Report of the Committee of Visitors
Division of Materials Sciences and Engineering
Office of Basic Energy Sciences
U.S. Department of Energy

to the

Basic Energy Sciences Advisory Committee

Review of Fiscal Years 2006, 2007, 2008

Germantown, Maryland
March 31 – April 2, 2009

Executive Summary

A Committee of Visitors (COV), under the guidance of the Basic Energy Sciences Advisory Committee (BESAC), reviewed the programs of the Materials Science and Engineering Division within the DOE Office of Basic Energy Sciences over the fiscal years 2006, 2007 and 2008. Thirty-four members of the committee met at the Germantown headquarters of BES on 31 March – 2 April, 2009. The charge to the COV came from Prof. John Hemminger, the chair of BESAC, and was: (i) For both DOE laboratory projects (Field Work Programs, FWPs) and university projects assess the efficacy and quality of the process used to solicit, review, recommend, and document proposal actions and to monitor active projects and programs. (ii) Within the boundaries defined by the DOE missions and available funding, comment on how the award process has affected the breadth and depth of portfolio elements, and the national and international standing of the portfolio elements. In addition, the COV was asked to provide input to the Office of Management and Budget (OMB) evaluation of the BES progress towards the long-term goals specified in the OMB Program Assessment Rating Tool (PART). The COV was chaired by Dr. Simon R. Bare and the format of the review was similar to that used in the prior COVs.

The COV would like to commend all of the Division staff and program managers for their dedication, professionalism, and skill. The fact that the positive findings of the COV greatly outweighed the negative findings is testimony to individuals who make the process work, and the process does work. The COV found that the best science is being funded and the science and individuals are of both national and international caliber.

There was a significant amount of discussion regarding the flexibility of the current system and the desire to impose a more rigid structure. This COV believes this will be an ongoing debate for future COVs and between principal investigators and program managers. A specific example of this is the flexibility in the proposal structure that is currently used versus using a mandated electronic template. As could be imagined, arguments can be given for both systems. We chose not to make any broad recommendations on this issue, but decided to leave the comments unedited in the specific panel reports.

The six programs within the Department of Material Sciences and Engineering (DMS&E) were individually rated with respect to the long-term goals of the Office of Basic Energy Sciences. For all the programs, in all categories which were applicable, the COV gave the highest rating possible: “excellent”. This is a manifestation of the comments made above regarding the program managers and Division management, with the cooperation of the PIs.

The staff, program managers, and DMS&E management are thanked for their help before and during this COV, and for the fantastic organization. This ensured that the whole COV process was conducted in an efficient and productive manner. All involved responded in a timely manner to the myriad of requests asked of them during the COV process.

The COV makes the following specific major recommendations:

- The influx of new money is an opportunity to implement ambitious new programs and directions, and to increase the average grant size.

- The highest priority should be given to implement the proposed Portfolio Analysis and Management System (PAMS) information management system – the single recommendation of the 2008 Division of Chemical Sciences, Geosciences and Biosciences (CSGB), is fully and strongly endorsed.

- The staffing level should be reviewed to ensure that it is commensurate with increased workload as a result of increased funding and proposal pressure.

- Improve communication methods to the research community, e.g. via a vastly improved BES website.

- Proposal submission and award process should be more transparent.

- The increased use of white papers is encouraged.

- Travel budget for PMs should be further increased to allow them to attend national & international meetings and to visit PIs on site.

- The EPSCoR Study Group recommendations (in response to the 2006 COV report) should be fully implemented.

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1. Introduction

This report documents the findings from a Committee of Visitors (COV) that was assembled under the auspices of the Basic Energy Sciences Advisory Committee (BESAC) to evaluate the processes and programs of the Division of Materials Sciences and Engineering Division (DMSE) in the Office of Basic Energy Sciences (BES). The COV met at the Department of Energy facilities in Germantown, MD for two and one-half days from March 31 through April 2, 2009. This was the third in the series of COV reviews of the MS&E Division; the first held in March 2003, the second April 2006.

2. The Charge to the Committee of Visitors

The charge to the COV was established in a letter from the Chair of BESAC to Dr. Simon R. Bare, a member of BESAC who had agreed to chair the COV. The letter is attached as Appendix I. The charge was to address the operations of the DMSE during the fiscal years 2006, 2007, 2008. The components of the Division that the COV was asked to review were: Materials Chemistry, Biomolecular Materials, Synthesis and Processing Science, X-ray Scattering, Neutron Scattering, Electron and Scanning Probe Microscopy, Ultrafast Science, Experimental Condensed Matter Physics, Theoretical Condensed Matter Physics, Mechanical Behavior and Radiation Effects, Physical Behavior of Materials, and the Experimental Program to Stimulate Competitive Research (EPSCoR).

The COV was asked to focus on the following major elements: (i) For both DOE laboratory projects (Field Work Programs, FWPs) and university projects assess the efficacy and quality of the process used to solicit, review, recommend, and document proposal actions and to monitor active projects and programs. (ii) Within the boundaries defined by the DOE missions and available funding, comment on how the award process has affected the breadth and depth of portfolio elements, and the national and international standing of the portfolio elements.

In addition, the COV was asked to provide input to the Office of Management and Budget (OMB) evaluation of the BES progress towards the long-term goals specified in the OMB Program Assessment Rating Tool (PART).

3. The Committee Membership

The COV membership was selected by the COV chair, Simon R. Bare, in consultation with the Division staff. The members were chosen to represent a cross-section of experts in their particular scientific field. A balance was achieved between researchers who currently receive funding from BES and those that do not (21 and 12, respectively), between academic (20), national laboratory (8) and industrial researchers (4), between

those that have previously served on a COV and those that have not (6 and 29, respectively), and also including some members from EPSCoR states (5).

Dr. Simon R. Bare, of UOP LLC, a Honeywell Company, a member of BESAC, and a member of a previous Chemical Sciences, Geosciences and Biosciences COV, chaired the COV.

Given the size of the Division and the breadth of programmatic areas, a sizable committee was assembled. The original COV consisted of a total of 35 members, including the chair, but due to a family illness Dr. Robert Dimeo was unable to attend. The remaining 33 members were divided between 6 panels for the first read, and 7 panels for the second read (which included the read for the EPSCoR program).

The following COV members kindly agreed to be the panel leads: Sam Stupp, NWU (Materials Chemistry and Biomolecular Materials), Ivan Bozovic, Brookhaven (Synthesis and Processing Science), John Tranquada, Brookhaven (X-ray and Neutron Scattering), Susanne Stemmer, UCSB (Electron and Scanning Probe Microscopy and Ultrafast Science), Brian Maple, UCSD (Experimental and Theoretical Condensed Matter Physics, and Robert Hull, RPI (Mechanical Behavior and Radiation Effects and Physical Behavior of Materials.

A full listing of the COV members and their panel assignments for both the first and second reads is given in Appendix II and Appendix III, respectively.

4. The Review Process

The COV assembled in Germantown at 8:30 AM on Tuesday, March 31, and adjourned at 10:00 AM on Thursday, April 2. The agenda for the COV is attached as Appendix IV.

Prior to convening in Germantown, each COV member was supplied with a binder containing a comprehensive set of information pertaining to: the COV process, the report template, the core research activities of the Division, research highlights from the Division, the procedures used by BES in reviewing both university and national laboratory programs, a solicitation listing covering the COV period, and a copy of the 2006 DMSE COV report together with the response from BES. This comprehensive document was found to be critically useful in setting the stage for the actual COV and enabled the panel members to be fully aware of their expectations. Additional information was also supplied to each member at the COV. The new binder also included copies of the plenary presentations, a more detailed overview of each of the Division's programs, a summary of the EPSCoR program, and a copy of a DOE EPSCoR Study Group Recommendation.

The COV began with a reiteration of the charge from the BESAC chair, John Hemminger. This was followed by an overview of BES by Dr. Harriet Kung, the Director of BES, an overview of the DMSE by the Acting Director Jim Horwitz, and a presentation on some

statistics from the Division by John Vetrano. The panel members were then presented with some details of the overall review process by the COV Chair, Simon R. Bare before adjourning to their panel break-out rooms.

The first reading began with an overview of the particular program by the respective program manager. Each panel was supplied with a set of proposals to evaluate the DMSE award/decline/monitor process. These proposals were distributed among four types of program decisions: easy awards, easy declines, difficult awards, and difficult declines, with 2 – 4 proposals in each program area, and thus a total about 16 proposals per panel. The projects included laboratory based projects (FWPs) and university grants. The panels were free to request any additional materials (including other jackets) and information that they felt would help them in their evaluation process. The program managers were not present during the panel review process but were always on hand to answer questions or provide additional input as needed.

The first reading occupied the remainder of the first day, with the exception of a brief overview by Linda Blevins on the new Portfolio Analysis and Management System (PAMS). The panels prepared preliminary conclusions that were discussed with the COV chair, and shared with the Division senior management, Jim Horwitz and Helen Kerch. Informal discussion and documentation continued well into the evening. The template used by the panels for their reports is presented in Appendix V.

On the morning of the second day, the panel members were assigned to different panels for the second read. The panel leads, however, remained to add continuity and context for the second read members. The second read allowed the refinement and review of the preliminary findings from the first read. Also on the second day, a seventh sub panel was assembled, led by Arunava Gupta, University of Alabama, to conduct the first and only read of the EPSCoR program.

During the afternoon of the second day, the original members of each panel reconvened (with the exception of the EPSCoR panel which continued their deliberations) with the panel lead to merge and finalize the findings from the first and second reads, and to prepare materials for the final report. The entire COV then met in executive session to discuss and reach consensus on the major findings and recommendations.

On the morning of the third day the entire COV met and presented the major findings and recommendations to Dr. Harriet Kung, the Division heads, and all of the program managers.

The written reports from the panels (Appendix VI and Appendix VII) and the conclusions and recommendations drawn from the executive session provided the basis for this report.

5. Major Findings of the COV

1 The level of staffing of DMS&E has increased since the last COV. This has coincided with a restructuring of the Division into three teams, with close coupling between the teams. The new program managers are fully integrated into the Division and are performing admirably. In the last DMS&E COV, it was noted that the division was understaffed and that there should be an effort to recruit new program managers (PMs). As presented in the overview talk by Acting Director Jim Horwitz, the Division will soon have (with the three positions yet to be filled) an adequate staffing level for the current workload.

2 All of the Division staff and program managers should be commended for their dedication, professionalism, and skill. The proposal review procedures are of highest quality and consistency. It was found that a sufficient number of reviews on each proposal were solicited and received, and yet the whole process is flexible enough to allow the PM to make fair and informed decision.

3 The funding decisions fully reflected the criteria documented in the program solicitations - the quality of science constituting the most important factor. This is a critical point: the quality of the proposed science should be the dominant factor in a funding decision, and it is.

4 It was found that throughout the Division the science is of the highest quality – with national & international recognition.

5 The Basic Research Needs reports & workshops have been extremely valuable in identifying new scientific opportunities commensurate with the core mission of BES. This has helped both the PIs and PMs alike.

6 There was consensus that Contractor's meetings are a most effective method for the PMs and the PIs to interact. It was valuable for the PMs to directly interact with all of the PIs that are funded, and also allows the PIs to network, and form potential new collaborations (among other benefits). The COV strongly endorses regular contractors meetings, which are deemed to be essential to the health of the programs.

7 There needs to be a balance in the funding opportunities between early-career scientists and more established researchers. The COV thought that generally there is a good balance between established names and early-career scientists. The PMs are to be commended for finding this appropriate balance.

8 A significant instrument for monitoring research programs is the annual progress report. The program managers are highly conscientious about reading and understanding the reports, and use this in their decision making process.

9 Generally the awards are of appropriate size, scope & duration. But, and this is a significant "but", this was only within the constraints of limited funding that was available during the COV period. There were four major funding initiatives in the COV period that were within the core mission of BES but with no awards made due to the dire funding situation.

10 The PMs use a variety of mechanisms for monitoring projects, e.g. Contractor's meetings, annual progress reports, site visits, conferences, etc. The COV found that this method is appropriate and working well.

11 There is a laudable commitment to balance the funding of excellent science between "hot" topics and other mission relevant fields.

12 The DMS&E is a unique source of critical research funding in many areas. For example, as a result of DOE/BES funding the US has today a clear lead in atomic-layer (digital) engineering of new functional meta-materials. This was an advanced materials synthesis technique identified in recent DOE/BES Workshop as one of the priority research directions.

13 Due to the diversity of the proposals received through EPSCoR, the COV found that the additional numerical criteria are useful for rating EPSCoR proposals.

14 The last COV was quite critical of monitoring and evaluation of the EPSCoR programs. This COV found that there has been a noticeable process improvement in the evaluation and monitoring in the EPSCoR program.

15 Overall, the funding level within DMS&E has been grossly inadequate during the period reviewed by the COV. This has negatively impacted the whole Division enterprise in several major ways:

- Many excellent proposals were not supported due to these inadequate funding levels.

- The COV noted that the DMS&E has been unable to create new programs. Creating new programs is central to the vitality of the research process and portfolio.

- There is little funding for mid-scale instrumentation at universities. There has been a shortage of funding for instruments in the $250,000 - $5,000,000 price range; a range that is difficult to obtain from other sources, and yet a common range for many state-of-the-art laboratory instruments which are critical for the PIs to effectively conduct their research.

16 The COV noted that there is a lack of clear and consistent guidance on multi-agency funding acknowledgements.

6. Major Recommendations of the COV

- The influx of new money is an opportunity to implement ambitious new programs and directions, and to increase the average grant size. Both the money from the American Recovery and Reinvestment Act 2009 and the FY2009 Omnibus Appropriations Act 2009 provide a unique opportunity to be bold and steer the Division into new scientific directions and opportunities.

- The highest priority should be given to implement the proposed Portfolio Analysis and Management System (PAMS) information management system. This COV strongly endorses the single recommendation of the 2008 CSGB. The strength of this recommendation can not be overstated. There are a plethora of examples from this COV where a reliable, efficient, usable information management system would greatly aid all involved.

- The staffing level should be reviewed to ensure that it is commensurate with increased workload as a result of increased funding and proposal pressure. An appropriate staffing level is critical to the efficiency and overall operation of the Division.

- The COV noted several examples where it appeared that the level of communication between DMS&E and the PIs was below what is optimal. This COV therefore recommends that there be an improvement in the communication methods to the research community. One suggested path forward is to drastically improve and keep current the BES website. The website should be the place where a PI can obtain complete information about all aspects of the DMS&E, including proposal submission guidelines and deadlines, new funding announcements and the research areas and directions that fall under the purview of DMS&E.

- The entire proposal submission and award process should be more transparent.

- The increased use of white papers is encouraged. The COV believes that white papers are an effective means to hone or discourage full proposals as appropriate. However, it is noted that communicating to PIs the advantages of a white paper prior to a full proposal has been a challenge.

- The travel budget for PMs should be further increased to allow them to attend national and international meetings and to visit PIs on site. These are critical components for the information gathering that is needed by the PM.

- Following the last COV, a DOE EPSCoR Study Group was convened to make recommendations regarding the program. This COV recommends that the EPSCoR Study Group recommendations should be fully implemented.

OMB Program Assessment Rating Tool (PART): Long Term Measures for DOE/BES

One of the charges of the COV was to provide input for the OMB evaluation of the BES progress towards the long-term (by 2015) goals specified in the OMB Program Assessment Rating Tool (PART). These goals are:

1) By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.
2) By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.
3) By 2015, develop new concepts and improve existing methods for major energy research needs identified by the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs for a Secure Energy Future.
4) By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

The full description of the PART goals together with the definitions of the ratings is provided in Appendix V.

Ratings given by 2009 COV

Program Area	Goal 1	Goal 2	Goal 3	Goal 4
Materials chemistry and biomolecular materials	**Excellent**	**Excellent**	**Excellent**	**Excellent**
Synthesis and processing science	**Excellent**	**Excellent**	**Excellent**	**Excellent**
X-ray and neutron scattering	**Excellent**	**n/a**	**Excellent**	**Excellent**
Electron and scanning probe microscopy / Ultrafast science	**Excellent**	**Excellent**	**Excellent**	**Excellent**
Experimental and theoretical condensed matter physics	**Excellent**	**n/a**	**Excellent**	**Excellent**
Mechanical behavior and radiation effects / Physical behavior of materials	**Excellent**	**Excellent**	**Excellent**	**Excellent**

Appendix I: Charge from the Chair of BESAC, Prof. John Hemminger to the Chair of the COV, Dr. Simon R. Bare.

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February 25, 2009

Dr. Simon Bare
Senior R&D Associate
UOP LLC
15 East Algonquin Road
Des Plaines, IL 60017

Dear Dr. Bare:

The Basic Energy Sciences Advisory Committee (BESAC) has been charged by the Department of Energy Office of Science to assemble a Committee of Visitors (COV) to review the management processes for the Materials Sciences and Engineering Division of the Basic Energy Sciences (BES) program. Thank you for agreeing to chair this BESAC COV panel. Under your leadership, the panel should provide an assessment of the processes used to solicit, review, recommend, and document proposal actions and monitor active projects and programs.

The panel should assess the operations of the Division's programs during the fiscal years 2006, 2007, and 2008. The panel may examine any files from this period for both DOE laboratory projects and university projects. The components of the Division that you are being asked to review are:

1. Materials Chemistry
2. Biomolecular Materials
3. Synthesis and Processing Science
4. X-Ray Scattering
5. Neutron Scattering
6. Electron and Scanning Probe Microscopy
7. Ultrafast Science
8. Experimental Condensed Matter Physics
9. Theoretical Condensed Matter Physics
10. Mechanical Behavior and Radiation Effects
11. Physical Behavior of Materials
12. EPSCoR

You will be provided with background material on these program elements prior to the meeting. The COV is scheduled to take place on March 31, 2009 through April 2, 2009 at the BES/DOE Germantown location at 19901 Germantown Road, Germantown,

Maryland 20874-1290. A presentation to BESAC is requested at its Summer 2009 meeting (as yet unscheduled). Following acceptance of the report by the full BESAC committee, the COV report with findings and recommendations will be presented to the Director of the Office of Science.

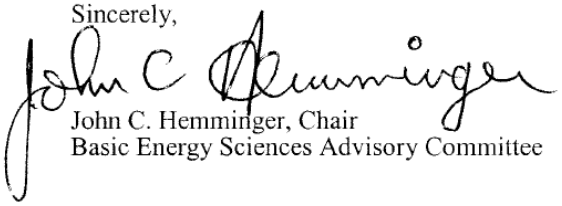
I would like the panel to consider and provide evaluation of the following four major elements:

1. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
   (a) solicit, review, recommend, and document proposal actions and
   (b) monitor active projects and programs.
2. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
   (a) the breadth and depth of portfolio elements, and
   (b) the national and international standing of the portfolio elements.

In addition to the above elements, the panel is asked to provide input for the Office of Management and Budget (OMB) evaluation of Basic Energy Sciences progress toward the long-term goals specified in the OMB Program Assessment Rating Tool (PART, attached). Each of the components (or sub-components, if appropriate) of the Materials Sciences and Engineering Division should be evaluated against each of the four PART long-term goals. If a particular long-term goal is not applicable to a specific program component, please indicate so in the evaluation. Note that the OMB guidelines specify ratings of (1) excellent, (2) good, (3) fair, (4) poor or (5) not applicable. In addition to these ratings, comments on observed strengths or deficiencies in any component or sub-component of the Division's portfolio, and suggestions for improvement, would be very valuable.

If you have any questions regarding BESAC or its legalities, please contact Katie Perine, Office of Basic Energy Sciences at 301-903-6529 or by e-mail at katie.perine@science.doe.gov. Christie Ashton, the Program Analyst for the Materials Sciences and Engineering Division, will provide logistical support for the COV meeting. She may be contacted by phone at 301-903-0511 or by e-mail at Christie.Ashton@science.doe.gov. For questions related to the Materials Sciences and Engineering Division, please contact Jim Horwitz, 301-903-4894, or by e-mail at James.Horwitz@science.doe.gov. Also, if I can be of any help with the process, please feel free to contact me, 949-824-6020 or by email at jchemmin@uci.edu.

Sincerely,



John C. Hemminger, Chair
Basic Energy Sciences Advisory Committee

Attachment

cc: H. Kung
C. Ashton
K. Perine

Appendix II: COV Members and Contact Information

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Dr. Ivan Bozovic (Panel Lead) Brookhaven National Laboratory Condensed Matter and Materials Science Building 480 P. O. Box 5000 Upton, NY 111793-5000 Phone: 631-344-4973 Email: bozovic@bnl.gov	Professor Brian Maple (Panel Lead) University of California, San Diego Department of Physics 9500 Gilman Drive, Mail Code 0360 La Jolla, CA 92093-0360 Email: mbmaple@ucsd.edu
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Appendix III: COV Panel Assignments

First Read

Materials Chemistry and Biomolecular Materials	*Synthesis and Processing Science*	*X-ray and Neutron Scattering*
√ **Sam Stupp, NWU**	√ **Ivan Bozovic, Brookhaven**	√ **John Tranquada, BNL**
√ Arunava Gupta, U Alabama	√ *Juan de Pablo, University of Wisconsin*	√ *Tessema Guebre, NSF (formerly Clemson)*
√ *Don Murphy, Bell Labs (ret)*	√ *Roger French, DuPont*	√ Takeshi Egami, UT
√ Cyrus Safinya, UCSB	√ Peter Green, University of Michigan	√ *Bruce Chase, DuPont*
√ *Mike Ward, NYU*	√ Terry Tritt, Clemson	√ *Christian Vettier, ESS Lund Sweden*
√ Karen Winey, Penn	√ *Janice Reutt-Robey*	

Electron and Scanning Probe Microscopy/Ultrafast Science	*Experimental and Theoretical Condensed Matter Physics*	*Mechanical Behavior and Radiation Effects/Physical Behavior of Materials*
√ **Susanne Stemmer, UCSB**	√ **Brian Maple, UCSD**	√ *Robert Hull, RPI*
√ Roger Falcone (LBNL)	√ *Kevin Bedell, Boston College*	√ *Julia Weertman, NWU (retired)*
√ Geoff Campbell (LLNL)	√ Mark Jarrell, U of Cincinnati	√ Julia Phillips, Sandia
√ *Susan Dexheimer (WSU)*	√ John Rehr, University Washington-Seattle	√ Max Lagally, Wisconsin
√ Ulrike Diebold (Tulane)	√ Sashi Satpathy, University Missouri-Columbia	√ *Christina Trautmann*
	√ Joseph Thompson, LANL	

Second Read

Materials Chemistry and Biomolecular Materials	*Synthesis and Processing Science*	*X-ray and Neutron Scattering*
√ **Sam Stupp, NWU**	√ **Ivan Bozovic, Brookhaven**	√ **John Tranquada, BNL**
√ *Juan de Pablo, University of Wisconsin*	√ *Don Murphy, Bell Labs (ret)*	√ Roger Falcone (LBNL)
√ Julia Phillips, Sandia - (need to leave early on	√ *Mike Ward, NYU*	√ Cyrus Safinya, UCSB
√ Peter Green, University of Michigan	√ Mark Jarrell, U of Cincinnati	√ *Kevin Bedell, Boston College*
√ *Bruce Chase, DuPont*		√ *Susan Dexheimer (WSU)*

Electron and Scanning Probe Microscopy/Ultrafast Science	*Experimental and Theoretical Condensed Matter Physics*	*Mechanical Behavior and Radiation Effects/Physical Behavior of Materials*
√ **Susanne Stemmer, UCSB**	√ **Brian Maple, UCSD**	√ *Robert Hull, RPI*
√ Max Lagally, Wisconsin	√ *Roger French, DuPont*	√ Joseph Thompson, LANL
√ *Christina Trautmann*	√ *Tessema Guebre, NSF (formerly Clemson)*	√ Sashi Satpathy, University Missouri-Columbia
√ *Christian Vettier, ESS Lund Sweden*	√ Ulrike Diebold (Tulane)	√ Karen Winey, Penn
√ *Janice Reutt-Robey*		√ Takeshi Egami, UT

EPSCoR
√ Arunava Gupta, U Alabama
√ Terry Tritt, Clemson
√ *Julia Weertman, NWU (retired)*
√ John Rehr, University Washington-Seattle
√ Geoff Campbell (LLNL)

Names in Red indicate member of a previous COV
Names in italics indicate not currently funded by BES
Names in blue indicate the panelist is from an EPSCoR state

Merged Panel

Materials Chemistry and Biomolecular Materials	*Synthesis and Processing Science*	*X-ray and Neutron Scattering*
√ **Sam Stupp, NWU**	√ **Ivan Bozovic, Brookhaven**	√ **John Tranquada, BNL**
√ *Don Murphy, Bell Labs (ret)*	√ *Juan de Pablo, University of Wisconsin*	√ *Tessema Guebre, NSF (formerly Clemson)*
√ Cyrus Safinya, UCSB	√ *Roger French, DuPont*	√ Takeshi Egami, UT
√ *Mike Ward, NYU*	√ Peter Green, University of Michigan	√ *Bruce Chase, DuPont*
√ Karen Winey, Penn	√ *Janice Reutt-Robey*	√ *Christian Vettier, ESS Lund Sweden*

Electron and Scanning Probe Microscopy/Ultrafast Science	*Experimental and Theoretical Condensed Matter Physics*	*Mechanical Behavior and Radiation Effects/Physical Behavior of Materials*
√ **Susanne Stemmer, UCSB**	√ **Brian Maple, UCSD**	√ *Robert Hull, RPI*
√ Roger Falcone (LBNL)	√ *Kevin Bedell, Boston College*	√ Julia Phillips, Sandia
√ *Susan Dexheimer (WSU)*	√ Mark Jarrell, U of Cincinnati	√ Max Lagally, Wisconsin
√ Ulrike Diebold (Tulane)	√ Sashi Satpathy, University Missouri-Columbia	√ *Christina Trautmann*

EPSCoR
√ **Arunava Gupta, U Alabama**
√ Terry Tritt, Clemson
√ *Julia Weertman, NWU (retired)*
√ John Rehr, University Washington-Seattle
√ Geoff Campbell (LLNL)

Names in Red indicate member of a previous COV

Names in italics indicate not currently funded by BES

Names in blue indicate the panelist is from an EPSCoR state

Appendix IV: COV Agenda

AGENDA
Committee of Visitors Review of the Materials Sciences and Engineering Division
March 31 – April 2, 2009, DOE Germantown Complex

Tuesday, March 31, 2009			
Time	**Activity**	**Participants/Lead**	**Location**
7:30 am	Shuttle Pickup	COV Members/Christie Ashton	In Front of Hotel
7:40 am - 8:30 am	Check-in Germantown Facility	BES Staff/Christie Ashton	North Lobby
8:30 am - 8:45 am	Welcome and Charge to the Committee	John Hemminger, BESAC Chair	A-410
8:45 am - 9:00 am	Welcome and SC-BES Overview	Harriet Kung, BES Director	A-410
9:00 am - 9:30 am	DMS&E Overview	James Horwitz, (Acting) DMS&E Director	A-410
9:30 am - 9:45 am	DMS&E Statistics	John Vetrano, Program Manager	A-410
9:45 am – 10:00 am	Instructions, procedures, and schedule	Simon Bare, COV Chair	A-410
10:00 am - 10:20 am	Refreshment Break		A-410
10:20 am - 12:15 pm **First Read** Panel Breakout **Session I**	Panel 1 – Electron and Scanning Probe Microscopy/Ultrafast Science Panel 2 – Mechanical Behavior and Radiation Effects/Physical Behavior of Materials Panel 3 – Synthesis and Processing Science Panel 4 - X-ray and Neutron Scattering Panel 5 – Experimental and Theoretical Condensed Matter Physics Panel 6 - Materials Chemistry and Biomolecular Materials	Panel 1 – Susanne Stemmer, Lead DMS&E Rep: Jane Zhu Panel 2 – Robert Hull, Lead DMS&E Reps: John Vetrano, Refik Kortan Panel 3 – Ivan Bozovic, Lead DMS&E Rep: Bonnie Gersten Panel 4 – Robert Dimeo, Lead DMS&E Rep: Lane Wilson, Thiyaga Thiyagarajan Panel 5 – Brian Maple, Lead DMS&E Reps: Andy Schwartz, Michael Lee Panel 6 –Sam Stupp, Lead DMS&E Reps: Dick Kelley, Mike Markowitz	E-114 G-207 G-426 E-401 E-301 H-406
	• Panel Overview by DMS&E Rep (~ 15 min.) • Q & A with DMS&E Rep • Preliminary Review of Folders		
12:15 pm - 1:15 pm	Working Lunch		A-410
1:15 pm - 3:15 pm **First Read** Panel Breakout **Session II**	Same Breakout Panels and Meeting Locations as Listed in Session I • Review Folders • Formulate Panel Comments		
3:15 pm - 3:30 pm	Refreshment Break Coffee located at A-410		In Panel Rooms
3:30 pm - 4:00pm	COV Executive Session	COV Panel Leads and Chair	A-410
4:00 pm - 4:45 pm	COV and BES General Discussion	COV Panel Leads & Chair and BES Management	A-410
4:45 pm - 5:00 pm	PAMS – Portfolio Analysis & Management System	Linda Blevins, Office of Science	A-410
5:00 pm	Check-out Germantown Facility	COV members/Christie Ashton	North Lobby
5:00 pm	Shuttle Return to Hotel	COV members/Christie Ashton	Germantown Front Entrance
6:00 pm - 7:30 pm	BES-hosted Dinner	BES/DMS&E/COV members	Carrabba's

Wednesday, April 1, 2009

7:50 am	Shuttle Pick-up	COV members/Christie Ashton	In Front of Hotel
8:00 am - 8:30 am	Check-In Germantown Facility	COV members/Christie Ashton	North Lobby
8:30 am - 11:30 am **Second Read** Panel Breakout	Panel 1 – Electron and Scanning Probe Microscopy/Ultrafast Science	Panel 1 – Susanne Stemmer, Lead DMS&E Rep: Jane Zhu	E-114
	Panel 2 – Mechanical Behavior and Radiation Effects/Physical Behavior of Materials	Panel 2 – Robert Hull, Lead DMS&E Reps: John Vetrano, Refik Kortan	G-207
	Panel 3 – Synthesis and Processing Science	Panel 3 – Ivan Bozovic, Lead DMS&E Rep: Bonnie Gersten	G-426
	Panel 4 - X-ray and Neutron Scattering Panel 5 – Experimental and Theoretical Condensed Matter Physics	Panel 4 – Robert Dimeo, Lead DMS&E Rep: Lane Wilson, Thiyaga Thiyagarajan	E-401
	Panel 6 - Materials Chemistry and Biomolecular Materials	Panel 5 – Brian Maple, Lead DMS&E Reps: Andy Schwartz, Michael Lee, Arun Bansil	E-301
	Panel 7 - EPSCoR	Panel 6 –Sam Stupp, Lead DMS&E Reps: Dick Kelley, Mike Markowitz	H-406
	• Review of Folders • Formulate Panel Comments • Review 1st Read Comments Refreshments will be served in F-411	Panel 7 –Arunava Gupta, Lead DMS&E Rep: Tim Fitzsimmons	E-243
11:30 am - 12:30 pm	Working Lunch		A-410
12:30 pm - 1:30 pm	COV Executive Session Preliminary Panel Findings	COV Panel Leads and Chair	A-410
1:30 pm - 4:50 pm Breakout Panels Merge Sessions	• Merge 1st and 2nd Reads Comments • Formulate Panel Final Comments • Finalize Points/Ratings • Outline Summary for Briefing • Prepare Draft Panel Report Refreshments will be served in Panel Rooms. Coffee located in F-411	Panel 1 – Susanne Stemmer	E-114
		Panel 2 – Robert Hull	G-207
		Panel 3 – Ivan Bozovic	G-426
		Panel 4 – Robert Dimeo	E-401
		Panel 5 – Brian Maple	E-301
		Panel 6 – Sam Stupp	H-406
		Panel 7 - Arunava Gupta	E-243
4:50 pm - 5:00 pm	Check-out Germantown Facility	COV members/Christie Ashton	North Lobby
5:00 pm	Shuttle Return to Hotel	COV members/Christie Ashton	Germantown Front Entrance
6:00 pm - 7:30 pm	No-Host Working Dinner	COV Members Only	On their Own

Thursday, April 2, 2009

7:50 am	Shuttle Pick-up	COV members/Christie Ashton	In Front of Hotel
8:00 am - 8:30 am	Check-In Germantown Facility	BES Supporting Staff	North Lobby
8:30 am - 9:15 am	Breakout Panels – Final Wrap-Up	COV Members only	A-410
9:15 am - 10:00 am	COV Executive Session	COV and BES management	A-410
10:00 am - 11:00 am	Closeout Session	COV Members and BES staff	A-410
11:00 am	**Adjourn – Thank You!**		

Appendix V: First Read/Second Read COV Report Template and Progress Toward the Long-term Goals of the Office of BES

REPORT TEMPLATE

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

First or Second Read Subpanel
Program: _____

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:
- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

Comments:

Recommendations:

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

Comments:

Recommendations:

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

Comments:

Recommendations:

(b) the national and international standing of the portfolio elements
Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

Comments:

Recommendations:

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section, the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

a) supported research leads to important discoveries that impact the course of others' research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.

b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

Good: the program contributes in at least one of the following ways:

a) supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are world class

Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
__ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable
Comments:

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
__ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable
Comments:

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
__ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable
Comments:

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):

__ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

Appendix VI: Summary Reports from the Seven Panels

Panel 1. Materials Chemistry and Biomolecular Materials
Panel 2. Synthesis and Processing Science
Panel 3. X-ray and Neutron Scattering
Panel 4. Electron and Scanning Probe Microscopy / Ultrafast Science
Panel 5. Experimental and Theoretical Condensed Matter Physics
Panel 6. Mechanical Behavior and Radiation Effects / Physical Behavior of Materials
Panel 7. EPSCoR

Panel 1. Materials Chemistry and Biomolecular Materials Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- Considering the budgetary constraints in FY2006-2008 MCBM has performed commendably with respect to sustaining solicitations, evaluating proposals, and identifying programs worthy of funding.

- Based on a review of a cross-section of case studies, the panel concluded that the program managers have processed the proposals in a timely manner, have chosen reviewers carefully, and have provided thorough internal reports as well as thorough responses to the PI.

- The panel endorsed the policy of allowing the PI to respond to criticisms or reviewer concerns about clarity before making a final decision. This appears to have been performed in a skillful and timely manner.

- Program managers often need to make difficult decisions and the case studies the panel examined reflected careful review that took into account the reviewer's opinions, the PI (or PIs) prior performance, and the objectives of the program. In some cases the program managers graded manuscripts as "difficult decline" but the panel thought that the decisions were correct for the packets examined.

- The routing procedure used internally reflects good teamwork among program managers and directors.

Comments:

- The panel felt that the program selects an adequate number of reviewers for balanced review, uses reviewers having appropriate expertise/qualifications, and uses a sufficiently broad pool of reviewers

Recommendations:

- The panel suggests that BES consider a standardized policy that invites proposers to suggest reviewers as part of the proposal submission process, as well as individuals who should be excluded as reviewers. If this is adopted, the reviewers suggested by the PI and those selected by the program manager should be carefully documented for the internal file. This can be integrated readily with the proposed new electronic database.

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- The records provided to the panel did not include sufficient information to comment on this question. The panel members are aware, however, that the program managers exercise standard operating procedures and that they monitor their projects through all mechanisms listed above.

Comments:

Recommendations:

- The panel strongly endorses regular contractors meetings, which are essential to the health of the program. The travel budget should be sufficient to allow program managers to attend meeting pertinent to their program for their professional development and to gain a firm understanding of the fields they support.

- The panel recommends that MCBM organize a Materials Chemistry contractors meeting or preferably a joint meeting with Biomolecular Materials.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- The panel found that the quality of the science funded by the program, overall, was high, and the use of the peer review system appears to be ensuring the sustainability of high quality research.

- The materials chemistry and biomolecular chemistry portfolios appear very broad in scope, and BES investments in fundamental research is essential for discovery and a necessary complement to use-based energy-relevant research.

Comments:

- A positive attribute of the program is its inclination to fund PIs for multiple award periods, which the panel felt was important for encouraging PIs to take risks in research. As such, the DOE culture complements other federal agencies in a very appropriate manner.

- Some panel members expressed concerns about whether the relatively high renewal rate was discouraging the introduction of new investigators to the program. The panel recognized that this view may be uninformed because it could not separate university funding from lab funding. As such, the program and BES should provide this data.

Recommendations:

- The panel recommends that the program capitalize on the anticipated increase in funding to aggressively recruit new investigators and develop new energy-relevant programs.

- The panel felt that biomolecular materials may have a role in advancing research in new biomaterials for green technology and sustainability.

- The panel felt that BES should consider awards to university PIs of longer duration, perhaps five years. This would be more compatible with the structure of university research, increasingly complex research problems, and performance of high-risk research. This also would reduce processing workload for the program managers and staff so that they can focus their attention on program monitoring.

- The annualized funding of the awards examined appeared appropriate, as did the scope.

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

- The portfolio elements overall are significant and embody high scientific impact. Investigators have strong national and international standing. The unique aspect of this portfolio is the continuity of support for high-performing projects and PIs, and the ability of PIs to pursue high-risk projects.

Comments:

Recommendations:

- Capitalize on the increase in funding to bring in new investigators that are or will emerge as nationally and internationally recognized scientists.

Panel 2. Synthesis and Processing Science Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- Excellent

Comments:

- Well organized review process and folders. Documentation very complete and well organized; significantly improved over 2003 COV. Number, stature and quality of reviewers and reports are appropriate.

  - e.g., Zhang Penn State. Good moderation of reviewer, and balanced decision and outcome. The PI given an opportunity to address and clarify reviewer comments. Funded research and it became one of the program highlights.

  - PNNL, FWP, Good on site review. Clear guidance, action items and follow on guidance. Strong, clear messages.

Recommendations:

- Communication with the PI regarding potential resubmission is desirable for scientifically excellent proposals that have been turned down because of lack of funding or programmatic considerations.

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- Appropriate process

Comments:

- The use of contractor meetings, to foster information exchange and interactions among PIs funded by the Processing and Synthesis PM is a very useful idea, and

will improve knowledge of the thematic areas and will help the program manager identify emerging scientific questions and challenges that need attention. The meetings will also leverage the impact of the funded research programs.

Recommendations:

- Continue the good work.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- This is an enabling scientific area, and its new formulation properly captures the critical scientific challenges ahead.

- Some excellent scientific proposals were declined because of not fitting into program areas. This is one indication that this portfolio area needs increased funding. This is a form of positive "scientific pressure" highlighting the exciting opportunities in science.

- This program stands out for taking higher risks, bringing in new people, and pushing the traditional limits of the sub-fields. And has very good success, as seen from the highlights appearing in the previous 18 months. The fact that this has occurred with such a small program budget is remarkable. This represents a successful evolution of DMS&E programs into new and exciting areas.

Comments:

- The foci of this area, as stated in the Major Thrusts, Scientific Challenges, and Program Evolution are excellent

- We commend the program manager's efforts to expand soft and hybrid materials topic areas, which are currently underrepresented, in the portfolio.

- Due to the cross cutting nature of Synthesis and Processing to all of DMS&E, communication across the different program areas is important, especially during the white paper proposal evaluation phase.

Recommendations:

- The current funding level is inadequate; two times or three times increase in funding is necessary to take advantage of these critical opportunities.

- A couple of semantic details: in the program evolution section, it would be useful to clarify more the phrase "develop novel synthesis methods using extreme environments of field and flux". Next, the use of the word "Synthesis" in "Synthesis and Processing" may obscure the goals of the portfolio. A better descriptive title might be, "Assembly and Processing."

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

- Excellent

Comments:

- These are visible, high impact programs, with PIs who are highly regarded.

- The highlights for Synthesis and Processing were predominantly from 2007/8, which demonstrates the vigor, vitality and scientific impact of this small and evolving program area.

Recommendations:

Panel 3. X-ray and Neutron Scattering Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:

(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions

Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- The choice of reviewers generally appears to be quite good, though in a few cases reviews lacked substance. A minimum of 3 reviews is required to make a decision.

- There is no documentation regarding conflict-of-interest statements by reviewers or potential reviewers, as there is no standard procedure for recording such information.

- The internal memos framing the Program Managers' proposal decisions are generally of high quality and demonstrate sound judgment, with a clear knowledge of the field.

- Feedback to PIs, especially in the case of declined proposals, is often provided by telephone. Such conversations can be a better form of communication than writing; however, there is no record of such contacts in the folders, nor is there a mechanism for recording them.

- There is no computerized mechanism for evaluating the number of young investigators that are supported, or, more generally, for automatically evaluating the level of diversity of supported investigators.

- The rolling acceptance of university-based proposal submissions, as opposed to a schedule with deadlines, has not been optimal for either program managers or PIs.

Comments:

- In the reviewed period, there are numerous cases where the time between proposal submission and funding decision was greater than one year. Such delays are generally attributed to unexpected funding limitations and delays. There may have been intermediate phone conversations or e-mails with the PI to explain the situation; however, there is no record of such contacts in the folders. Thus, based on an examination of folders alone, one might incorrectly conclude that there were unreasonable delays in the process of handling some proposals. A mechanism of logging contacts, as in a suitable computer database, would reduce possible misinterpretations of the record. It would also be useful when new PMs are hired and need to catch up on the histories of particular proposals.

Recommendations:

- There is a clear need for a modern (SC-wide) computerized database for handling proposals, reviews, and referee information. Such a database should include the ability to document conflict-of-interest issues and to log (at least with the date) proposal-related contacts with PIs.

- There should be an explicit and transparent policy regarding PI recommendations for proposal reviewers. It would be reasonable to consider accepting at least one suggested reviewer, as done at NSF, as this could benefit new PIs.

- A mechanism to encourage white papers prior to full proposals should be established.

(b) Monitor active project and programs

Consider, for example

- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- Detailed written progress reports are received from PIs, and notations on them indicate that they have been read by program managers.

- Site visits are generally limited to Laboratory reviews, largely due to limits on travel funding.

- Attendance at scientific meetings provides opportunities for program managers to judge relative impact of supported work, identify new reviewers, and to communicate funding opportunities to new young investigators. Work loads and travel budgets severely limit the ability of program managers to attend appropriate meetings.

Comments:

Recommendations:

- The travel budget should be doubled.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- The overall quality of the science presented is high.

- There is a clear opportunity to expand the portfolio in soft matter research. The newly hired program manager for Neutron Scattering has expertise in this area, and we expect that he will have an impact in this area.

- In terms of the balance of supported PIs in neutron scattering, there appears to be a deficiency in the number of new, young investigators, who are important to the

vitality of the field. This situation has been impacted both by recent funding limitations and by problems with neutron facility availability and reliability, conditions that are outside of the control of PMs.

- There is a healthy overlap with other parts of the Division. The degree of overlap is likely to increase with the emphasis on interdisciplinary research.

- The recent budgetary limitations in the reviewed period have not encouraged PIs to be especially daring in their proposed research.

Comments:

- Support for instrument development during the reviewed period has been productive. The initial inclusion of Community Development funds provided valuable motivation for PIs to be involved in developing instrument concepts and proposals at facilities such as the SNS and APS. However, there has been an evolution of the process of funding instruments, due in large part to the demands of Project Management. For new instruments funded as Major Items of Equipment, the funds all go to the relevant user facility. Given that the time line from proposal submission to instrument completion can extend over a decade, there is a long delay between a PI's efforts on a proposal and any benefits to research. This represents a disincentive to involvement. Re-establishment of some form of Community Development funds, in particular to support grad students and post docs, would help to provide reasonable motivation.

Recommendations:

- To the extent possible with new funding, program managers should be given the flexibility to support short-term, high-risk, high-impact research, outside of the proposal system.

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

- Both the national international standing of the supported programs is excellent.

Comments:

Recommendations:

Panel 4. Electron and Scanning Probe Microscopy/Ultrafast Science Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:
- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- Overall, the processes for solicitation, review and recommendation of proposals are straight-forward and transparent. Proposal submitters are given a clear idea of the missions of BES and this program.

- The COV was provided with a selection of proposals and reviews. The proposal reviewers were observed to be highly qualified experts. An adequate number of very detailed reviews were provided for each proposal. The process allows the program managers to make fair and informed decisions.

- The program managers are to be commended on the completeness of the evaluation process for each proposal, which includes a response from the applicants and a detailed report written by the program managers, which forms the basis for proposal actions.

Comments:

Recommendations:

- It would be useful to future COVs if White Papers were added to the proposal files, in cases where the PI submitted one.

(b) Monitor active project and programs

Consider, for example

- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- The main instrument for monitoring programs is the annual progress report. The program managers are highly conscientious about reading and understanding the reports.

- The main purpose of the contractors meetings is to provide a higher level overview for the program managers of the directions in the overall core research area as well as stimulate interactions and discussion among the PIs. Two contractors meetings have been held in the ESPM core area and have been highly successful in meeting these objectives.

- The travel budget is too limited for site visits to universities.

Comments:

- Overall, the mechanisms in place for monitoring are excellent and work well.

Recommendations:

- The program managers should not be limited because of budget reasons to conduct site visits to locations of high impact programs as such visits are an important vehicle for monitoring the progress and new direction in programs.

- Travel to both national and international workshops and conferences should be supported for the program manager.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- The overall quality of the science is excellent.

- There is synergy with the user facilities program, as the many of the science programs funded by the ESPM core program form the basis for a highly active and visible user community at the national facilities. As a result of recent restructuring there is now a clear distinction in allocation of funding between science programs and user facility programs.

- The ESPM program is widely recognized for supporting high-risk innovative and transformational research projects that are at the forefront of the field. This is particularly impressive given that the restructuring of the program took place during fiscally very challenging years.

- The program is highly interdisciplinary, with programs impacting other areas in the division, such as chemistry, physics and materials science. Well-defined plans for expansion of the program exist but were not realized because of the budget restrictions in 2006 – 2008.

- The ultrafast portfolio contains very strong research programs but appears subcritical in size.

- The growth of the ultrafast portfolio has suffered from uncertainty in the magnitude of base funding available for this research.

- The program managers make an effort to identify and fund new investigators. However, the very limited budget for single investigator programs at universities limits the ability of the program managers to bring in many new investigators while still funding ongoing excellent research programs.

Comments:

Recommendations:

- There should be a clear determination of the scale of an ultrafast materials program. Broad consultation among the various relevant BES programs could help inform this decision.

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

- The award process has worked well in identifying high-quality researchers and innovative investigations, such as development of new diffraction techniques of small nanostructures.

- The program portfolio has significantly contributed to the US effort in TEM being world-class and in maintaining its competitive edge. In the condensed matter field, there are few other resources for funding fore-front research in electron microscopy. Compared to efforts in other countries, this program has been more successful in applying these developments to forefront challenges in materials science.

Comments:

Recommendations:

- Strong continued support for this program is recommended to maintain international prominence in this area.

Panel 5. Experimental and Theoretical Condensed Matter Physics Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:
- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings and Comments:

- The committee was very impressed with the depth of consideration given by the program managers, especially for the marginal proposals. It is clear that great effort was expended for these proposals.

- The choice of referees was relevant and the quality of the referee reports was exceptional. This demonstrates the significant breadth of knowledge of the program managers. This is reinforced by the demonstrated ability of the program managers to disregard inappropriate comments; even those from well-regarded scientists.

- The number of reviews was adequate and the decision-time was reasonable.

- We appreciate the practice of extending the consideration of marginal proposals to the next funding cycle.

- The documentation of the proposal review process is very good.

Recommendations:

- Keep up the good work!

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings and Comments:

- The monitoring of active programs and projects is adequate.
- Lab site visits are useful not only for the DOE assessment duties but, perhaps more significantly, it gives the researchers the opportunity to self-assess.
- The programs benefit from the program managers attendance of the national and international meetings both through informal discussions with the PIs, and the scientific content of the meeting which helps them to remain abreast of new discovery and trends.

Recommendations:

- It is essential that the travel funds used by the program managers to attend meetings remain uncut.
- We believe that the contractor's meetings are a good idea as an effective means of communication between the program managers and the PIs. They will also enhance cross-fertilization of funded projects.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- Funding decisions were driven by the overall quality assessments of the referees, and generally addressed to specific proposal strengths, rather than simply PI quality and track record.
- Funded proposals seemed to reflect a good balance between innovative and established research. However, there was little evidence of interdisciplinary components.
- The proposal topics appear to be timely, and in keeping with evolving research interests in the field of condensed matter physics.
- The proposals reviewed showed limited evidence of connections to other parts of the Division.
- The award size and scope in 2006-8 was often inadequate to support more than one grad student or postdoc.

Comments:

- The limited support of grad students is consistent with a downward trend in the training of new scientific manpower.

- The encouragement of joining theory and experiment proposals by the CMT and CME programs is to be commended.

Recommendations:

- The funding of grad students and postdocs should be given some consideration in assessing overall budget requests.

- It might be desirable for the BES to consider funding graduate fellowships separate from research grants.

- Some effort to incorporate high performance computational techniques into the program should be considered, especially when their inclusion could increase the scientific output of the program.

- After years of decreased/declining funding, an increased effort should be made to bring promising young investigators into the program.

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings and Comments:

- The portfolio does encompass some of the leading research in the fields of CMT and CME.

- The stature of the PIs is of a very high caliber. About 35% are APS Fellows and a significant number are NAS members or Nobel laureates. Overall the list of PIs reads like a Who's Who of modern US science.

- In many fields, the US continues to lead the world. However, it appears that Japan still has an edge in innovative materials development and European states dominate theoretical software development with codes such as ABINIT, VASP and WIEN.

Recommendations:

- It is important for the Division to fund a mix of both young upcoming researchers and established highly recognized scientists.

- An increased emphasis on combined theory/experiment/computation techniques should be encouraged. This is especially important for BES goals such as in materials by design.

- The mix between theory and experiment should be reevaluated. Currently the funded theoretical component seems to be substantially smaller than at the national labs and universities.

Panel 6. Mechanical and Physical Behavior of Materials Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
(a) solicit, review, recommend, and document proposal actions and
(b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
(a) the breadth and depth of portfolio elements, and
(b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:
- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- The sub panel found the proposal review procedures to be of the highest quality and consistency.

- The decisions fully reflected the criteria documented in program solicitations, with the quality of science constituting the most important factor. The minimum number of reviews for a decision was three (often more reviews were received) and the reviews were nearly always thorough, detailed and authoritative.

- The time to decision was generally in the range 5-8 months, although occasionally there seemed to be a significant lag (c. 3 months) between receipt of reviews and transmission of the final decision to the PI.

- The documentation for each proposal decision was very thorough.

- The program managers appear to be exercising discretion and authority very effectively in making their final decisions. While the peer reviews are clearly critical inputs into the final decision, the PMs appear to be balancing these inputs appropriately with their own expertise and experience. In particular, the mechanism of giving PIs the opportunity to respond to reviews in borderline cases appears to be very effective.

- White papers prior to full proposal submission are also being used effectively to hone or discourage full proposals as appropriate.

Comments:

- The minimum number of three reviews is potentially marginal, especially if they are mixed or inconclusive, but our clear impression is that coupled with the judgment of the PMs in these programs, the net result is still a very effective and thorough review procedure.

- We also noted one example (from the response from the PI) that a previous program manager had apparently encouraged a renewal proposal submission at very short notice, presumably in response to perceived enhanced funding availability. While there may have been good grounds for this advice, in this one case it did seem that it caused a rushed and lower quality proposal which ultimately was not funded. There is no evidence that this is an issue under the current PMs, however.

Recommendations:

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- Progress reports appear to be taken very seriously by PIs and program managers alike. Contractors meetings appear to be a success for both PMs and PIs.

- Likewise, the anecdotal evidence is that site reviews are a constructive and effective process for grantees, PIs (and even reviewers!).

- PM attendance at scientific meetings is also an effective mechanism for maintaining contact with PIs, for staying current with the latest advances in the field, and for soliciting proposals from the community.

Comments:

Recommendations:

- Funds should continue to be made available for travel to site reviews, contractors meetings and scientific meetings, and increased as needed (the committee lauds the apparent improvement in availability of funds since the last COV).

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) the breadth and depth of portfolio elements
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

- Much of the science is clearly of the very highest quality, and is leading to breakthroughs in the fields covered by these programs. A high proportion of the PIs supported are among the very best in their fields, and the number of papers in leading journals such as Science and Nature that arise from support from these programs is impressive.

- At the same time, there is a good balance of support between fields that are currently "hot" and those that are less so, but are critical to sustaining progress in fields that are key to DOE's mission (e.g. mechanical deformation of metals).

However, some key fields appear to be losing traction within the program portfolios, notably radiation effects on materials and corrosion.

- There is a good balance of established leaders and younger scientists whose reputations are developing among the set of supported PIs. The PMs should continue to aggressively seek the best new ideas and researchers in the programs' fields.

- Awards appear to be of appropriate scope, size and duration. The intent to sustain investment beyond the initial award period if reasonable progress is made was viewed by the panel as beneficial in developing scientific continuity. However, where renewal was not supported by productivity and/or the peer review process, the PMs have made the necessary hard decision.

Comments:

- The panel believed there is strong evidence of revitalization of these programs under the new PMs. They are to be lauded for the strong progress made in the past two years, particularly given budgetary constraints.

Recommendations:

- The panel recognizes the challenge in maintaining critical mass of support across the broad scientific waterfront covered by these programs. However, we recommend that continued attention be given to maintain / rebuild critical mass in the science of radiation effects and corrosion, given their critical relevance to the DOE emphases on materials in extreme environments and on materials for nuclear energy.

(b) the national and international standing of the portfolio elements
Consider, for example:
- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

- Multiple aspects of these programs were viewed as world leading by the panel. Commensurate with the levels of investments, the outcomes overall are highly competitive. The portfolio of project PIs includes many who are world leaders.

- The program also realizes strong balance across the great majority of the broad set of sub-fields that are important to the DOE mission.

Comments:

Recommendations:

Panel 7. EPSCoR Report

BES COMMITTEE OF VISITORS (COV)
Reviewing the Materials Sciences and Engineering Division
Fiscal Years 2006, 2007, and 2008

Charge to the COV:

1. For both the Implementation grants and individual investigator projects through Laboratory-Partnership grants, assess the efficacy and quality of the processes used to:
   (a) solicit, review, recommend, and document proposal actions and
   (b) monitor active projects and program.

2. Within the boundaries defined by DOE missions and available funding, comment on:
   (a) how the award process has addressed the EPSCoR program goals and
   (b) how the Laboratory-Partnership program has taken advantage of the unique DOE laboratory assets.

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs's processes and management used to:

(a) Solicit, review, recommend, and document proposal actions
Consider, for example:
- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

- The funding decisions appear to be consistent with the EPSCoR priorities and criteria.
- The number of reviewers varied between 3 and 5, with appropriate expertise.

- The method of review is well documented. One difference compared to the other divisions is that a numerical score between 0 and 10 is included in addition to

reviewer comments. This numerical criterion appeared to work well, with general consistency among different reviewers. This numerical criterion assisted the program manager to assess proposals over a broad range of research areas.

- The year-to-year level of funding for EPSCoR in recent years appears to be more variable than in other BES programs. Thus the longer time to decision on some proposals seems to be justified.

- The considerations used in the award decisions are well documented.

Comments:

- The Program Manager has used judgment to retain some proposals for possible funding in subsequent years, subject to the availability of funding.

Recommendations:

- The award procedures appear to be working well and should be continued.

- The COV panel agrees with the DOE EPSCoR Study Group's recommendations in response to concerns of the 2006 COV. Specifically the criteria for the "Success or Effectiveness of the Implementation awards" should be part of the review process and should also be included in the Solicitation.

(b) Monitor active project and programs
Consider, for example
- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

- In addition to written progress reports in the folders, the panel was provided with some details concerning the annual Contractors' Meetings and site visits. In addition to the progress reports, publications, presentations, and active participation in the project by the PIs and CoPIs are taken into account in awarding continuations and renewals.

- DOE EPSCoR does have an annual Contractors' Meeting for both Implementation and Laboratory Partnership awards, which is hosted at DOE Labs on a rotating basis. The meetings also include some keynote presentations by outside invited speakers. The meetings provide opportunities for collaborations between EPSCoR state investigators and DOE labs.

- Several site visits have been carried out for the Implementation Programs.

- In contrast to previous critical comments of the 2006 COV, the progress reports now seem to be well documented, following suggested format and requirements provided by the DOE EPSCoR Program Manager.

Comments:

- We commend the DOE Office of Science for convening the DOE EPSCoR Study Group to respond to the 2006 COV recommendations and concerns.

- We also commend the EPSCoR Program Manager for ongoing efforts to implement the various recommendations by the Study Group.

Recommendations:

- Site visits by the DOE Program Manager and expert participants are highly recommended before any Implementation Award is renewed.

- More oral presentations should be encouraged at the Contractor's meeting, especially from recently funded groups.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

(a) How the award process has addressed the EPSCoR program goals
Consider, for example:
- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the contributions of the program in advancing the DOE energy mission goals

Findings:

- The objectives of the EPSCoR program goals appear to have been addressed in the proposals reviewed as part of the award process.

- The program does appear to have funded DOE relevant initiatives, has brought in young faculty members, trained students, enhanced research capabilities, and generally has had a positive effect on the scientific research competitiveness of EPSCoR states.

- The award process is sound and does appear to select those with the highest quality science from the proposals submitted.

- The Laboratory Partnership grants do foster interdisciplinary research and aligns the work with the DOE mission goals. The Program Manager has used judgment whether or not to accept high risk projects, in order to balance the program.

Comments:

Recommendations:

- We recommend that the careful stewardship of the award process by the current Program Manager be continued.

- The COV notes that the cost-sharing in the Implementation Awards has been reduced from 100% to 50%. We recommend that cost-sharing should not be reduced further, since this represents a clear statement of commitment by the institutions involved.

- We strongly urge that the Study Group recommendations in response to the 2006 COV report, should be included for the Implementation Programs, as part of the award process.

(b) How the Laboratory-Partnership program has taken advantage of the unique DOE laboratory assets.

Consider, for example:
- the uniqueness and significance of DOE Lab expertise and facilities being utilized
- the extent of scientific interactions between EPSCoR PIs and DOE Lab researchers

Findings:

- The DOE Labs have facilities which can be of great value to enhancing the research effectiveness of EPSCoR states.

- However, there are barriers to effective collaborations with the DOE labs. This is due to difficulties of establishing extended stays at the labs, safety training requirements at the labs, and so on.

Comments:

Recommendations:

- Supplemental travel grants are important to encourage more participation with the associated Laboratories.

- More incentives should be provided to the DOE labs to participate in the Lab Partnership programs, e.g., from the DOE program that co-funds a project.

- We encourage interactions between DOE lab investigators and PIs at the annual DOE EPSCoR Contractors' meeting.

Appendix VII: Panel Reports Towards Long-term BES Goals

Panel 1. Materials Chemistry and Biomolecular Materials

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

a) supported research leads to important discoveries that impact the course of others' research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.

b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

Good: the program contributes in at least one of the following ways:

a) supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are world class

Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
X Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
X Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
X Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
X Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

Panel 2. Synthesis and Processing Science

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

a) supported research leads to important discoveries that impact the course of others' research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.

b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

Good: the program contributes in at least one of the following ways:

a) supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are world class

Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
_x_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):

_x_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
_x_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- This is an enabling scientific area, and its new formulation properly captures the critical scientific challenges ahead. The current funding level is inadequate; 2X or 3X increase in funding is necessary to take advantage of these critical opportunities.

Panel 3. X-ray and Neutron Scattering

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

a) supported research leads to important discoveries that impact the course of others' research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.

b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by

the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

Good: the program contributes in at least one of the following ways:

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Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- X-ray and neutron scattering characterizations of the structure and dynamics of new materials, especially metals, alloys, and ceramics, have a dramatic impact on theory, as well as the synthesis process. There is great, but not-yet-realized, potential in areas such as polymers, which have been underrepresented in this portfolio.

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas

phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
__ Excellent
__ Good
__ Fair
__ Poor
_X_ Not Applicable

Comments:

- To the best of our knowledge, this is not an area where x-ray and neutron scattering techniques are the appropriate investigative tools.

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- The continued development of scattering and crystal growth techniques supported in this area are important for research in areas such as Superconductivity, described in more detail in later Basic Research Needs reports.

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- The x-ray and neutron scattering program has supported the conception and development of techniques that have had (and will have) major impacts on the characterization of materials.

Panel 4. Electron and Scanning Probe Microscopy/Ultrafast Science

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

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b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

Good: the program contributes in at least one of the following ways:

a) supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are world class

Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

Panel 5. Experimental and Theoretical Condensed Matter Physics

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to *progress* toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

Excellent: the program contributes in at least one of the following ways:

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b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

c) supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.

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a) supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.

b) supported research leads to new instruments that are world class

Fair: the program contributes in at least one of the following ways:

a) supported research leads to modest outputs of good quality that show the potential to impact energy research.
b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Support of experimental and theoretical condensed matter physics leads o advancement of knowledge and understanding. Development of novel and complex materials in which strong electronic correlations lead to new phenomena arising from collective states of matter, many of which impact future technologies and energy security (e.g., high temperature superconductors, thermoelectrics, multiferroics, spintronic materials, permanent magnets, etc.).

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
__ Excellent
__ Good
__ Fair
__ Poor
x Not Applicable

Comments:

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Development of new and advanced materials (e.g., superconducting, magnetic, thermoelectric, etc.). Fundamental research leading to information that enables development of new strategies for finding materials with enhanced properties.

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
x Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Development of various scanning probes with high sensitivity and resolution to study atomic scale electronic and structural variations (STM, AFM, SQUID). Development of magnets that produce high magnetic fields of 100 T nondestructively for research. Development of computational techniques for visualizing real time atomic scale processes.

Other issues:

- Specific guidelines of how support from DOE and other funding agencies should be acknowledged in published papers should be developed and clearly communicated. All sources of support should be identified as appropriate and acknowledged.

- Workload of program managers is already too large for the number of proposals submitted. With increase in funding levels, this problem will be greatly exacerbated. Additional program management positions should be created to handle the pressure of increasing numbers of proposals.

Panel 6. Mechanical and Physical Behavior of Materials

III. PROGRESS TOWARD THE LONG-TERM GOALS OF THE OFFICE OF BASIC ENERGY SCIENCES

In this section the COV should evaluate the program's contribution to progress toward achieving the Office Basic Energy Science long-term goals (shown below) that are being tracked by the Office of Management and Budget (OMB). The BES goals are shown below. The progress toward successfully achieving the individual goals should be rated based on the definitions given below.

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b) supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department's technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department's technology offices.

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Fair: the program contributes in at least one of the following ways:

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b) supported research leads to new instruments that are of high quality

Poor: supported research could contribute to the long term goals but currently does not contribute.

Not Applicable: the goal is not applicable to the program or sub-program being reviewed.

A. By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Commensurate with available resources, the programs are making excellent progress with respect to this criterion, effectively balancing support across the broad set of relevant sub fields, and generating multiple breakthroughs among their supported projects.

B. By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Multiple leading programs supported in relevant fields such as plasmonics, nanomotors, core-shell nanowires, thermoelectric materials.

C. By 2015, develop new concepts and improve existing methods for major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, Basic Research Needs to Assure a Secure Energy Future.

Progress rating for the program under review (select one):
X__ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments: Strong progress in fields such as thermoelectrics, harvesting of solar energy, plasmonics, energy conversion, and membrane materials.

D. By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.

Progress rating for the program under review (select one):
_X_ Excellent
__ Good
__ Fair
__ Poor
__ Not Applicable

Comments:

- Although not a core activity of these programs, major progress has been made in developing and applying new instruments and components (e.g. pioneering use of the atom probe, and development of the nanowire optical probe) that enable new science to be accessed with DOE instrument investments.

Report of the Committee of Visitors of the Division of Materials Science and Engineering (DMSE) to the Basic Energy Sciences Advisory Committee

Review of FY 2006, 2007, and 2008

March 31 – April 2, 2008

Simon R. Bare (UOP LLC, a Honeywell Company)
Chair of the COV

July 9, 2009

2009 Committee of Visitors Division of Materials Science & Engineering Panel Membership

Materials Chemistry and Biomolecular Materials	*Synthesis and Processing Science*	*X-ray and Neutron Scattering*
Sam Stupp, NWU	**Ivan Bozovic, Brookhaven**	**John Tranquada, BNL**
Arunava Gupta, U Alabama	Juan de Pablo, U of Wisconsin	Tessema Guebre, NSF
Don Murphy, Bell Labs (ret)	Roger French, DuPont	Takeshi Egami, UT
Cyrus Safinya, UCSB	Peter Green, U of Michigan	Bruce Chase, DuPont
Mike Ward, NYU	Terry Tritt, Clemson	Christian Vettier, ESS Lund Sweden
Karen Winey, Penn	Janice Reutt-Robey, U Maryland	

Electron and Scanning Probe Microscopy/Ultrafast Science	*Experimental and Theoretical Condensed Matter Physics*	*Mechanical Behavior and Radiation Effects/Physical Behavior of Materials*
Susanne Stemmer, UCSB	**Brian Maple, UCSD**	***Robert Hull, RPI***
Roger Falcone, LBNL	Kevin Bedell, Boston College	Julia Weertman, NWU (ret)
Geoff Campbell, LLNL	Mark Jarrell, U of Cincinnati	Julia Phillips, Sandia
Susan Dexheimer, WSU	John Rehr, U Washington	Max Lagally, U Wisconsin
Ulrike Diebold, Tulane	Sashi Satpathy, U Missouri-Columbia	Christina Trautmann, GSI Germany
	Joseph Thompson, LANL	

EPSCoR
Arunava Gupta, U Alabama
Terry Tritt, Clemson
Julia Weertman, NWU (ret)
John Rehr, U Washington
Geoff Campbell, LLNL

Major Findings

- **Proposal review procedures are of highest quality and consistency: sufficient number of reviews and flexible enough to allow PM to make fair and informed decision.**
- **The funding decisions fully reflected the criteria documented in program solicitations - the quality of science constituting the most important factor.**
- **Science is of highest quality – with national & international recognition.**
- **The BRN reports & workshops have been extremely valuable in identifying new scientific opportunities commensurate with the core mission of BES.**
- **Level of staffing of DMS&E has increased since last COV. New PM's are fully integrated into the Division and are performing admirably.**

Major Findings

- **Generally there is a good balance between established names and early-career scientists.**
- **Progress reports important and taken seriously by PM's.**
- **Awards are of appropriate size, scope & duration - within the constraints of limited funding.**
- **Mechanism of monitoring projects is appropriate and working well.**
- **There is a laudable commitment to balance the funding of excellent science between "hot" topics and other mission relevant fields.**
- **Contractor's meetings are effective method for PM's and PI's to interact.**
- **DMS&E is a unique source of critical research funding in many areas.**

Major Findings

- **There has been a noticeable process improvement in the evaluation and monitoring in the EPSCoR (Experimental Program to Stimulate Competitive Research)program.**
- **The additional numerical criteria are useful for rating EPSCoR proposals.**

- **Many excellent proposals were not supported due to inadequate funding levels.**
- **Reduced funding limited the ability of DMS&E to create new programs (e.g. 4 major funding initiatives with no awards).**
- **There is little funding for mid-scale instrumentation at universities.**

Recommendations

- **High priority should be given to implement the proposed PAMS information management system – the single recommendation of the 2008 CSGB COV is fully and strongly endorsed.**
- **The influx of new money is an opportunity to implement ambitious new programs and directions, and to increase the average grant size.**
- **The staffing level should be reviewed to ensure that it is commensurate with increased workload as a result of increased funding and proposal pressure.**
- **Improve communication methods to the research community**
  - **Improve and keep current the BES website**
  - **Proposal submission and award process should be more transparent**

Recommendations

- **The increased use of white papers is encouraged.**
- **Travel budget for PM's should be further increased to allow them to attend national & international meetings and to visit PI's on site.**
- **The EPSCoR Study Group recommendations (in response to the 2006 COV report) should be fully implemented.**

OMB Program Assessment Rating Tool

- **Tool to evaluate progress towards the long-term (2015) goals of BES specified by OMB.**

Program Area	Goal 1	Goal 2	Goal 3	Goal 4
Materials chemistry and biomolecular materials	**Excellent**	**Excellent**	**Excellent**	**Excellent**
Synthesis and processing science	**Excellent**	**Excellent**	**Excellent**	**Excellent**
X-ray and neutron scattering	**Excellent**	**n/a**	**Excellent**	**Excellent**
Electron and scanning probe microscopy / Ultrafast science	**Excellent**	**Excellent**	**Excellent**	**Excellent**
Experimental and theoretical condensed matter physics	**Excellent**	**n/a**	**Excellent**	**Excellent**
Mechanical behavior and radiation effects / Physical behavior of materials	**Excellent**	**Excellent**	**Excellent**	**Excellent**

Commentary

- **Significant discussion regarding flexibility of the current system and desire to impose more rigid structure.**

Summary

- **COV commends all Division staff and program managers for their dedication, skill and professionalism.**
  - **The best science is being funded**
  - **Science and individuals are of both national and international caliber**

Thanks….

- **To Jim Horwitz (Acting Director) & Helen Kerch.**
- **To the program managers, division staff, and associated personnel for assembling review materials and being available for questions and all organizational aspects of the COV review.**
- **Special thanks to Christie Ashton.**