Report from the Executive Committee

April 2023 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, Tanmoy Bhattacharya (SPC ex-officio) [recent members]
  - Rotations off (2022) - Huey-Wen Lin

- Governance:
  - Terms are 3 years: alternate chair/deputy between HEP & NP
  - Oct. 1, 2021: Robert Edwards (chair/NP) + Tom Blum (deputy/HEP)
  - Rotation: Andreas Kronfeld (now committee member)

- Elected junior EC members (2 year term):
  - William Detmold (2016) [became senior member]
  - Christoph Lehner (2018)
  - Huey-Wen Lin (2020)
  - Phiala Shanahan (2022)

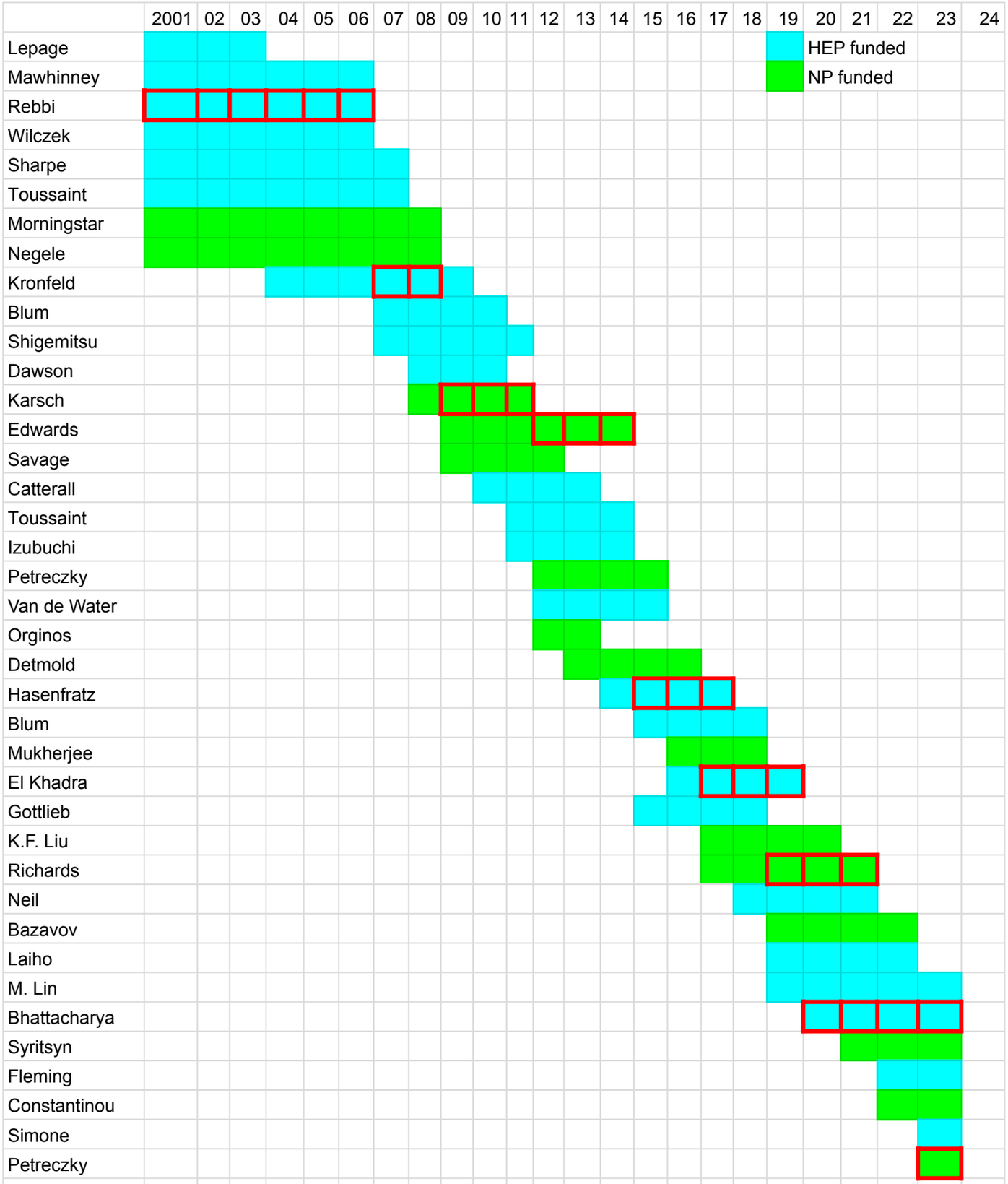



Scientific Program Committee

- Tanmoy Bhattacharya (Chair)
- Martha Constantinou
- George Fleming
- James Simone
- Meifeng Lin
- Peter Petreczky (Deputy chair)
- Sergey Syritsyn

- Type A proposals: this meeting
- Type B: submit to Tanmoy 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

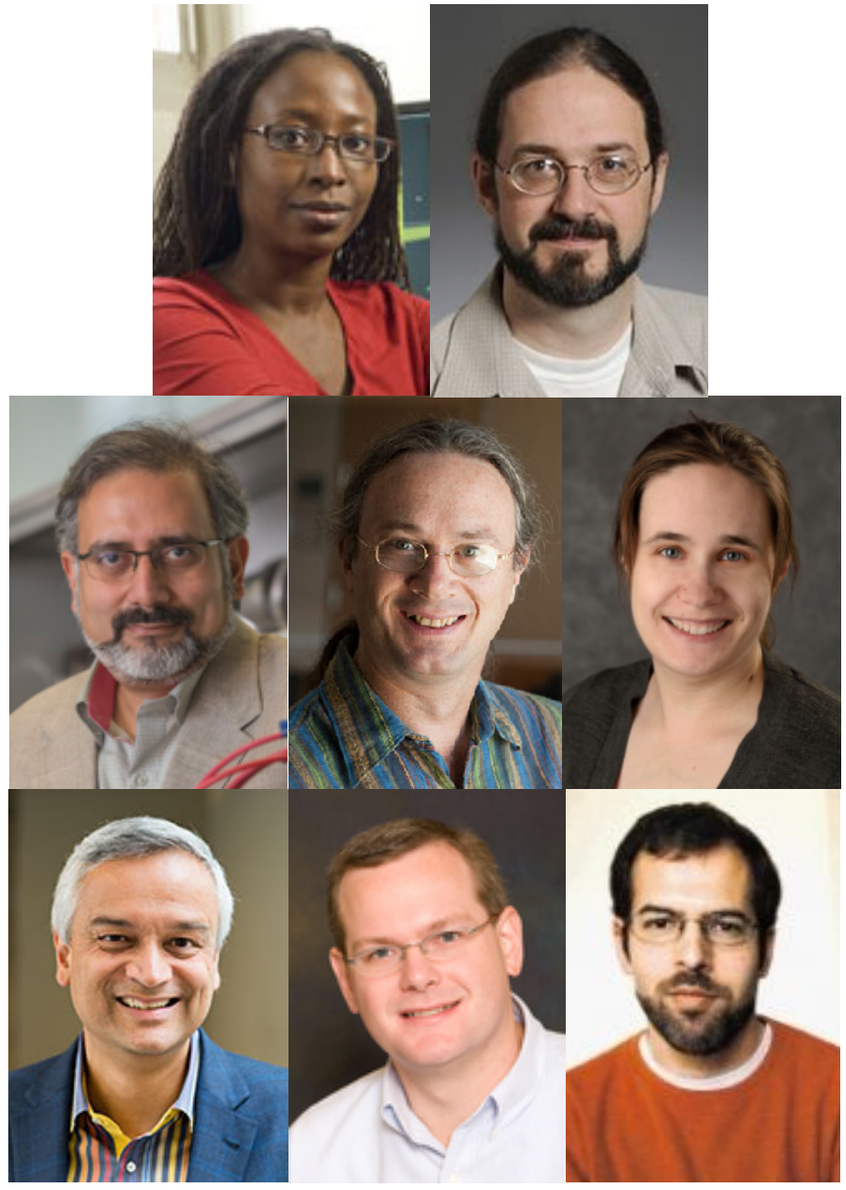
Chairs:
Bhattacharya, Richards, El Khadra, Hasenfratz,
Edwards, Karsch, Kronfeld,
Rebbi

Next chair: Petreczky

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 and EIC Developments

Structure of USQCD

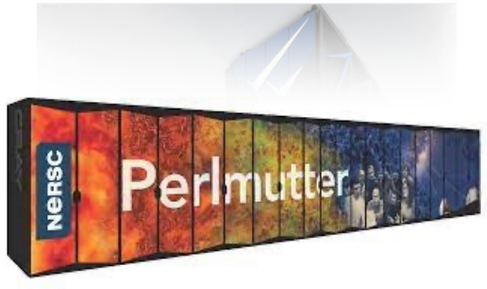
- Executive Committee started with SciDAC support to develop software, and soon became steward of a QCDOC and dedicated clusters

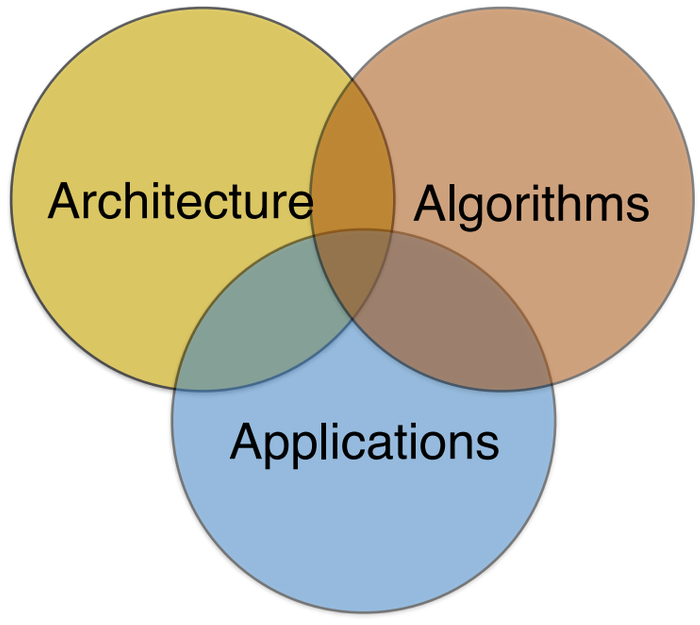
- USQCD supports/coordinates-with
  - LQCD ext. III research program
  - NPPLC initiative
  - SciDAC (currently HEP/ASCR + NP/ASCR)
  - Exascale Computing Project (in practice, subsumed previous Software Committee)

- Like last few cycles, USQCD not organizer of INCITE proposals)

USQCD & LQCD software development

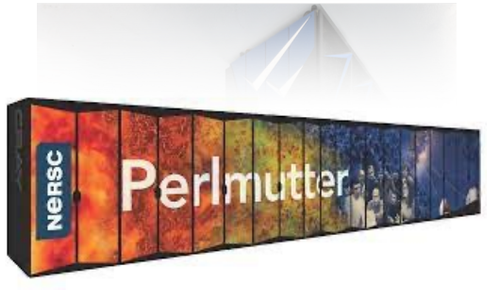
Software efforts: efficiently utilize national resources leveraged with local/commodity resources

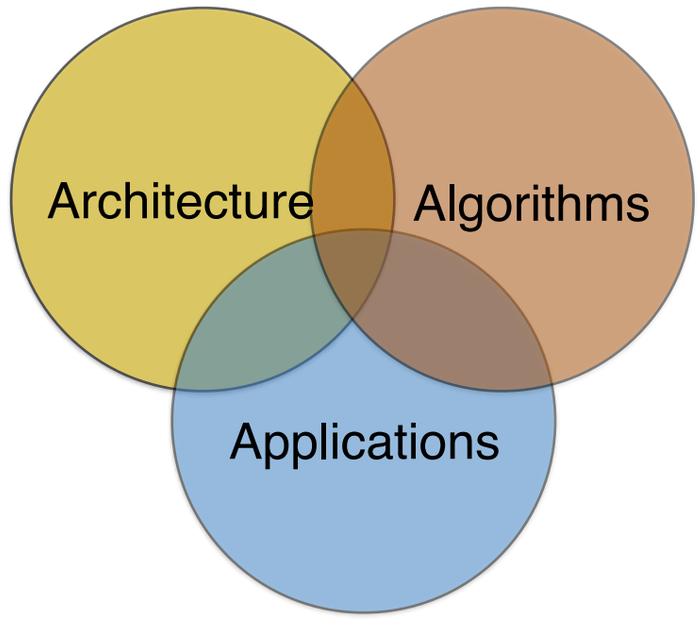




USQCD & LQCD software development

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 - facilities reports, nor Initiative Manager talks (see Jo and Amitoj), DEI, no software

- Here:
  - Resources
  - Recommendations from May 2021 HEP review (in FY2020-2024 funding cycle)
  - Workforce

USQCD resources - Program and Initiative

- LQCD extension III research program (since Oct. 2021, Josephine Fazio, PI)
  - (currently) $2.5 M/year from DOE HEP for node-hours (IC model)
  - $0.3M/year from DOE/HP for long-term storage facility (TB-years)
  - reviews: Sept. 9-10, 2020; May 19,2021; none in 2022
  - 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)
  - (informally) reviewed annually
  - contacts Paul Sorensen and Xiaofeng Guo

- Both initiatives in-sync; joint review May 22, 2023; renewal 2024

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

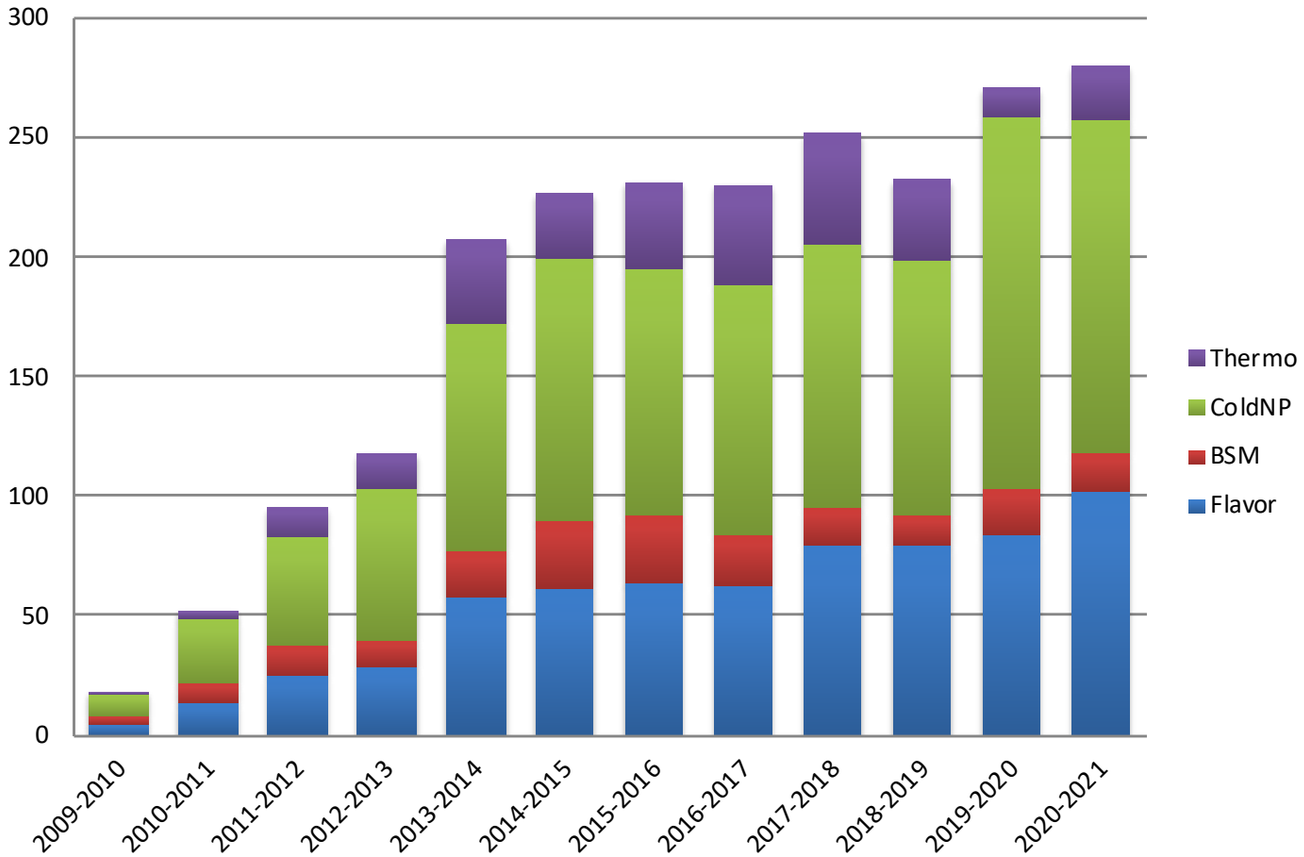
- HEP and NP funding unbalanced, but reality for proposals is about 50:50 from SPC classification of "dual use" projects
  - e.g., nucleon matrix elements and parton distributions

LQCD computing facilities highly leveraged

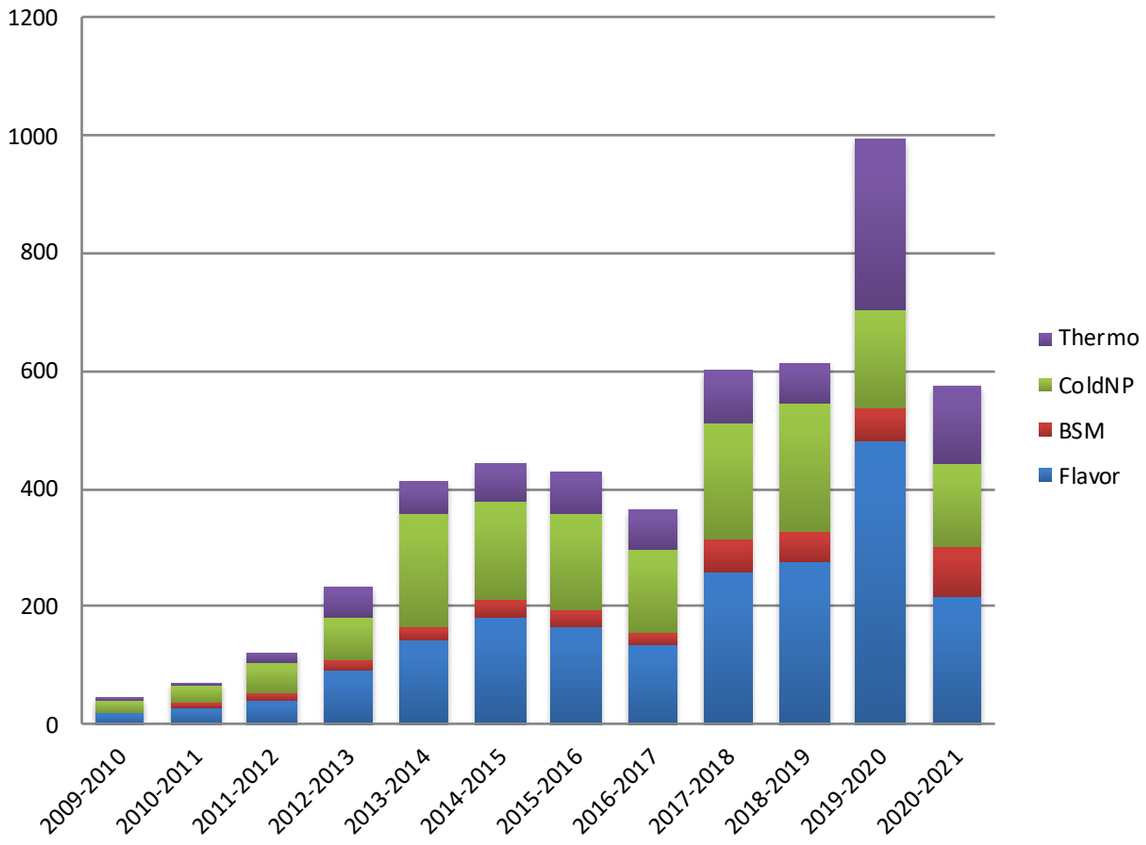
Total by Field (in units of equiv. “M-Skylake”-core-hours)

Sky ~ 6.4 GFlops/sec

USQCD hardware



USQCD+leadership



NP and HEP are approximately equal by agreement

USQCD about half to third of total amount

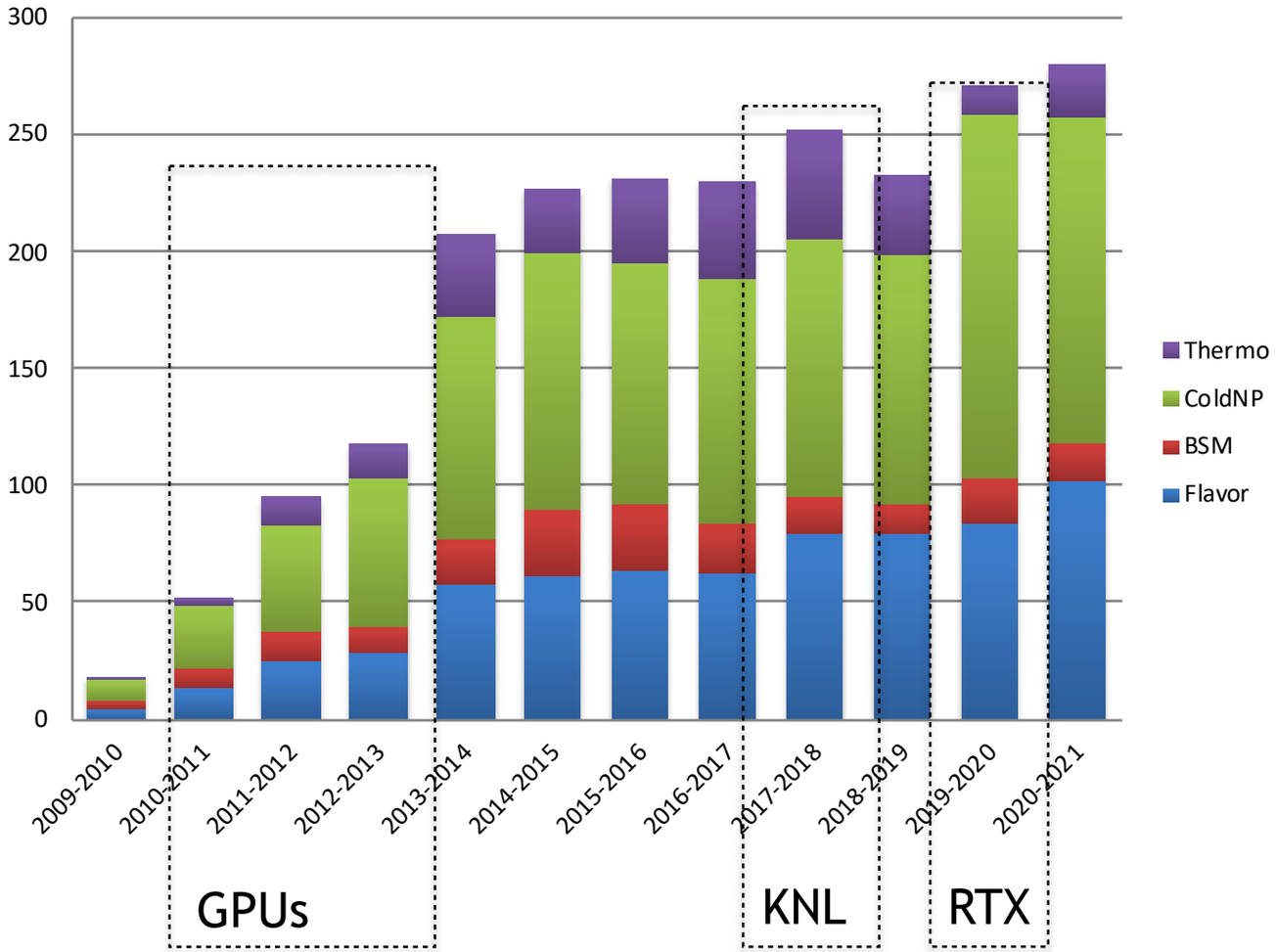
USQCD essential leverage of leadership resources → greater productivity

Resources

Total by Field (in units of equiv. “M-Skylake”-core-hours)

Sky ~ 6.4 GFlops/sec

USQCD hardware



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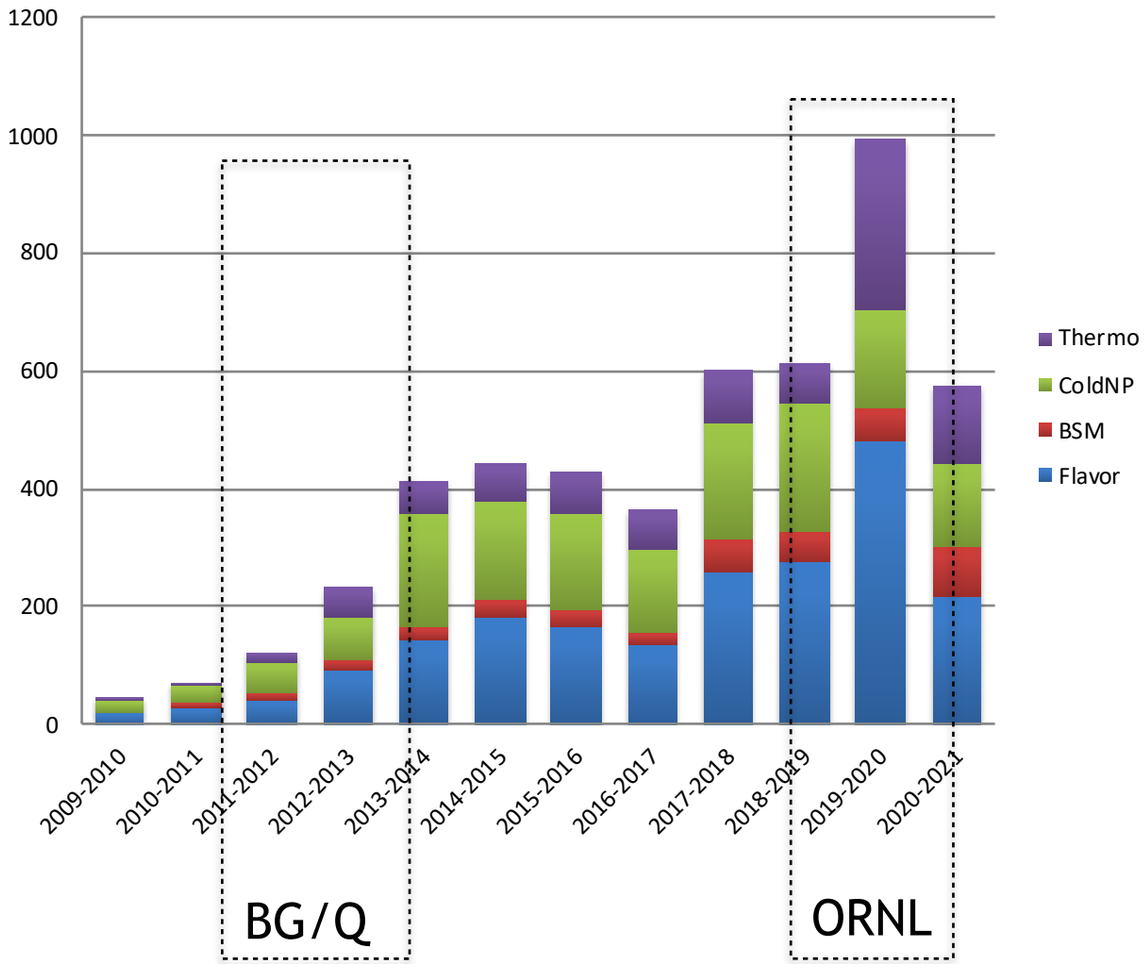


Lattice QCD early adopters/innovators → maximize leadership resources

2021 HEP review

- May 18-19, 2021 - DOE/HEP conducted virtual review of LQCD ext. III Computing Program
- USQCD responded to recommendations: three mentioned here:
  - Physics - LQCD are essential interpret results of FNAL muon g-2 expt. USQCD should prioritize g-2 HVP calculations and seek a decisive SM prediction before the expt presents next results
  - Management - Improve internal assessement
    - ➡ Survey of DEI
    - ➡ Improve internal assessment of governance - EC & SPC and allocations
    - ➡ [Additional] questions/entries in survey - comment on allocation process
  - Physics - present a timeline for results in context of HEP & NP expt programs - information to both communities

2021 HEP review - recommendation #1

- Physics - LQCD are essential interpret results of FNAL muon g-2 expt. USQCD should prioritize g-2 HVP calculations and seek a decisive SM prediction before expt. presents next results

- Response straightforward
  - Agree with the spirit of recommendation!
  - Pace of “predictions” (which include computations) *impossible* without sufficient resources
    - ➡ Thinking Perlmutter, Frontier, Aurora, INCITE+ALCC+ERCAP on all of these
    - ➡ Requires leadership resources

2021 HEP review - recommendation #2a

- Management - USQCD conduct an anonymous survey of DEI climate within LQCD ext-III program

- USQCD did (and has been) carry out surveys
  - Jo Fazio (HEP program initiative) [discussion later]
  - Will Detmold (Committee DEI) [talk later]

2021 HEP review - recommendation #2b

- Management - USQCD should design/implement feedback mechanism for governance

- USQCD meeting today

2021 HEP review - recommendation #2c

- Management - add questions to User Survey allowing for comments on allocation process

- New questions in survey

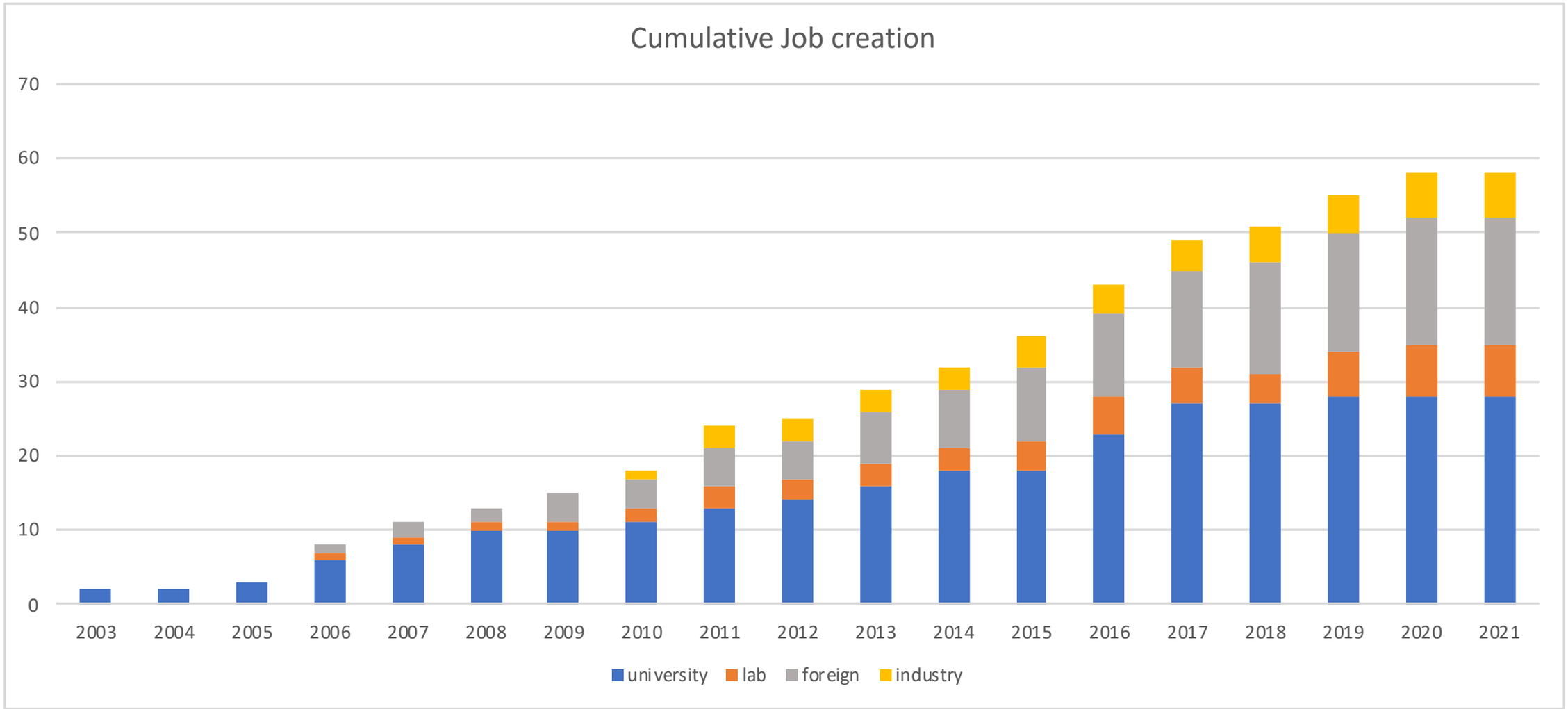
2021 HEP review - recommendation #3

- Present a timeline for results in context of HEP & NP expt programs - information to both communities

- Approach
  - Develop/present LQCD timeline
  - Asking USQCD project PIs to share plans
  - Using Overleaf with GitHub (link here)

- End goal - format transparent to future review panels, USQCD as a whole, and visitors

Junior faculty and staff job creation



Good job creation over the years

10+ DOE/NSF Early Career awards

10+ new US faculty jobs in last five years

Job drivers - joint/bridge with JLab, Riken-BNL, FRIB, LBNL