U.S. Department of Energy
and the
National Science Foundation

August 6, 2009

To: Howard Nicholson, Program Manager, DOE Office of High Energy Physics

Subject: Request to Review the Super Cryogenic Dark Matter Search project

The Department of Energy (DOE) Office of High Energy Physics (OHEP) and the National Science Foundation (NSF) request that you conduct a review of the proposed Super Cryogenic Dark Matter Search (SuperCDMS) Project on August 6, 2009 at Fermi National Accelerator Laboratory (FNAL).

The CDMS Collaboration will conduct the SuperCDMS experiment, located at the Soudan mine in Minnesota, to search for Weakly Interacting Massive Particles (WIMPs), a possible form of dark matter. It uses the infrastructure previously employed for the CDMS II experiment. The goals of the SuperCDMS experiment are to either detect the interaction of dark matter with detector nuclei or increase the limits on its direct detection by approximately one order of magnitude beyond currently published limits for a WIMP mass of 60 GeV/c^2. This is a level of sensitivity where many theoretical extensions of the Standard Model predict direct dark matter detection will occur. To accomplish these goals, the SuperCDMS Project will build 3 additional "supertowers" of 3 inch diameter and 1 inch thick Germanium, which, when added to the current experimental infrastructure, will yield a total of 5 supertowers with 15 kg total Germanium mass.

The scientific program was affirmed in the May 2007 report from the Dark Matter Scientific Assessment Group (DMSAG) subpanel: "CDMS is the present world leader in cryogenic solid state WIMP detection technology and has demonstrated a clear strategy that should allow this experiment to almost certainly reach 10^{-8} pb (10^{-44} cm^2) sensitivity, and very probably 10^{-9} pb (10^{-45} cm^2) with the proposed 25 kg phase of SuperCDMS". The DMSAG recommended that "the CDMS Collaboration be supported to continue its outstanding direct-detection program". The SuperCDMS-Soudan experiment will be a significant step towards achieving the goal recommended by the DMSAG.

Funding is anticipated to be provided by the DOE and NSF. The DOE responsibilities in the Project would be funded as a Major Item of Equipment. The NSF responsibilities in the Project would be funded as a grant. Project management is being led by FNAL.

The purpose of the review is to assess the maturity of the Project's design, its readiness to begin fabrication, and the effectiveness of its management. In carrying out its charge, the review committee is requested to address the following specific items:

1. Technical: Will the Project deliverables be able to achieve the science goals? Is the final design sufficiently mature so that the Project can initiate procurement and fabrication? Is the Project documentation sufficiently complete? Have the major risks been identified?

2. Baseline Cost and Schedule: Is the proposed cost and schedule baseline sufficient to complete the Project scope? Are the allocations of contingency adequate for the risks?

3. Management: Has the appropriate management structure been put in place to deliver the proposed scope within technical specifications, budget and schedule?

4. ES&H: Have environmental safety and health issues been identified and addressed?

5. Fabrication: Is the Project satisfactorily prepared to begin execution of the fabrication activities?

Howard Nicholson is the DOE program manager for the SuperCDMS Project and will serve as the Office of High Energy Physics contact for the review. Jim Whitmore is the NSF program manager for the SuperCDMS Project and will serve as the NSF Division of Particle and Nuclear Astrophysics contact for the review.

We appreciate your assistance in this matter. As you know, these reviews play an important role in successfully executing our programs. Both agencies look forward to receiving the committee's report within 60 days of the review.

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