CORE QUESTIONS and REPORT TEMPLATE
for
FY 2010 NSF COMMITTEE OF VISITOR (COV) REVIEWS

Guidance to the COV: The COV report should provide a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the ***processes*** related to proposal review; and (B) the quality of the ***results*** of NSF's investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. Discussions leading to answers for Part A of the Core Questions will require study of confidential material such as declined proposals and reviewer comments. *COV reports should not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Core Questions will involve study of non-confidential material such as results of NSF-funded projects. Suggested sources of information for COVs to consider are provided for each item. The reports generated by COVs are used in assessing agency progress in order to meet government-wide performance reporting requirements, and are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

ARRA Addendum: Awards funded by the American Recovery and Reinvestment Act (ARRA) were made during the period of time under review by the COV. We have included questions on the template that deal explicitly with this subset of the overall portfolio and the extent to which it met the objectives of the Act and the priorities articulated by the NSF Director. Key information regarding ARRA and NSF priorities as well as optional program-specific priorities will be provided to you.

We encourage COV members to provide comments to NSF on how to improve in all areas, as well as suggestions for the COV process, format, and questions. For past COV reports, please see http://www.nsf.gov/od/oia/activities/cov/covs.jsp.

FY 2010 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV:
Program/Cluster/Section:
Division:
Directorate:
Number of actions reviewed: **Awards:** **Declinations:** **Other:**
Total number of actions within Program/Cluster/Division during period under review: **Awards:** **Declinations:** **Other:**
Manner in which reviewed actions were selected:

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

A.1 Questions about the quality and effectiveness of the program's use of merit review process. Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	**YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[1]**
1. Are the review methods (for example, panel, ad hoc, site visits) appropriate? Comments: Source: Jackets and Program Director Presentations.	
2. Are both merit review criteria addressed a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? Comments: Source: Jackets	

[1] If "Not Applicable" please explain why in the "Comments" section.

3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals? Comments: Source: Jackets	
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? Comments: Source: Jackets	
5. Does the documentation in the jacket provide the rationale for the award/decline decision? (Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.) During FY 2009, NSF permitted reversal of a declined decision for funding through ARRA for proposals declined after October 1, 2008. (NOTE: This question does not apply to programs for which the reversal decline option was not used.) i) Were the reversals of the decision to decline based on both the high quality* of the reviews received on the initial submission and the lack of available funding at the time the origin was made? *Rated "Very Good or above" or the functional equivalent by review panels. ii) Is documentation provided, including a revised Review Analysis, to support the award decisions? Comments: Source: Jackets	

6. Does the documentation to PI provide the rationale for the award/decline decision? (Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.) Comments: Source: Jackets	
7. Is the time to decision appropriate? Note: Time to Decision --NSF Annual Performance Goal: **For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later**. The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals. Comments: Source: Jackets and Data available on Website.	

8. Additional Comments

a) Additional comments on the quality and effectiveness of the program's use of merit review process.

b) To what extent does the documentation in the jacket or otherwise available provide the rationale for use of ARRA funding?

Source: document "American Recovery and Reinvestment Act (ARRA) in DMR"

A.2 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	**YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[2]**
1. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: Source: Jackets	
2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups? Note: Demographic data is self reported, with only about 25% of reviewers reporting this information. Comments: Source: Jackets.	

[2] If "Not Applicable" please explain why in the "Comments" section.

3. Did the program recognize and resolve conflicts of interest when appropriate? Comments: Source: Jackets and Program Director Presentations	

4. Additional comments on reviewer selection:

A.3 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[3], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: Source: Highlights and Program Director Presentations.	
2. Does the program portfolio promote the integration of research and education? Comments: Source: Program Director Presentations.	
3. Are awards appropriate in size and duration for the scope of the projects? Comments: Source: Jackets and Data available on website.	
4. Does the overall program portfolio (including ARRA funded awards) have an appropriate balance of innovative/potentially transformative projects?	

[3] If "Not Appropriate" please explain why in the "Comments" section.

ARRA Specific Question: Does the ARRA funded portfolio have an appropriate balance of innovative/potentially transformative projects? Comments: Source: Highlights and Program Director Presentations.	
5. Does the program portfolio have an appropriate balance of: • Inter- and Multi- disciplinary projects? Comments: (can combine with question 10 on p. 12) Source: Jackets, program information, and data e.g. on jointly funded projects.	

6. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program? Comments: Source: Program Director Presentations.	
7. Does the overall program portfolio (including ARRA funded awards) have an appropriate balance of awards to new investigators? ARRA Specific Question: Does the ARRA funded portfolio have an appropriate balance of awards to new investigators? NOTE: A new investigator is defined as an individual who has not served as the PI or co-PI on any award from NSF (with the exception of doctoral dissertation awards, graduate or postdoctoral fellowships, research planning grants, or conferences, symposia & workshop grants.) Comments: Source: Program Director Presentations.	
8. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators?	

Comments: Source: Data available on website.	
9. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: Source: Data available on website.	
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity? Comments: Source: Jackets and program information	

11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: Source: Data available on Web and Program Director Presentations.	
12. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. Comments: Source: Program Director Presentations and information on DMR COV website under public attachments.	
13. Additional comments on the quality of the projects or the balance of the overall portfolio (including ARRA funded awards). ARRA Specific Comments: Additional comments regarding the portfolio of ARRA awards addressing the NSF or program-specific priorities for ARRA funding?	

A.4 Management of the program under review. Please comment on:

1. Management of the program. Comments:
2. Responsiveness of the program to emerging research and education opportunities. Comments:
3. Program planning and prioritization process (internal and external) that guided the development of the portfolio. Comments:
4. Responsiveness of program to previous COV comments and recommendations. Comments:
5. Additional comments on program management:

PART B. RESULTS OF NSF INVESTMENTS

The NSF mission is to promote the progress of science; advance national health, prosperity, and welfare; and secure the national defense (NSF Act of 1950).

In this Section, the COV is asked to comment on (1) noteworthy achievements based on NSF awards in the portfolio under discussion; (2) ways in which funded projects have collectively affected progress toward NSF's mission and the strategic outcome goals of Discovery, Learning, and Research Infrastructure: and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

In addition to identifying particularly noteworthy accomplishments or "highlights," the COV is encouraged to comment on the impact of NSF supported contributions to the field. For example, the COV report may include comments on NSF supported work in context of contributions to advance a field, impact of NSF investments to stimulate emerging new areas, and potential for transformative impact in research or education.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. The COV is asked to use this information, members' own knowledge of the field, and other appropriate information to develop its comments for this section.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: *"Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*
This category includes NSF's disciplinary and interdisciplinary research in science and engineering, education research, and centers.

Comments:

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.*"
This category includes K-12, undergraduate, graduate, and postdoctoral education and training; public understanding of science; and lifelong learning.

Comments:

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.*"
This category includes facilities, research instrumentation, and cyberinfrastructure.

Comments:

PART C. OTHER TOPICS

1. Organization

Materials science and materials engineering research in its broadest sense is conducted in divisions within the Directorate for Mathematical and Physical Sciences (MPS) as well as in other directorates throughout the Foundation. This distribution of programs and efforts may be seen as reflective of the vibrancy of the field but is it the most efficient and effective model for driving innovative high-risk materials research?

If there were the opportunity to configure a new materials research directorate within the Foundation, what would the COV like to see included in such a directorate and should it be structured along traditional or thematic areas?

If it were impractical to create a new directorate, is the current structure of DMR appropriate and sufficiently agile to catalyze emerging research areas? If not, what structure(s) would you recommend be considered?

2. Facilities and Instrumentation

DMR is invested in providing the materials research community with state-of-the-art facilities and instruments. It supports research and development of major facilities such as Coherent Light Sources, is the steward of national user facilities such as light sources and the high magnetic field laboratory, and supports the acquisition, conceptual design and/or construction of midscale instrumentation by/for the materials research community. The support for facilities and instrumentation initiatives amounts to approximately 20% of the annual budget.

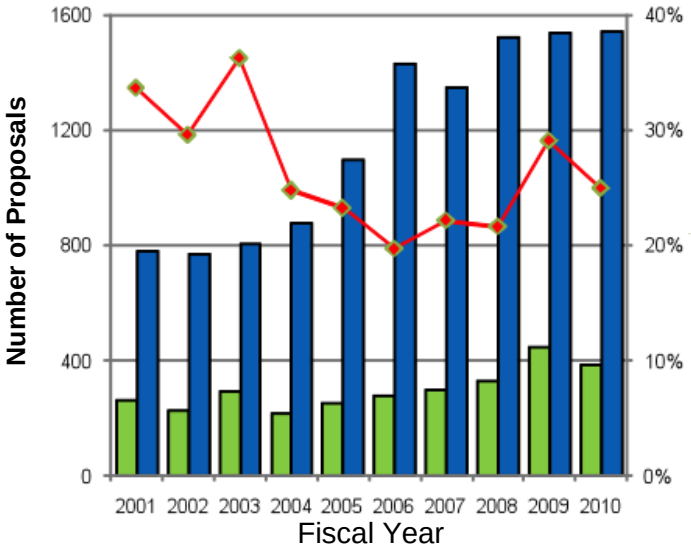
Is the current portfolio of user facilities and instrumentation programs appropriate or are there activities that should be receiving more attention?

How does this portfolio fit within the national context of tools for materials research?

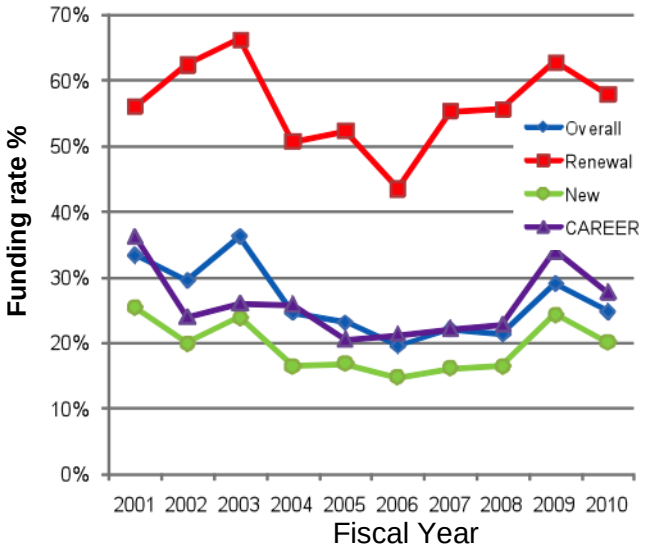
Within the 20% of annual budget for tools, is the balance across all scales healthy and appropriate?

3. Balancing system pressure, award size and success rate.

The following figures summarize the historical trend in number of proposals submitted, number of awards made, funding rate and the success rate for renewal proposals as well as for new proposals:



DMR 10-year funding history for Individual Investigator awards. Funding rate, Funded proposals proposals submitted.



DMR ten-year history of funding success rate for Individual Investigator awards.

Given this information along with the workload pressure this places on the entire systems, program directors, reviewers and budget, what would you recommend with regard to:

- Restricting the number of submissions a PI can make in any one funding cycle in DMR, to any division within MPS, and to the Foundation.

Note: The following appears on the NSF DMR homepage:

"DMR discourages the submission of more than one proposal from the same Principal Investigator during the proposal-submission window."

- Restricting the number of times a declined proposal can be resubmitted by the PI. Here it is important to remember that if the proposal is submitted with substantial changes, it must be reviewed; the program managers have little flexibility to reject a proposal without review.

- Balancing the size of the award with the success rate

- Rebalancing the research portfolio to make the award size larger and have an acceptable funding rate, but in fewer research areas.

4. Broader impacts

The director of NSF, Dr. Subra Suresh, indicated in a recent article in Science that he might like to see some rethinking of the review criterion related to the "broader impacts" component of research proposals.

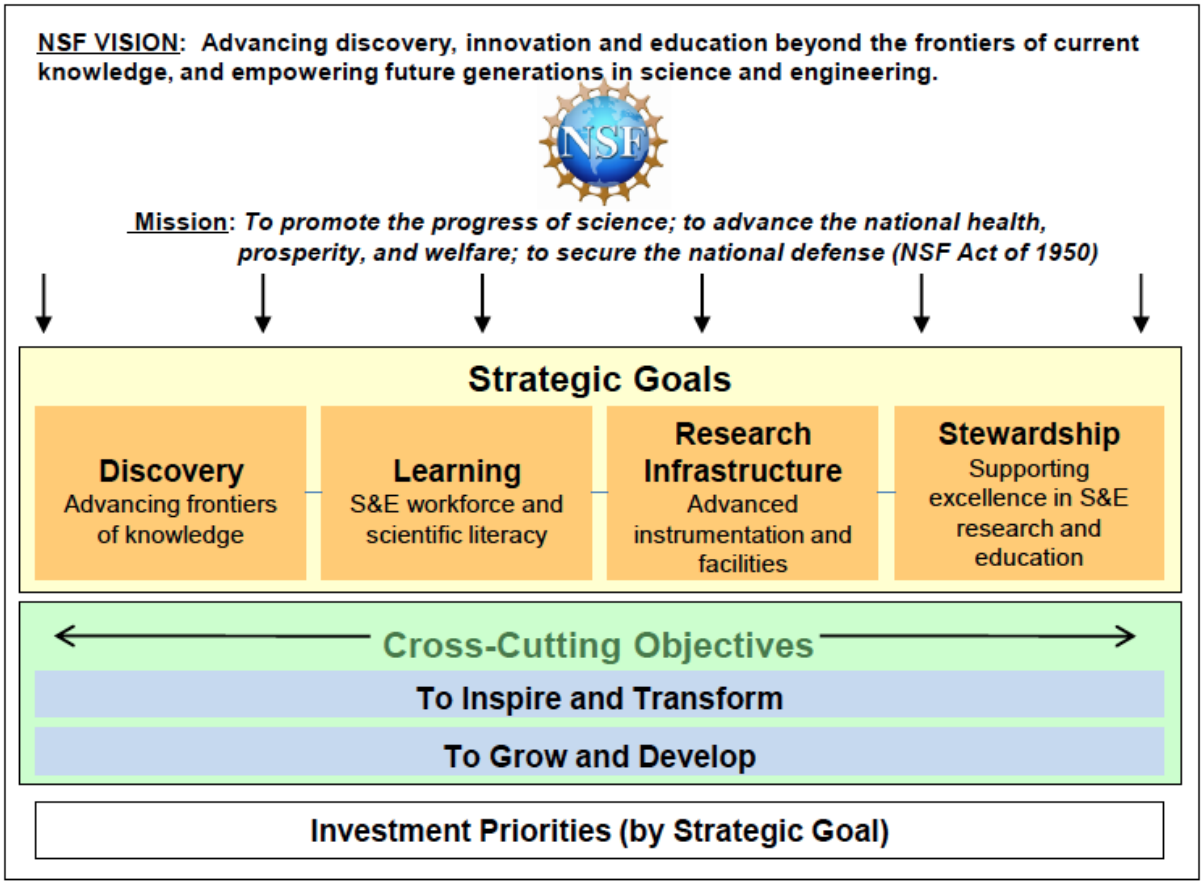
The following, extracted from the Grant proposal Guide, gives different categories of broader impacts:

a. How well does the activity advance discovery and understanding while promoting teaching, training, and learning?

b. How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
c. To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
d. Will the results be disseminated broadly to enhance scientific and technological understanding?
e. What may be the benefits of the proposed activity to society?
f. Mentoring activities provided to postdoctoral researchers

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

What recommendations would the COV give regarding how to reformulate the broader impacts component of research programs, including individual investigator as well as centers, to make it more



effective and meaningful such that the Foundation goals are met?

SIGNATURE BLOCK:

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For the 2011 Division of Materials Research Committee of Visitors
Dr. Murray Gibson
Chair