

**Lattice QCD Computing Projects**  
*LQCD-ext and LQCD-ARRA*

**Response to Recommendations**  
**from the**  
**2011 DOE Annual Progress Review of the**  
**LQCD-ext/ARRA Computing Projects**

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March 12, 2012

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## INTRODUCTION

On May 10-11, 2011, the U.S. Department of Energy (DOE) Office of High Energy Physics and the Office of Nuclear Physics conducted an Annual Progress Review of the LQCD-ext (LQCD Extension) and LQCD-ARRA (American Recovery and Reinvestment Act) projects. The review was held at the Fermi National Accelerator Laboratory and resulted in a written report that contained six recommendations to help improve project effectiveness and impact. This document summarizes the project response to the recommendations, along with subsequent actions taken.

## RESPONSE TO RECOMMENDATIONS

### **1) USQCD should improve its demographic information so that its impact on postdoc and graduate students training could be addressed quantitatively.**

*We have made a significant improvement in our demographic information during the past year thanks to the efforts of LQCD-ext Associate Project Manager Bakul Banerjee. In the survey taken in September, 2010, the total membership was given as 106; however, after working with senior members of USQCD, Dr. Banerjee determined that the actual membership was 183. We intend to continue our new approach to the demographic survey, collecting information regarding institution, email address and academic status of each member of the collaboration.*

### **2) Continued bridges must be built with the community of experimentalists and phenomenologists. Continuation of the "Lattice QCD Meets Experiment" series, invitations of "outside" guest speakers to the annual All-Hands Meeting, and participations by lattice conveners in non-lattice conferences all are helping to foster this aim.**

*We agree with all of these recommendations and intend to follow them. The next "Lattice Meets Experiment Workshop" will bring us into the LHC era with "Lattice Gauge Theory Meets Experiment in BSM Physics". It took place on October 14-15, 2011 at Fermilab. It brought together lattice gauge theorists studying strongly coupled BSM models with BSM phenomenologists and experimenters. They discussed what BSM lattice gauge theorists are attempting to do at present, what they hope to do in the future, and what phenomenologists would like to see them do. The next Lattice Meets Experiment in flavor physics is planned for 2012.*

**3) An effort should be made to improve the user survey in particular by making it shorter and easier to complete in a short time. Users should be urged to complete the survey (or perhaps it should be part of their proposals that all individuals complete their survey).**

*We agree that the User Satisfaction Survey needs to be improved in order to 1) enable us to better identify and address problems encountered by the users; 2) identify areas for improvement; and 3) increase the response rate to produce better statistics. Following the suggestions made by the 2011 Progress Review Committee, we reviewed and revised the survey questions. We reduced the total number of questions from 44 to 22 and revised the wording on some questions to simplify the survey. We did retain the ability for users to provide free-form comments, which tend to provide more insight into user issues or concerns. As in past years, users were urged to complete the survey through a series of e-mail reminders. Perhaps as a result of the changes made to the survey, we achieved a 60% response rate to the FY11 user survey, compared to a 39% response rate in FY10.*

**4) The impressive successes with GPUs depend upon effective software development which has come through the SciDAC initiative. USQCD and the DOE must find some means of putting this program on a more solid funding base.**

*USQCD agrees that it is critical to put funding for the SciDAC effort on a solid basis. We have submitted both NP and HEP proposals to the SciDAC-3 Program. Work on GPU systems is a significant new part of the new proposals, as is software for beyond-the-standard-model lattice gauge theories.*

**5) The Federal Project managers should review the LQCD-ext acquisition plans it develops over the July-September window. Further delays in the BG/Q schedule could remove it from the FY2012 hardware plan.**

*Development of the FY12 acquisition plan was discussed with the Federal Project Director and Federal Project Monitor (Dr. John Kogut and Dr. Helmut Marsiske, respectively) on a monthly basis through the July-September timeframe. The FY12 acquisition planning process was executed following the process that was presented and endorsed at the 2011 Annual Progress Review. The project team completed the FY12 Alternatives Analysis on August 11, 2011. Five alternatives were considered and one option selected as the preferred choice based on optimal price-performance benefits. The preferred choice consisted of a combination of conventional Infiniband and GPU-accelerated cluster hardware. Procurement and deployment of the FY12 acquisition will occur at JLab. The BG/Q was removed from consideration in FY12 due to schedule uncertainty, as well as a lack of suitable performance benchmarks and pricing information due to non-disclosure constraints.*

*On August 21, 2011, the LQCD-ext Project Manager received notice that the USQCD Executive Committee had concurred with the preferred hardware choice. On September 1, 2011, the LQCD-ext Project Manager presented the results of the Alternatives Analysis and preferred hardware choice to the Federal project managers for review. The proposed plan was accepted and authorization to proceed was granted.*

**6) Although the leadership has made substantial efforts to reach out to the HEP and NP communities via workshop, talks, collaborations, the use of open source software, etc., there may be additional means to attract more attention, interest, and participation in their programs. An outreach effort should be considered. It might include a central effort to communicate via printed materials, a collection of images, and materials for lattice speakers to facilitate their presentations.**

*We agree that interactions with scientists outside the lattice gauge theory community are of great importance. The web provides an excellent means for communicating the exciting scientific and computational results produced by our collaboration, and we intend to upgrade our website in order to better do so.*