

**Thank You**

**Paul**

# The Early History of USQCD

# Scientific Simulation Initiative (SSI)

- Planning began in 1999.
- Proposal included state-of-the-art Supercomputers, and funds for application groups to develop software.
- Planning meeting for lattice gauge theorists organized by Jeff Mandula and Vicky White.
- The initiative was not funded.
- The major outcome for the lattice gauge theory community was the formation of the QCD Executive Committee.

# Original Members of the Executive Committee

R. Brower (Boston U.)  
N. Christ (Columbia U.)  
M. Creutz (BNL)  
P. Mackenzie (Fermilab)  
J. Negele (MIT)  
C. Rebbi (Boston U.)  
S. Sharpe (U. Washington)  
R. Sugar (UCSB)  
W. Watson III (JLab)

# Role of the Executive Committee

- Set priorities for the development of infrastructure.
- Obtain funding for hardware and software infrastructure needed for the study of QCD and other gauge theories of importance in high energy and nuclear physics.
- Organize the the construction of this infrastructure.
- Develop plans for the use of the infrastructure by the entire US lattice gauge theory community.

# Scientific Discovery through Advance Computing

## (SciDAC)

- Similar in structure and goals to the SSI.
- USQCD received a three year grant of \$2 M per year starting on July 1, 2001. A number of extensions and renewals followed.
- Funds primarily for software development, but 25% for the development of “prototype hardware”.

# SciDAC Highlights

- Software work at five universities (Arizona, Boston, Illinois, MIT, Utah) and three laboratories (BNL, FNAL, JLab). Rich Brower Software Co-ordinator.
- Development of the QCD API makes it straight forward to create high performance parallel code.
- SciDAC work enables early adoption of GPUs, which leads to major improvements in price/performance.

# Arguments for Hardware Funding

- Importance of the calculations for the experimental programs in high energy and nuclear physics.
- Cost effectiveness of computers that take advantage of special features of QCD (regular grids, regular, predictable communications).
- QCDOC under development at BNL, and specialized clusters at FNAL and JLab.
- Initial goal of \$1M per sustained teraflop/s. (25 times better price/performance than Japanese Earth Simulator).

# Approval of Hardware Funding

- Meetings with leaders of High Energy Physics and Nuclear Physics Divisions.
- Importance of LQCD calculations for research in nuclear physics recognized by NSAC in 2002 and 2003.
- Investment in LQCD hardware endorsed by HEPAP in February, 2003.
- Meeting of Ray Orbach, T.D. Lee, Frank Wilczek, Norman Christ and Bob Sugar in Washington.

# LQCD Computing Project

- Funding guidance: \$2.5 M per year for FY06, FY07, FY08, and \$1.7 M for FY09 for a total of \$92 M.
- Large project necessitated considerable bureaucracy.
  - OMB Exhibit 300.
  - Funds for the project went directly to the three participating laboratories.
  - Executive Committee advisory to the Contract Project Manager (Don Holmgren).

# LQCD Computing Project

- Yearly reviews.
- Several extension plus additional funds from ARRA Program.

# INCITE

- Innovative and Novel Computational Impact on Theory and Experiment.
- INCITE is meant to support high-impact, computationally intensive research programs in a broad array of science, engineering and computer science domains.
- Resources available at ALCF and OLCF.
- First general USQCD grant in 2007.

# Scientific Program Committee

- Makes annual call for proposals for use of USQCD hardware, and supercomputer time allocated to USQCD.
- Organizes USQCD All-Hands Meetings.
- Allocates USQCD computing resources.
- Members rotate, serving three year terms.

# Paul's Many Contributions

- Leader of the Fermilab Lattice Collaboration.
- Liaison between USQCD and the Fermilab Computing Division.
- Member of the Executive Committee for twenty years, and Chair for ten years.

# John Negele

Dear Paul,

I regret I am not able to join the others at this meeting in thanking you in person, but would like to express my appreciation in writing.

One of the great professional pleasures of my life in physics has been observing the success of the USQCD collaboration, in which the leadership by the person serving as Spokesman and Chair of the Executive Committee has played an essential role.

So I want to thank you for nearly a decade of thoughtful and effective leadership and your sustained effort on behalf our collaboration. Highly visible successes as PI in obtaining SciDAC grants and INCITE awards and successful DOE reviews speak for themselves. But I especially want to thank you for your deft human touch in leading a group of strong personalities in a manner that has consistently facilitated coherent effort and collegiality.

I join all of your colleagues gathered at Fermilab for your celebration in thanking you for your leadership and wishing you all the best in your retirement.

John