



U.S. DEPARTMENT OF
ENERGY

Office of
Science

HEP Funding Opportunities and Workshops

HEPAP Meeting
May 30, 2019

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FOA and Workshop Summary

- ▶ All FY 2019 FOAs and LAB Announcements are in progress
 - ▶ Many thanks to community members who are helping review proposals from one (or more!) of these announcements
 - ▶ Aiming to have comparative review out soon, all decisions made before end of fiscal year
- ▶ Hope to return to normal schedule in FY 2020
 - ▶ Aim for Comparative Review in fall
- ▶ Basic Research Needs Workshops are playing a growing role in shaping aspects of the program
 - ▶ Community is encouraged to continue participating in generating and responding to these reports



FY 2019 US-Japan Program

- ▶ National Lab Program Announcement (NLA), “US-Japan Science and Technology Cooperation Program in High Energy Physics” [LAB 19-1902], for the FY 2019 US-Japan cooperative R&D program was issued October 15, 2018
 - ▶ Marked the 3rd round of joint US-Japan call for proposals
 - ▶ Must be lab-led proposals, consortium model (single lead institution + subcontracts)
- ▶ Research areas supported:
 - ▶ R&D to enhance the physics yield of current or future HEP experiments
 - ▶ Accelerator Science and Technology R&D
 - ▶ Detector R&D for HEP
 - ▶ Workshops, conferences and/or travel to incubate and develop new concepts
- ▶ NOT supported:
 - ▶ ILC cost-reduction R&D (there is a separate funding mechanism for this)
 - ▶ Proposals that do not involve significant collaboration between US and Japanese investigators
 - ▶ Theoretical research, except via workshops as noted above
 - ▶ Scientific staff. Support for engineering or technical staff ok.
- ▶ **Final Proposal deadline December 14, 2018 – CLOSED**
- ▶ Awards are being processed now
 - ▶ 33 proposals received, including 9 Japan-only proposals; 20 U.S. awards totaling \$1.6M



US-Japan Student Exchange Program

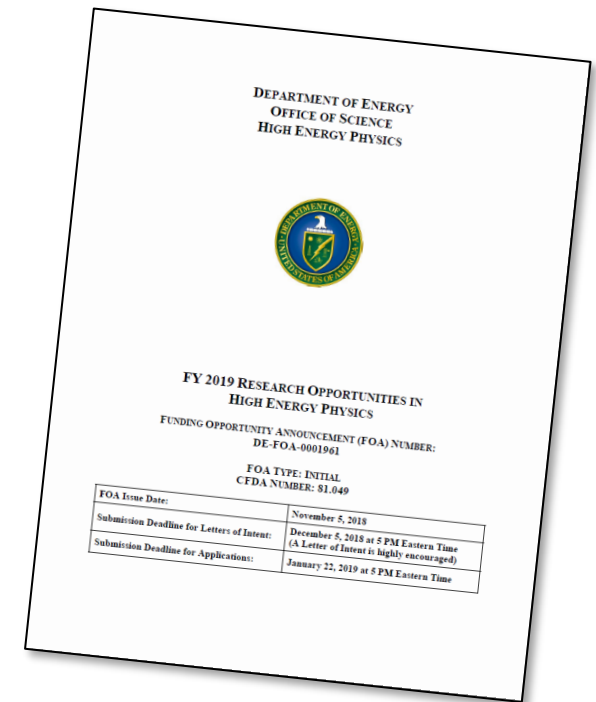


- ▶ This program aims to strengthen the US-Japan scientific collaboration by facilitating greater cooperation in projects of mutual benefit to Japan and the United States in the areas of accelerator and particle physics. Each year, up to five proposals will be selected in the U.S. and up to five in Japan.
 - ▶ Graduate students enrolled in US Physics PhD programs are eligible to submit a proposal to conduct HEP research or technology R&D in Japan
 - ▶ The award will provide travel, housing and cost of living expenses stipend for the stay in Japan. Tuition will be the responsibility of the students and their home institution. Duration is for a 3 to 12 month period.
 - ▶ Web address and further info: <https://www.bnl.gov/ozaki/>
 - ▶ **Application deadline January 15, 2019 - CLOSED**
- ▶ Okazaki Exchange Program Committee awarded **2 candidates from Japan and 4 candidates from U.S** for its 1st selection starting FY 2019



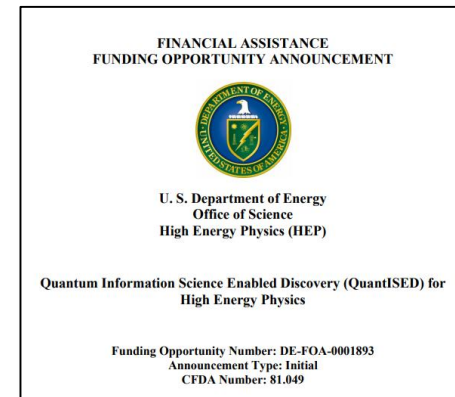
FY 2019 HEP Comparative Review

- ▶ Funding Opportunity Announcement (FOA), “FY 2019 Research Opportunities in High Energy Physics” [DE-FOA-0001961], for the FY 2019 university comparative review process was issued November 5, 2018
 - ▶ Marked the 8th round of annual university comparative review process in HEP
- ▶ 6 HEP research subprograms:
 - ▶ Energy, Intensity, and Cosmic Frontiers
 - ▶ HEP Theory
 - ▶ Accelerator Science and Technology R&D
 - ▶ Detector R&D
- ▶ Letter of Intent (strongly encouraged) due December 5, 2018
- ▶ **Final Proposal deadline January 22, 2019 - CLOSED**
- ▶ Funding decisions are being processed now
 - ▶ Most (not all!) PIs to be recommended have been contacted



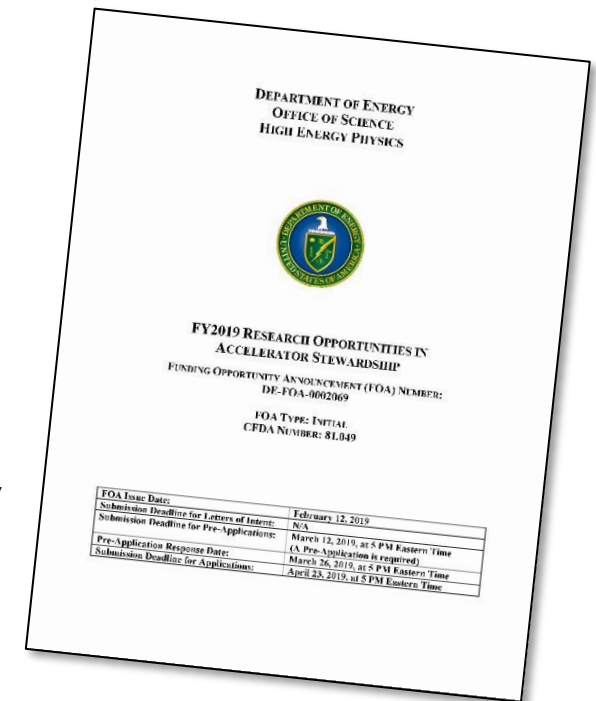
FY 2019 QIS FOA & Lab Announcement

- ▶ **Quantum Information Science Enabled Discovery (QuantISED) for High Energy Physics**
- ▶ **Closed April 16, 2019 - CLOSED**
 - ▶ **HEP received another enthusiastic response!**
- ▶ **Objective:** Forge new routes to scientific discovery along HEP mission and P5 science drivers, invoking interdisciplinary advances in the convergent field of QIS, and intersection with expertise, techniques, technology developed in HEP community
- ▶ **Topics:**
 - ▶ **A:** Cosmos and Qubits
 - ▶ **B:** Foundational QIS-HEP Theory and Simulation
 - ▶ **C:** Quantum Computing for HEP
 - ▶ **D:** QIS-based Quantum Sensors
 - ▶ **E:** Research Technology for QIST
 - ▶ **F:** Innovative HEP-QIS Small Experiments
 - ▶ Topic F only eligible for **QuantISED Exemplars**: small-scale, QIS-inspired or QIS-enabled HEP experiments led by DOE Laboratories
 - ▶ They must provide detailed deliverables and milestones, an appropriate management plan, delineate scope of work separate from other HEP experiments, and provide detailed justifications of all costs requested
- ▶ Proposals are in the process of being reviewed



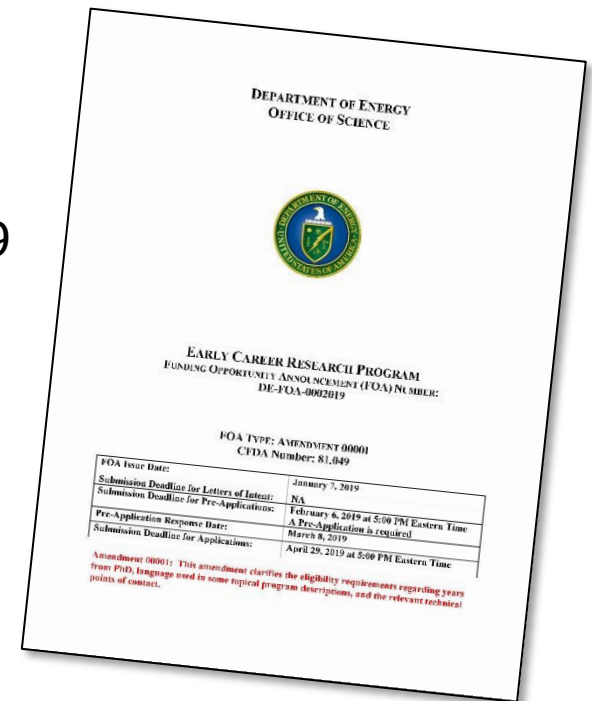
FY 2019 Accelerator Stewardship

- ▶ “FY2019 Research Opportunities in Accelerator Stewardship” [DE-FOA-0002069, LAB 19-2069] for FY 2019 was issued Feb. 12, 2019
 - ▶ Supports basic accelerator research of broad benefit
 - ▶ FOAs, reviews, and awards coordinated with 11 federal agencies
- ▶ Track 1: Accelerator Stewardship Topical Areas
 - ▶ a) Particle Therapy Beam Delivery Improvements
 - ▶ b) Ultrafast Laser Technology Program
 - ▶ c) Energy and Environmental Applications of Accelerators
- ▶ Track 2: Long-Term Generic Accelerator R&D (FOA only)
 - ▶ Distinct from the HEP Comparative Review FOA in that R&D funded here will be expected to predominantly impact accelerator applications beyond those currently used in HEP-sponsored research
- ▶ Track 3: Accelerator Stewardship Test Facility Program
 - ▶ Continuation of the “Accelerator Stewardship Test Facility Pilot Program” (ASTFPP), initiated in 2015
- ▶ Submission Deadline for Pre-Applications (Required): March 12, 2019, at 5 PM Eastern Time
- ▶ **Submission Deadline for Applications: April 23, 2019 - CLOSED**
- ▶ Proposals are being reviewed now



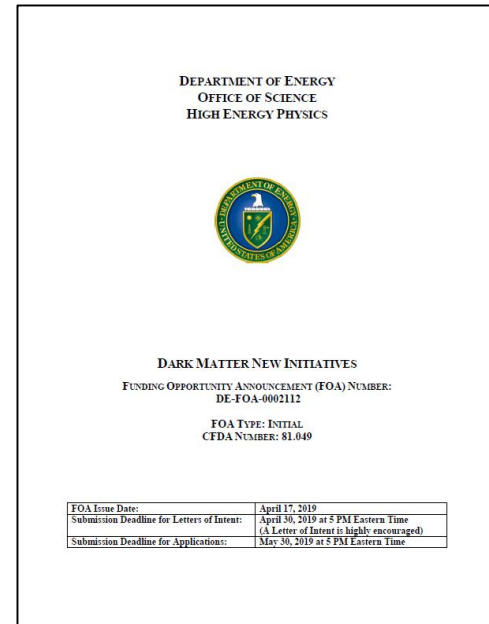
FY 2019 Early Career Research Program

- ▶ “Early Career Research Program” [DE-FOA-0002019, LAB 19-2019] for FY 2019 was issued January 7, 2019
 - ▶ For the present competition, those who received doctorates no earlier than 2008 are eligible
 - ▶ FOA: Ceiling \$1M over 5 years, Floor \$750k over 5 years
 - ▶ LAB: No ceiling, Floor \$2.5M over 5 years
- ▶ Submission Deadline for Pre-Applications: February 6, 2019 at 5:00 PM Eastern Time
- ▶ Pre-Application Response Date: March 8, 2019
- ▶ **Submission Deadline for Applications: April 29, 2019 at 5:00 PM Eastern Time - CLOSED**
- ▶ Proposals are being reviewed now



FY 2019 HEP Dark Matter New Initiatives

- ▶ Funding Opportunity Announcement (FOA), “FY 2019 Dark Matter New Initiatives” [DE-FOA-0002112] and companion Lab-19-2112, was issued April 17, 2019 to “Develop the design and execution plans for small projects to carry out dark matter particle searches, making use of DOE laboratory infrastructure and/or technology capabilities.”
- ▶ 3 Priority Research Directions defined in the FOA:
 - ▶ PRD #1 – Create and Detect DM Particles at Accelerators
 - ▶ PRD #2 – Detect Galactic Particle Dark Matter Underground
 - ▶ PRD #3 – Detect Galactic Wave Dark Matter in the Laboratory
- ▶ 2 Tracks in the FOA:
 - ▶ Track 1 – One to two years; culminates in a design report and execution plan for carrying out the small project.
 - ▶ Track 2 – Two to four years; first one to two years to pursue near-term technology R&D followed by requirements in Track 1.
- ▶ Letter of Intent (strongly encouraged) due April 30, 2019
- ▶ **Final Proposal deadline May 30, 2019 – CLOSING TODAY!**
- ▶ In addition to information provided in the FOA, an updated FAQ is provided on the DOE/HEP Funding Opportunity website with relevant Q&A



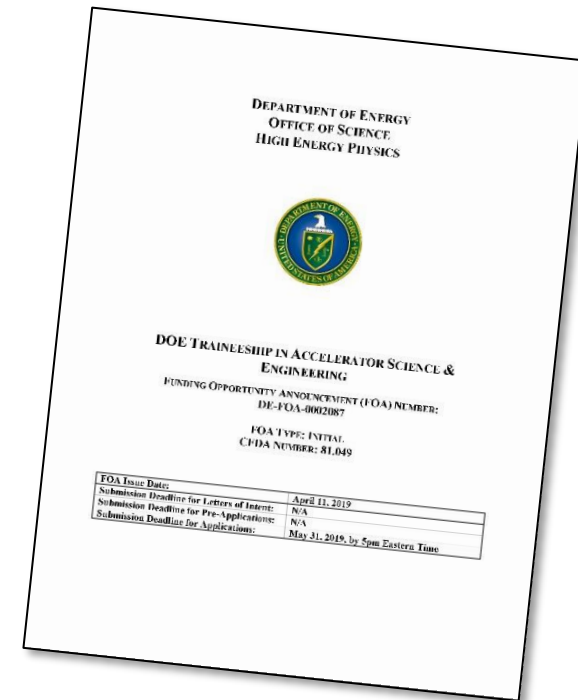
Notional Timeline for New DM

- ▶ March 2017: Community-led workshop collected ideas
 - ▶ White paper at <https://arxiv.org/abs/1707.04591>
- ▶ Late 2018: Basic Research Needs (BRN) study for Dark Matter New Initiatives
 - ▶ Identified three Priority Research Directions for exploring new ideas in DM with small experiments
 - ▶ Report available at: <https://science.osti.gov/hep/Community-Resources/Reports>
- ▶ 2019: Support conceptual development of small experiments/projects through dedicated FOA/LAB Announcement
 - ▶ Aim to develop concept studies and near-term technology R&D that respond to high impact opportunities described in the BRN
- ▶ 2020+: Select concept(s) for fabrication (possibly in stages)
 - ▶ Continue to support theory studies, research efforts, tech. R&D needed to support project(s) as necessary and appropriate



2019 DOE Traineeship in Accelerator Science & Engineering

- ▶ Issued April 11, 2019 [FOA DE-FOA-0002087]
- ▶ Supports tuition, fees, stipend for students studying any of 4 areas of critical need:
 - ▶ Physics of large accelerators and systems engineering
 - ▶ Superconducting radiofrequency accelerator physics and engineering
 - ▶ Radiofrequency power system engineering
 - ▶ Cryogenic systems engineering (especially liquid helium systems)
- ▶ Up to \$5M in total award funding (\$5M ceiling, no floor), with up to two awards planned
- ▶ FOA includes full details of traineeship program objective and requirements, required program elements, and requirements on using of funding
 - ▶ Awards made under this FOA are intended to offset the costs of graduate student stipends, tuition, fees and training related expenses for the appointed graduate student trainees
- ▶ **Submission Deadline for Applications: May 31, 2019, by 5pm Eastern Time**



SC WDTS Research Opportunities

- ▶ Science Undergraduate Laboratory Internships (SULI)
 - ▶ Latest round just closed (Applications due May 29, 2019)
- ▶ Community College Internships (CCI)
 - ▶ Latest round just closed (Applications due May 29, 2019)
- ▶ Visiting Faculty Program (VFP)
 - ▶ Applications closed Jan. 2019, notifications completed in April
- ▶ Office of Science Graduate Student Research Program (SCGSR)
 - ▶ Two annual solicitations in May and November (next in Nov. 2019)
- ▶ Albert Einstein Distinguished Educator Fellowship
 - ▶ Annual cycle closed on November 15, 2018
- ▶ More information and key dates for all programs at:
 - ▶ <https://science.osti.gov/wdts>



Compact Accelerators for Security and Medicine

May 6-8, 2019 Tysons, VA

- ▶ There is a long history of applying accelerator technology to address national security and medical issues
 - ▶ Accelerator technology advances of the last decade are not fully adopted in the field
 - ▶ New applications have emerged
 - ▶ Want to understand the highest impact applications enabled by R&D to-date, and develop a list of Priority Research Directions for the future
- ▶ Co-sponsored by DOE-SC, NIH-NCI, DHS-CWMD, DOE-NA21, DOE-NA22, and DOD-ONR
- ▶ Charge: Develop R&D Business Case and Priority Research Directions for six application areas in security and medicine identified by the sponsoring agencies
 - ▶ Restricted to “compact accelerators” and technologies that can reach TRL-4 within 5 years. One working group charged to look at the long-term future.
 - ▶ 112 Participants: 23 University, 20 Industry, 19 SC Lab, 11 Defense Labs, 30 Federal Observers, 8 International, 1 NGO
- ▶ Workshop Report will be published this summer



Image credit: University Health Network of Canada



Image credit: Idaho Accelerator Center



Future Basic Research Needs Workshops

- ▶ **BRN Process and Structure**
 - ▶ Targeted topics defined by, and workshop charge issued by, SC program office
 - ▶ Attendance is limited and by invitation
 - ▶ Typical structure: Opening plenary sessions, panel breakout sessions that develop priority research directions, closing plenary session, and extended writing session – draft report completed before departure!
 - ▶ Prompt output: final report released typically 60-90 days after the workshop
- ▶ **BRN reports are expected to serve as reference documents with a long shelf life, and to be readily accessible**
 - ▶ Post-workshop outreach activities often include communication of the results to the broader community by co-chairs and the SC program, and briefings by federal staff to other interested federal parties (within and beyond DOE)
 - ▶ BRNs may, individually or collectively, serve as the basis for subsequent funding opportunities
 - ▶ BRNs by themselves do not make funding decisions
- ▶ **Next HEP BRN will focus on opportunities in Detector R&D**
 - ▶ Aiming for workshop in late 2019
 - ▶ We are considering additional topics for BRNs in 2020



Research Consortia

- ▶ Research consortia are a possible mechanism for funding where a single proposal is created by multiple institutions
 - ▶ One member of the consortium serves as the prime recipient/consortium representative (lead organization).
 - ▶ Consortia must provide a collaboration agreement which sets out the rights and responsibilities of each consortium member, including:
 - ▶ Management structure
 - ▶ Method of making payments to consortium members
 - ▶ Means of ensuring and overseeing members' efforts on the project
 - ▶ Provisions for members' cost sharing contributions
 - ▶ Provisions for ownership and rights in intellectual property developed previously or under the agreement
 - ▶ Note that a consortium is applied for in one application and results in one award with subawards to consortia members
- ▶ This mechanism could allow research efforts with specific timelines and goals to provide the "big picture" for consideration, rather than "puzzle pieces" from separate individual institution proposals
 - ▶ This approach is already being used in certain sectors (e.g. QIS)
 - ▶ A consortium approach may benefit specific topics in future FOAs



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