

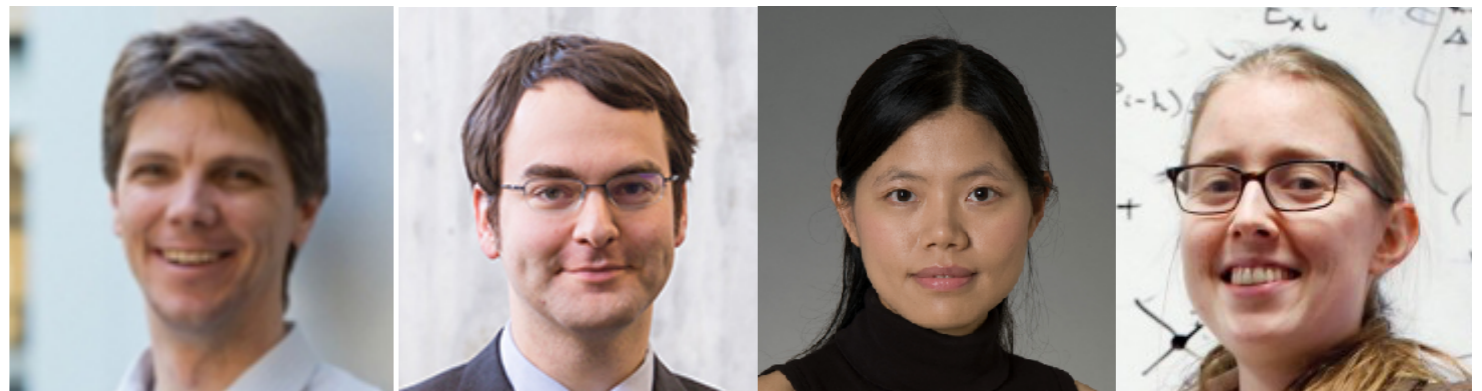
Report from the Executive Committee

April 2024 USQCD All Hands Meeting

Robert Edwards

USQCD Executive Committee

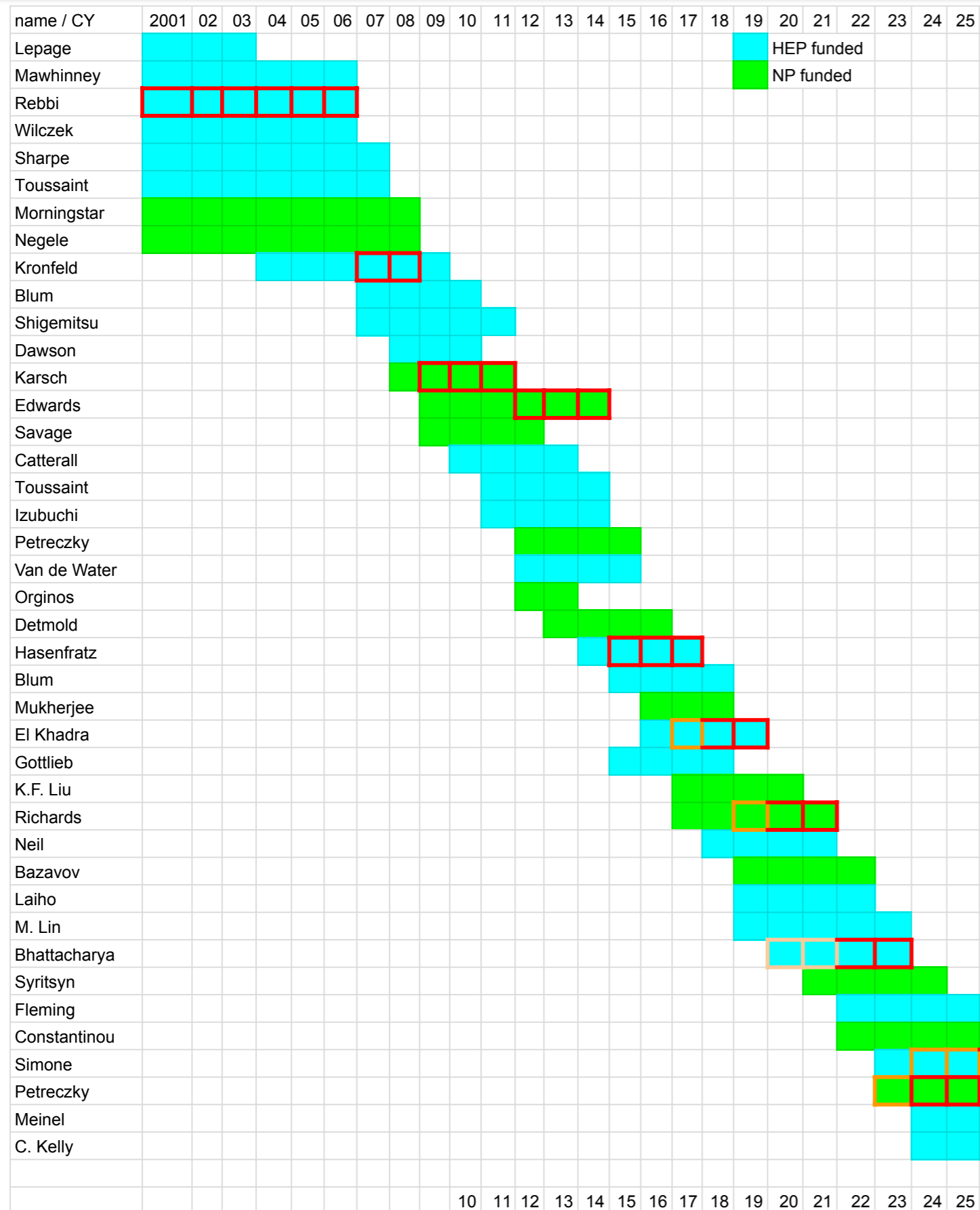
- Current EC members:
 - Tom Blum, Norman Christ, Carleton Detar, Robert Edwards, Will Detmold, Anna Hasenfratz, Andreas Kronfeld, Swagato Mukherjee, Kostas Orginos, Phiala Shanahan, **Peter Petreczky (SPC ex-officio) [recent members]**
- Governance:
 - Terms are 3 years: alternate chair/deputy between HEP & NP
 - **Oct. 1, 2021: Robert Edwards (chair/NP) + Tom Blum (deputy/HEP)**
- Elected junior EC members (2 year term):
 - William Detmold (2016) [became senior member]
 - Christoph Lehner (2018)
 - Huey-Wen Lin (2020)
 - Phiala Shanahan (2022)



Scientific Program Committee

- Peter Petreczky (Chair)
- Martha Constantinou
- George Fleming
- Chris Kelly
- Stefan Meinel
- James Simone (Deputy chair)
- Sergey Syritsyn
- Rotated off
- Tanmoy Bhattacharya (Chair)
- Meifeng Lin
- Type A proposals: this meeting
- Type B: submit to Peter anytime; response ~1 week
- Type C: submit to site contacts
 - BNL: [Peter Boyle](#)
 - FNAL: [Jim Simone](#)
 - JLab: [Amitoj Singh](#)
- No response? Send follow-up

SPC membership history



Past and current members:
serve about 3 - 4 years

Chairs:

Petreczky, Bhattacharya, Richards,
El Khadra, Hasenfratz,
Edwards, Karsch, Kronfeld,
Rebbi

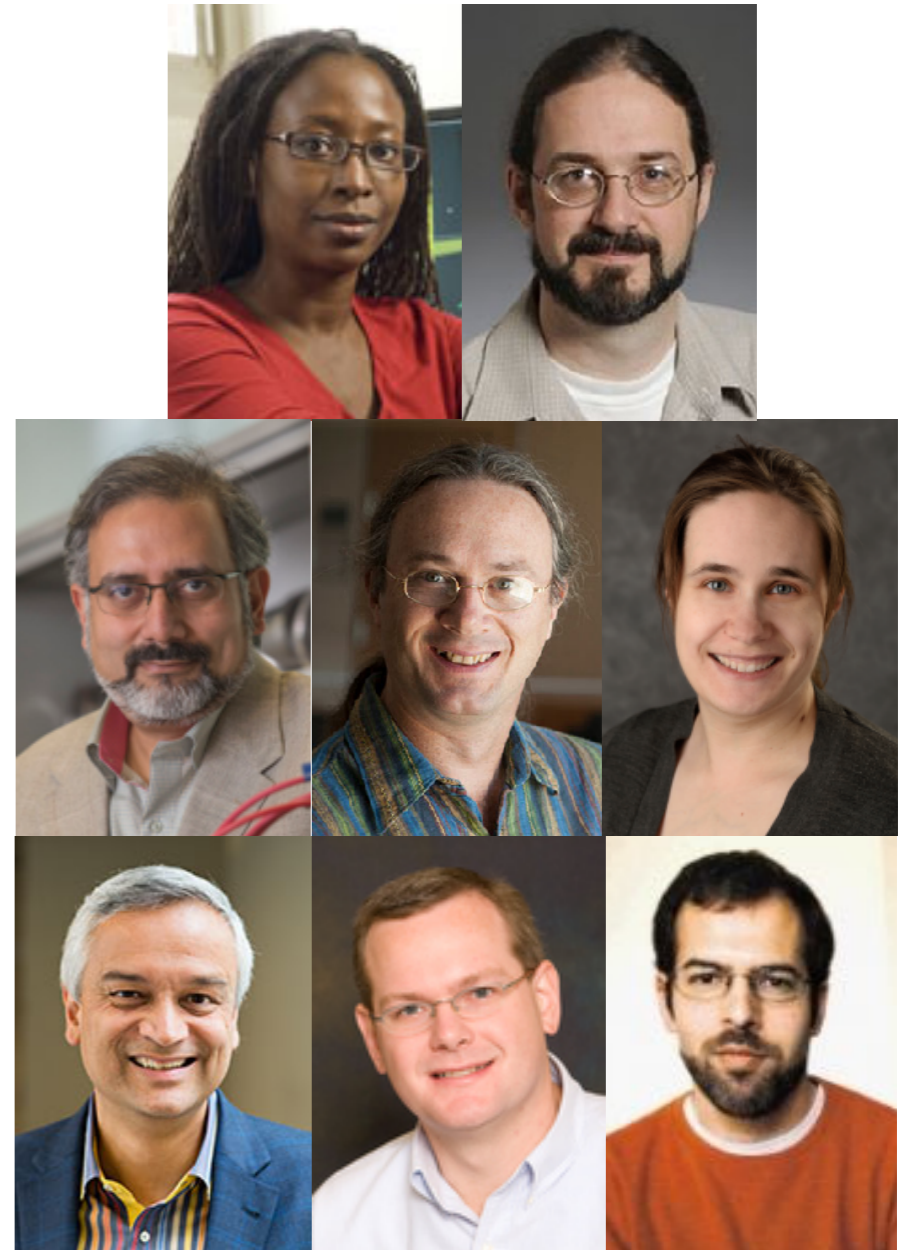
Current Deputy chair: Simone

HEP & NP
funded
members

USQCD Scientific Advisory Board

- Current members:

- Ayana Arce (Duke, ATLAS)
- * Roy Briere (Carnegie Mellon, Belle II, BES III)
- * Abhay Deshpande (Stony Brook, RHIC, EIC)
- Lawrence Gibbons (Cornell, mu2e)
- * Kendall Mahn (MSU, T2K, DUNE)
- Krishna Rajagopal (MIT, theory)
- Matthew Shepherd (Indiana, GlueX, BES III)
- Jure Zupan (Cincinnati, theory)



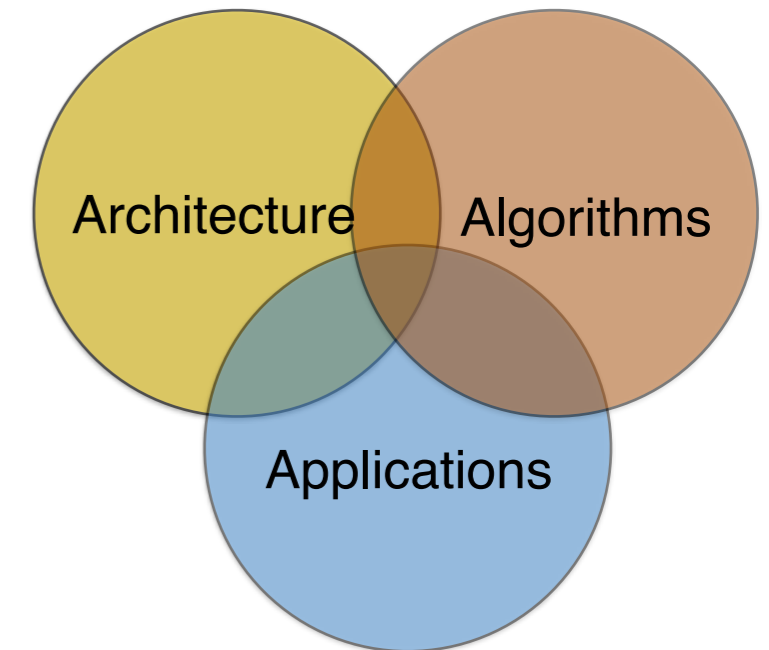
- EC solicited comments on Snowmass Process, EIC Developments, & LQCD Facility review

Structure of USQCD

- Executive Committee started with SciDAC support to develop software, and soon became steward of a QCDOC and dedicated clusters
- USQCD supports/coordinates-with
 - LQCD ext. III research program
 - NPPLC initiative
 - SciDAC (currently HEP/ASCR + NP/ASCR)
 - Exascale Computing Project (in practice, subsumed previous Software Committee - finished Dec. 2023)
- Like last few cycles, USQCD not organizer of INCITE proposals)

USQCD & LQCD software development

Software efforts: efficiently utilize national resources leveraged with local/commodity resources



DOE Office of Science - software development grants:

Partners: ASCR: Advanced Scientific Computing Research | HEP: High Energy Physics | NP: Nuclear Physics

2001 - 2012: ASCR/HEP/NP: Scientific Discovery through Advance Computing: 1 & 2

2013 - 2017: HEP + ASCR SciDAC-3

2013 - 2017: NP + ASCR SciDAC-3

2016 - 2023: Exascale Computing Project (ECP)

2017 - 2022: NP + ASCR SciDAC-4

Recent successful proposals

2023 - 2027: HEP + ASCR SciDAC-5 (P. Boyle, PI)

2023 - 2027: NP + ASCR SciDAC-5 (R. Edwards, PI)

Reminder...

- When you (as PI) submit a proposal, you tacitly agree that, should you receive an allocation:
 - you and all active users on your project fill out the User Survey
 - you will acknowledge USQCD resources in publications
- *“Computations for this work were carried out with resources provided by the USQCD Collaboration, [other sources]. USQCD resources are acquired and operated thanks to funding from the Office of Science of the U.S. Department of Energy.”*

Confidentiality and Transparency

- The AHM is a collaboration meeting:
 - everything discussed here is collaboration confidential
 - applies particularly and especially to scientific ideas and plans
- From the CfP:
 - *“The investigators whose proposals have been selected by the Scientific Program Committee for a possible award of USQCD resources shall agree to have their proposals posted on a password protected website, available only to our Collaboration, for consideration during the All Hands’ Meeting.”*
- Posting proposals and allocations are necessary for transparency
 - Must be treated as collaboration confidential

Outline

- Not in this talk:
 - Initiative Manager talks (see Alan & Amitoj), facilities reports (Peter, Lydia & Zhihua, Amitoj), DEI, no software
- Here:
 - Outcome of previous reviews
 - New 5-year LQCD Computing Initiatives (FY25 - 29)

Outcomes of FY21 & FY23 Initiative reviews

- FY21 recommendation:
 - Present a timeline for results in context of HEP & NP expt programs - information to both communities
- First compiled in 2023
 - Asked USQCD project PIs to share plans
 - Using Overleaf with [GitHub](#) (link [here](#))
 - Format transparent to future review panels, USQCD as a whole, and visitors.
- Presented at May 2023 joint **HEP & NP review**
- Updated for May 2024 joint **HEP & NP renewal**
- FY23 recommendation:
 - Allow HEP/LQCD to either procure nodes or use Institutional cluster

2024 Renewal: LQCD computing initiative(s)

- **May 29-30, 2024 - DOE/HEP/NP** - in-person review of LQCD Computing Initiatives (LQCD ext. III & NPPLC)
- Renewal in 2024 for new initiatives starting FY25 - 29
 - HEP & NP charge letters:
 - One committee & report to two program offices and two funding streams
- Formulated a long range computing plan for USQCD
 - BNL & FNAL (HEP), JLab (NP)
 - Status: submitted on April 8, 2024
 - One science narrative for FY25-29
 - Separate business plans for HEP and NP
 - LQCD theory & expt. time-line

Guidance

- Both offices instruct USQCD to develop the strongest possible program on LQCD and other lattice FT's
 - the SPC, with guidance from EC, formulates the program
- However, **both HEP and NP** have to be responsive to the proposal narratives that secured their funding
 - “strongest” in the eyes of the reviewer, but be mindful panels have included:
 - ➔ HEP experimentalists, theorist and computing experts
 - ➔ NP theorists in comparative review
- HEP and NP funding unbalanced, but reality for proposals is about 50:50 from SPC classification of “**dual use**” projects
 - e.g., nucleon matrix elements and parton distributions

USQCD resources: current initiatives

- LQCD extension III **research program** (since Oct. 2023, Alan Prosser, CPM)
 - (currently) \$2.5 M/year from HEP for **nodes** (new - acquisition/purchase model)
 - \$0.3M/year from DOE/HP for long-term storage facility (**TB-years**)
 - review: May 2021, **May 2023**
 - contacts John Kogut and Bill Kilgore
- Nuclear and Particle Physics Lattice-QCD Computing Initiative (Edwards, PI)
 - (currently) \$1.0M/year from DOE for **nodes** (acquisition/purchase model)
 - JLab provides long-term storage of NP-relevant data (**TB**)
 - review: **May 2023**
 - contacts Keith Jankowski, Paul Sorensen, Xiaofeng Guo
- Both initiatives in-sync; **renewal May 29 & 30, 2024**

LQCD funding profile for HEP & NP

- **Two LQCD initiatives**

- HEP: LQCD Ext.-III (2020 - 2024) - \$2.5M/yr - funds systems @ BNL and FNAL
- NP: NPPLCI (2018 - 2024) - \$1M/yr - funds systems @ JLab
- Both provide cycles to USQCD community and allocated by SPC

- **HEP model**

- Dedicated (purchase nodes) or Institutional Clusters (least existing nodes)
- FNAL: major customer is USQCD (LQ1 & 2), BNL: new system under procurement

- **NP**

- Dedicated/optimized clusters - need to aggregate funds for purchase

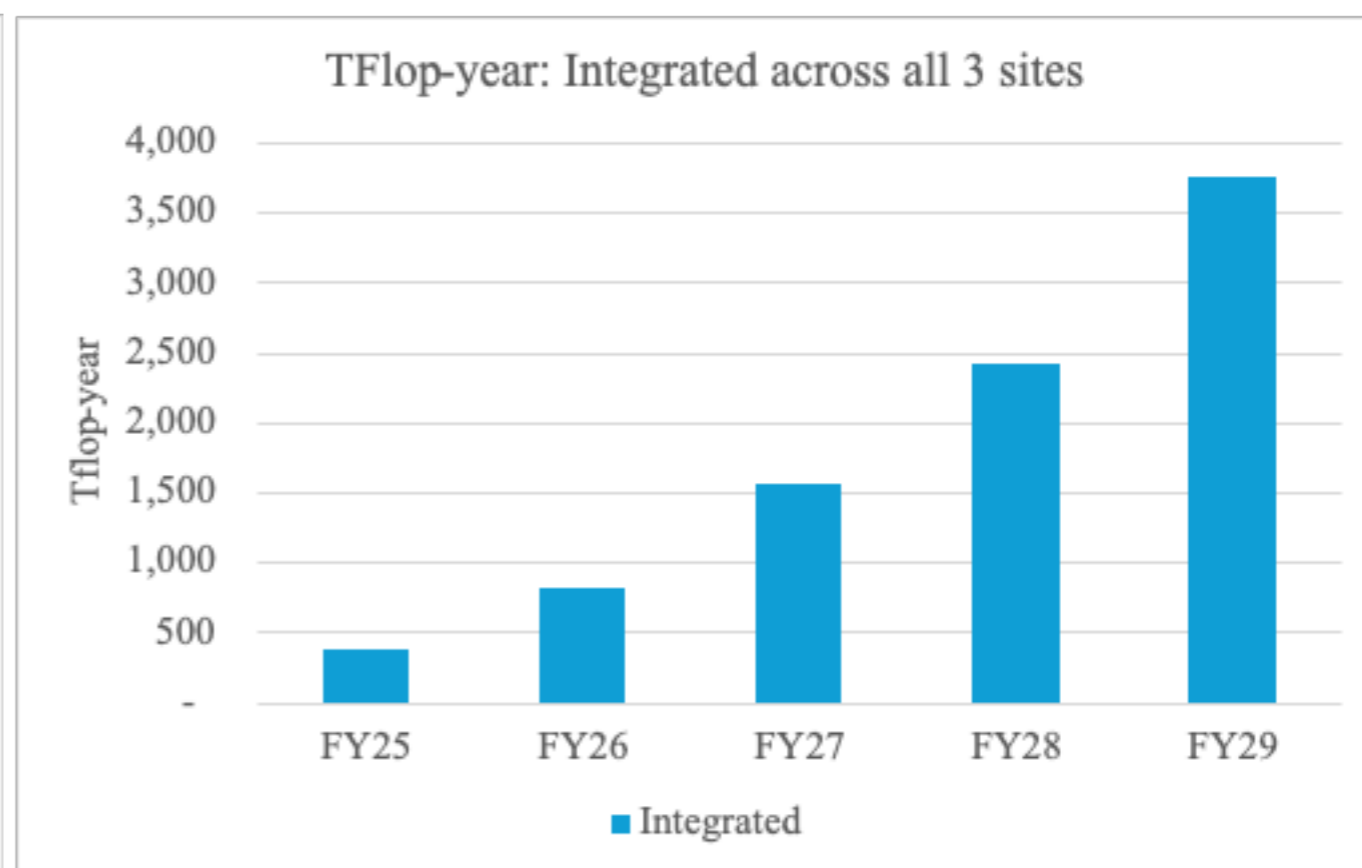
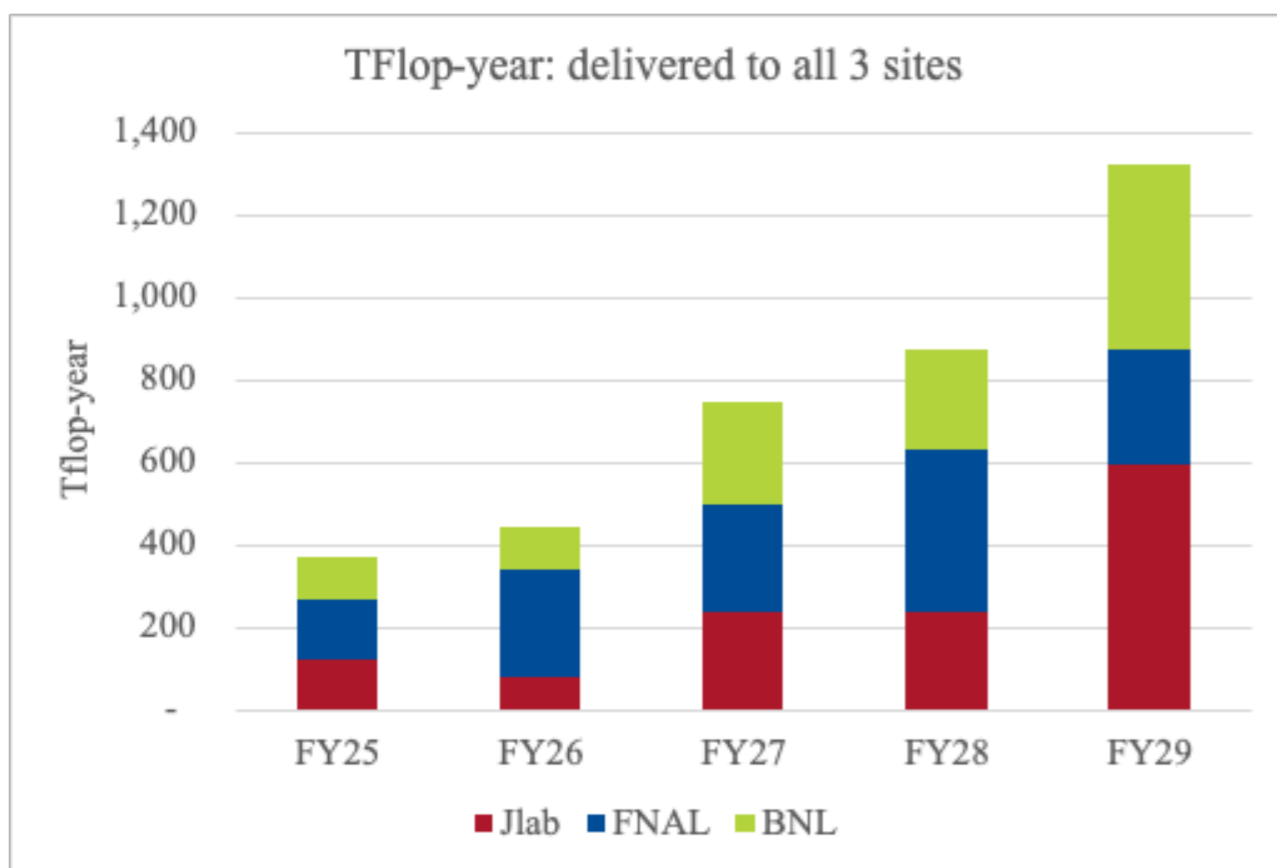
Renewal: optimize LQCD funding profile

- For HEP, move to a “ping-pong” model
 - Determine operations costs for existing & new systems for BNL & FNAL
 - With available funds, aggregate purchases at BNL & FNL in alternate years
- For NP
 - New system ~every two years
- Benefits
 - Large systems accommodate our growing program
 - Amortize installation costs - new system every 2 years
 - Mitigate new platform fatigue for users & sites
- **Result: Maximize science**

Long range computing plan

- Deploy large system at each site ~every 2 years
- FY23 (FNAL), FY24 (JLab), FY25 (BNL), FY26 (FNAL), FY27 (BNL & JLab), FY28 (BNL & FNAL), FY29 (BNL & JLab)
- Budget: > \$1.3M for each system (doubled in dual deployment years)

Baseline: CPU systems + Moore's law 20%/yr



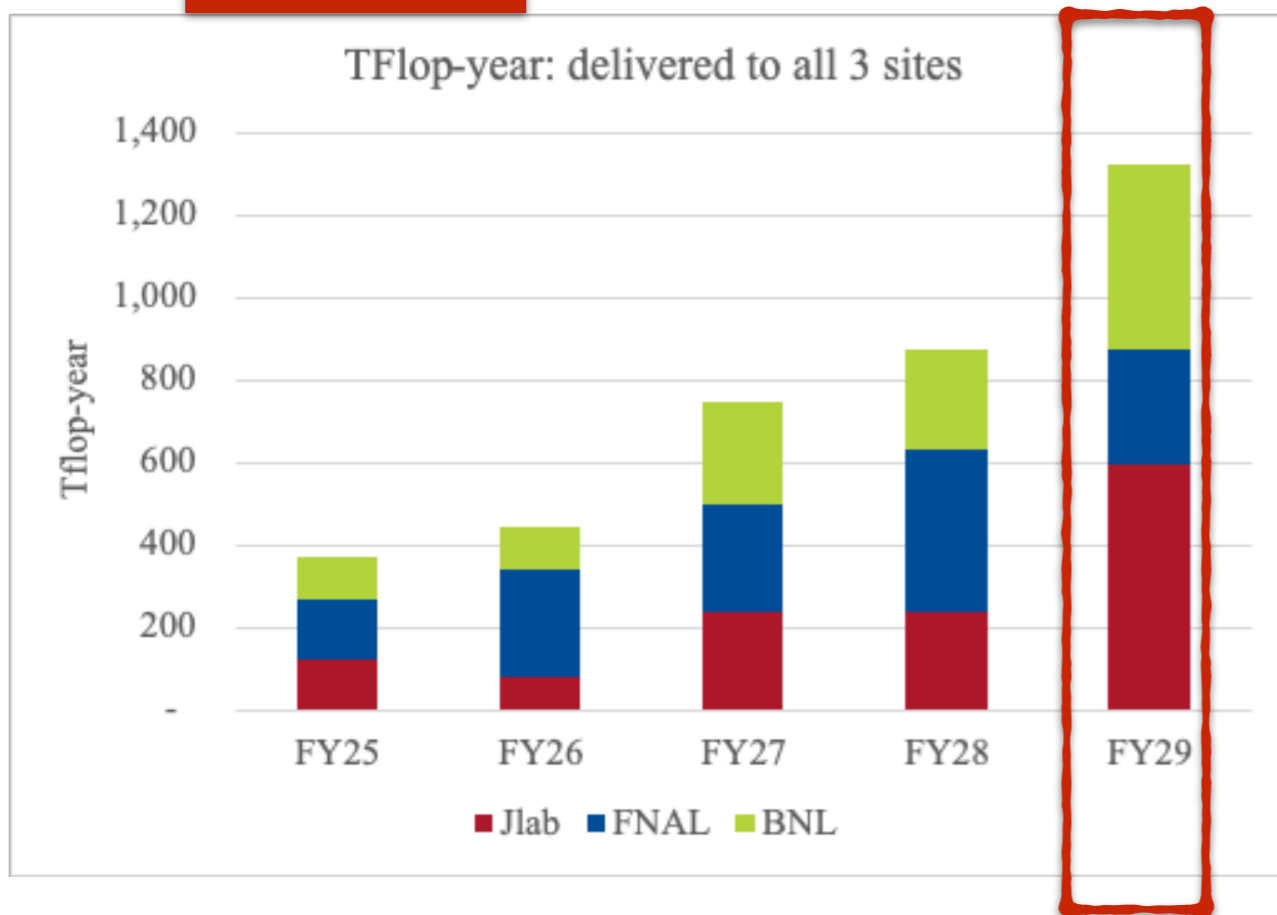
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Long range computing plan

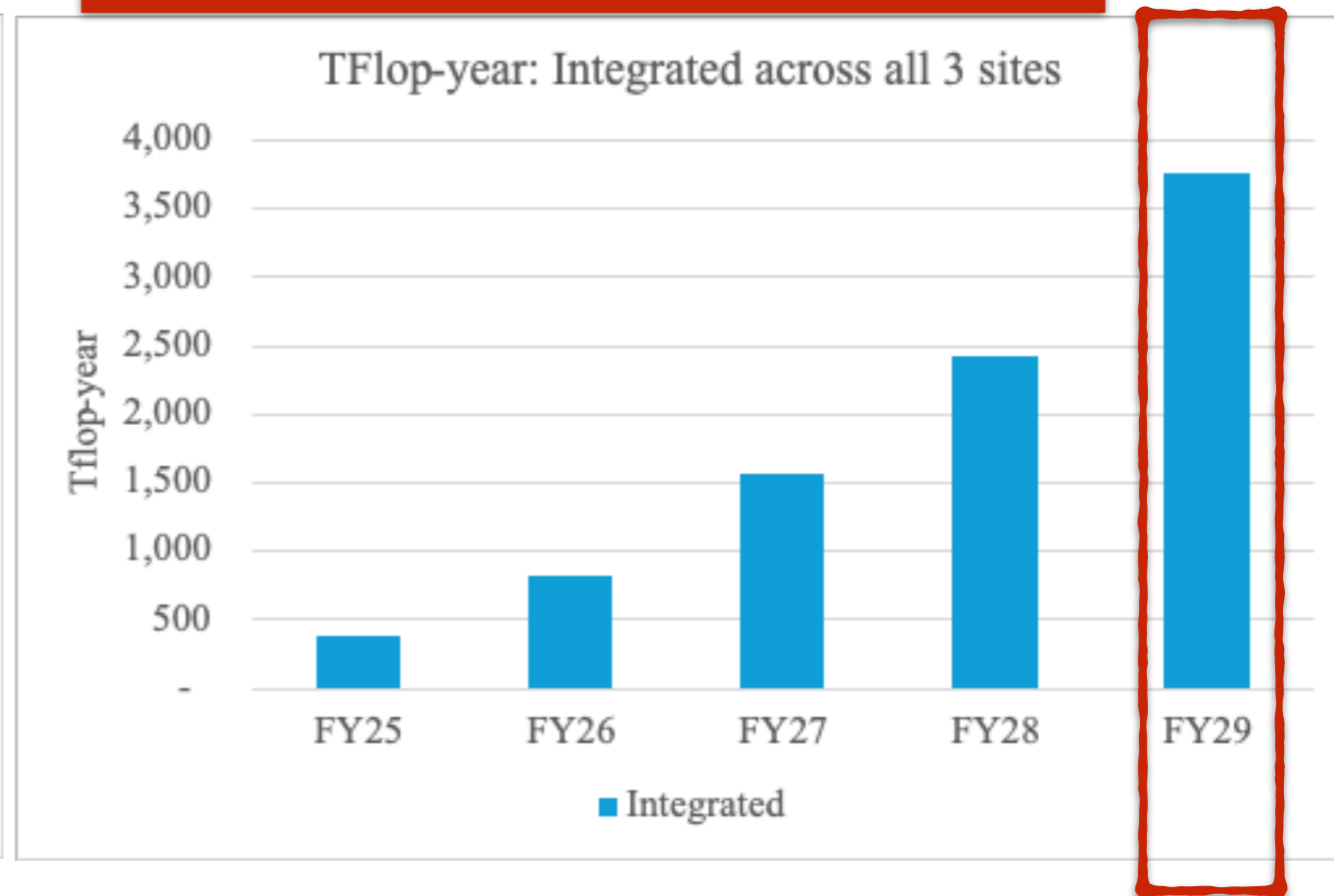
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1 PFlop-yr



Comparable to Exascale allocations



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Steps forward

Have started new model in FY23 - aggregated funds to increase FNAL IC system

JLab deploying FY23 purchase (“24s” - replacing KNLs)

Procurement underway with BNL for FY24 system / FY25 deployment

Requested budgets recorded with DOE:

\$3M/yr for HEP (averages to \$1.5M/yr for BNL & FNAL); \$1.5M/yr for NP (JLab)

➡ Looking forward to a positive review & endorsement for renewal

➡ And new resources for USQCD!