

# Report from the Executive Committee

April 2022 USQCD All Hands Meeting

Robert Edwards

# USQCD Executive Committee

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- Current EC members:
  - **Tom Blum**, Norman Christ, Carleton Detar, Robert Edwards, Will Detmold, Anna Hasenfratz, Andreas Kronfeld, **Huey-Wen Lin**, Swagato Mukherjee, Kostas Orginos, **Tanmoy Bhattacharya (SPC ex-officio)** [recent members]
  - **Rotations off (2020)** - Richard Brower, Christoph Lehner, Aida El Khadra
- 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)

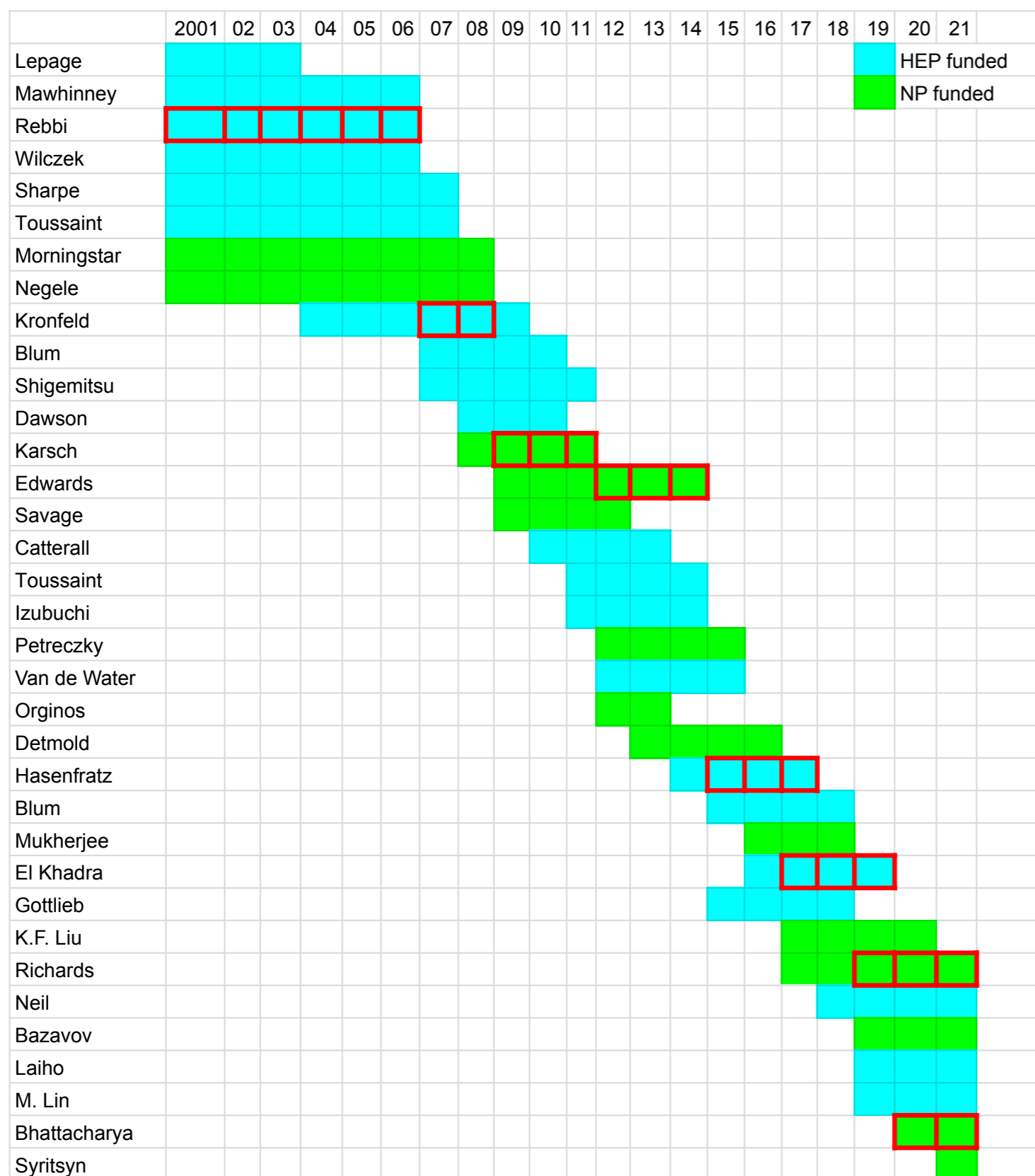


# Scientific Program Committee

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- Alexei Bazavov
- Tanmoy Bhattacharya (Chair)
- Martha Constantinou
- George Fleming
- Jack Laiho
- Meifeng Lin
- 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 \(new JLab site manager\)](#)
- No response? Send follow-up
- Thank you to David Richards for your work as SPC chair

# SPC membership history



Past and current members:  
serve about 3 - 4 years

Chairs:

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

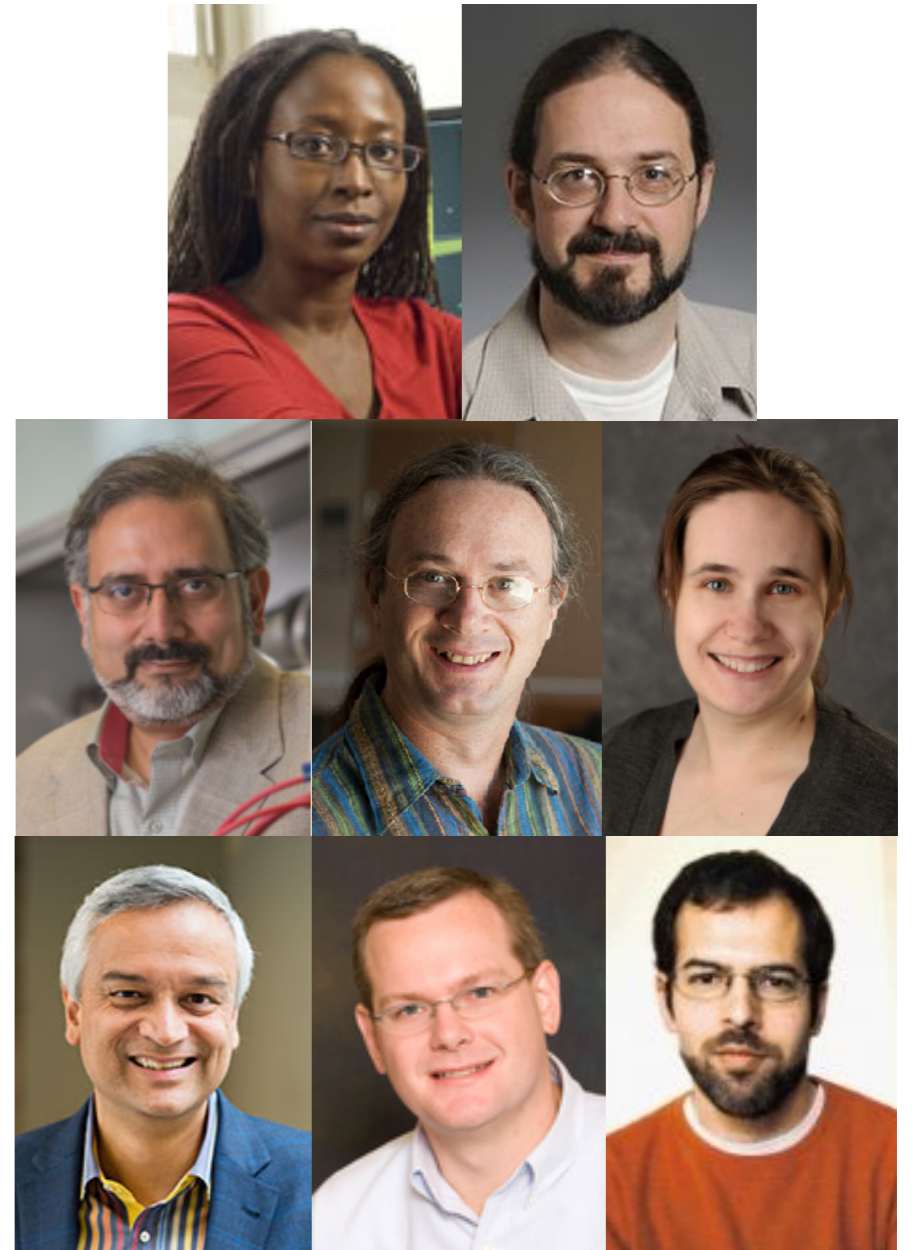
HEP & NP  
funded  
members

# USQCD Scientific Advisory Board

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- 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

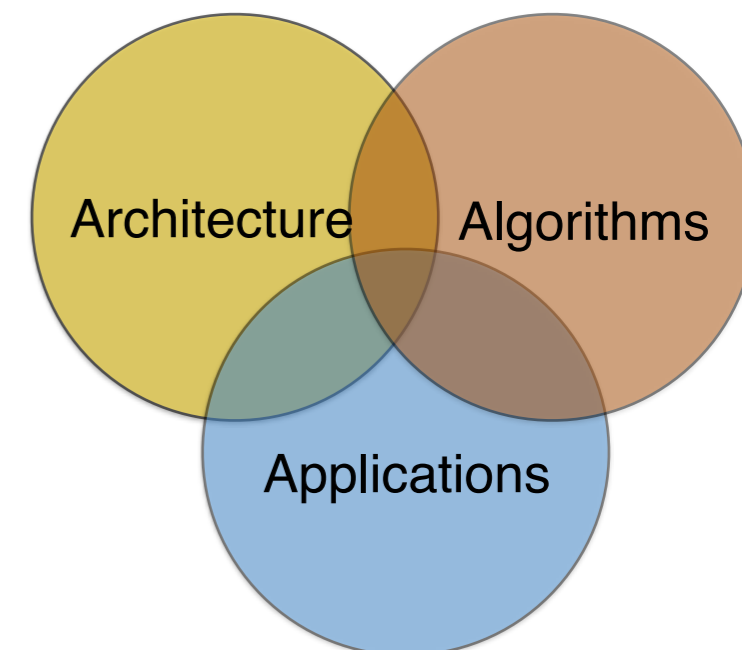
# Structure of USQCD

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- 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 (NP+HEP for 1,2,3, now NP only for SciDAC-4)
  - 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

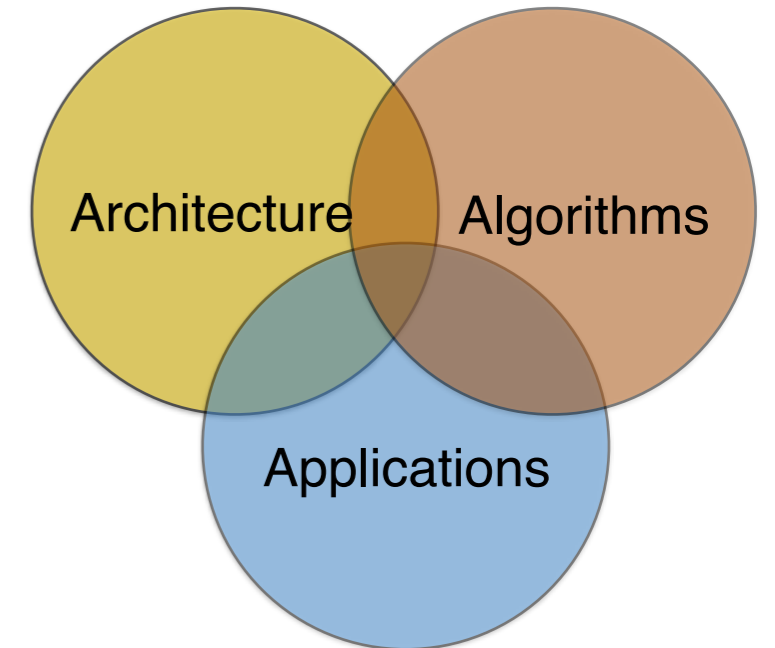


2023 - 2027: HEP + ASCR SciDAC-5 (P. Boyle, PI)

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

# 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

## New proposals

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

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



# Reminder...

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- 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

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- 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

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- Not in this talk - facilities reports, nor Initiative Manager talks (see Jo and Robert with a different hat), no software (but have been ECP talk by Carleton 2 years ago), Snowmass (see Andreas' talk)
- Here:
  - Resources
  - Recommendations from May 2021 HEP review (in FY2020-2024 funding cycle)
  - Workforce
  - Lead in to Diversity, Equity, Inclusion discussion

# USQCD resources - Program and Initiative

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- LQCD extension III **research program** (since Oct. 2021, Josephine Fazio, PI)
  - (currently) \$2.2 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; warmup 2023; big one 2024
  - 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 and (formally) as part of Comparative Review of NP lab theory programs (postponed)
  - contacts Paul Sorensen and Xiaofeng Guo

# Guidance

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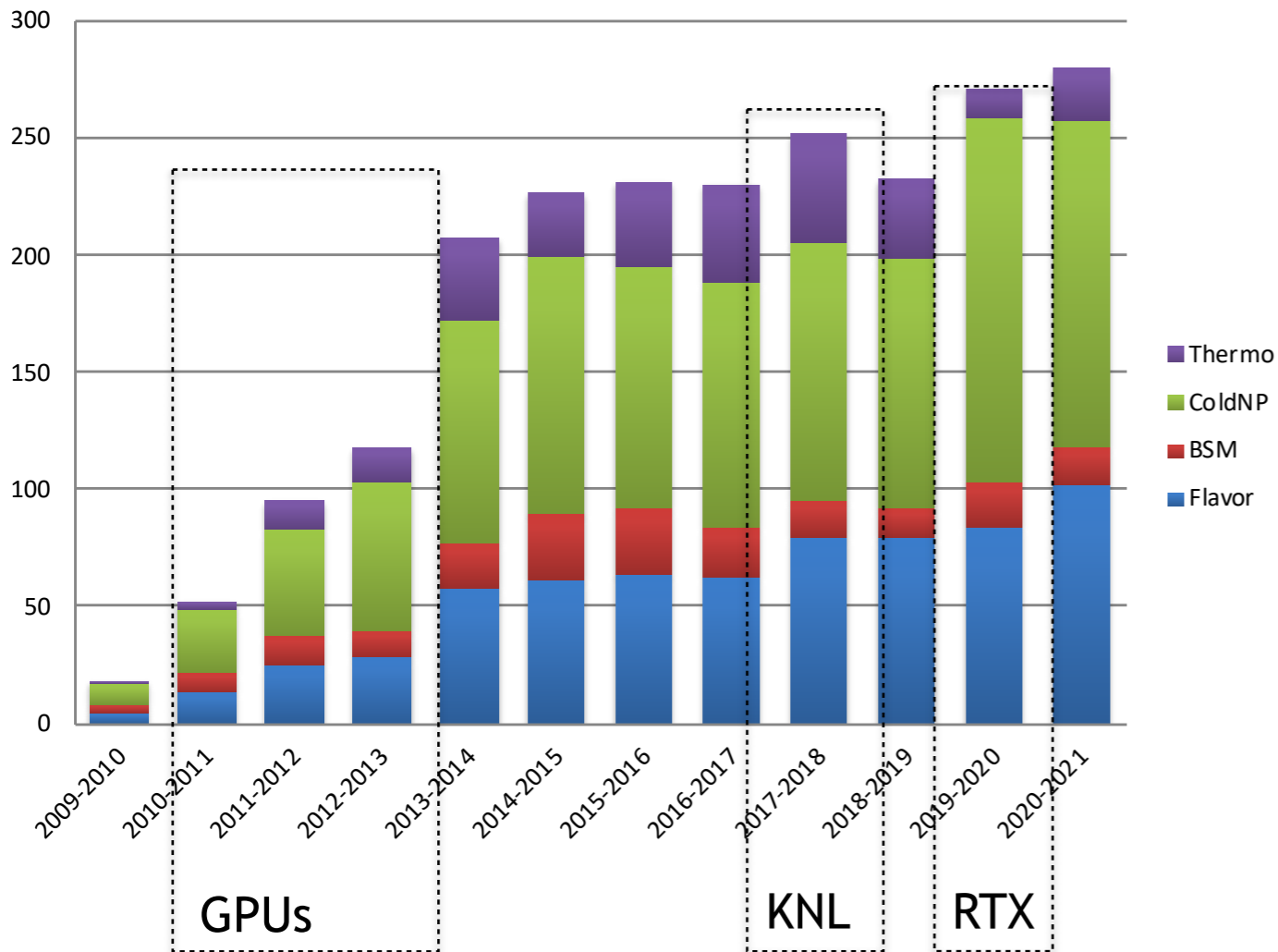
- Both offices instruct USQCD to develop the strongest possible program on LQCD and other lattice FT's
  - the SPC, with guidance from EC, formulates the program
- However, **both HEP and NP** have to be responsive to the proposal narratives that secured their funding
  - “strongest” in the eyes of the 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

# Resources

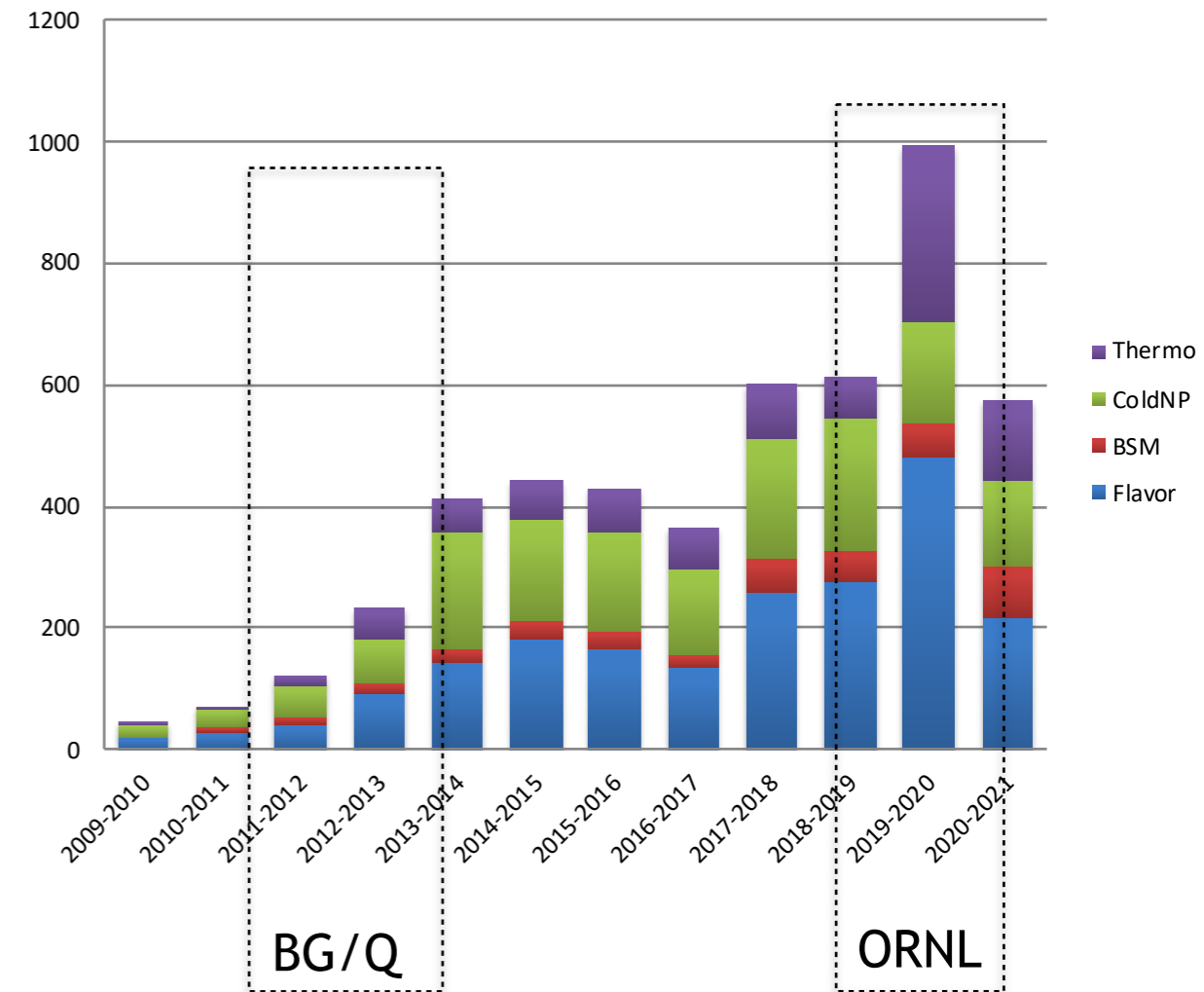
Total by Field (in units of equiv. “M-Skylake”-core-hours)

Sky ~ 6.4 GFlops/sec

## USQCD hardware



## USQCD+leadership



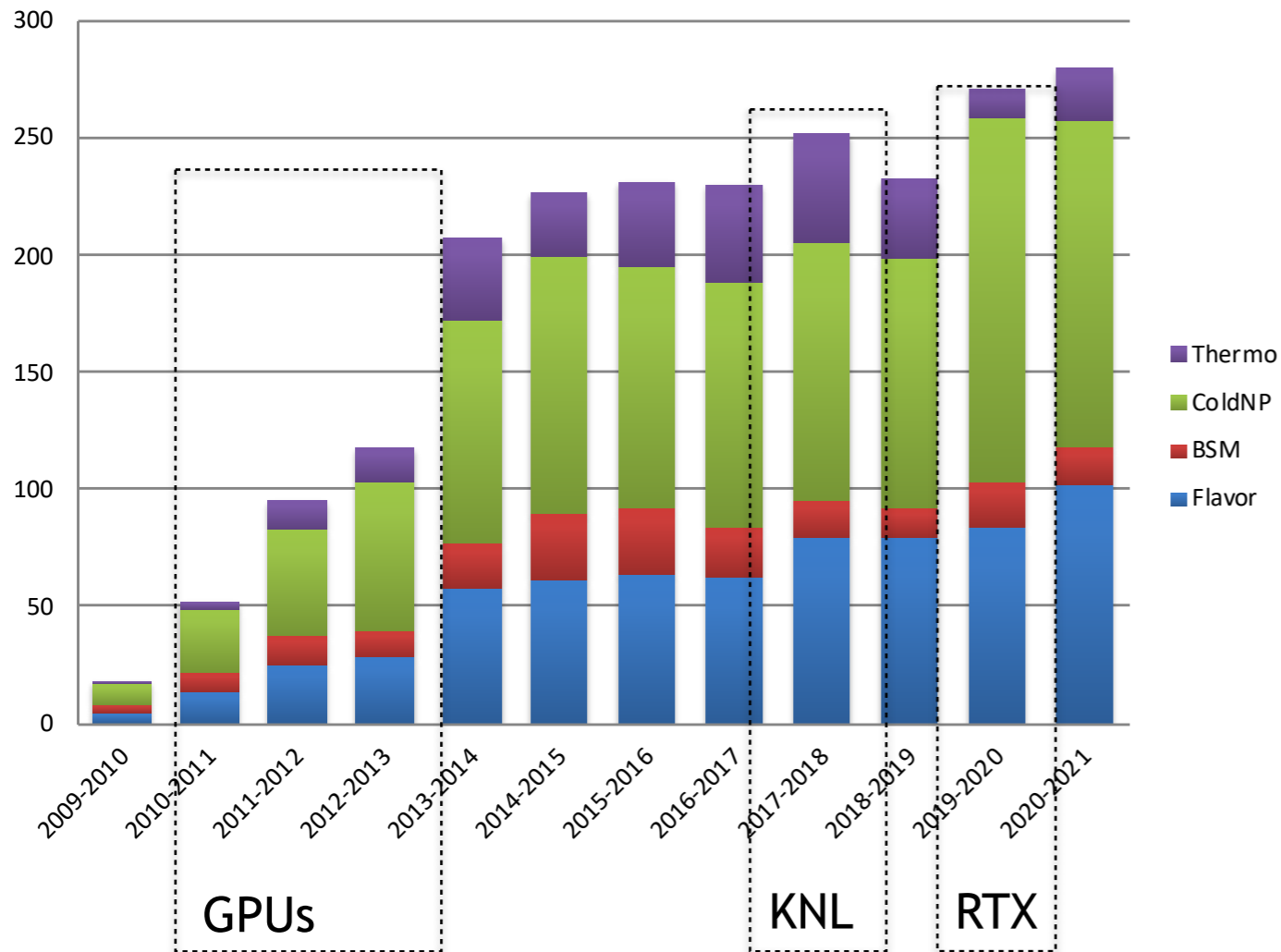
Lattice QCD early adopters/innovators → maximize leadership resources

# Allocations

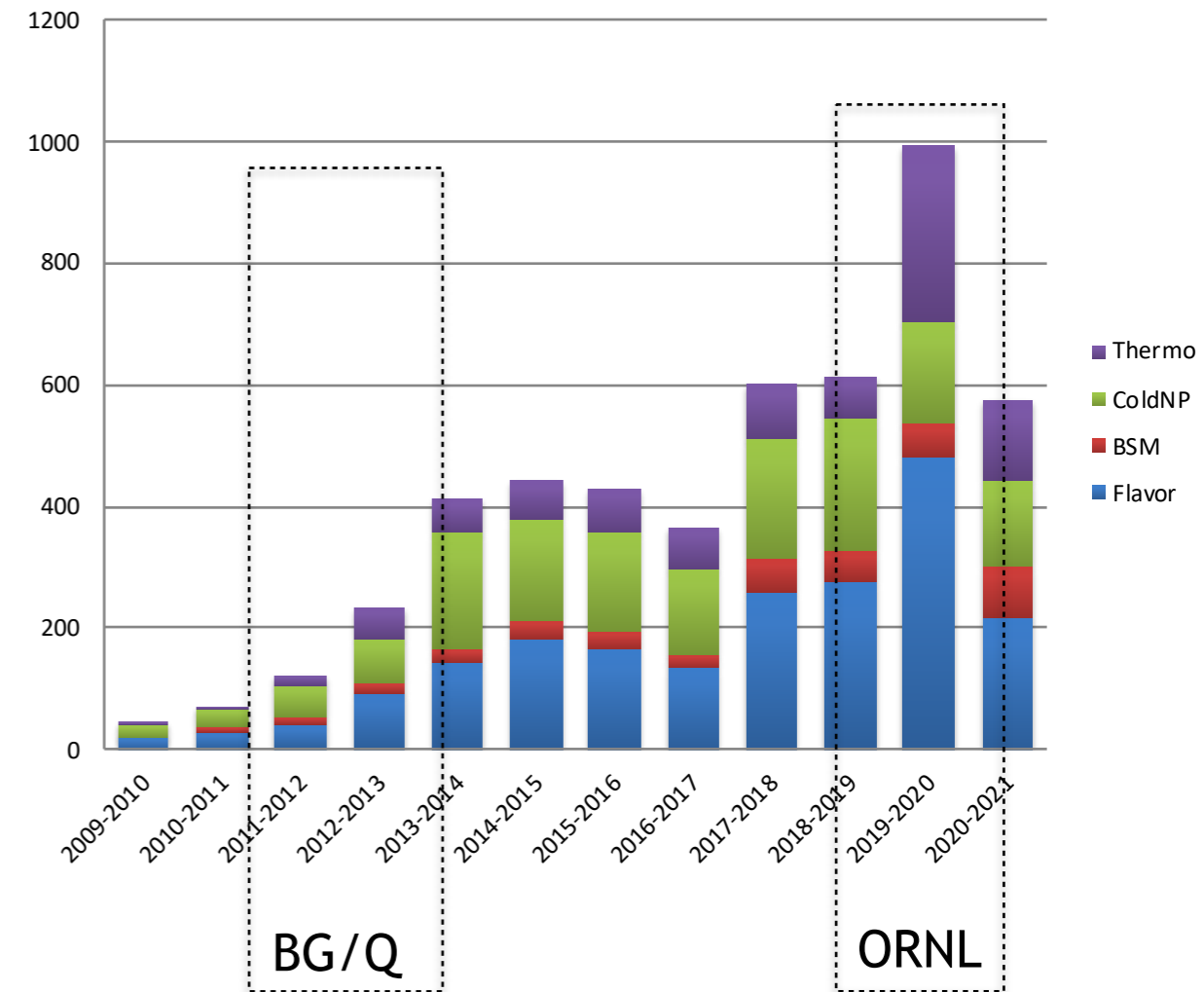
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## USQCD hardware



## USQCD+leadership



Lattice QCD early adopters/innovators → maximize leadership resources

# 2021 HEP review

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- May 18-19, 2020 - DOE/HEP conducted virtual review of LQCD ext. III Computing Program
- HEP LQCD ext. III manager Josephin Fazio will cover part of this topic
- Here, focus on the three recommendations:
  - **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 assessment
    - ➔ 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

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- **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

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- **Management** - USQCD conduct an anonymous survey of DEI climate within LQCD ext-III program
- USQCD did carry out survey - results/discussions in talks by:
  - Jo Fazio (HEP program initiative) [talk later]
  - Will Detmold (Committee DEI) [talk later]

# 2021 HEP review - recommendation #2b

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- **Management** - USQCD should design/implement feedback mechanism for governance
- USQCD meeting today

# 2021 HEP review - recommendation #2c

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- **Management** - add questions to User Survey allowing for comments on allocation process
- Part of questions in last survey (talk by Jo Fazio)

# 2021 HEP review - recommendation #3

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- Present a timeline for results in context of HEP & NP expt programs - information to both communities
- A challenge! - engage the community
  - HEP FWP was derived from community white papers
  - Best to develop/present LQCD timeline on USQCD web-site
  - New technology needed!
  - Will ask USQCD project PIs to share plans
- End goal - format transparent to future review panels, USQCD as a whole, and visitors

# Junior faculty and staff job creation

Name	Year	Research institution, HEP	Research institution, NP	Computational scientist	Teaching college	Industry	Foreign
Oliver Witzel	2020						Siegen
Jiqun Tu	2020					NVIDIA	
Eloy Romero	2020			JLab			
Balint Joo	2020			ORNL			
Chris Monahan	2019		William&Mary/JLab				
David Schaich	2019						Liverpool
Peter Boyle	2019	BNL					
Michael Wagman	2019	Fermilab					
Christoph Lehner	2018						Regensburg
Evan Weinberg	2018					NVIDIA	
Phiala Shanahan †	2018		MIT				
Yibo Yang	2018						ITP/CAS
Luchang Jin ¶	2017	U.Conn/RBRC					
Phiala Shanahan §	2017		William&Mary/JLab †				
Prasad Hegde	2017						Indian Inst Sci
Raúl Briceño ‡,§	2017		Old Dominion/JLab				
Xu Feng	2017						Peking
Zohreh Davoudi	2017		Maryland/RBRC				
Alexei Bazavov	2016		MSU				
Andrea Schindler	2016		MSU				
Boram Yoon	2016			LANL			
Chris Bouchard	2016						Glasgow
Huey-Wen Lin	2016		MSU				
Jozef Dudek §	2016		William&Mary/JLab				
Martha Constantinou	2016		Temple				
Sergei Syritsyn	2016		Stony Brook/RBRC				
entries after 2015 are shown							
Total (from 2003)		13+2	23+5	7	3	6	17

Good job creation since 2003 (shown last few years)

Ten new US faculty jobs in last four years

Job drivers - joint/bridge with JLab & RBRC

† NSF Early Career Award  
‡ DoE OJI/Early Career Award

¶ RIKEN/BNL bridge positions  
§ JLab joint positions

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David Schaich	2019						Liverpool	
Peter Boyle	2019	BNL						
Michael Wagman	2019	Fermilab						
Christoph Lehner	2018						Regensburg	
Evan Weinberg	2018					NVIDIA		
Phiala Shanahan ‡	2018		MIT					
Yibo Yang	2018						ITP/CAS	
Luchang Jin ¶	2017	U.Conn/RBRC						
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Martha Constantinou	2016		Temple					
Sergey Syritsyn †	2016		Stony Brook/RBRC					
			entries after 2015 are shown					
Total (from 2003)		13+2	23+5	7	3	6	17	

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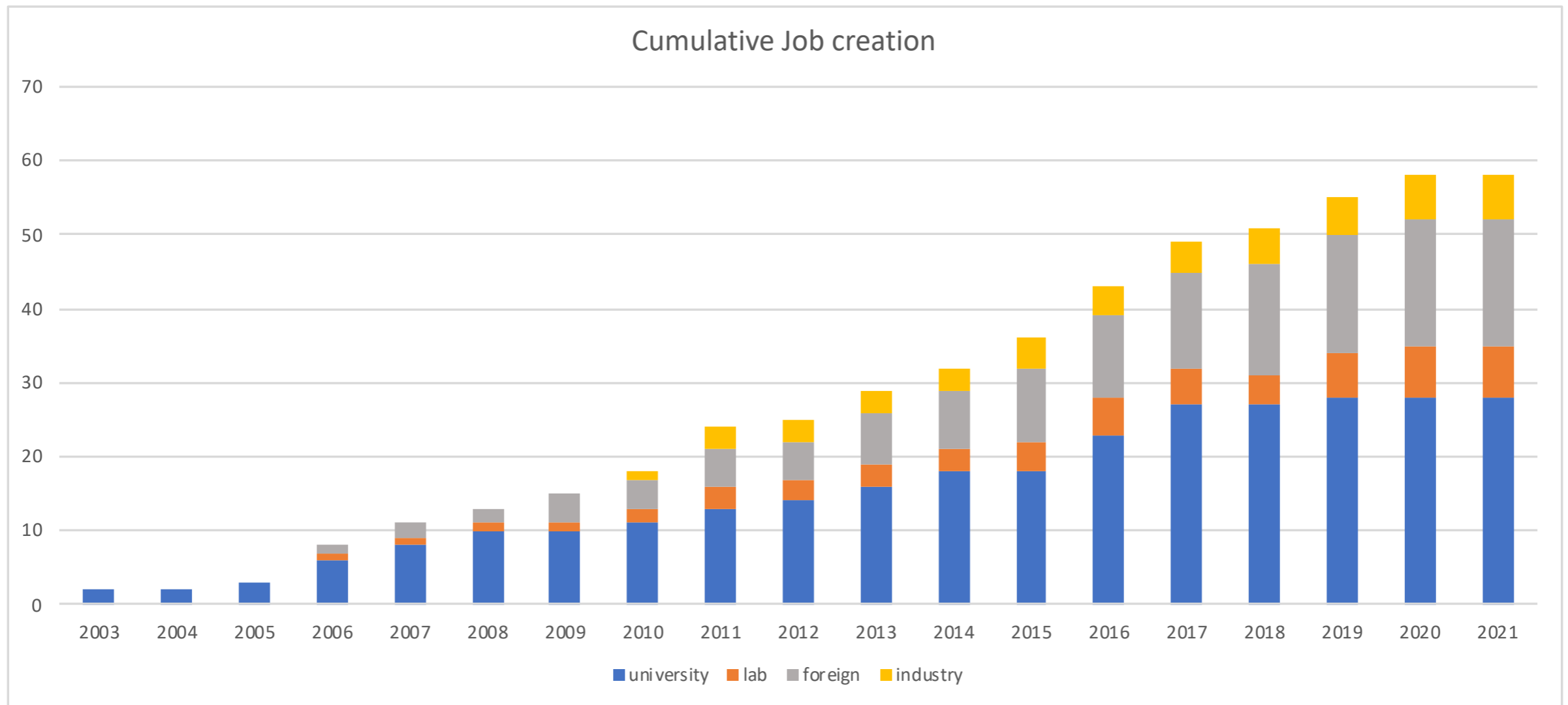
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# Junior faculty and staff job creation



Good job creation over the years

10+ DOE/NSF Early Career awards

Ten new US faculty jobs in last four years

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



# Junior faculty and staff job creation since 2003

Name	Year	Research institution, HEP	Research institution, NP	Computational sci	Teaching college	Industry	Foreign			
	2021									
Oliver Witzel	2020						Siegen			
Eloy Romero	2020			JLab						
Balint Joo	2020			JLab→ORNL						
Peter Boyle	2019			BNL						
Christopher Monahan ***	2019		William & Mary/JLab							
Evan Weinberg	2018					NVIDIA				
Zohreh Davoudi**	2017		Maryland/RBRC						NSF Early Career Award	
Luchang Jin **,**	2017	Connecticut/RBRC							** DoE OJI/Early Career	
Phiala Shanahan**,***	2017		Wm & Mary →MIT						*** RIKEN/BNL or JLab bridge positions	
Raul Briceno **,****	2017		Old Dominion/JLab						**** JLab joint positions	
Heechang Na	2017			Ohio Supercomp.						
Xu Feng	2017						Peking			
Mridupawan Deka	2017						Dubna			
Anyi Li	2017					IBM				
Prasad Hegde	2017						Indian Inst Sci			
Chris Bouchard	2016						Glasgow			
Sergei Syritsyn**	2016		Stony Brook/RBRC							
Martha Constantinou**	2016		Temple							
Andrea Schindler	2016		MSU							
Huey-Wen Lin**	2016		MSU							
Alexei Bazavov	2016		MSU							
Mattian Wagner	2015					NVIDIA				
Ethan Neil ***	2015	Colorado/RBRC								
Christoph Lehner **	2014	BNL→Regensburg								
Mei-Feng Lin	2014			BNL						
Stefan Meinel ***	2014	Arizona/RBRC								
Hiroshi Ohno	2014						Tsukuba			
Heng-Tong Ding	2013						CCNU			
Todd Evans	2013			TACC						
Andre Walker-Loud**,****	2013		Wm & Mary/JLab→LBL							
Jack Laiho	2013	Glasgow→Syracuse								
Christopher Thomas	2013						Cambridge			
Ruth Van de Water	2012	BNL→Fermilab								
Brian Tiburzi ***	2011		CUNY/RBRC							
Andrei Alexandru *	2011		GWU							
Elvira Gamiz	2011						Granada			
Kate Clark	2011					NVIDIA				
Ron Babich	2011					NVIDIA				
Christopher Aubin	2010				Fordham					
Swagato Mukherjee	2010		BNL							
Changhoan Kim	2010					IBM				
Will Detmold **	2009		Wm & Mary →MIT							
Enno Scholz	2009						Regensburg			
Taku Izubuchi	2008	BNL								
James Osborn	2008			Argonne						
Chris Dawson	2007	Virginia/JLab →Google								
Nilmani Mathur	2007						Tata Institute			
Joel Giedt	2007	RPI								
Matthew Wingate	2006						Cambridge			
Jozef Dudek**,****	2006		Old Dominion/JLab→William&Mary							
Jimmy Juge	2006				U. of the Pacific					
Peter Petreczky	2006		BNL							
Balint Joo	2006			JLab						
Kieran Holland	2006				U. of the Pacific					
Kostas Orginos**,****	2005		Wm & Mary/JLab							
George Fleming	2005			Yale						
Tom Blum ** ***	2003	Connecticut/BNL								
Silas Beane *	2003		UNH→U Wash.							
Total		10	18	8	3	6	12		57	

Good job creation in last few years

Ten new US faculty jobs in last four years

Job drivers - joint/bridge with JLab & RBRC

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# Our community - DEI

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- Survey on DEI climate within USQCD
- Will Detmold will speak on this

# Many thanks to our Andreas and Bill

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- Andreas Kronfeld
  - First chair of USQCD EC in this new org - 3 year terms
  - Consistently advocated for the LQCD program & communi
  - Guided HEP LQCD Research program into renewal (till 2024)
  - Actively involved in Theory at all levels (now big-wig at FNAL)
  
- William Boroski
  - Formerly PI for HEP LQCD Research Program
  - Guided HEP LQCD research program into growth (with new DOE project guidelines)
  - Now a big(ger)-wig at FNAL