NP Accelerator R&D Principal Investigators Exchange Meeting

December 7, 2023

Manouchehr Farkhondeh
DOE Office of Science, Nuclear Physics Program

U.S. DEPARTMENT OF ENERGY

Outline:

- This Meeting
- NP Accelerator R&D
- FY 2020 Accelerator R&D FOA and awards
- FY 2022 Accelerator R&D FOA and awards
- FY2023 AI/ML FOA awards- in Accelerator
- A new Requirement for all FY2023 and beyond FOAs
- Communications and Presentation Guidelines

U.S. DEPARTMENT OF ENERGY

DOE SC Statement of Commitment

- *The DOE SC Diversity, Equity and Inclusion webpage:*
- *https://science.energy.gov/sc-2/research-and-conduct-policies/diversity-equity-and-inclusion/*
- *"The DOE Office of Science (SC) is fully committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity. Effective stewardship and promotion of diverse and inclusive workplaces that value and celebrate a diversity of people, ideas, cultures, and educational backgrounds is foundational to delivering on the SC mission. The scientific community engaged in SC-sponsored activities is expected to be respectful, ethical, and professional.*
- *The DOE SC does not tolerate discrimination or harassment of any kind, including sexual or non-sexual harassment, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior in the federal workplace, including DOE field site offices, or at national laboratories, scientific user facilities, academic institutions, other institutions that we fund, or other locations where activities that we support are carried out…"*

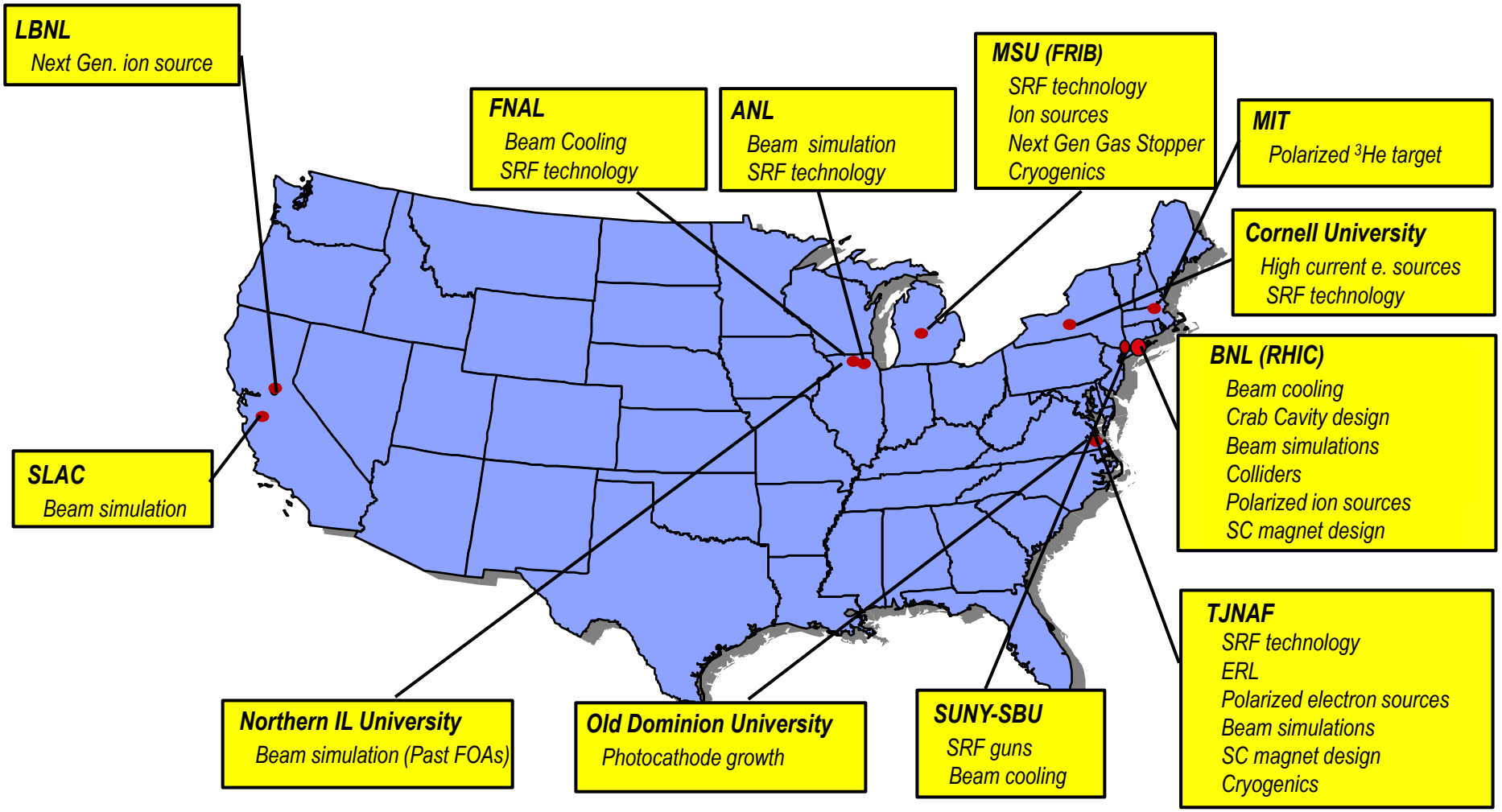
- *If you are subject to or witness harassment or discrimination, please contact any of the NP PM present or our Division Director. You can also visit the following:*

  How to Report a Complaint | U.S. DOE Office of Science (SC) (osti.gov)

DOE Office of Nuclear Physics Accelerator R&D

- Annual direct NP investment in accelerator R&D through the competitive funding opportunity announcement (FOA) and National Laboratory Accelerator R&D for FY2022-23 is on the order of $20 M per year.
- NP is also investing in non-EIC accelerator R&D with focus on key technology areas and in core competencies at NP laboratories
- NP publishes biennial FOAs with 2-year duration awards last of which was in FY2022.
- **NP is planning to publish a new FOA in ~January 2024 for FY2024-25 funding.**

Core Competencies at NP Labs and Universities



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FY20: Accelerator R&D FOA Awards

	NP FY2020-21 Awards in Accelerator R&D FOA			
#	Proposal ID	Institution	Proposal Title	PI and Co-PI
1	254578	TJNAF	Using improved growth techniques such as CBE to grow high polarization strained superlattice GaAs/GaAsP photocathodes, including those with Distributed Bragg Reflector structure	Stutzman, Marcy
2	255054	Cornell	High current sources for spin polarized and un-polarized electron beams	Bazarov, Ivan
3	254811 254853	TJNAF BNL	Photocathodes with 90% polarization and QE greater than 1% for DOE NP	Poelker, Matthew Wang, Erdong
4	255032	MSU	Gas Stopper Developments for Improved Purity and Intensity of Low-Energy, Rare Isotope Ion Beams	Ringle, Ryan
5	*254,943* *254,946* 349799	ANL RadiaBeam FNAL	Development of Practical Niobium-Tin Cavities for Ion Linacs	Kelly, Michael Kutsaev, Sergey Posen, Sam
6	254442	TJNAF	High Voltage Insulators and Electrodes for 500 kV DC High Voltage Photogun with Inverted Insulator Design	Hernandez-Garcia, Carlos
7	255039 254801 254816 254881	SUNY FNAL TJNAF BNL	Superconducting RF electron gun	Litvinenko, Vladimir Yakovlev, Vyacheslav Poelker, Matthew Jing, Yichao
8	254406 254781	TJNAF ORNL	In Situ Plasma Processing of Superconducting Cavities	Powers, Tom Doleans, Marc
			Total year 1 Awards: $3.65M	

Subject of last two talks today under No Cost Extension.

M. Farkhondeh, 2023 NP Accelerator R&D PI Exchange Meeting

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FY22: Accelerator R&D FOA (Topic of this Exchange meeting)

***FUNDING OPPORTUNITY ANNOUNCEMENT** (FOA)*

Research and Development for Next Generation Nuclear Physics Accelerator Facilities
Funding Opportunity Number : DE-DE-FOA-0002670
ISSUE DATE: February 10, 2022
Application Due Date: April 8, 2022

- *Accelerator R&D for this announcement was in the following general categories:*
  - *Accelerator R&D that significantly advances the state-of-the art accelerator capabilities of relevance to next generation machines for the study of nuclear physics.*
  - *Accelerator R&D that significantly advances the state-of-the art accelerator capabilities of relevance to improving the performance of existing facilities studying nuclear physics.*
- *In particular, proposals in the following areas were encouraged:*
  - *Transformative accelerator R&D in SRF technology for restoring cryomodule performance at SRF-based accelerator facilities.*
  - *Transformative accelerator R&D in next generation ion and electron sources.*
- Artificial Intelligence and Machine Learning was not included in this FOA because of a standalone AI and data science call in this area.

FY22: Accelerator R&D FOA Awards

Award #	Proposal ID	Institution	Proposal Title	Topic Area	New/ Existing Work	PI Name	Lead
1	0000267565	LBNL- 88 Inch	Development of a MARS superconducting cold mass for future generations of ECRIS	Next Gen Ion Source	New	Xie, Daniel	
2	0000267790	ODU/TJNAF	Enhancing the Design of Photocathodes with 90% polarization and QE > 1% for DOE NP	Pol Photocathode	Existing	Marsillac, Sylvain	ODU, TJ subcon.
3	0000267812	Cornell	Long lifetime spin-polarized electron sources: high current performance of alternative GaAs activation materials and novel spin-polarized sources via epitaxial growth	Pol Source	Existing	Bazarov, Ivan	
4	0000267656	ANL	A Practical Niobium-Tin Cavity for the ATLAS Superconducting Linac	SRF	Existing	Kelly, Michael	Lead
	0000267831	FNAL	Collaboration			Posen, Sam	
	0000267694	Radiabeam Technologies	Collaboration			Kutsaev, Sergey	
5	0000267691	TJNAF	In situ plasma processing of superconducting cavities	Plasma Processing	Existing	Powers, Tom	
6	0000267794	MSU	Development of Transformative Preparation Methods to Push up High Q&G Performance of FRIB Spare HWR Cryomodule Cavities	SRF Cryomodules	New	Saito, Kenji	
7	0000267789	BNL	Development of high current highly charged laser ion source	Laser Ion Source	New	Okamura, Masahiro	
8	0000267801	LBNL	Advanced Modeling of Beam Physics and Performance Optimization for Nuclear Physics Colliders	Beam dynamics modeling	New	Qiang, Ji	Lead
	0000267652	MSU	Collaboration			Hao, Yue	
	0000267677	BNL	Collaboration			Gu, Xiaofeng	
9	0000267811	TJNAF	1497 MHz Vertical Slice Test of Magnetron & Superconducting Cavity	RF sources		Jordan, Kevin	

Subject of this year's PI meeting (no significance to color codes in rows)

M. Farkhondeh, 2023 NP Accelerator R&D PI Exchange Meeting

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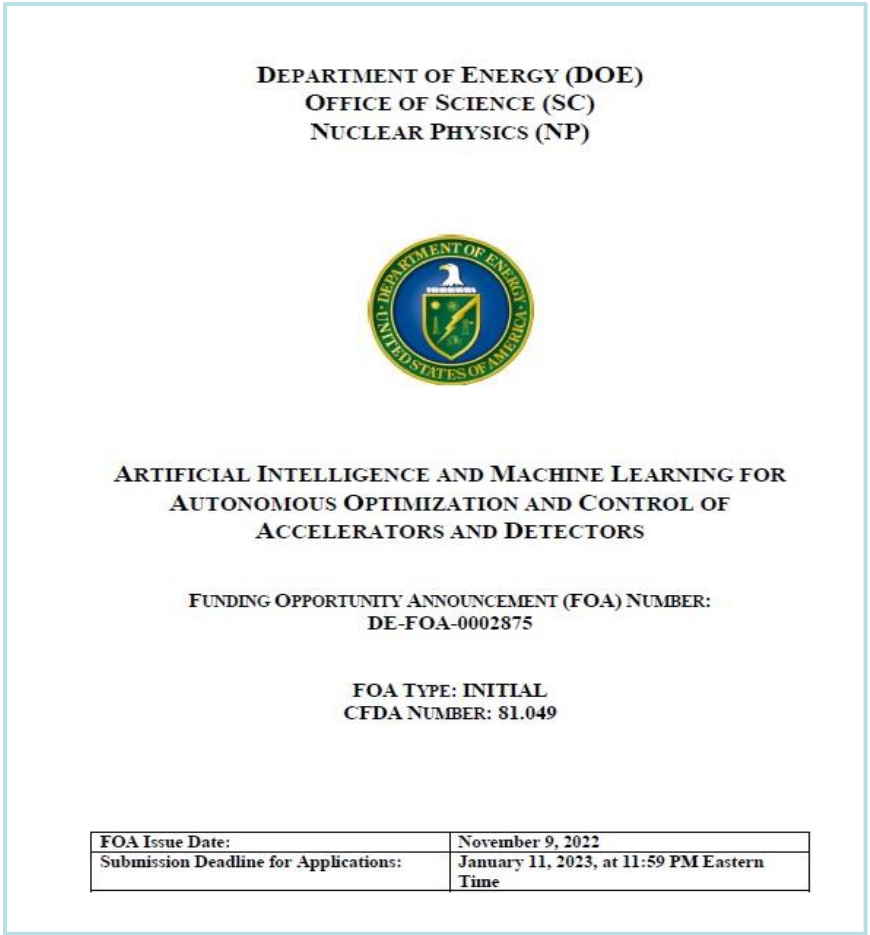
NP AI/ML FOA DE-FOA-0002875
FY2023

FY2023 AI/ML General approach: Application of AI/ML tools and methods for **experiments, simulation, theory and accelerator operation to expand scientific outreach**

- *FOA: DE-FOA-0002875*
- *Issue Date: Nov 9, 2022*
- *Proposals due: Jan 11, 2023*
- *Total funding ~$16M FY23-24*

Proposal Topic	Submitted	Awarded
Accelerator	**11**	**4**
Detectors	8	4
Experiments + EIC	15	5
Theory	4	2
Totals	**38**	**15**



DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)
NUCLEAR PHYSICS (NP)

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FOR AUTONOMOUS OPTIMIZATION AND CONTROL OF ACCELERATORS AND DETECTORS

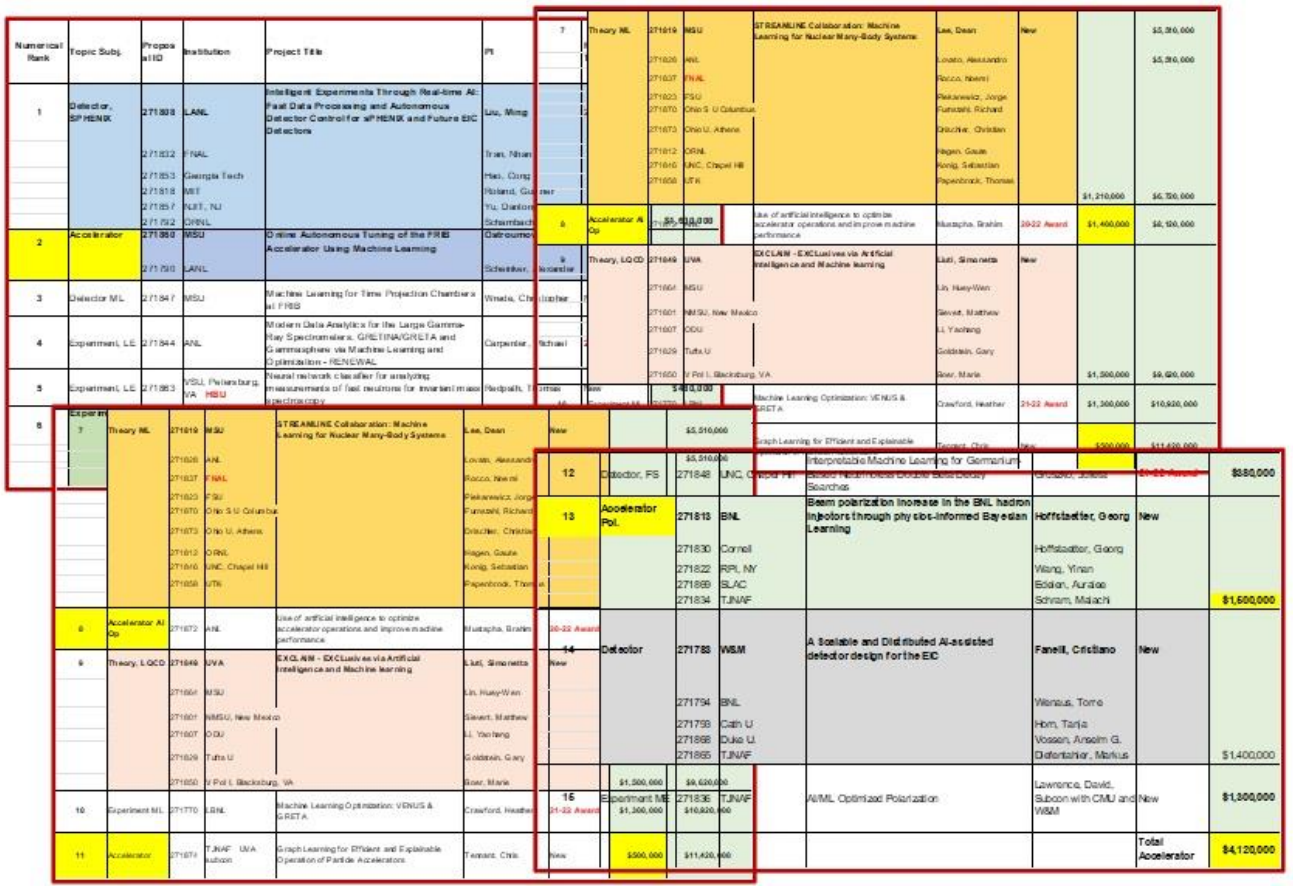
FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER:
DE-FOA-0002875

FOA TYPE: INITIAL
CFDA NUMBER: 81.049

FOA Issue Date:	November 9, 2022
Submission Deadline for Applications:	January 11, 2023, at 11:59 PM Eastern Time

FY23: AI/ML FOA Awards (All 15 awards)

- **Total applications** : 38, with 16 collaborative and 22 single institution applications.
- **Breakdown:** A total of 15 independent awards- with 4 related to accelerator totaling ~$4.8M over two years (these 4 awards)



Numerical Rank	Topic Subj.	Propos al ID	Institution	Project Title	PI
1	Detector, sPHENIX	271808	LANL	Intelligent Experiments Through Real-time AI: Fast Data Processing and Autonomous Detector Control for sPHENIX and Future EIC Detectors	Liu, Ming
		271832	FNAL		Tran, Nhan
		271853	Georgia Tech		Hao, Cong
		271818	MIT		Roland, Gunther
		271857	NJIT, NJ		Yu, Darlene
		271792	ORNL		Schambach
2	Accelerator	271850	MSU	Online Autonomous Tuning of the FRIB Accelerator Using Machine Learning	Ostroumov
		271700	LANL		Scheinker,
3	Detector ML	271847	MSU	Machine Learning for Time Projection Chambers at FRIB	Windis, Christopher
4	Experiment, LE	271844	ANL	Modern Data Analytics for the Large Gamma-Ray Spectrometers, GRETINA/GRETA and Gammasphere via Machine Learning and Optimization - RENEWAL	Carpenter, Schaal
5	Experiment, LE	271863	VSU, Petersburg, VA HBCU	Neural network classifier for analyzing measurements of fast neutrons for inverse mass Redpath, Thomas spectroscopy	
6	Experiment				
7	Theory ML	271819	MSU	STREAMLINE Collaboration: Machine Learning for Nuclear Many-Body Systems	Lee, Dean
		271826	ANL		Lovato, Alessandro
		271837	FNAL		Rocco, Nemi
		271823	FSU		Piekarewicz, Jorge
		271870	Ohio S U Columbus		Furnstahl, Richard
		271873	Ohio U. Athens		Drischler, Christian
		271812	ORNL		Hagen, Gaute
		271849	UNC, Chapel Hill		Konig, Sebastian
		271858	UTK		Papenbrock, Thomas
8	Accelerator AI Op	271872	ANL	Use of artificial intelligence to optimize accelerator operations and improve machine performance	Mustapha, Brahim
9	Theory, LQCD	271849	UVA	EXCLAIM - EXCLusive via Artificial Intelligence and Machine learning	Lidi, Simonetta
		271864	MSU		Lin, Huey-Wen
		271801	NMSU, New Mexico		Sievert, Matthew
		271807	ODU		Li, Yaohang
		271829	Tufts U		Goldstein, Gary
		271850	W Pol I, Blacksburg, VA		Baer, Marie
10	Experiment ML	271770	LBNL	Machine Learning Optimization: VENUS & GRETA	Crawford, Heather
11	Accelerator	271874	TJNAF UVA subcon	Graph Learning for Efficient and Explainable Operation of Particle Accelerators	Tennant, Chris
12	Detector, FS	271848	UNC, Chapel Hill	Interpretable Machine Learning for Germanium Searches	
13	Accelerator Pol.	271813	BNL	Beam polarization increase in the BNL hadron injectors through physics-informed Bayesian Learning	Hoffstaetter, Georg
		271830	Cornell		Hoffstaetter, Georg
		271822	RPI, NY		Wang, Yinan
		271869	SLAC		Edelen, Auralee
		271834	TJNAF		Schram, Malachi
14	Detector	271788	W&M	A Scalable and Distributed AI-assisted detector design for the EIC	Fanelli, Cristiano
		271794	BNL		Wenaus, Torre
		271799	Cath U		Horn, Tanja
		271868	Duke U		Vossen, Anselm G.
		271865	TJNAF		Diefenthaler, Markus
15	Experiment ML	271836	TJNAF	AI/ML Optimized Polarization	Lawrence, David, Subcon with CMU and W&M
					Total Accelerator

Numerical Rank	Topic Subj.	Propos al ID	Institution	Project Title	PI	Type	Funding	Total
1	Detector, sPHENIX	271808	LANL	Intelligent Experiments Through Real-time AI: Fast Data Processing and Autonomous Detector Control for sPHENIX and Future EIC Detectors	Liu, Ming			
		271832	FNAL		Tran, Nhan			
		271853	Georgia Tech		Hao, Cong			
		271818	MIT		Roland, Gunther			
		271857	NJIT, NJ		Yu, Darlene			
		271792	ORNL		Schambach			
2	Accelerator	271850	MSU	Online Autonomous Tuning of the FRIB Accelerator Using Machine Learning	Ostroumov			
		271700	LANL		Scheinker,			
3	Detector ML	271847	MSU	Machine Learning for Time Projection Chambers at FRIB	Windis, Christopher			
4	Experiment, LE	271844	ANL	Modern Data Analytics for the Large Gamma-Ray Spectrometers, GRETINA/GRETA and Gammasphere via Machine Learning and Optimization - RENEWAL	Carpenter, Schaal			
5	Experiment, LE	271863	VSU, Petersburg, VA HBCU	Neural network classifier for analyzing measurements of fast neutrons for inverse mass Redpath, Thomas spectroscopy				
6	Experiment							
7	Theory ML	271819	MSU	STREAMLINE Collaboration: Machine Learning for Nuclear Many-Body Systems	Lee, Dean	New		$5,310,000
		271826	ANL		Lovato, Alessandro			$5,310,000
		271837	FNAL		Rocco, Nemi			
		271823	FSU		Piekarewicz, Jorge			
		271870	Ohio S U Columbus		Furnstahl, Richard			
		271873	Ohio U. Athens		Drischler, Christian			
		271812	ORNL		Hagen, Gaute			
		271849	UNC, Chapel Hill		Konig, Sebastian			
		271858	UTK		Papenbrock, Thomas			
8	Accelerator AI Op	271872	ANL	Use of artificial intelligence to optimize accelerator operations and improve machine performance	Mustapha, Brahim	20-22 Award	$1,400,000	$4,100,000
9	Theory, LQCD	271849	UVA	EXCLAIM - EXCLusive via Artificial Intelligence and Machine learning	Lidi, Simonetta	New		
		271864	MSU		Lin, Huey-Wen			
		271801	NMSU, New Mexico		Sievert, Matthew			
		271807	ODU		Li, Yaohang			
		271829	Tufts U		Goldstein, Gary			
		271850	W Pol I, Blacksburg, VA		Baer, Marie		$1,500,000	$9,020,000
10	Experiment ML	271770	LBNL	Machine Learning Optimization: VENUS & GRETA	Crawford, Heather	21-22 Award	$1,300,000	$10,920,000
11	Accelerator	271874	TJNAF UVA subcon	Graph Learning for Efficient and Explainable Operation of Particle Accelerators	Tennant, Chris	New	$500,000	$11,420,000
12	Detector, FS	271848	UNC, Chapel Hill	Interpretable Machine Learning for Germanium Searches				$880,000
13	Accelerator Pol.	271813	BNL	Beam polarization increase in the BNL hadron injectors through physics-informed Bayesian Learning	Hoffstaetter, Georg	New		
		271830	Cornell		Hoffstaetter, Georg			
		271822	RPI, NY		Wang, Yinan			
		271869	SLAC		Edelen, Auralee			
		271834	TJNAF		Schram, Malachi			$1,600,000
14	Detector	271788	W&M	A Scalable and Distributed AI-assisted detector design for the EIC	Fanelli, Cristiano	New		
		271794	BNL		Wenaus, Torre			
		271799	Cath U		Horn, Tanja			
		271868	Duke U		Vossen, Anselm G.			
		271865	TJNAF		Diefenthaler, Markus			$1,400,000
15	Experiment ML	271836	TJNAF	AI/ML Optimized Polarization	Lawrence, David, Subcon with CMU and W&M	New		$1,300,000
						Total Accelerator		$4,120,000

FY23: AI/ML Awards in Accelerator R&D

Topic Subj.	Proposal ID	Institution	Project Title	PI
Accelerator	**271860**	**MSU**	**Online Autonomous Tuning of the FRIB Accelerator Using Machine Learning**	**Ostroumov, Peter**
	271790	LANL		**Scheinker, Alexander**
Accelerator Op	271872	ANL	**Use of artificial intelligence to optimize accelerator operations and improve machine performance**	**Mustapha, Brahim**
Experiment and Accelerator ML	271770	LBNL	**Machine Learning Optimization: VENUS & GRETA**	**Crawford, Heather**
Accelerator Op	271874	TJNAF /UVA subcon	**Graph Learning for Efficient and Explainable Operation of Particle Accelerators**	**Tennant, Chris**
Accelerator	**271813**	**BNL**	**Beam polarization increase in the BNL hadron injectors through physics-informed Bayesian Learning**	**Hoffstaetter, Georg**
	271830	Cornell		**Hoffstaetter, Georg**
	271822	RPI, NY		**Wang, Yinan**
	271869	SLAC		**Edelen, Auralee**
	271834	TJNAF		**Schram, Malachi**
				Total Accelerator $4.8M

4-5 awards in Accelerator related AI-ML applications

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FY 2023 SC FOAs

➢ ***A new Requirement for all FY2023 SC FOA applications:***

- *All new and renewal applications must provide a Promoting Inclusive and Equitable Research (PIER) Plan as an appendix to the research narrative.*

➢ As a result, a new criteria (PIER) is added to the four existing SC Merit Review criteria

- *Scientific and/or Technical Merit of the Project;*
- *Appropriateness of the Proposed Method or Approach;*
- *Competency of Applicant's Personnel and Adequacy of Proposed Resources;*
- *Reasonableness and Appropriateness of the Proposed Budget; and*
- *Quality and Efficacy of the Promoting Inclusive and Equitable Research (PIER) Plan.*

➢ *PIER Criterion Questions:*

- *Is the proposed Promoting Inclusive and Equitable Research (PIER) Plan suitable for the size and complexity of the proposed project and an integral component of the proposed project?*
- *To what extent is the PIER plan likely to lead to participation of individuals from diverse backgrounds, including individuals historically underrepresented in the research community?*
- *What aspects of the PIER plan are likely to contribute…*

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Communications between NP and PI for Accelerator R&D work

Two modes of communications between PIs and NP office: Quarterly reports and an annual face to face meeting with all PI in one place.

- Quarterly Reports
  - PIs are asked to submit quarterly reports to NP in a "Small Project" format. The FY2023 4th quarter request was received recently. Quarterly reports are reviewed by the Division (they are not just filed away).

- PI Exchange Meeting:
  - **Accelerator R&D:** Since 2015, NP conducts annual "PI Exchange" meetings with presentations on current status of work by all Principal Investigators who received awards under previous fiscal year funds.
  - **AI/ML:** This year NP hosted a separate, in-person AI/ML exchange meeting that covered years 3 of Lab awards and the 6 awards for the FY2021 FOA and three awards for FY2020 Lab call. Meeting occurred yesterday.

NP Matrix for Quarterly Report Review and PM Assessment.

Include brief and clear responses to these NP Matrix questions in your quarterly reports.

- *NP matrix for Quarterly Report and progress assessment.*
- *Make sure your quarterly reports addresses elements of this matrix for our evaluation*
- *Continue to use the NP "small Project" template Ms. Saryna Camron sends you.*

These questions are for the NP PM and your response are only part of the information I use to arrive at my own assessments.

1-		**PI's performance during the quarter**
	a	Progress made
	b	Milestones met
	c	Any breakthrough
2-		**Assessment of risk mitigation**
	a	Issue comunicated?
	b	appropriate mitigation strategies
3-		**Likelihood of achieving project goals**
	a	Will they meet cost and schedule
	b	Will they deliver the promised scope
4-		**Recommendation on need for action**
	a	Are there any actions you need to take in response to points above

PI Exchange Meeting, December 7, 2023

- Presentations on current status of work by all Principal Investigators (PIs) who received awards
  - under FY22 FOA DE-FOA-0002670 for Accelerator R&D

- This is not a review, and no review panel is involved. Presentations will be made to NP Office Program Managers and Division Directors, and possibly a few PMs from HEP and BES Program Offices.

- To facilitate exchange of information between PIs and the NP Office and among PIs and institutions on all current NP Accelerator R&D.

- A continuation of yearly meetings on NP supported Accelerator R&D for next generation NP facilities.

PI Meeting Presentation Guidelines:

Each presentation should include the following information:

- Description of the project and the current status;
- The main goal of the project for which you received the FY 2022-23 Accelerator R&D awards,
- A table showing annual budget and the total received to date (see below);
- A table showing major deliverables and schedule; and
- There will be no written report or follow up actions required for this meeting.
- Summary of expenditures by fiscal year (FY):
- All talks will be posted on PI Exchange meeting page on NP website.
- **35 min talks should allow 7 min for Q/A and 30 min talks 5 min for Q/A**

	Year 1	Year 2	Totals
a) Funds allocated			
b) Actual costs to date			

U.S. DEPARTMENT OF ENERGY

FY2023 PI Meeting Agenda

Work #	Time (E.S.T)	Dur. (min)	Principal Investigator	Institution	R&D Area	Presentation Title	Speaker(s)
	10:00	5	-	DOE NP	-	Introductory Remarks	Mantica
	10:05 AM	35	-	DOE NP	-	NP supported Accelerator R&D and AI/ML	Farkhondeh
1	10:40 AM	35	Marsillac, Sylvain Poelker, Matthew Wang, Erdong	ODU TJNAF BNL	Polarized Sources	Enhancing the Design of Photocathodes with 90% polarization and QE > 1% for DOE NP	Marsillac
2	11:15 AM	35	Bazarov, Ivan	Cornell	Electron Sources	High current sources for spin polarized and un-polarized electron beams	Andorf/ Bazarov
	11:50 AM	**15**	**Break**				
3	12:05 PM	35	Kelly, Michael Kutsaev, Sergey Posen, Sam	ANL RadiaBeam FNAL	SRF	A Practical Niobium-Tin Cavity for the ATLAS Superconducting Linac	Kelly
4	12:40 PM	35	Dan Xie	LBNL-88 inch	Next Gen Ion source	Development of a MARS superconducting cold mass for future generations of ECRIS	Ferracin
	1:15 PM	**50**	**Lunch**				
5	2:05 PM	35	Powers, Tom	TJNAF	Plasma Processing	In Situ Plasma Processing of Superconducting Cavities	Powers
6	2:40 PM	35	Saito, Kenji	MSU	SRF Cryomodules	Development of Transformative Preparation Methods to Push up High Q&G Performance of FRIB Spare HWR Cryomodule Cavities	Saito
7	3:15 PM	35	Okamura, Masahiro	BNL	Laser Ion Source	Development of high current highly charged laser ion source	Okamura
8	3:50 PM	35	Qiang, Ji	LBNL MSU BNL	Beam dynamics modeling	Advanced Modeling of Beam Physics and Performance Optimization for Nuclear Physics Colliders	Qiang
	4:25 PM	**15**	**Break**				
9	4:40 PM	35	Jordan, Kevin	TJNAF	RF sources	1497 MHz Vertical Slice Test of Magnetron & Superconducting Cavity	Jordan
			Accelerator R&D FY2020-2021 Awards -under No Cost Extension (NCE)**				
10**	5:15 PM	20	Ringle, Ryan	MSU	Gas Stoppers	Gas Stopper Developments for Improved Purity and Intensity of Low-Energy, Rare Isotope Ion Beams	Ringle
11**	5:35 PM	20	Hernandez-Garcia, Carlos	TJNAF	Electron Sources	High Voltage Insulators and Electrodes for 500 kV DC High Voltage Photogun with Inverted Insulator Design	Palacios-Serrano
	5:55 PM	5	Closing Remarks				
	6:00 PM		**Adjourn**				

Acknowledgements of Federal Support
For your award

Peer Reviewed Articles and Technical Papers

For peer reviewed and technical papers, the following acknowledgment of support is **required:**

- **For Financial Assistance (Grants, etc.):**

  Acknowledgment: "This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of [insert the sponsoring SC Program Office, e.g., Nuclear Physics], [Add any additional acknowledgements or information requested by the sponsoring SC Program Office] under Award Number(s) [Enter the award number(s)]."

  Example: "This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of **Nuclear Physics** under Award Number DE-SC-000yyy."

- **For National Lab awards:**

  Example: "This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office Nuclear Physics program under Award Number DE-SC-000zzz.

Here is the link on Acknowledgment:
https://science.osti.gov/Funding-Opportunities/Acknowledgements

Thank You

FY20: Accelerator R&D FOA (Topic of this Exchange meeting)

***FUNDING OPPORTUNITY ANNOUNCEMENT** (FOA)*

Research and Development for Next Generation Nuclear Physics Accelerator Facilities
Funding Opportunity Number : DE-DE-FOA-0001230
ISSUE DATE: April 1, 2020
Application Due Date: May 1, 2020

- *Accelerator R&D for this announcement was in the following general categories:*
  - *Accelerator R&D that significantly advances the state-of-the art accelerator capabilities of relevance to next generation machines for the study of nuclear physics.*
  - *Accelerator R&D that significantly advances the state-of-the art accelerator capabilities of relevance to improving the performance of existing facilities studying nuclear physics.*
- *In particular, proposals in the following areas were encouraged:*
  - *Transformative accelerator R&D in SRF technology for restoring cryomodule performance at SRF-based accelerator facilities.*
  - *Transformative accelerator R&D in next generation ion and electron sources.*
- Artificial Intelligence and Machine Learning was not included in this FOA because of a standalone multi-office Laboratory call in this area.