



U.S. DEPARTMENT OF
ENERGY

Office of
Science

**FY 2018 Report of Committee of Visitors
BES Materials Sciences and Engineering Division
FY 2015, 2016, 2017
April 18-20, Rockville, Maryland**

Presented to the Basic Energy Sciences Advisory Committee

Esther Takeuchi, COV Chair

July 12, 2018

Committee of Visitor Charge (Standard)

1. For both DOE laboratory projects (Field Work Proposals) and grant program, assess the efficacy and quality of the process used:
 - (a) solicit, review, recommend, and document proposal actions and
 - (b) monitor active projects and programs.

2. Within the boundaries defined by the 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.



FY 2018 BES-MSE Committee of Visitors

- Members provided access prior to the COV meeting. A tutorial on how to use PAMS for the COV was also provided.
- PAMS used to access proposal and award folders, report template, list of the core research proposal activities of the Division, copies of 2012 and 2015 MSE Division COV reports together with the BES response
- Additional information supplied to each member during the meeting of the COV: Copies of the plenary presentations, web highlights from each of the Division's programs, and summary of the EPSCoR program
- Covered applications for the following Funding Opportunities and Lab Announcements:
 - FY 2015 –2017 Office of Science Annual FOAs
 - FY 2015 –2017 Early Career Research Program (first time inclusion in COV)
 - FY 2015 and 2016 –Computational Materials Sciences (CMS)
 - FY 2016 -EPSCoR State National Laboratory Partnership and Ammonia State National Laboratory Partnership FOAs
 - FY 2017 Scientific Discovery through Advanced Computing (SciDAC)

FY 2018 BES-MSE Committee of Visitors

17 COV panelists organized into 4 panels (Centered on the 3 MSE Division team components and EPSCoR):

1. Scattering and Instrumentation Sciences Team

Lead: Susanne Stemmer, UCSB

2. Materials Discovery, Design, and Synthesis Team

Lead: Monica Olvera de la Cruz, Northwestern University

3. Condensed Matter and Materials Physics Team

Lead: Harold Hwang, SLAC/Stanford

4. Established Program to Stimulate Competitive Research (EPSCoR)

Lead: Jeff Nelson, SNL



COV Members

Last Name	First Name	Affiliation
Allison	John	University of Michigan
Bobev	Svilen	University of Delaware
Bonnell	Dawn	University of Pennsylvania
DeYoreo	Jim	PNNL/University of Washington
Gedik	Nuh	Massachusetts Institute of Technology
Headrick	Randall	University of Vermont
Huang	Yu	University of California, Los Angeles
**Hwang	Harold	SLAC/Stanford University
Lau	Jeanie	Ohio State University
Millis	Andy	Columbia University
**Nelson	Jeff	Sandia National Laboratories
**Olvera de la Cruz	Monica	Northwestern University
Ong	Phuan	Princeton University
Sinha	Sunil (Sunny)	University of California, San Diego
**Stemmer	Susanne	University of California, Santa Barbara
*Takeuchi	Esther	Stony Brook University/ BNL
Yakobson	Boris	Rice University

* COV Chair

** Panel Leads

COV Demographics

- Academia: 16; DOE Lab: 4
- Funded by BES-MSE: 14
- EPSCoR state representatives: 3
- BESAC Service: 3

(Note: 3 COV members have joint academic and national lab appointments)

Major Findings (1)

1. The program managers are doing an outstanding job of managing their portfolios as they are knowledgeable, using high quality reviewers and are making highly informed decisions. They should be commended on their high quality work. Further, many PIs comment on the importance of having a sustained contact person. This can contribute to continuity of programs.
2. The use of white papers is a very valuable and effective process. The program managers devote significant time to this process where they inform prospective Principal Investigators (PIs) on the areas of emphasis for their program. The success of proposals is strongly influenced by the PI engagement with the program managers during the white paper phase. While the process is informal using email and phone calls, the COV sees no need to formalize the process.
3. The COV observes that there is an appropriate turn-over rate for the program portfolios. This ensures the ability to maintain strong continuity as well as the ability to bring in fresh ideas and new PIs.
4. The Basic Research Needs (BRN) reports are highly influential, both in terms of shaping/focusing the portfolio and defining fields as a whole. These reports are outstanding resources for those in the field and provide a view of needed research directions.

Major Findings (2)

5. DOE BES is unique in providing strong and sustained support in the fields of characterization and technique development. This support bears fruit in enabling science that otherwise may not be possible.
6. PAMS was overall an effective tool to provide detailed information to the members of the COV. The panel members also comment that PAMS is also a useful proposal submission tool. Specific additional information that could be made more readily accessible is highlighted in the panel reports that may be useful for future COVs.
7. PI meetings are outstanding venues to gain insight into program content, initiate collaborations and provide crucial interactions for EPSCoR and Early Career PIs. These meetings are regarded as some of the best, if not the best in the field. Additional site visits by program managers would be useful, particularly for the academic PIs.
8. Several members of the COV find 3 years to be too short for funding cycles, in particular for larger multi-PI efforts including those at DOE national laboratories.

Major Recommendations (1)

1. It is highly recommended that the program managers are provided expanded travel funds to attend national and international meetings/conferences to stay informed about the field and conduct site visits. This should include participation in smaller, focused workshops which are often highly informative. The lack of travel funds inhibits direct access by the program managers to rapidly evolving domestic and international research.
2. The COV recommends addition of staff to the MSE Division. First, replacement of personnel that have left is needed. Second, current staffing levels provide little to no opportunity to train personnel in anticipation of retirements or departures. The program managers play critical roles in the stewardship of the research portfolio and the need for additional talented staff is emphasized.
3. Consider implementing the flexibility to make COVs less frequent than every 3 years. The decisions regarding timing would be made in conjunction with the relevant constituencies such as the division, DOE leadership and BESAC.

Major Recommendations (2)

4. The COV recommends implementing the option to extend the term of awards. Consider ideas such as 4-5 years for large multi-PI awards or 3+2 awards based on the program needs, success, and program manager's discretion.
5. The Early Career Research Program has clearly been a big success in attracting top new talent and should definitely be continued. Based on the low acceptance rate, it is perceived that the early career program may be accepting too many full proposal submissions. Consider methods to reduce the number of full proposals submitted.
6. Continue and expand communication pathways of programmatic emphasis areas and those deemphasized. This is particularly important for EPSCoR, academic early career or first time PIs.
7. The COV recognizes that metrics for research are needed and it is understood that multiple considerations are currently employed. The COV expresses caution about the perception of using publication in 'high impact factor' journals as a metric of program success. (Note: The COV saw no evidence that "high impact" journal publications were used inappropriately by MSE staff in assessment of awards.)

Other Comments

- The COV chair and the COV highly commend the BES MSE Division personnel and leadership for the significant advance preparation and planning that they completed prior to the arrival of the COV members. This advance effort was important in enabling the process to flow smoothly.
- The COV chair and the COV express their appreciation to the BES MSE Division personnel and leadership for their active participation in the process during the COV on-site activities. The discussions among the COV panelists, the program managers and the leadership enabled any questions or issues to be addressed real time. This provided for an effective process with significant interaction.
- The COV chair commends the panel leads and panel members for their participation and thoughtful insights.

Summary

- The BES MSE division effectively manages an outstanding portfolio of research.
- While this is accomplished in spite of travel constraints and limited personnel due to prior departures, resolution of these issues should take place for long term sustainable success.
- As opportunities for expanded research for BES arise, these should be accompanied by appropriately increased funding.