

# Charter of USQCD

September, 2015

## USQCD

USQCD is a consortium of collaborations and individuals in the US using lattice field theory techniques to solve fundamental problems in high energy and nuclear physics. USQCD organizes the hardware and software infrastructure needed by the United States lattice gauge theory community for the study of Quantum Chromodynamics (QCD), the theory of the strong interactions of subatomic physics, and other theories that have been proposed to explain physics beyond the standard model. The USQCD Executive Committee was formed to provide leadership in developing this computational infrastructure. USQCD receives primary funding from the DOE's LQCD computing hardware Project and SciDAC software program, as well as computing time on large-scale resources from the DOE and the NSF. In accordance with USQCD's original mandate, these resources are available to all members of the US lattice community. Membership in USQCD is open to all US lattice gauge theorists, and almost all US lattice gauge theorists have joined. Members may submit proposals to use the computing resources of USQCD for lattice field theory calculations. Members are expected to abide by the rules of USQCD on use of community gauge configurations for noncompeting projects, and not to compete with USQCD's proposals for funding or computing resources. USQCD organizes this infrastructure nationally and sets the broad physics goals of the US lattice program. These goals are chosen to address outstanding research opportunities presented by the national and international programs in high energy and nuclear physics and to represent the goals and capabilities of the physics collaborations and individuals who make up USQCD. The actual research using the USQCD hardware and software infrastructure is carried out and published by these collaborations and individuals within USQCD.

This document describes the current procedures of USQCD. These procedures have evolved over the life of USQCD in response to suggestions of review panels at the Annual Progress Reviews of the LQCD computing hardware IT Project, and as a results of discussions with USQCD members at All Hands meetings. We expect them to continue to gradually evolve in the future.

## The Executive Committee

The Executive Committee of USQCD provides leadership for and manages USQCD. The Executive Committee members were originally chosen as representatives of the large lattice QCD collaborations in the US, which agreed to work together within the structure of USQCD and/or as leading experts in the physics and computational aspects of lattice field theory research. The Executive Committee is responsible for setting scientific goals, determining the computational infrastructure needed to achieve these goals, developing plans for creating the infrastructure, securing funds to carry out these plans, and overseeing the implementation of all of the above. The Executive Committee advises the DOE and the Contract Project Manager of the LQCD hardware project regarding scientific priorities and the computing resources needed to accomplish them. The LQCD computing project is carried out in association with USQCD's

three partner laboratories: Brookhaven Lab, Fermilab, and Jefferson Lab. The Executive Committee appoints the Scientific Program Committee, which allocates the project's computational resources. The broad scientific goals of USQCD are set by the Executive Committee with input from the Scientific Program Committee and the membership at large. The nine members of the Executive Committee rotate at the rate of around one per year. Around half of the members of the Executive Committee are expected to remain during the lifetime of a five-year hardware or software project. If a vacancy occurs, it is filled by a vote of the remaining members of the Executive Committee to meet the following objectives:

- Maintain representation for the large collaborations which work together within USQCD, with collaboration representatives chosen by the Executive Committee after consultation with the respective collaborations.
- Insure broad expertise within the Executive Committee covering the important physics opportunities open to lattice research.
- Encourage a balanced distribution of seniority including vigorous leadership for new scientific and computational directions

#### Responsibilities of the Executive Committee

- The Executive Committee sets the scientific goals and determines the computational infrastructure needed to achieve them,
- Organizes the writing of proposals for new hardware and software grants,
- Submits the USQCD proposals for hardware and software funding and for access to large-scale computing resources,
- Decides on resource opportunities to which USQCD will make a single, comprehensive proposal, with the resulting resources to be allocated by the SPC.
- Acts as principle investigators or co-principle investigators for these proposals, as appropriate,
- Establishes procedures for the equitable use of the infrastructure by the national lattice gauge theory community,
- Arranges for oversight of progress in meeting the scientific goals,
- Arranges regular meetings of the national lattice gauge theory community to describe progress, and to obtain input,
- Appoints the members of the Scientific Program Committee and the Science Advisory Board,
- Approves the allocations made by the Scientific Program Committee,
- Manages the rotation of Executive Committee membership.

#### Spokesperson

The Chair of the Executive Committee serves as the Scientific Spokesperson for the project and as the principle investigator for USQCD proposals, as appropriate. The Chair is elected by the Executive Committee and is a member of the Executive Committee.

#### *Responsibilities*

- The Chair provides leadership for the Executive Committee,
- Is the principal point of contact to DOE on scientific matters related to the project,
- Presents the project's scientific objectives to the DOE, its review committees and its advisory committees,

- Acts as liaison between the Executive Committee and the Scientific Program Committee and the Science Advisory Board,
- Acts as liaison between the Executive Committee and the Contract Project Manager of the LQCD hardware project, relating the Executive Committee's priorities to the CPM, and transmitting the CPM's progress reports to the Executive Committee,
- Chairs the LQCD Project Change Control Board.

### **Scientific Program Committee**

The charter of the Scientific Program Committee (SPC) is to assist the Executive Committee in providing scientific leadership for the LQCD infrastructure development efforts. This committee monitors the scientific progress of the effort, and provides leadership in setting new directions.

The Scientific Program Committee is charged with allocating time on the integrated hardware resources operated within the scope of the LQCD computing hardware project, the DOE INCITE program, and on any other computing resources of USQCD. The needs of the US experimental programs in nuclear and particle physics play a leading role in these allocations. The official goals of USQCD are spelled out in its most recent white papers and most recent proposals for hardware and software, which are organized by the Executive Committee and written by members of the Executive Committee, the SPC, and members of the community. When making allocations, an important responsibility of the SPC is recommending a program that addresses these goals. Further, the SPC should advise the Executive Committee when, in its view, the goals of the collaboration need to evolve or change.

This committee has instituted the following allocation process. Once a year, proposals are solicited for the use of computational resources that are available to the user community during the allocation period July 1 to June 30. The Committee reviews the proposals and makes preliminary allocations based on its reviews. An open meeting attended by most members of USQCD is then held to discuss the proposals and the preliminary allocations. The Committee makes final recommendations for each resource following this meeting. These allocations are reviewed and normally accepted by the Executive Committee. The three LQCD Site Managers are responsible for configuring and managing the hardware project's resources at their respective institutions in accordance with those allocations. It is the responsibility of the various research groups receiving allocations to carry them out, interacting as necessary with the three Site Managers.. The objective of this process is to achieve the greatest scientific benefit from the dedicated computing resources through broad input from the USQCD membership. The Committee is also charged with organizing the annual meeting described above to review progress in the development of the infrastructure and scientific progress achieved with that infrastructure, and to obtain input on future directions. While the Scientific Program Committee plays an essential role in guiding the research program of USQCD, this research program is proposal driven and carried out by the separate collaborations and individuals that make up USQCD. Through its allocations and instructions to successful projects, the SPC endeavors to achieve results of the highest scientific quality. However, it is ultimately these research groups, which take scientific responsibility for the research performed and its timely publication.

The seven members of the Scientific Program Committee are appointed by the Executive Committee. The committee chair rotates every two years. Current members have staggered terms of four years. When a vacancy occurs, the open slot is filled by the Executive Committee.

## **Other Important Committees**

### Software

Members of the USQCD software effort meet weekly to discuss the software needs of the collaboration and to report on progress towards the milestones of the software proposals. These meetings are organized by the Software Coordinator, who is appointed by the Executive Committee and also provides overall coordination of the software effort. The software coordinator is responsible for making sure that the goals and milestones set out in our SciDAC proposals are being met, for making sure that the software effort is meeting the needs of the physics program, and for being alert to new software needs and opportunities. The Software Committee also advises the Executive Committee in the writing of new SciDAC proposals.

### The Science Advisory Board

The Science Advisory Board consists of seven particle and nuclear physicists who are not lattice gauge theorists. Its charge is to provide USQCD with advice on how to best meet the needs of the DOE and NSF particle and nuclear physics programs for lattice calculations. They provide advice on how USQCD is meeting its scientific goals, and also advice on the needed evolution of those goals.

### The LQCD Project Change Control Board

The DOE-mandated Change Control Board (CCB) evaluates the feasibility, cost and impact of proposed changes to the LQCD computing project which result in more than a minimal cost or schedule change. The members are the Project Manager, the Chair of the LQCD Executive Committee, who serves as chair of the CCB, the FNAL Chief Information Officer, the JLab Chief Information Officer, the BNL Information Technology Division Director, and a member of the USQCD Collaboration selected by the Executive Committee to represent the interests of the user community.

## **USQCD Community Resources**

The large data sets, gauge configurations and, in some cases, quark propagators, generated with USQCD resources are shared with all members of USQCD as they are created. Because the generation of these data sets requires a great deal of time and effort, groups engaged in this activity may specify a limited number of physics projects for which they will have first use of the data sets. Other USQCD users of the data sets agree not to employ them for these reserved projects until one year after the first paper on that reserved topic has been published by their creators. The data sets will be made publicly available within one year of the first publication of papers on all of the reserved projects. It is the responsibility of the users to acknowledge the data sets and the centers at which they were produced in all publications resulting from them.

USQCD's HEP and NP SciDAC grants have enabled the creation of a body of community libraries and community codes for core lattice gauge theory tasks such as generating

configurations and calculating quark propagators. These codes may be downloaded by anyone in the US (or the world) at [http:// http://www.usqcd.org/usqcd-software/](http://www.usqcd.org/usqcd-software/) .