6 March 2013

Dr. Martha Potvin, Provost
Dr. Ron Larsen, Associate Provost, Academic Affairs
Dr. Nicholas Ward, Chair, University Council

Subject: Materials Science PhD Proposal — Review Comments by the Academic Programs Working Group

Dear Dr. Potvin, Dr. Larsen and Dr. Ward;

The Academic Programs Working Group met on 26 February 2013 to discuss the revised proposal for a PhD program in Materials Science. This revised proposal has been modified and updated. It now provides more details and specifics in regards to curricula and the administration of this cross-campus collaborative program. However, we believe that some of the concerns mentioned in our previous review letter dated 22 August 2012 and concerns mentioned in the AAAS review report dated August 2012 are still relevant and have not been sufficiently addressed by the revised proposal.

Program Strengths

Some of the Program strengths identified by our committee are described below.

A-1) The committee supports the concept of MSU-Bozeman offering a PhD in Materials Science. A PhD in Material Sciences furthers the mission of MSU as a land grant university committed to offering the highest quality education and training for students in the sciences and engineering fields.

A-2) The Program will meet the needs of future students desiring a degree in a rapidly growing highly technical field with a global demand for materials scientists and materials engineers.

A-3) The Program will provide highly trained graduates to fulfill needs that have been identified by employers and industry in Montana; there is currently no doctoral program of this type in the state or intermountain region.

A-4) The Program fulfills objectives in MSU's strategic mission including increasing the number of doctoral degrees awarded and it will also increase the number of faculty PhD mentors in STEM areas.

A-5) The Program its collaborative and bridges not only different Departments and Colleges, but also different campuses in the MUS system. While each campus has its own strengths; a move toward a collaborative framework is applauded, especially for training students at the PhD level. For
example, this type of effort reflects the goals of Montana EPSCoR to bring the different campuses within the MUS system together.

A-6) The Program will bring additional resources to the three universities and will consequently enhance the local economies in Bozeman, Butte and Missoula.

**Concerns and Weaknesses**

B-1) Faculty have strong concerns regarding overall startup costs for launching this program; especially considering the logistics of the three-campus approach that is described in the proposal.

B-2) This joint undertaking between the three campuses offers some system-wide benefits and assets in terms of collaborations and sharing of resources, including specialty labs and equipment; however, the three-campus approach adds layers of administrative complexity that are not fully spelled out in the proposal. In many respects, how such a three-campus collaboration will work is left undefined. These include: how indirect costs will be addressed, the three-campus concept may be confusing to prospective students, the requirement of nine credit hours off campus may pose an extra (unnecessary) burden to students, and many additional institutional differences and standards exist between the three campuses that will complicate this offering and result in additional expenses.

B-3) The Program will add additional administrative burdens to departments that are already heavily taxed and understaffed. In addition, the proposal is unclear and confusing in terms of how an individual department on one of the campuses will actually grant this PhD, and which department will house the Program.

B-4) UM and MTech would require significant increases in resources to initiate a materials science program on their campuses. The resource needs would be significant and include several new faculty lines at each campus; laboratory and research space for faculty and students; and new faculty startup funds, which could be as much as $500,000 per new faculty hire. The analysis of resource needs and projected revenue evaluation in the proposal (Table 3, page 21) was confusing and did not appear to be complete. In addition, the resource analysis does not adequately address all the resource issues that will be necessary to build and sustain a successful Program. (For example, administration costs, human resources, space, library holdings, equipment, startup funds for new faculty hires, to name a few.)

B-5) The proposal calls for additional faculty on all three campuses. However, there will be a need not only for additional materials science faculty but additional ancillary faculty to address workload shortages caused by the redirection of existing faculty into this new Program. Existing faculty called on to teach new materials science courses will not be available to teach other courses in their respective departments. The proposal lacks details on how this need will be met, both in terms of faculty lines and supporting resources.

B-6) The issues addressed herein bring into question whether MTech should even be able to offer a PhD degree. (This defines a University versus a College; i.e., the ability to grant advanced degrees.) This is important because, for instance, the current typical teaching load at MTech will
make it very difficult for faculty to mentor PhD students. The proposal calls for reduced teaching loads for faculty involved in training PhD students, but this may very well set up a division between faculty on that campus, with some faculty designated “teaching faculty” and others designated “researching or mentoring faculty.” We believe all these questions should be teased out before any Program is adopted.

B-7) MSU has the faculty, staff, facilities, laboratories, infrastructure, library resources, almost everything that is needed for this program to succeed. MSU will carry the brunt of the responsibilities for ensuring this program is successful. This is not spelled out sufficiently in the present document. Careful consideration should be given to who exactly will be leading the effort and what additional resources will be needed.

B-8) The delivery of courses is inadequately addressed. Will the core courses be offered on all campuses? Will there be online versions of all courses? If not, which ones will have online versions? Faculty who have to simultaneously present face-to-face and online versions may, in effect, end up teaching two different courses in terms of workload requirements. How will this be addressed?

In summary, the committee supports the creation of a Materials Science Doctoral program in the MUS system. However, we have some concerns, especially related to the significant cost the program will require for startup and long-term stability. We recommend that items B-1 through B-8 described in this letter be addressed by the proposal team prior to advancing this proposal beyond the university review level.

Please contact me if you would like to discuss these review comments in more detail.

Sincerely,

Dr. Robert Mokwa
Chair, Academic Affairs Committee

Representing Academic Affairs Committee Members:
Dr. Steve Cherry
Dr. Doug Downs
Dr. Robin Gerlach
Dr. Michael Reidy
Mr. Richard Wojtowicz