**



# COV CHARGE

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- The integrity, efficacy, and quality of the processes used to solicit, review, recommend and document proposal actions.
- The quality of project management, monitoring, and evaluation of funded proposals.
- The quality and significance of the results of the programmatic investments in terms of program, and NSF-wide goals.
- The program's balance, priorities, and strategies for realizing the potential of the program.



*FINDINGS*

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❖ A.1, Items 1-8: Quality & Effectiveness of Merit Review Process

- ❖ Review methods very appropriate & rigorous; preproposals were utilized along with at least 3 reviews per full proposal
- ❖ Individual reviewers: comment in expert manner & detail in timely manner

❖ A.2, Items 1-4: Selection of Reviewers

- ❖ Panelists generally have appropriate expertise and backgrounds



*FINDINGS*

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- ❖ A.3, Items 1-13: Resulting Portfolio of Awards
  - ❖ Appropriate in all areas, except one -appropriate participation of under represented minorities
  - ❖ COV commends funding of exiting, potentially transformative, out of the box ideas from a diversity of institutions
  
- ❖ A.4, Items 1-4: Program Management
  - ❖ COV applauds leadership, & creativity of Director & commends inclusion of educational opportunities as well as traditional research opportunities



## ❖ A.1, Items 1-8: Quality & Effectiveness of Merit Review Process

- ❖ EFRI solicitation should emphasize need for strong discussion of broader impacts to secure grant
- ❖ When wide span of ratings exist, there should be discussion to probe reasons for span
- ❖ Solicitations should request description of how workforce & diversity at all levels will be enhanced by proposed work and this should be reflected in comments by reviewers



- ❖ A.2, Items 1-4: Selection of Reviewers
  - ❖ Recommend participation of nontraditional/commercial reviewers
  - ❖ Participation of under represented minority groups & women to be increased
  - ❖ Better demographic data to be collected
  - ❖ The Selection Process for Reviewers should be well described for the next COV



## A.3, Items 1-13: Resulting Portfolio of Awards

- ❖ Recommend collection of data differentiating between early or established investigators & geographic distribution of proposals in all stages
- ❖ The participation of underrepresented minority PIs and co-PIs is unacceptably low. EFRI should initiate a series of innovative efforts geared at addressing this issue. As an example EFRI could emulate the ERC in engaging minority serving institutions in their research and education plans.
- ❖ PIs should be asked to offer presentation materials on diversity at the annual conference and/or Webex seminar.



## ❖ A.3 (cont.) Items 1-13: Resulting Portfolio of Awards

- ❖ Develop & incorporate new diversity requirements into 2011
- ❖ The Solicitation should encourage participation of under represented PIs and Co-Pis and women

## ❖ A.4, Items 1-4: Program Management

- ❖ Streamline program planning and prioritization process for efficiency
- ❖ Consider web posting of topics proposed and discussed at retreats
- ❖ An Assistant Director of the EFRI Program Should be Budgeted



### ❖ B.1: Outcome Goal for Discovery

- ❖ EFRI has devised and implemented an innovative, research community-Inclusive and highly effective process to solicit, cultivate, refine and propose cutting edge interdisciplinary research topics that represent paradigm shifts in research approaches and have strong potential to create new research areas.
- ❖ Out-of-the box approaches which leverage novel methods including biomimicry.



## ❖ B.2: Outcome Goal for Learning

❖ Major educational benefit is development of a culture of interdisciplinary research & innovation

❖ Knowledge transfer is visible in the exchange of student researchers across multi-institutional programs and industries



## ❖ B.3: Outcome Goal for Research Infrastructure

- Enhancing the nation's research capability through developing cutting-edge research tools in critical and emerging areas.
- Numerous projects in the areas targeted by EFRI have enabled investigators to develop new technologies that would not have been possible with traditional awards that are limited in size and scope.
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- EFRI has filled the gap that has long existed between the ERC and the traditional funding programs and has helped accelerate development of new technologies.
- Focus on multi-disciplinary and multi-investigator research has promoted the utilization of infrastructure resources across departments and campuses



## ❖ B.1: Outcome Goal for Discovery

- ❖ NSF-wide efforts to develop pathways for EFRI funded investigators to seek follow-on funding should be pursued to ensure advancement of transformative research and innovation to products and technologies.
- ❖
- ❖ Critical need will be to develop measurable metrics to ensure EFRI award decisions are aligned with NSF-wide goals. Well defined, quantifiable metrics will ensure success of the program, the National Science agenda, and sustained leadership position of the Engineering Directorate.



## ❖ B.2: Outcome Goal for Learning

- ❖ There needs to greater engagement of members from under represented groups at all levels and across all research and educational activities
- ❖ Mentorship & development for research leadership
- ❖ Workshops for awardees on diversity & outreach
- ❖ Establish dialogue with partner organizations/ agencies to enhance diversity
- ❖ Consider asking awardees to focus on an area within education & outreach to achieve excellence



## ❖ B.3: Outcome Goal for Research Infrastructure

- ❖ The thrust of the EFRI program is not the enhancement of infrastructure
- ❖ Obvious that it will have a significant impact on the future research infrastructure demands in the nation driven by cutting-edge research and discoveries.



- ❖ C.1: Program Improvement Areas
  - ❖ COV enthusiastically supports EFRI program
  - ❖ There is need for more concrete definition of what it means to be “transformative”
  - ❖ Need exists for more emphasis on post-award support
  - ❖ In order to benefit ongoing projects, need for assessing outcomes and impacts of EFRI program



## ❖ C.2: Program Specific Improvement Areas

### ❖ Sustaining EFRI Topics

- ❖ Continue oversight when PD IPAs leave NSF

- ❖ Develop sustainability plan for project  
in yrs 3 or 4

- ❖ Develop relationships with other federal agencies  
for potential sustained support



### ❖ C.2: Program Specific Improvement Areas

#### ❖ Topic Selection Process

- ❖ Selection process considered to be generally fine

- ❖ Recommend selecting topics every 2 yrs to reduce Program Director workload & provide time to address program outcomes and impact assessment

#### ❖ PD Workloads and Overlapping EFRI Activities

- ❖ Workload is currently high, hence the recommendation to modify selection cycle to every 2 years.



## ❖ C.3: Agency-Wide Issues

- ❖ EFRI fills an important niche in NSF programming and can serve as a model to other programs
- ❖ NSF should consider adding an assistant program director and administrative support personnel to allow for program evaluation and impact assessment



## ❖ C.4: Other Relevant Issues

- ❖ NSF should find ways to broaden the EFRI program scope (Workshops, Wild Card Slots e.g.)
- ❖ Use of novel, transformative ideas from engineering and scientific community provides base for this expansion



## ❖ C.4: Other Relevant Issues

❖ Annual conferences and reports provide/ opportunity to collect data for future program assessment and provides Pis information on what EFRI values. Collection and tracking of outcome metrics should become a priority

## ❖ C:5: Improving the COV Review Process

❖ STPI report can be made more relevant if focused on assessing EFRI program using metrics pertaining to questions presented to the COV



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**THANK YOU FOR THE OPPORTUNITY  
TO SERVE.**

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