

Report on QCDOC

All Hands' Meeting
US Lattice QCD Collaboration Meeting
BNL, April 16-17, 2010

Stratos Efstathiadis
BNL

**BROOKHAVEN**
NATIONAL LABORATORY
a passion for discovery

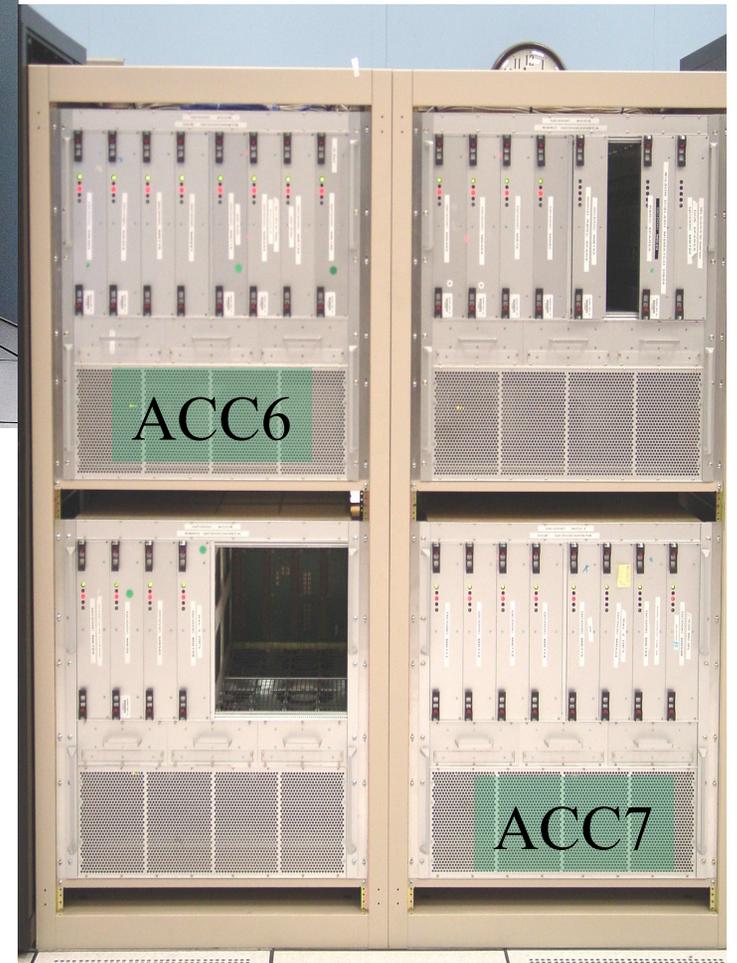
 **Office of
Science**
U.S. DEPARTMENT OF ENERGY



Available Hardware

12 water cooled racks (12288 nodes)

Air Cooled Crates (1024 nodes)



Single Slot Back Plane (SSBP8 and 9)

QCDOC Current Status

(Water-Cooled Racks Only)

Partition (Click for partition details)	Allocated? (Click to Allocate)	Alloc. User	Run User (Click for User Jobs)	Run Time [Days-]Hrs:Min:Secs
acc6	True	xyjin	-	-
rack16/crate0	True	cschmidt	-	-
rack16/crate1	True	cschmidt	-	-
rack17/crate0	True	cschmidt	cschmidt	6-02:16:41
rack17/crate1	True	cschmidt	-	-
rack18-19	True	cmiao	-	-
rack20	True	cmiao	cmiao	03:53:09
rack21	True	mabramcz	mabramcz	1-07:08:43
rack22	True	cmiao	cmiao	19:57:56
rack23	True	endres	endres	04:32:40
rack24-27	True	chulwoo	chulwoo	16:41:04
ssbp8-9	True	qiliu	-	-

[Current Status](#)

[List All Running Jobs](#)

[List All Done Jobs](#)

[List All Jobs](#)

<http://www3.bnl.gov/qcdoc/status/>

Racks 16, 17	4 x 512-nodes	PI: Peter Petreczky (p4 Thermo)
Racks 18, 19	1 x 2048 partition	
Racks 20, 21, 22, 23	4 x 1024	PI: Peter Petreczky PI: Tom Blum PI: Mike Endres
Racks 24, 25, 26, 27	1 x 4096 partition 64 ³ x 192	PI: S. Sharpe
	2 x 2048 48 ³ x 144	

Future Plans for the USQCD QCDOC machine

- Project allocation ends **12/31/2010**
- There is funding available to continue running the machine until the **03/31/2011**. Machine will run in a “friendly user” mode.
- The machine may run for longer if additional funding becomes available and the resources it requires (space , power, etc.) are not needed by other projects.

The Blue Gene Experience: **New York Blue**



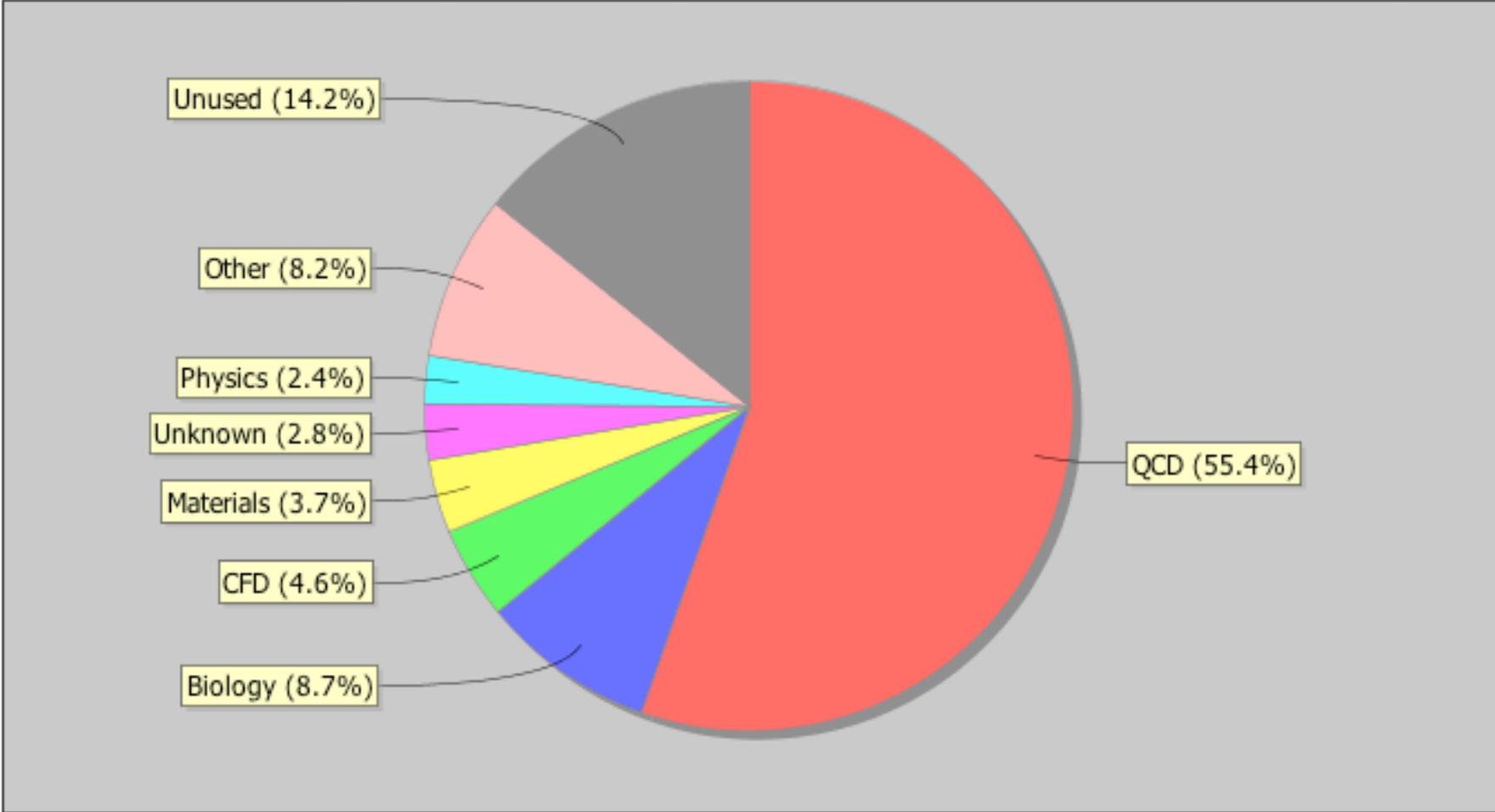
- 18 racks of BG/L
- 103 TFlops peak
- Installed spring 2007

- 2 racks of BG/P
- 28 Tflops peak
- Installed Dec. 2007

- Blue Gene machines are very reliable.
- Most of the technical issues are handled by BNL people.



NYBlue Usage by Domain (Annual - Mar/2009 - Feb/2010)



● QCD ● Biology ● CFD ● Materials ● Unknown ● Physics ● Other ● Unused

Exploring the possibilities of the next Blue Gene Machine for LQCD at BNL

- IBM is planning the next version of Blue Gene **BG/Q**. We expect commercial hardware in **2012**.
- Members of USQCD have been given **access under NDA** to BG/Q simulation hardware. Chulwoo Jung (BNL) has been compiling and running QCD code on BG/Q.
- Peter Boyle (Edinburgh) has written **high performance kernels** with remarkable efficiency for DWF and a strategy for staggered fermions is being developed.
- The **processor-memory interface** has been designed by a Columbia/Edinburgh/RBRC team so explicit care has been taken that QCD will run efficiently on this machine.
- BG/Q should be highly efficient for QCD with at least **10-20 times the performance of BG/P per node**.

Exploring the possibility of the next Blue Gene Machine for LQCD at BNL

- We expect the performance of QCD on BG/Q to be very competitive with clusters while supporting a larger range of gauge configuration generation projects.
- Given BNL's strong experience with previous versions of Blue Gene (L and P) and Columbia/Edinburgh/RBRC software and hardware expertise, BNL would be eager to host a BG/Q machine.

User Support

QCDOC Team at BNL (Led by **Bob Mawhinney**)

- Management

- **Eric Blum**

- BNL Site Mgr for the LQCD Computing Project
 - BCF Mgr

- Software

- **Efstathios Efstathiadis**
 - **Chulwoo Jung**
 - **Oliver Witzel**

- Hardware

- **Joe Depace**
 - **Robert Riccobono**



RBRC (right) and DOE (left) 12K-node QCDOC machines