

Division of Materials Research

National Science Foundation
Arlington, VA

MEMORANDUM

Date : May 1, 2002
To : Dr. Robert A. Eisenstein
From : Director, Division of Materials Research
Subject : Response to the 2002 DMR Committee of Visitors Report

I would like to express my sincere thanks to the members of the 2002 Committee of Visitors (COV) for the Division of Materials Research (DMR) for the thoughtful, insightful, and fair report that they have produced. Chairman Narayanamurti and his colleagues have provided a document that contains substantive and very useful recommendations. I have read the report closely, and I intend to follow up on the suggestions therein.

Overall Findings: We would like to commend the Division and its program directors for running an outstanding program consistent with broad national and NSF objectives in all areas vis-à-vis People, Ideas and Tools. The DMR and MPS management clearly responded to the issues raised by the last COV and considerable progress was noted in the area of merit review criteria, particularly of criteria II, use of which has steadily increased. We continue to find the Program Directors (PD's) overworked and were pleased to note that two additional slots have been authorized. The size and duration of awards have shown improvement over the last three years and we urge continued emphasis in this area so that the goal of median (not mean) grant size of \$130,000 to \$150,000 a year over four years is attained as soon as possible.

I share the concern of the COV that the size and duration of awards is still inadequate. As the COV has pointed out the Division Director's Reserve has been used to increase the median grant size. I will continue to put half of any increase over \$20,000 into the program from the reserve until the median annualized grant size reaches at least \$150,000 per year. In addition, the grant duration is currently at 3.4 years and I will continue to encourage Program Directors to increase the average duration to four years over the next three years which is more in line with the time which it takes to educate a graduate student.

1/21/05: The use of Criterion II has been strongly emphasized by NSF since the last DMR COV; it is used routinely by panelists and by most mail reviewers for DMR. Award and declination documentation will be made

available at the FY 2005 COV review. DMR has continued to increase median grant size and duration in individual investigator programs since FY 2001. Reserve funds are used to encourage larger awards on renewal. Data on award size and duration are being made available to the FY 2005 Committee of Visitors.

Balance of Programs: *The DMR has basically two major pieces: (1) individual investigators and small groups (3 PI's or less) and; (2) large centers and instrumentation facilities. We did not have time to look at the balance between the individual investigator/ small group activities vs. the larger initiatives and centers. We believe this balance should be looked at carefully by the next COV. In the meantime, we hope that all efforts will be made to make sure that individual investigators/small group awards are not squeezed in relation to other major national initiatives. At the same time, we would like to express our enthusiastic support for the increasing levels of interdisciplinary and collaborative programs in DMR.*

Much of the current NSF emphasis on the multidisciplinary initiatives in priority has put additional pressure on available funds for core programs. Efforts will be made to increase the core funding of the individual investigator portfolio. In addition, within a year I will convene a special emphasis panel of experts to study the issue of balance within the portfolio and make recommendations to the division.

1/21/2005: Program balance continues to be a concern in the context of NSF-wide initiatives, operating costs for facilities, and the need for state-of-the-art instrumentation in materials research. A special emphasis panel has not been convened to date, however. Data on support levels for individual investigator/small group awards, centers, facilities and initiatives will be provided to the FY 2005 COV.

Director's Reserve Fund: *We were generally very pleased with the usage of the Director's Reserve Fund as a means to foster the broader goals of the foundation, to fund higher risk multi-disciplinary projects, to grow the size of awards, to encourage diversity and to enhance the coupling of education and research.*

I concur with this and find it a very useful tool to accomplish the Foundation's goals of increasing diversity, etc., and intend to continue this innovation.

1/21/2005: DMR has continued the use of reserve funds to foster the broader goals of NSF.

Staffing Issues: *As mentioned in the overall findings, the workload for the PD's is very high. With the growth of interdisciplinary programs and collaborations this workload is further exacerbated. We recommend that*

further attention be paid to providing adequate staffing levels in DMR from the highest management of the foundation. Even though the policy of rotation of PD's is a good one, the ceramics area has suffered from high turnover. Providing stability for this area is important. We also note that one or two minority members amongst the PD's are likely to leave soon due to the policy of rotation. Given the small pool of candidates, we feel it is important that extra effort be made to maintain diversity amongst the PD's in DMR.

As noted by the COV, the division will have two new Program Directors starting soon. This should help to alleviate some of the current workload. In the coming year, other recruitments will be initiated to try to hire another minority Program Director. In addition, I will pursue obtaining a permanent Program Director for the Ceramics Program.

1/21/05: DMR has added two full-time Program Director positions and one Senior Staff Associate position since FY 2001, and has hired outstanding personnel to fill these additional positions. Two of the three positions have been filled by women. Over the same period, DMR has reduced the number of support staff positions. In addition one minority Program Director who was a Visiting PD has accepted a permanent position in DMR. The Ceramics position is not filled by a permanent Program Director, but the same PD (Dr. Madsen) has directed the program continuously since December 2000.

PD Judgment: *We were generally pleased to note how carefully the Program Directors had documented the rationale for funding. The peer review system can sometimes lead to very conservative modes of funding. In evolving scientific areas with high risk, this judgment has to be provided by the PD after input from reviewers and PI's. We found positive evidence for funding by program directors for higher risk projects. We encourage this trend.*

I will continue to encourage the high standards thus far achieved, including judicious support for high-risk projects.

1/21/05: DMR continues to use reserve funds to encourage support for high-risk proposals and other activities.

Reviewer Pool: *We are concerned with the small number of industrial and national lab reviewers (~ 5%). As detailed in the report, we recommend that special efforts be made to enlarge this pool.*

With the slow demise of major industrial research institutions such as Bell Laboratories and IBM, it has become much more difficult to find industrial reviewers in areas such as Condensed Matter Physics. In addition, in some fields the pool of underrepresented scientists is quite small. Efforts will be made in the coming years to increase the use of industrial and national

laboratory reviewers by stressing to the Program Directors the importance of increasing their numbers.

1/21/05: Program Directors are aware of the need to include industrial and National Lab reviewers for proposal evaluation to the extent possible. Data on reviewer demographics will be made available to the FY 2005 COV.

COV Process: The Division of the review panel into 3 major clusters (Basic Sciences, Centers and Facilities, and Materials) was generally viewed with favor. However, the very strict interpretations of the Foundation's rules on COI greatly complicated this review and in some regards made it less effective than it might otherwise have been. If our expertise could not be used in its most effective way in the context of the COV review, one worries this limitation must effect other major evaluations and reviews undertaken by the NSF. Some method has to be found to relax these very burdensome constraints. There are also other detailed suggestions for improvement in the COV process in section B6.

One issue noted by the COV was that the very strict interpretation of the Foundation's rules on COI greatly complicated the review. This rule states that "no one with an action under consideration in a program could review that program". This requirement effectively eliminated anyone who was funded by a program since a yearly or final progress report constitutes an action under consideration. This issue will be brought to the attention of the Office of General Counsel to see if the wording can be changed to refer to "a proposal under consideration in the program," thus relaxing a very burdensome constraint.

1/21/2005: The rules on COIs are defined for NSF as a whole and have not been relaxed.

As detailed in section B6, the COV found it difficult to find additional nuggets, other than those examples cited in the Program Director Annual Reports, to include in the reporting template. To make it easier for the COV members chose other nuggets, I have asked each Program Director to compile a CD of nuggets from all of the projects, which they fund. These will be distributed to each member of the next COV.

1/21/05: CDs of nuggets from each DMR program, representing several hundred awards each year, were compiled for FY 2002, 2003 and 2004 and have been made available to the current COV members.