

LQCD-ext III Project Report

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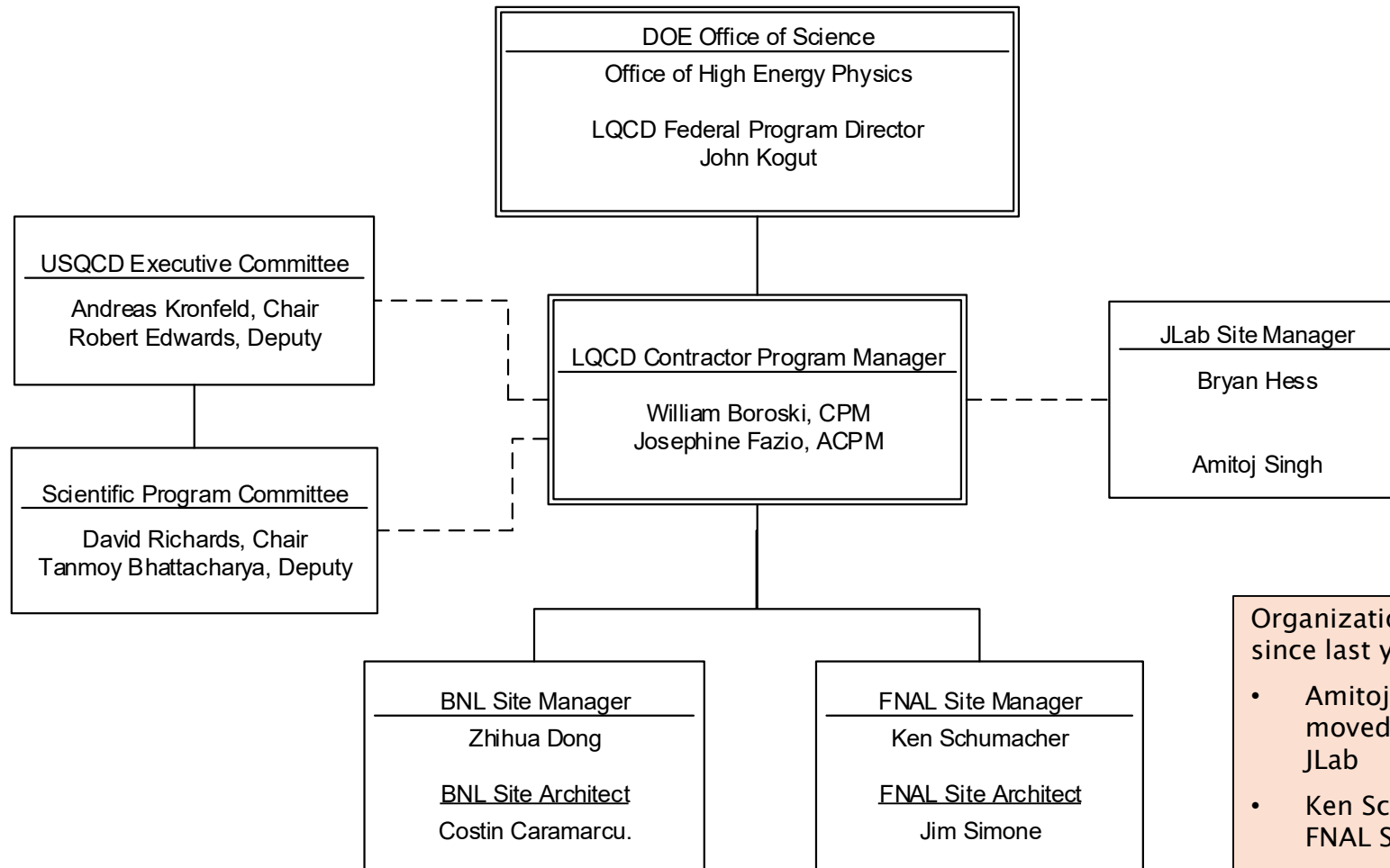
USQCD All-Hands Meeting

Apr 30 – May 1, 2021

Outline

- ▶ Organizational update
- ▶ Highlights over the past 12 months
- ▶ Results from 2020 DOE Annual Review
- ▶ Long-term data archive

LQCD-ext III Integrated Project Team (IPT)



Organizational changes since last year:

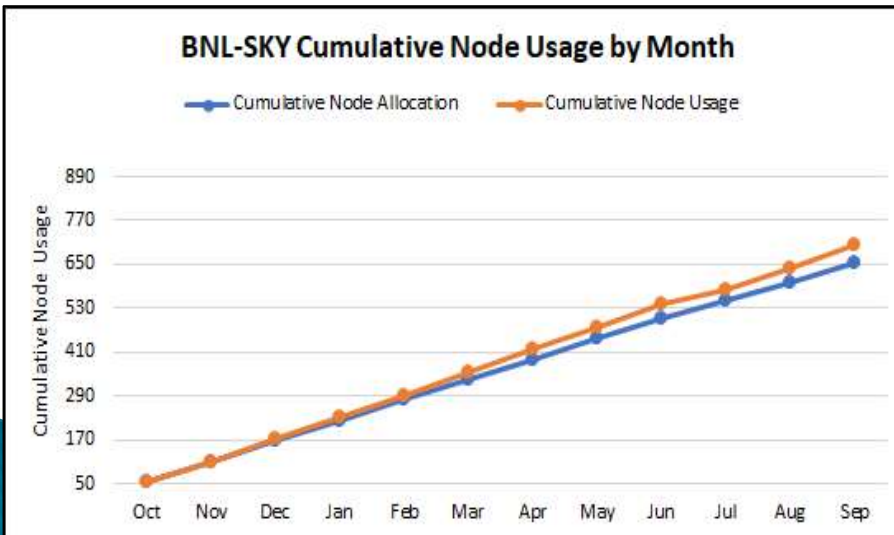
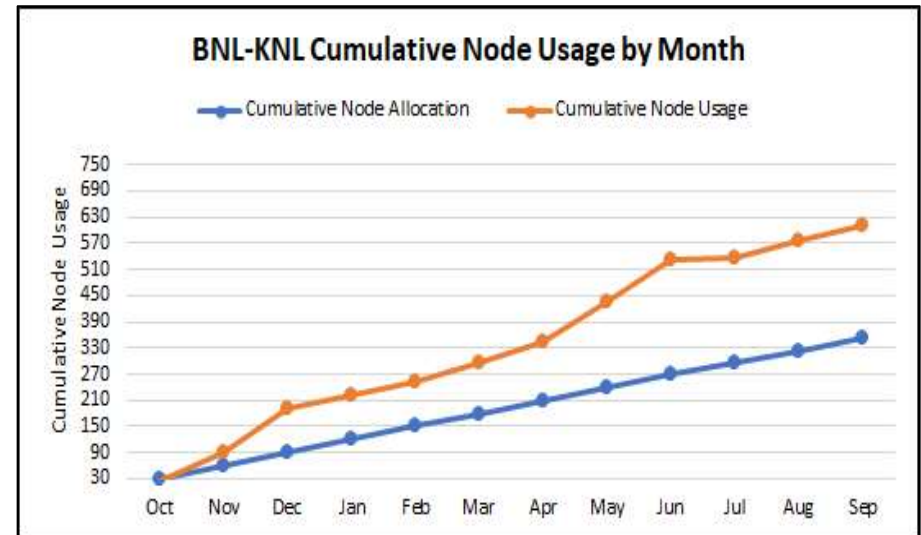
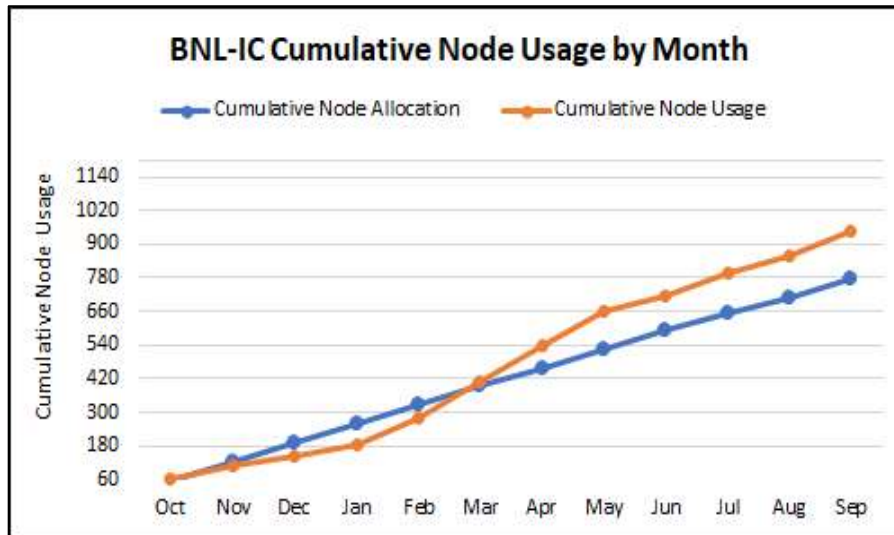
- Amitoj Singh recently moved from FNAL to JLab
- Ken Schumacher is FNAL Site Manager
- Jim Simone is FNAL Site Architect

Fare-thee-well, dear friend and colleague



Amitoj Singh receiving an
Exceptional Performance
Recognition Award from
Fermilab Director Nigel Lockyer
for his outstanding efforts in the
establishment and ongoing
success of the Fermilab
Lattice QCD Computing Facility.

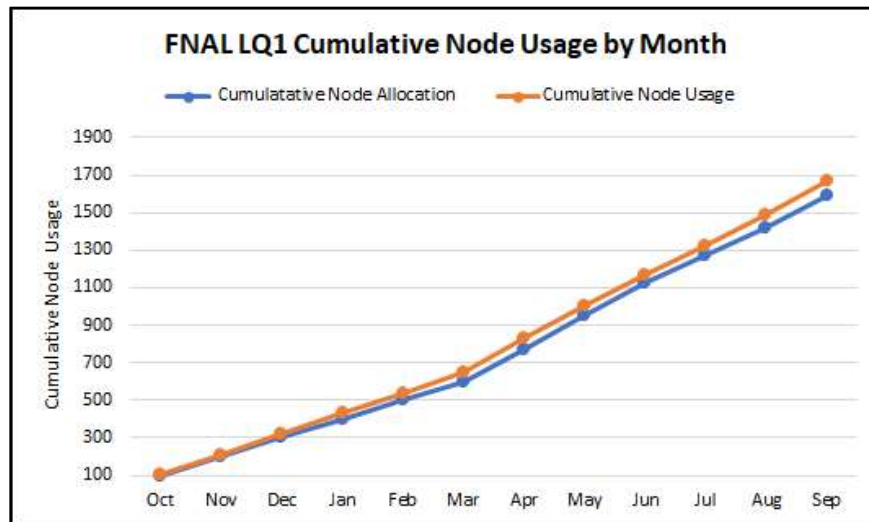
Utilization of our FY20 Allocations – BNL



FY20: Oct thru Sep:

System	Node Allocation	% of Cumulative Allocation Used
BNL-IC	72	122%
BNL-KNL	58	173%
BNL-SKY	58	107%

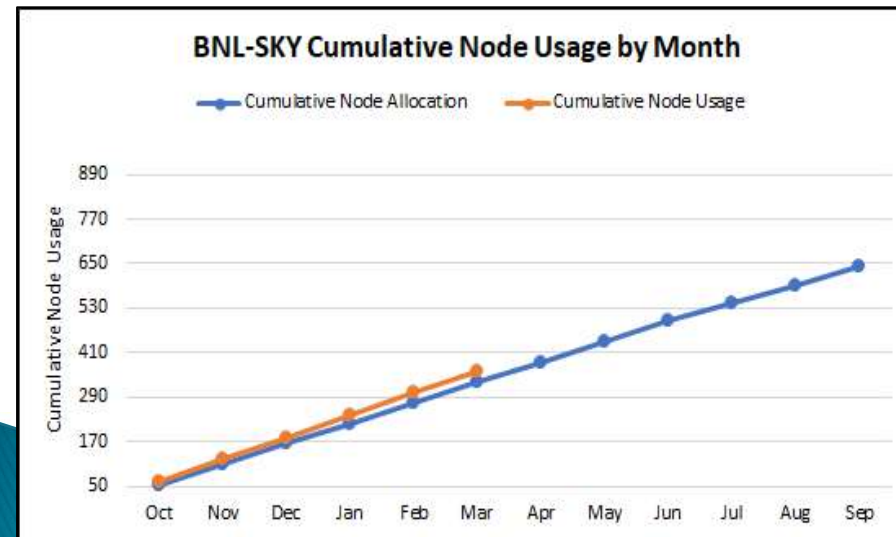
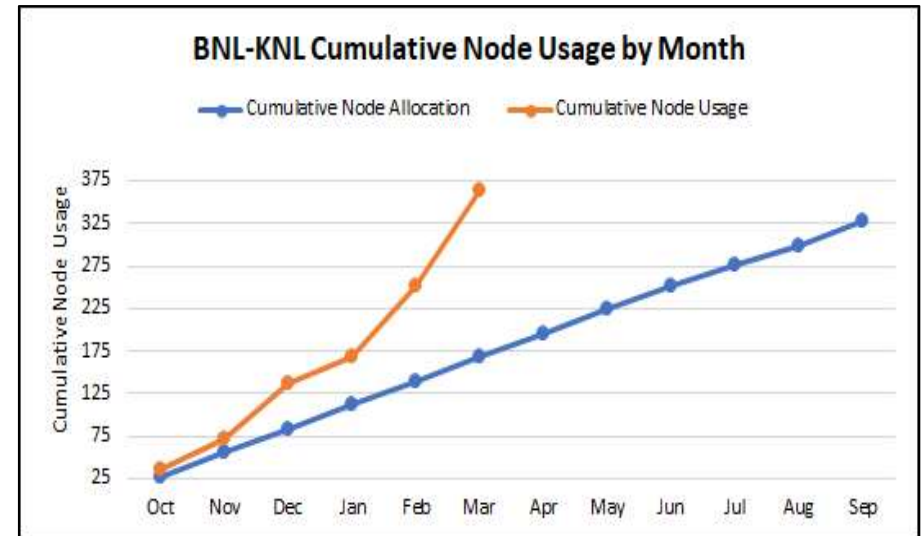
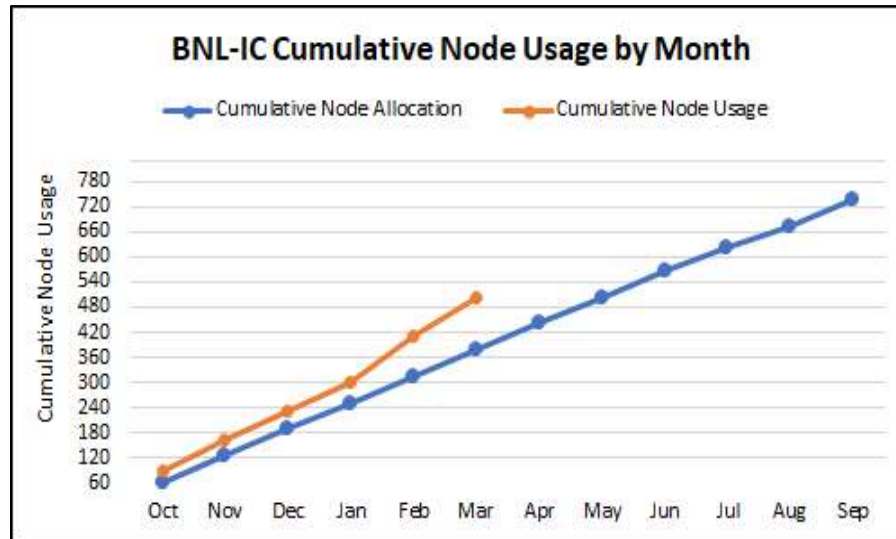
Utilization of our FY20 Allocations – FNAL



FY20: Oct thru Sep:

System	Node Allocation	% of Cumulative Allocation Used
FNAL-LQ1	100 -> 175	105%

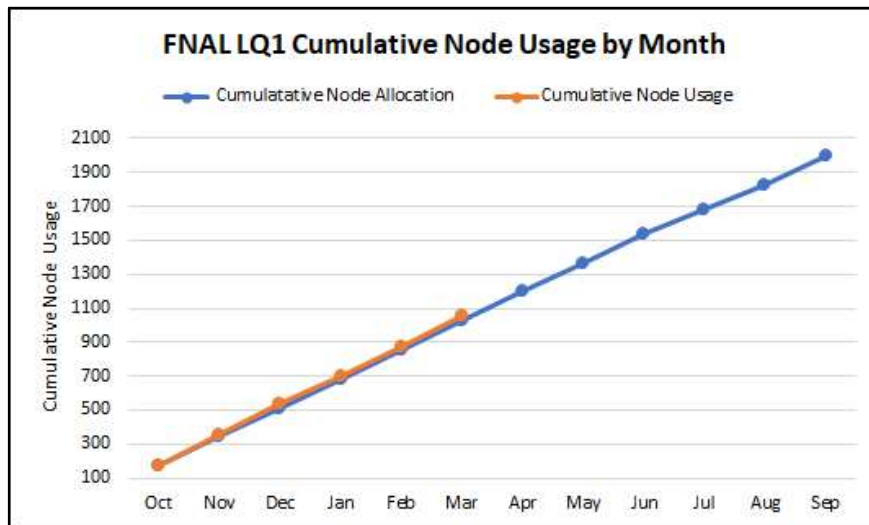
Utilization of our FY21 Allocations – BNL



FY20: Oct thru Sep:

System	Node Allocation	% of Cumulative Allocation Used
BNL-IC	63	133%
BNL-KNL	28	216%
BNL-SKY	55	109%

Utilization of our FY21 Allocations – FNAL



FY20: Oct thru Sep:

System	Node Allocation	% of Cumulative Allocation Used
FNAL-LQ1	171	103%

Project Usage through Apr 29: BNL-IC, Sky, and KNL

83% of Allocation Year Complete

Institutional Cluster										
(Sky Core Hours)										
updated: 2021-04-29 00:03:33										
Cluster	Account	Start Date	End Date	Allocation	Usage	Usage(%)				
Annie-IC	lqcd-20-21	2020-07-01	2021-06-30	37,905,000	39,897,999	105.26%				
Project	Original SPC Allocation	Adjustment	Adjusted SPC Allocation	Usage	Progress(%)	Remain	30Day Usage	30Day BurnRate		
1 stagemug-20-21	4,655,000	(734,289)	3,920,711	4,407,099	112.41%	0	910,075	23.21%		
2 exclhvp-20-21	3,990,000	223,767	4,213,767	4,475,400	106.21%	0	181,358	4.30%		
3 qgpd-20-21	3,657,500	40,207	3,697,707	3,669,330	99.23%	28,377	0	0.00%		
4 piongpd-20-21	2,992,500	340,595	3,333,095	6,160,189	184.82%	0	515,720	15.47%		
5 axialgpu-20-21	3,325,000	8,505	3,333,505	5,662,137	169.86%	0	1,469,696	44.09%		
6 nucstructclover-20-21	4,555,250	208,679	4,763,929	3,929,348	82.48%	834,581	0	0.00%		
7 sextet-20-21	3,657,500	8,329	3,665,829	2,825,890	77.09%	839,939	912,219	24.88%		
8 protongff-20-21	4,821,250	(107,881)	4,713,369	4,439,285	94.18%	274,083	0	0.00%		
9 a1res-20-21	2,992,500	4,321	2,996,821	2,492,450	83.17%	504,371	510,932	17.05%		
10 semibdff-20-21	2,926,000	7,768	2,933,768	1,836,872	62.61%	1,096,895	3,774	0.13%		
11 lqcd-other	0	0	0	0	0.00%	0	0	0.00%		
12 UnAllocated:	332,500	2	332,502	0	0.00%	0	0	0.00%		

Skylake Cluster										
(Sky Core Hours)										
updated: 2021-04-29 00:03:33										
Cluster	Account	Start Date	End Date	Allocation	Usage	Usage(%)				
Skylake	lqcd-sky-20-21	2020-07-01	2021-06-30	17,100,000	15,120,935	88.43%				
Project	Original SPC Allocation	Adjustment	Adjusted SPC Allocation	Usage	Progress(%)	Remain	30Day Usage	30Day BurnRate		
1 gflow8f-sky-20-21	5,500,000	126,658	5,626,658	4,413,920	78.45%	1,212,738	663,222	11.79%		
2 qgpd-sky-20-21	3,700,000	34,762	3,734,762	2,925,133	78.32%	809,629	217,678	5.83%		
3 axialgpu-sky-20-21	1,100,000	(344,806)	755,194	514,632	68.15%	240,562	173,218	22.94%		
4 stagemug-2-sky-20-21	4,000,000	140,087	4,140,087	4,420,674	106.78%	0	448,243	10.83%		
5 semibdff-sky-20-21	2,800,000	43,299	2,843,299	2,846,576	100.12%	0	0	0.00%		
6 UnAllocated:	0	0	0	0	0.00%	0	0	0.00%		

KNL Cluster										
(Sky Core Hours)										
updated: 2021-04-29 00:03:15										
Cluster	Account	Start Date	End Date	Allocation	Usage	Usage(%)				
Frances-KNL	lqcd-knl-20-21	2020-07-01	2021-06-30	9,345,800	14,319,375	153.22%				
Project	Original SPC Allocation	Adjustment	Adjusted SPC Allocation	Usage	Progress(%)	Remain	30Day Usage	30Day BurnRate		
1 ndbeta-knl-20-21	2,871,300	(913,194)	1,958,106	131,206	6.70%	1,826,900	3,734	0.19%		
2 qcdqeda-knl-20-21	5,067,000	962,978	6,029,978	5,492,247	91.08%	537,731	1,037,155	17.20%		
3 pdfa-knl-20-21	1,407,500	(1,407,500)	0	0	0.00%	0	0	0.00%		
4 lsd4p6-knl-20-21	0	1,357,716	1,357,716	6,773,049	498.86%	0	1,601,111	117.93%		
5 class-c-w0scale-20-21	20,000	0	20,000	903	4.51%	19,097	0	0.00%		
6 class-c-omegamass-20-21	20,000	0	20,000	1,921,970	9,609.84%	0	609,941	3,049.70%		
7 UnAllocated:	-40,000	(0)	-40,000	0	0.00%	0	0	0.00%		

<https://monitoring.sdcc.bnl.gov/pub/allocation/lqcd.html>

Project Usage through Apr 29: BNL-IC

83% of Allocation Year Complete

Expanded table from previous slide...

Institutional Cluster							
(Sky Core Hours)							
updated: 2021-04-29 00:03:33							
Cluster	Account	Start Date	End Date	Allocation	Usage		
Annie-IC	lqcd-20-21	2020-07-01	2021-06-30	37,905,000	39,897,999		
Project	Original SPC Allocation	Adjustment	Adjusted SPC Allocation	Usage	Progress(%)	Remain	
1 stagemug-2-20-21	4,655,000	(734,289)	3,920,711	4,407,099	112.41%	0	
2 exclhvp-20-21	3,990,000	223,767	4,213,767	4,475,400	106.21%	0	
3 qgpd-20-21	3,657,500	40,207	3,697,707	3,669,330	99.23%	28,377	
4 piongpd-20-21	2,992,500	340,595	3,333,095	6,160,189	184.82%	0	
5 axialgpu-20-21	3,325,000	8,505	3,333,505	5,662,137	169.86%	0	
6 nucstructclover-20-21	4,555,250	208,679	4,763,929	3,929,348	82.48%	834,581	
7 sextet-20-21	3,657,500	8,329	3,665,829	2,825,890	77.09%	839,939	
8 protongff-20-21	4,821,250	(107,881)	4,713,369	4,439,285	94.18%	274,083	
9 a1res-20-21	2,992,500	4,321	2,996,821	2,492,450	83.17%	504,371	
10 semibdff-20-21	2,926,000	7,768	2,933,768	1,836,872	62.61%	1,096,895	
11 lqcd-other	0	0	0	0	0.00%	0	
12 UnAllocated:	332,500	2	332,502	0	0.00%	0	

Project Usage through Apr 26: FNAL – LQ1

83% of Allocation Year Complete

Project Name	Cluster	SPC Original Allocation (Sky-Core-Hours) ▲	Adjustments (Sky-Core-Hours)	SPC Adjusted Allocation (Sky-Core-Hours)	Project Used as of Jul 1, 2020 (Sky-Core-Hours)	Progress against Adjusted Allocation	Remaining Allocation (Sky-Core-Hours)
lp3	FNAL-LQ1	12,500,000	-641,998	11,858,002	7,349,805	62%	4,508,197
nme	FNAL-LQ1	11,400,000	-2,268,859	9,131,141	6,391,211	70%	2,739,930
chiqcd	FNAL-LQ1	11,000,000	1,813,371	12,813,371	11,560,465	90%	1,252,906
nedm	FNAL-LQ1	8,200,000	-171,350	8,028,650	6,177,518	77%	1,851,132
mslight	FNAL-LQ1	6,800,000	-1,151,247	5,648,753	3,302,301	58%	2,346,452
vcbok	FNAL-LQ1	5,000,000	1,355,588	6,355,588	4,811,899	76%	1,543,689
rhqbbar	FNAL-LQ1	3,800,000	-172,408	3,627,592	2,243,541	62%	1,384,051
hadstruc	FNAL-LQ1	3,000,000	1,236,902	4,236,902	3,522,941	83%	713,961
lattsusy	FNAL-LQ1	600,000	-	600,000	555,351	93%	44,649
gluonpdf	FNAL-LQ1	500,000	-	500,000	299,103	60%	200,897
tumqcd	FNAL-LQ1	100,000	-	100,000	8	0%	99,992
hiq2ff	FNAL-LQ1	100,000	-	100,000	36	0%	99,964
higgs	FNAL-LQ1	100,000	-	100,000	-	-	100,000
s1080	FNAL-LQ1	100,000	-	100,000	-	-	100,000
vacuumdecay	FNAL-LQ1	20,000	-	20,000	1,680	8%	18,320
stggm2dev	FNAL-LQ1	20,000	-	20,000	23	0%	19,977
4fermi	FNAL-LQ1	-	-	-	442,201	-	-
stgmugm2	FNAL-LQ1	-	-	-	1,160,514	-	-
fourpluseight	FNAL-LQ1	-	-	-	1,214,743	-	-
lqcdadmin	FNAL-LQ1	-	-	-	6,256	-	-
axial	FNAL-LQ1	-	-	-	159,076	-	-
hadtensor	FNAL-LQ1	-	-	-	1,259	-	-
comphiggs	FNAL-LQ1	-	-	-	60,993	-	-
safe	FNAL-LQ1	-	-	-	1,484,391	-	-
heavylight	FNAL-LQ1	-	-	-	349,376	-	-
nptmd	FNAL-LQ1	-	-	-	1,199,207	-	-
TOTAL	FNAL-LQ1	63,240,000	-1	63,239,999	52,293,898	73.1%	17,024,117

<https://computing.fnal.gov/lqcd/cluster-status/>

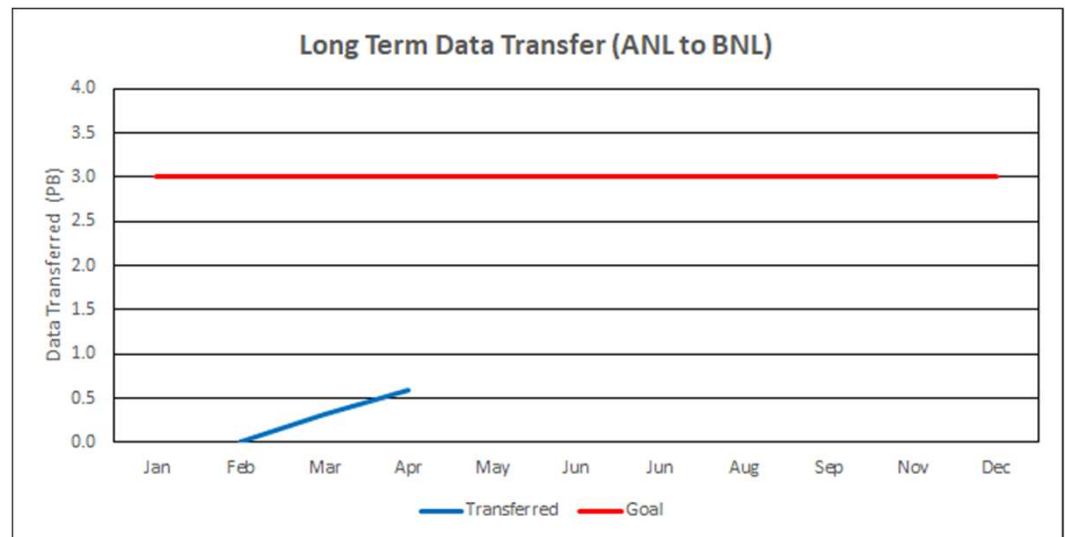
<https://www.usqcd.org/fnal/clusterstatus/lq1/accounting.html>

DOE Annual Review Results

- ▶ 2020 Annual Review held virtually on Jul 9–10, 2020
- ▶ Commendations
 - “The review panel was very impressed with the technical and scientific achievements of LQCD-ext III and USQCD.”
 - The project is to be commended on its performance on its technical scope. It should continue with its present methods and plans.
- ▶ No formal recommendations
- ▶ Two formal suggestions
 1. The impact of lattice results would be stronger by maintaining and enhancing connections with the neutrino cross-section community through Neutrino Scattering Theory Experiment Collaboration, the International Workshop on Neutrino Interactions workshops, and other venues that bring experiment/theory and the Office of High Energy Physics/Nuclear Physics groups together. The project should develop a plan to increase its impact on this research area, which is becoming a larger portion of the domestic high energy physics program. The Letters of Intent at Snowmass could be a start.
 2. USQCD should work with the laboratories (Fermilab and BNL) offices on Diversity, Equity and Inclusion & Science, Technology, Engineering and Math outreach activities

Long-term Data Storage Archive

- ▶ LQCD-ext III Computing Program has received funding to establish long-term data archives at BNL and FNAL.
 - Budget provides for ~10 PB of long-term tape storage, to be divided between BNL and FNAL according to need.
 - In addition to tape media, budget covers tape facility costs (hardware, personnel, media refresh, etc.)
- ▶ Data archive is described in, and managed according to, the “USQCD Long-Term Data Management Strategy and Plan”
- ▶ Initial data transfer is underway (3 PB of data from ANL)
 - Data transfer from Argonne National Laboratory (ANL) to BNL began March 3rd
 - As of April 16th, 593TB of data have been moved



Summary

- ▶ Operations continue to run smoothly at BNL and FNAL. We receive excellent service and support from both labs.
- ▶ Site Managers and their support teams strive to provide the best service and support possible.
- ▶ The institutional cluster model continues to serve us well.
- ▶ Please submit jobs and use your allocations according to the run plans submitted with your proposals.
- ▶ We appreciate your participation in our Annual User Survey and have made improvements based on your input – keep the feedback coming.

Questions?