DOE High Energy Physics Funding Opportunity Announcements
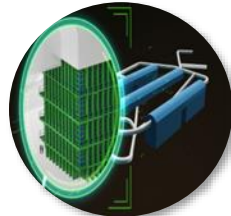
DOE-HEP Principal Investigator Meeting
APS/DPF - Pheno Meeting Pittsburgh · May 13-17, 2024
https://indico.cern.ch/event/1358339/

William Kilgore
U.S. Department of Energy
Office of High Energy Physics

U.S. DEPARTMENT OF ENERGY | Office of Science

High Energy Physics: A Mission-Driven Agency

▸ **The mission of the HEP program is to understand how the universe works at its most fundamental level by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time.**

▸ **Office is divided into the Research, Accelerator & Technology, and Facilities & Operations Divisions**

   ▸ This talk will focus on the **Research** and the **Accelerator & Technology Divisions**

   ▸ The **Facilities & Operations Division** is responsible for the construction of major instruments and facilities and for the operations programs to keep those instruments and facilities running.

▸ **Research and Technology programs are "mission-driven":**

   ▸ Each HEP experimental subprogram develops and supports a specific portfolio of projects and emphasis is placed on the research needed to conduct the experiments and obtain results.

   ▸ The HEP technology subprograms support R&D that advances the state-of-the-art in particle accelerators, detectors, computing, and quantum information that will lead to new, more capable facilities.

   ▸ Each HEP experimental subprogram supports collaborations in different development stages, to maintain a balanced and sustainable program to deliver scientific results.

   ▸ The Theory subprogram seeks to support theoretical activities that **provide the vision** and the mathematical framework for understanding and **extending our knowledge** of particles, forces, space-time, and the universe.

HEP Budget and Planning

Michelle Bandy
Erin Cruz
Alan Stone

International Cooperation
Abid Patwa

Office of High Energy Physics

Regina Rameika, Director
Eric Colby, Sr. Technical Advisor
Carol Atherly, Administrative Support (*CONTR*)
Janice Hannan, Administrative Support

HEP Support

Christie Ashton
David Bogley
Kathy Yarmas

Broadening Engagement

Alan Stone
Jacqueline Smith (AAAS Fellow)

Accelerator and Technology Division
Regina Rameika, Acting Director

Research Division

Glen Crawford, Director

Facilities and Projects Division

Michael Procario, Director

Accelerator Programs
Camille Ginsburg
Derun Li
Ken Marken
Craig Burkhart (Detailee)
Christine Clarke (Detailee)
Roark Marsh (Detailee)

Instrumentation and Detector R&D
Helmut Marsiske
Ray Bunker (Detailee)

QIS, AI/ML, Computational HEP
Jeremy Love
Vacant PM (Acting: *Glen Crawford & Abid Patwa*)
Eric Church (Detailee)

Energy Frontier
Abid Patwa
Charles Young (Detailee)

Intensity Frontier
Brian Beckford
Jessica Esquival (Detailee)
Laurence Littenberg (Detailee)

Cosmic Frontier
Manuel Bautista
Bryan Field
Kathy Turner
Chris Jackson (Detailee)

Theory
William Kilgore

AGILE
Glen Crawford

Facility Lab Operations
Eric Feng (FACET-II, DUNE, NERSC)
Clayton Hallowell (SURF)
John Kogut (FNAL, BNL, SLAC, LBNL)
Abid Patwa (LHC, ANL)
Kathy Turner (Cosmic Experiments)

Projects
Joseph Diehl (LBNF/DUNE)
Athans Hatzikoutelis (HL LHC)
John Kogut (ACORN)
Ted Lavine (mu2e, CMB-S4)
Simona Rolli (LBNF/DUNE)
Kathy Turner (LuSEE night, DMNI)

Overview of HEP Funding Opportunities

- **Recent Funding Opportunities**
  - HEP Technology Traineeships
  - FY 2024 HEP Comparative Review
  - FY 2024 Office of Science Early Career Research Program
  - FY 2024 EPSCoR
  - WTDS Opportunities
- **Current Funding Opportunities**
  - RENEW and FAIR
  - Hardware-award AI for HEP
  - HEP-QIS: QuantISED-2.0
  - Microelectronics
- **HEP Comparative Review and Funding Opportunity Timelines**
- **Changes for Current and Upcoming FOAs**
- **Changes for FY 2025 HEP Comparative Review**
- **Guidance for Applicants to FY 2025 HEP Comparative Review**
- **See also:** https://science.osti.gov/hep/Funding-Opportunities

Recent Funding Announcements

HEP Technology Traineeships
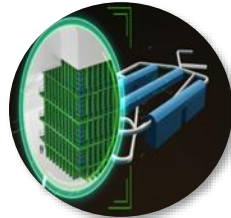
▸ **HEP has developed a program of technology traineeships**

  ▸ High Energy Physics Instrumentation, since 2021 (see DE-FOA-0002496)

  ▸ Computational HEP, since 2022 (see DE-FOA-0002743)

  ▸ Acceleratory Science and Engineering, since 2017 (see DE-FOA-0003025).

    ▸ The FY 2023 FOA marks the 4th instance of the AS&E Traineeship (2017, 2019, 2021, 2023)

    ▸ The AS&E Traineeship scope was determined through community input

    ▸ 29 students graduated; including ongoing programs, 74 students had participated through the 22-23 academic year.

    ▸ For more information, see the APS/DPB 2023-2024 Newsletter

  ▸ Funding predominantly goes to student stipends (in FY24, includes "living wage" adjustments)

  ▸ HEP Instrumentation and Computational HEP traineeships are expected to recompete regularly.

FY 2024 HEP Comparative Review

▸ **Call for proposals issued as part of FY 2024 SC Open Call DE-FOA-0003177**

  ▸ **FY 2025 Comparative Review also part of DE-FOA-0003177 (see later slides)**

  ▸ **Applications for support of HEP research activities in any of the 6* areas identified below could be submitted for the FY 2024 Comparative Review. HEP expects to convene comparative merit review panels on a yearly basis for both New and Renewal applications devoted to these research activities.**

  ▸ **Experimental HEP: Energy Frontier, Intensity Frontier, Cosmic Frontier**

  ▸ **HEP Theory**

  ▸ **Technology R&D: General Accelerator R&D (GARD), Detector R&D**

*Computational HEP/AIML and HEP-QIS covered in separate FOAs in FY 2024 (see later slides)

Status : In final decision process. Decisions anticipated by late May/early June.

For more information (FAQ, webinar) : https://science.osti.gov/hep/Funding-Opportunities

FY24 Early Career Research Program

▶ **DE-FOA-0003176:** Applications for support of HEP research activities in any of the 8 areas identified below may be submitted to this FOA. HEP expects to convene comparative merit review panels on a yearly basis, as described below, for New applications devoted to these research activities.

  ▶ Experimental HEP: **Energy Frontier, Intensity Frontier, Cosmic Frontier**

  ▶ **HEP Theory**

  ▶ Technology R&D: **General Accelerator R&D (GARD), Detector R&D, Computational HEP, HEP-QIS**

▶ Eligibility time window (max years past PhD for PIs) increased for this competition for a second year from 10 to 12 years for all applicants. DOE/SC intends to revert to the original 10-year eligibility window in subsequent competitions.

Status: Full proposals were submitted by April 25 and are currently under review. Decisions are anticipated by late June

For more information (Webinar, previous awards) : https://science.osti.gov/early-career

Building EPSCoR-State/National Laboratory Partnerships

- **DE-FOA-0003201:** DOE Established Program to Stimulate Competitive Research supports research programs in jurisdictions underrepresented in Federal research funding
  - This biennial FOA supports building new collaborative research activities with DOE national labs
  - Participation by undergraduate students, graduate students, or postdoctoral fellows is required.
  - Other biennial EPSCoR FOA supports building research infrastructure at universities.

- **Maximum funding of $1,000,000 over four years with possibility of one renewal of up to three years. Any subsequent support subject to competitive solicitation process of the relevant DOE core program. Applications must propose research areas supported by DOE programs.**

- **Previously (before FY24) limited to 1 application per institution. Now, up to 2 applications per program area (e.g., ASCR, BES, BER, FES, HEP, NP, applied energy programs) per institution.**

- **DOE/SC EPSCoR funding also now distributed among SC programs.**

- **Large increase in HEP-related proposals in FY24.**

- **Status : In final decision process.**

For more information (Webinar) :

WDTS Opportunities

▶ **The Office of Science Workforce Development for Teachers and Scientists (WDTS) offers programs for early-career researchers from undergraduates to junior faculty.**
  ▶ Research is carried out at National Labs

▶ **Three programs of particular interest:**
  ▶ **Science Undergraduate Laboratory Internships (SULI)**
    ▶ Supports undergraduate research at a DOE lab, 10-16 weeks
    ▶ Three calls per year, for following Spring/Summer/Fall terms
    ▶ The call for the fall term is open now! Applications due May 22, 2024
  ▶ **The Visiting Faculty Program (VFP)**
    ▶ Seeks to increase the research competitiveness of faculty members and students from institutions of higher education that are historically underrepresented in the research community to expand the workforce that addresses DOE mission areas.
    ▶ One call per year, for Summer term. Open now! Applications due May 22, 2024
  ▶ **Office of Science Graduate Student Research fellowships (SCSGR)**
    ▶ Supplemental awards to supports graduate student research at a DOE lab, 3 to 12 months while conducting their PhD research
      • Students must be a PhD candidate in a qualified graduate program and a US Citizen or lawful permanent resident
      • Research must be aligned with the SCGSR priority areas, but no prior SC award is required
    ▶ Two calls per year, usually Feb/Aug. Applications typically due May/Nov for following Fall or Summer start
      • The February call closed on **May 1, 2024.** Look for the next call in August.

Active Funding Announcements

Office of Science RENEW and FAIR Initiatives
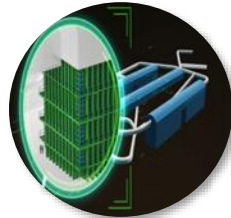
- **Reaching a New Energy Sciences Workforce (RENEW)**
  - Leverage SC's national laboratories, user facilities, and other research infrastructures to support traineeships for students and postdoctoral researchers at institutions underrepresented in the SC portfolio.
  - Applications to RENEW must include training activities* beyond conduct of research.
- **Funding for Accelerated, Inclusive Research (FAIR)**
  - Build research capacity, infrastructure, and expertise at institutions historically underrepresented in the SC portfolio by funding fundamental research relevant to the SC mission.
- **Both initiatives aim to:**
  - Increase the diversity of institutions participating in SC research.
  - Build relationships with institutions historically underrepresented in the SC research portfolio.
- **Focus on non-R1 emerging research institutions (ERIs) and non-R1 minority serving institutions (MSIs)****

For HEP : Applications must propose subject areas supported by HEP (same 8 areas as for ECRP)

*Traineeships are structured, substantive STEM training programs with measurable expectations and a duration and intensity substantial enough to achieve both short-term and long-term training outcomes.

**Institution Designations and Classifications: https://science.osti.gov/grants/Applicant-and-Awardee-Resources/Institution-Designations

Reaching a New Energy Sciences Workforce (RENEW)

DE-FOA-0003280 Issued : March 12

Pre-applications due: April 30

**Pre-application response date: June 4**

Full applications due: July 23

Webinar date : March 21

Application Office Hours : July 10, 18

https://science.osti.gov/Initiatives/RENEW

HEP POC: Brian Beckford

▸ All applications must be submitted on behalf of a lead institution that is a non-R1 ERI or non-R1 MSI.

▸ The lead institution must partner with **at least one** team member from a DOE-affiliated institution (National Labs, User Facilities, etc.). See FOA for additional teaming requirements.

▸ **Limited to one application per PI and no more than 3 applications per program per institution.**

▸ There are two application tracks that are differentiated by the award size and duration

Application Track	Award Floor (Total)	Award Ceiling (Total)	Award Duration
Exploratory Application	$100,000	$400,000	2 years
Full Application	$750,000	$2,250,000	3 years

Funding for Accelerated, Inclusive Research (FAIR)

DE-FOA-0003207 **Issued : March 12**

Pre-applications due: April 23

Pre-application response date: May 28

Full applications due: July 16

Webinar date : March 20

Application Office Hours : July 2, 10

https://science.osti.gov/Initiatives/FAIR

HEP POC: Jeremy Love

▸ Build research capacity, infrastructure, and expertise though mutually beneficial partnerships between applicant and DOE national laboratories, user facilities, or R1 MSIs

- ▸ Support to a single institution and research partner
- ▸ Partner's role is to support research activities at the lead institution by providing expertise and experience

▸ In both FY23 & FY24, $35 million was designated to support awards under the FAIR FOA

- ▸ Three-year awards between $300,000 and $750,000 total.

▸ **HEP made five awards in support of FAIR Initiative in FY23**
- ▸ Three Early Career PIs
- ▸ Two PIs built on collaborations started through WDTS Visiting Faculty program (VFP)

▸ **Capacity and experience being developed:**
- ▸ Renovation of lab space to enable testing of cryogenic electronics
- ▸ Experience developing community software tools
- ▸ Capability to use externally funded material science center for HEP detector development
- ▸ Buying out faculty time to build research experience
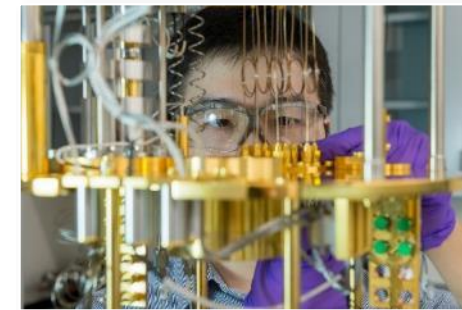
Hardware-Aware Artificial Intelligence for HEP

Lab 24-3305 issued: May 1

Pre-applications/LOIs due: June 26

Full applications due: July 24

Webinar date : May 29. Registration required.

https://science.osti.gov/hep/Research/Artificial-Intelligence-AI

HEP POC: Jeremy Love

Implemented as both a Lab call and (for University PIs) as a "Research Review" through the Office of Science Open Call.
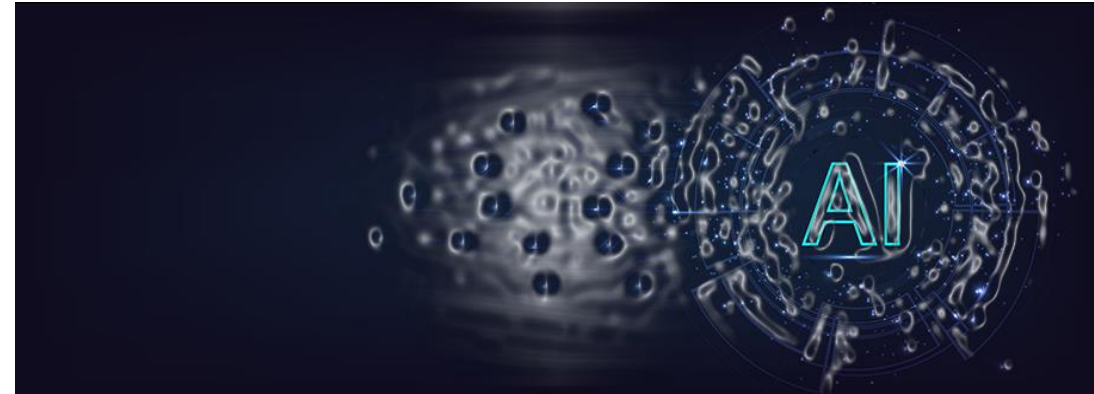
▸ **HEP is interested in ambitious research projects where detailed knowledge of HEP hardware systems informs the AI techniques and methods required for implementation**
  - ▸ Hardware systems for this review are HEP specific detector or sensor technologies deployed in HEP experiments and facilities or under development for future HEP applications, including the associated ASICs, control and readout electronics.
    - ▸ Widely used generic computational hardware (CPUs, GPUs, FPGAs, and Quantum Processors) are not considered HEP hardware for this call.

▸ **Applications are sought in two broad categories**
  - ▸ **Smart Detectors – Intelligence on detector in readout and control electronics**
  - ▸ **AI for Operations – AI/ML for improved experiment and facility operations and control**

HEP-QIS : QuantISED 2.0

FOA DE-FOA-0003354 Issued : May 7

Optional LOIs due: June 18

Full applications due: July 30

Webinar date : TBA

https://science.osti.gov/hep/Research/Quantum-Information-Science-QIS
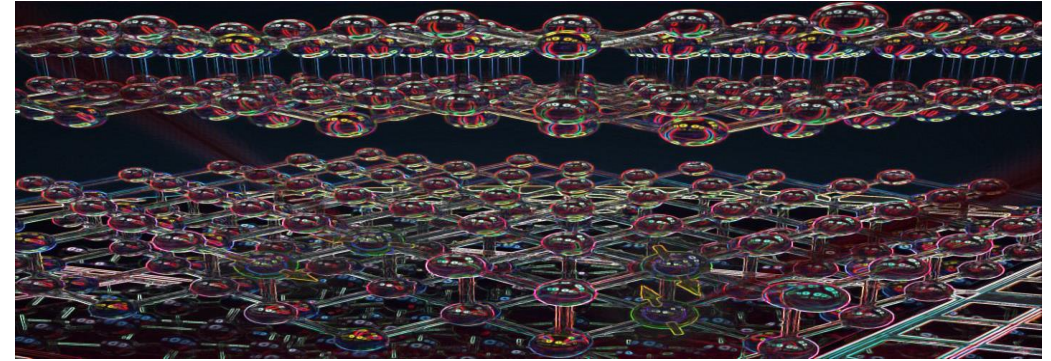
HEP POCs: Glen Crawford, William Kilgore, Helmut Marsiske

▸ Pursuing the exciting science opportunities in this emerging research area requires significant further development of the theory and practice of understanding and deploying real-world quantum systems, building on the achievements of the first cycle of QuantISED awards (2019-2020). Hence this call is QuantISED 2.0.

▸ Interviewed QIS PIs and consulted Snowmass QIS and Detector BRN/Sensor Workshop reports. This informs 3 main topical areas : HEP-QIS Theory; Quantum Sensing; and Pathfinder Experiments

▸ There are two application tracks that are differentiated by the award size, number of applicants and duration. See FOA for further guidance and restrictions.

Application Track	# of PIs	Award Floor (Total)	Award Ceiling (Total)	Award Duration
Seed Application	1	$140,000	$1,000,000	2-3 years
Team Application	>1	$1,200,000	$5,000,000	3-5 years

Microelectronics Science Research Center Projects

Lab call **LAB 24-3320** Issued : May 8

Pre-applications due: May 30

Pre-application response date: June 20

Full applications due: July 25

Webinar date : TBA

HEP POC: Helmut Marsiske
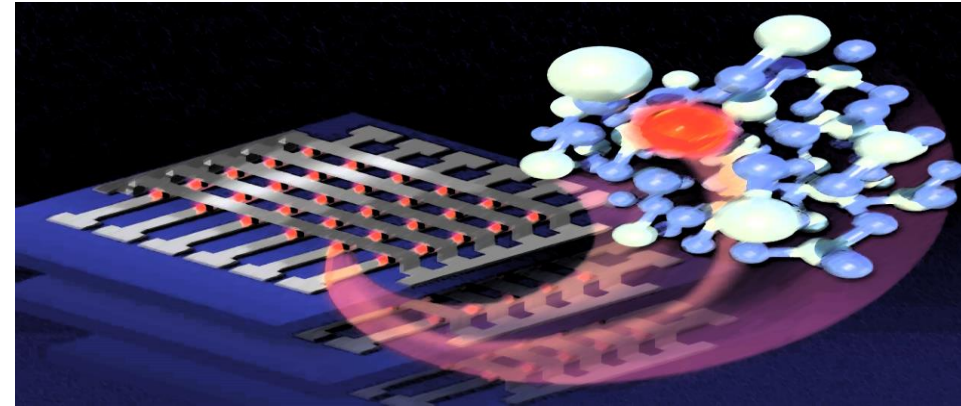
▸ Each center will have a focus either on energy efficiency and/or on extreme environments.

▸ Labs must be lead institution; teaming arrangements with other labs, universities, and industry strongly encouraged

▸ Proposals are requested for fundamental scientific research in the following four Research Areas:
  1. New or improved materials, surface processing and control, chemistry, synthesis, and fabrication
  2. Advanced computing paradigms and architectures
  3. Integrated sensing, edge computing, and communication
  4. Processing in extreme environments, radiation, radiation transport, and materials interaction

▸ Each Pre-Proposal and Proposal in response to this funding opportunity is encouraged to propose research that is integrated across at least two of these areas.

Application Track	Award Floor (Annual)	Award Ceiling (Annual)	Award Duration
Lab Application	$750,000	$3,000,000	4 years

HEP Comparative Review & Funding Opportunity Timelines

FOA Timeline: Before Comparative Review
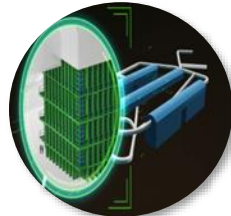
- Before the era of HEP Comparative Review, targeted initiatives, etc., all proposals came in via SC Open Call (always open, no fixed dates)
  - Renewal proposals were due ~ 6 months before the end date of current award
  - New proposals could come in any time
  - All reviews, awards etc., were done independently and asynchronously

Pro: ~naturally load-balanced

Cons: hard to plan budgets; no direct comparisons/calibration; no page limits or separate budgets; funding levels usually changed incrementally even when proposal quality changed significantly.

HEP University Comparative Reviews

▶ **Since FY 2012, DOE/HEP uses a process with comparative merit review panels for university research grants – those scheduled for renewal and any new proposals**

- ▶ **FY 2025 will marks the 14th round in the process**

▶ **This process was recommended by several DOE advisory committees, including the 2010, 2013, 2016 and 2020 HEP Committee of Visitors (COV):**

- ▶ 2010 COV: *"In several of the cases … proposal reviewers expressed negative views of the grant, but only outside of their formal responses. Coupled with the trend in the data towards very little changes in the funding levels over time, this suggests that grants are being evaluated based on the historical strength of the group rather than the current strength or productivity of the group. This is of particular concern when considering whether new investigators, new science, or high-risk projects can be competitive. Comparative reviews can be a powerful tool for addressing these issues and keeping the program in peak form."*
  - ▶ In 2012, HEP began to use comparative review panels on a regular basis
- ▶ 2013 COV: <u>Continue</u> comparative reviews. Augment with independent mail-in reviews
- ▶ 2016 *and* 2020 COV: <u>Continue</u> comparative reviews
  - ▶ Communicate about program priorities at DOE-HEP PI meetings, provide improved guidance to reviewers on, e.g., more uniform scoring, DE&I, …

Goal: improve overall quality and efficacy of the HEP research program by identifying the best proposals with highest scientific impact and potential

FOA Timelines: Comparative Review

▶ **In 2012, HEP adopted a program of Comparative Review**

▶ **Each year, a separate stand-alone FOA was issued with fixed dates for proposal review, page limits, additional budgets**

- ▶ FOA issued ~July
- ▶ Proposals due ~Sep
- ▶ Panel reviews ~Nov
- ▶ Funding plan ~Jan
- ▶ Awards recommended ~Feb/Mar
- ▶ Awards issued April/May

▶ **All reviews, awards etc. done synchronously**

Pro: Direct comparisons + panel discussion → priority recommendations.

Con: Increased workload and complexity. The annual process lasts most of a calendar year.

Comparative Review Timelines: Recent History

U.S. DEPARTMENT OF **ENERGY** | Office of Science

- ▶ Since,~2017, additional DOE internal review processes have stretched approval/award timelines

- ▶ Same FOA, modulo yearly tweaks, but ~3 month schedule shift
  - ▶ FOA issued ~Oct
  - ▶ Proposals due ~Dec/Jan
  - ▶ Panel reviews ~Mar
  - ▶ Funding plan ~Apr
  - ▶ Awards recommended ~May/June…
  - ▶ Awards issued ~July/August [*but nominal award start date ~Apr 1!*]

Pro: Direct comparisons + panel discussion → priority recommendations.

Cons: Increased workload and complexity plus overlap (time conflict) with other FOAs; awards come ~2-3 months late, stressing all parts of the system; "Just in time" delivery with little margin for error.

This leads to the desire to streamline the process going forward

FY 2024: HEP Comparative Review in the Open Call

▸ **In FY 2024, we continued to prioritize support for the university research program through Comparative Review but executed the process through the SC Open Call.**

▸ **There was no dedicated HEP Comparative Review FOA in FY 2024.**

From DE-FOA-0003177

Applications submitted for the annual HEP comparative review process:

1. FY 2024 HEP Comparative Review: HEP expects to convene merit review panels in February 2024 for research areas **(a)** through **(f)** below. Research applications, as described above, that are aligned with one or more of those research areas and are received **before** December 1, 2023, will be considered for merit review by those panels. Applicants are strongly encouraged to submit pre-applications prior to November 1, 2023.

▸ **There was also no relief from the challenging timeline.**

FY 2025: HEP Comparative Review in the Open Call

▸ **In FY 2025, we will continue to prioritize support for the university research program through Comparative Review and use the same edition of the Open Call.**

From DE-FOA-0003177

Applications submitted for the annual HEP comparative review process:

…

2. FY 2025 HEP Comparative Review: HEP expects to convene merit review panels in November 2024 for research areas **(a)** through **(g)** below. Research applications, as described above, that are aligned with one or more of those research areas and are received **before** September 5, 2024, will be considered for merit review by those panels. Applicants are strongly encouraged to submit pre-applications prior to August 1, 2024.

▸ **Moving the proposal due date to early September allows us to change the timeline. We anticipate completing reviews by December 2024.**

▸ **The Computational HEP program will participate in the FY 2025 Comparative Review**

HEP Comparative Review FOA
→ Office of Science Open Call

Recent Changes for Current and Upcoming FOAs
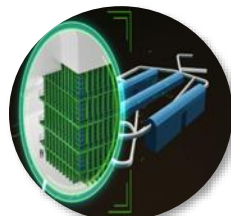
New since FY 2023: Research and Related Senior/Key Person Profile (Expanded)

A profile like this must be filled out for each Senior/Key person on the proposal.

Senior/Key Personnel include:
- The PI and all personnel identified by name in Section A of the budget;
- All others who contribute in a substantive, meaningful way to the scientific development or execution of the project (even if unpaid), including Research Scientists

Senior/Key Personnel must be aware that they are included in the application and must agree to perform the work if awarded.

A profile like this must be filled out for each Senior/Key person on the proposal.

Senior/Key Personnel include:
- The PI and all personnel identified by name in Section A of the budget;
- All others who contribute in a substantive, meaningful way to the scientific development or execution of the project (even if unpaid), including Research Scientists

Biographical Sketches and Current & Pending Support for each Senior/Key Person are attached to their Profile.

PROFILE - Project Director/Principal Investigator

- Prefix:
- * First Name:
- Middle Name:
- * Last Name:
- Suffix:
- Position/Title:
- Department:
- Organization Name:
- Division:
- * Street1:
- Street2:
- * City:
- County/ Parish:
- * State:
- Province:
- * Country: USA: UNITED STATES
- * Zip / Postal Code:
- * Phone Number:
- Fax Number:
- * E-Mail:
- Credential, e.g., agency login:
- * Project Role: PD/PI
- Other Project Role Category:
- Degree Type:
- Degree Year:
- *Attach Biographical Sketch — Add Attachment — Delete Attachment — View Attachment
- Attach Current & Pending Support — Add Attachment — Delete Attachment — View Attachment

New since FY 2023 FOAs: Changes to the Biosketch

▶ **The Office of Science (SC) requires the NSF format in the Science Experts Network Curriculum Vita (SciENcv) system (or a fillable PDF available from NSF).**

  ▶ The NSF format is not fully compatible with the information required by the FOA. Pages containing non-compatible information can be printed on a separate sheet and appended to the required format without incurring page limit violations.

  ▶ The "Collaborator list" is no longer part of the biosketch.

  ▶ The Biosketch is to be attached to the Senior/Key Person Profile.

  ▶ HEP strongly recommends using SciENcv over the fillable PDF:

    ▶ Software incompatibilities have occurred when merging fillable PDFs with other proposal documents.

    ▶ It is anticipated that the Office of Science will someday participate in a multi-agency effort to develop a common SciENcv Biosketch format for future FOAs and you will already be in the system.

  ▶ Refer to the FOA for full details.

New since FY 2023 FOAs: Reporting Current & Pending Support

▸ **The Office of Science (SC) requires the NSF format in the Science Experts Network Curriculum Vita (SciENcv) system (or a fillable PDF available from NSF).**

  ▸ The NSF format is not fully compatible with the information required by the FOA. Pages containing non-compatible information can be appended to the required format without incurring page limit violations.

  ▸ I recommend using SciENcv over the fillable PDF:

    ▸ Software incompatibilities have occurred when merging fillable PDFs with other proposal documents.

    ▸ It is anticipated that the Office of Science will create its own SciENcv Current & Pending Support format for future FOAs and you will already be in the system.

    ▸ The fillable PDF has many pages for a large number of entries. If you opt for the fillable PDF, <mark>please delete unused pages</mark>. One proposal (with many PIs) had over 500 pages of C&P, most completely empty. Reviewers were not pleased.

  ▸ The Current & Pending is to be attached to the Senior/Key Person Profile.

  ▸ All foreign government-sponsored talent recruitment programs must be identified in current and pending support. Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE.

  ▸ Refer to the FOA for full details.

New since FY 2022: Identification of Merit Review Conflicts

▸ **A list of Collaborators and other Individuals Who Should Not Serve as Reviewers must be provided for each Senior/Key Person.**

> ▸ The Office of Science provides a Collaborator Template (see link in the FOA) as an Excel Spreadsheet. Submit one document containing all entries for all Senior/Key Persons.
>
> ▸ The file should **not** be part of the narrative document; it should not be attached to the biosketch.   The FOA identifies a specific field (Field 12) of the SF-424 Research and Related Other Project Information Form for the attachment. Your application is incomplete without this document, and subject to **declination without review**.
>
> ▸ This document will not be part of the package sent out for review; it is for the use of HEP Program Officers.
>
> ▸ It is infinitely preferred that you use the Template and attach it as an Excel file. Conversions to PDF, other Spreadsheet formats, or home-brewed formats are much harder to work with and are strongly discouraged.
>
> ▸ Instructions are included in the FOA and in the Collaborator Template. Provide all required information.

▸ **Refer to the FOA for full details**

SC Commitment to Diversity, Equity, Inclusion, and Accessibility

As a steward of public funding, the Office of Science has a responsibility to ensure that we are serving the public.

SC is deeply committed to:

- Supporting diverse, equitable, inclusive, and accessible work, research, and funding environments that value mutual respect and personal integrity;

- promoting people of all backgrounds, including individuals from groups and communities historically underrepresented and minoritized in STEM fields;

- Advancing scientific discovery by harnessing a diverse range of views, expertise, and experiences to drive scientific and technological innovation.

The FY 2023 new proposal requirements are a reflection of this responsibility and of this commitment.

Merit Review Criteria

DOE SC's standard merit review criteria are set forth by 10 CFR Part 605.10 and may include additional criteria relevant to the scope and objectives of the solicitation. ***Unless otherwise tailored in the solicitation*** (Funding Opportunity Announcement or DOE Laboratory Call), the merit review criteria for the evaluation of applications are as follows, in descending order of importance:

- 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 Plan for Promoting Inclusive and Equitable Research.**

The sponsoring SC Program Office may elect to modify this order at the time the solicitation is developed, as appropriate for the scope and objectives of the solicitation.

Guiding Reviewer Questions for PIER Plan Criterion

QUALITY AND EFFICACY OF THE PLAN FOR PROMOTING INCLUSIVE AND EQUITABLE RESEARCH

- 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 to the goal of creating and maintaining an equitable, inclusive, encouraging, and professional training and research environment and supporting a sense of belonging among project personnel?

- How does the proposed Plan include intentional mentorship and are the associated mentoring resources reasonable and appropriate?

Additional reviewer questions may be included in the solicitation if applicable to the scope of the solicitation and history of the research efforts.

Promoting Inclusive and Equitable Research (PIER) Plans

At-a-glance:

- Should describe the activities and strategies proposed by the Principal Investigator (PI)/project team to promote equity and inclusion integral to the research project;

- Are between 1-3 pages long, and included as an appendix to the research proposal narrative;

- Will be evaluated as part of the merit review process used to inform funding decisions;

- Are required for all research proposals submitted to SC through FOAs, Laboratory Announcements, and invitational proposals from DOE Labs;

- Are not required for existing awardees unless they are submitting a renewal proposal starting in FY 2023;

- Are not required for applications for supplemental funding on existing awards;

- Are not required for applications requesting funding to support conferences (*but there are new conference proposal requirements for FY 2023*)

- Are not required for proposals submitted to SBIR/STTR Programs announcements. A requirement will be phased in at a later date.

PIER Plans and HEP Research Proposals

- Based on reviewer comments, most HEP PIs/institutions took this assignment seriously, and quality of responses was generally good, but there was large variance.
- Individual reviewer comments on the PIER plans are included in the redacted anonymous reviews provided to PIs.
- Some subprograms are now including panel summary statements on the PIER plan itself, as well as scientific merit and strength of research proposal.

- PIER is not meant to be a general-purpose exercise in Diversity, Equity, and Inclusion (DEI), nor does it ask for participation in unrelated outreach efforts. PIER is Promoting Inclusive and Equitable Research, and a PIER Plan should describe how inclusivity and equity are to be expressed in the research being proposed, and how senior investigators on the proposal are involved in the effort. A PIER Plan can leverage institutional DEI plans and resources, but it is not enough to simply describe those programs and resources; the PIER Plan must discuss how they are to be implemented in the proposed research. Please look at the information available at: https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans.

8/15/2023

Changes for FY 2025 HEP Comparative Review
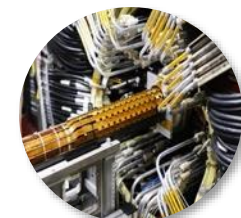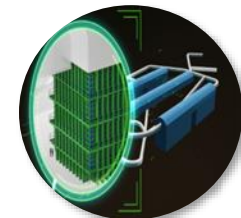
Moving Comparative Review to the Open Call

▶ **Fitting into the Open Call necessitated many changes to the structure of comparative review applications, which I will summarize in later slides.**

▶ **The Open Call is a general-purpose vehicle for applications to all programs in the Office of Science.**

▶ **HEP has limited ability to tailor the parameters of the FOA to our uses, but it also allows flexibility. The main changes to past procedure are:**

  ▶ Proposal Deadlines;
  ▶ Page Limits;
  ▶ Additional Budget Requirements for Multi-task (Umbrella) proposals;
  ▶ Shifting the timeline;
  ▶ Pre-proposals instead of Letters of Intent.

▶ **The HEP Program description in Section I of the FOA will contain HEP-specific instructions for research proposals, that augment the general instructions found, as usual, in Section IV of the FOA.**

8/15/2023

Changes: Proposal Deadlines

▸ **HEP has set a deadline for accepting proposals to Merit Review Panels (Comparative Review). The Open Call, however, is always open and proposals will be accepted by grants.gov after the deadline.**

▸ **Proposals that arrive after the deadline will be reviewed but might be declared ineligible for the Merit Review Panels. This arrangement permits (but does not compel!) greater flexibility in accommodating emergencies that prevent the timely submission of proposals. Contact HEP as early as possible if you face an unavoidable delay to improve the likelihood that we will exercise this flexibility.**

8/15/2023

Changes: Page Limits, Research Scientists

▸ **The nature of the Open Call is not amenable to the complicated definition of "Senior Investigators" used in past Comparative Reviews. Instead, we will permit 9 pages of research narrative for each Senior/Key Person. (The limit is on the total narrative length, not the length of any individual's contribution.)**

   ▸ Research Scientists are considered Senior/Key Personnel and are therefore allotted an equal number of pages in the research narratives. Since Research Scientist Biosketches and Current and Pending are attached to their Senior/Key Person Profiles, there is no longer any need for an appendix dedicated to Research Scientist activities.

   ▸ Warning: Do NOT enlist phantom research scientists to take advantage of the new rules to enhance your narrative page count. Including Senior/Key Persons whose narratives do not indicate key roles are an invitation to Declination Without Review!

8/15/2023

Changes: Additional Budget Requirements

- ▶ **If support is requested from two or more HEP research subprograms, you must provide a supplemental Title Page identifying each research thrust, the Senior/Key Persons involved in each subprogram, and the budget request for each year.**
  - ▸ This requirement does not apply to applications that request support from only a single research thrust, e.g., Accelerator Science and Technology R&D, Theory, CMS, ATLAS, LSST, DESI, DUNE, etc.

- ▶ **The nature of the Open Call does not allow us to assign a special appendix for this information.**

- ▶ **We require use of the Research & Related Subaward Budget Attachment(s) Form, available in the grants.gov package. Mark the Budget Type as "Project" and complete a budget form for each task.**
  - ▸ These budget pages have the same format as the main budget pages and have attachment points for the justifications.

- ▶ **If individual investigators request support from two or more HEP research subprograms and/or thrusts (including two or more thrusts in the same research subprogram), they must provide information on the distribution of their full-time effort (FTE) in a table included in the subprogram justifications.**

- ▶ **Refer to the FOA for full details.**

Changes: Pre-Applications

▸ **The Open Call permits Pre-Applications instead of Letters of Intent. This is largely a distinction without a difference.**

▸ **Though not required, we request those who plan to submit applications for Comparative Review to submit a Pre-Application to let us know who will be applying and permit us to arrange an appropriate slate of reviewers. The pre-application submission allows you to attach additional documents. We ask that you attach a copy of the Collaborator Template to your pre-application.**

  ▸ Please attach the Collaborator Template as an Excel Document.

8/15/2023

Changes: New program area

▸ **New for FY 2025: The Computational HEP program will participate in comparative review.**

▸ **Program areas that will participate in FY 2025 Comparative Review:**
- ▸ Experimental Research at the Energy Frontier in High Energy Physics
- ▸ Experimental Research at the Intensity Frontier in High Energy Physics
- ▸ Experimental Research at the Cosmic Frontier in High Energy Physics
- ▸ Theoretical Research in High Energy Physics
- ▸ Accelerator Science and Technology Research and Development in High Energy Physics
- ▸ Detector Research and Development in High Energy Physics
- ▸ Computational Research in High Energy Physics

FY 2025 HEP Comparative Review
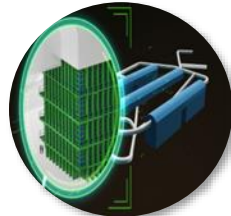
Proposal Project Narrative

- **The Project Narrative comprises the *research plan* for the project**
  - Should contain enough background material in the introduction to demonstrate sufficient knowledge of the research
  - Devote main portion to a description and justification of the proposed project, include details of the methods to be used and any relevant results
  - Indicate which project personnel will be responsible for which activities
  - Include timeline for the major activities of the proposed project

- **Must not exceed 9 pages per Senior/Key Person when printed on standard 8 ½" x 11" paper with 1-inch margins (top, bottom, left, and right). Font must not be smaller than 11 point*.**
  - Faculty members at collaborating institutions listed on the proposal (if any) are <u>not</u> included in the count.

- **PIs are encouraged to refer to Section IV and the HEP subsection of Section I of the FOA**
  - Includes useful information to help PIs in preparing better narratives — for e.g.:
    - What to address for the Background/Introduction
    - Multiple Investigators and/or Multiple Research Subprograms or Thrusts
    - Common narrative with overview of each group's activities in different research areas
      - Discussion of any synergies and connections between areas
    - Proposed Project Objectives, Research Methods, Resources
    - Timetable and Level of Effort of different activities, …

* No one will measure your fonts or margins unless the violations are obvious.

Key Items to Keep in Mind

▸ **Proposed research will review best if closely aligned with the DOE/HEP mission, its program, and the 2023 P5 strategy**

▸ **Investigators in experimental HEP research frontiers (Energy, Intensity, Cosmic) will review best if they are closely integrated into HEP experiment collaborations and have key roles and responsibilities on those experiments**

▸ **"Generic" research that is not to be carried out as part of a specific HEP experimental collaboration should be directed to the HEP Theory or Detector R&D programs, as appropriate.**

▸ **Read the FOA carefully and follow the requirements on content, length, etc.**
  ▸ **Some FOA requirements are set from outside the DOE/HEP office, and there is little to no flexibility to modify.**
    ▸ **Non-compliant proposals submitted to the FOA will not be reviewed.**

▸ **In recent years, ~5% of incoming proposals have been declined without review. The most often missed or overlooked requirements include: Page limits, separate budget sheets (if needed) for each research subprogram or thrust, Data management plans, missing Collaborator Lists**
  ▸ **Most declinations occur for "new" proposals. Ask a mentor or experienced PI for help.**

▸ **During and prior to submission, work with your university sponsored research office to make sure all FOA requirements are met.**

▸ **DOE uses Adobe software tools to combine the documents you submit into the packages that are sent for review. Make sure your documents are Adobe compatible; submit early and review your submission to see if corrections are needed.**

HEP Research Activities Supported

- ▶ **What DOE/HEP supports**
  - ▶ Efforts that are in direct support of DOE/HEP programs
    - ▶ support depends on merit review process, programmatic factors, and available funds
  - ▶ Research efforts (mainly scientists) on R&D, exp. design, data-taking, analysis-related activities
  - ▶ Some engineering support may be provided through the DOE/HEP Detector R&D subprogram
  - ▶ Theory, simulations, phenomenology, computational studies
- ▶ **Faculty support**
  - ▶ Based on merit reviews and/or optimizing the number of research personnel supported by financial assistance awards, support of up to 2-months faculty summer salary
  - ▶ Summer support should be adjusted according to % time the faculty is on research effort
- ▶ **Research Scientists**
  - ▶ Support may be provided, but due to long-term expectations, need to consider case-by-case on merits: whether the roles and responsibilities are well-matched with individual capabilities and cannot be fulfilled by a term position
  - ▶ Efforts should be related towards research; not *long-term* operations and/or project activities
- ✖ **What's not supported by 'Research' grants**
  - ▶ Any significant HEP operations and/or project-related activities:
    - ▶ engineering, major items of equipment, consumables for prototyping or production
  - ▶ Non-HEP related efforts — *e.g.:*
    - ▶ gravity waves (LIGO); heavy-ion (RHIC *or* at the LHC)

Connecting the Narrative to Research Initiatives

- **Significant HEP funding comes through Initiatives (Congressional, Administration, Agency).**
- Current Research Initiatives include Quantum Information Science (QIS), Artificial Intelligence and Machine Learning (AI/ML), Advanced Computing, and Microelectronics.
- **AI/ML has significant impact across the entire HEP research program, QIS has become a common research tool for parts of the Theory and Detector Development programs, while Microelectronics primarily impacts the Detector Development program.**
- Clearly identify those components of your proposed research that may connect to initiative funding:
  - If applications and/or development of initiative-related techniques are a part of your research effort, call attention to them so that they can be properly reviewed. Consider adding a dedicated section to your narrative to describe the research group's efforts in these directions and their importance to completing the proposed research, explaining the associated methods to be used and their impact to advance the group's scientific results; highlight particular results which are expected to be significantly improved or enabled by the use of these methods. Identify the personnel (e.g., students, postdoctoral researchers, etc.), their training, and effort level for carrying out such activities in the proposed research plan.
- **Distinguish the initiative-related research scope being proposed from that supported by other Federal research grants (if any) through QuantISED, or dedicated AI/ML or Microelectronics FOAs.**

Cross-cut, Multi-thrust, or Transitional Proposals

▸ **Applications where a PI is proposing to conduct research across multiple HEP research subprograms during the project period will be considered**

▸ **PIs are encouraged to submit only one application, describing:**

- ▸ Overall research activity, including fractional time planned in each subprogram

- ▸ In proposal's Budget Justification material (Appendix 7), include a level-of-effort table for any transitions of effort during project period

▸ **As part of their overview of the subprogram and review process, DOE PMs will provide the panel with details regarding such research plans across multiple HEP thrusts**

▸ **Reviewers with appropriate topical expertise in the research area(s) will assess the full scope, relevance, and impact of the proposed research in the merit review process —**
e.g., **merit review questions consider:**

- ▸ Are plans for such cross-cutting efforts reasonably developed and balanced?

- ▸ Does the scope of the full proposed program provide synergy or additional benefits to the HEP mission beyond the individual thrusts?

- ▸ Will PI's overall efforts across multiple thrusts add value to HEP program goals and mission and have impact?

Proposal Budgets and Budget Justifications

- **Applicants are encouraged to work with their SRO/SPO to develop their budgets and budget justifications with the same care that is devoted to the project narrative.**
  - Reviewers and panelists often express frustration and/or confusion about budget details leading to lengthy panel discussions about what is being requested.
  - Points for consideration:
    - Funds are awarded to the institution. Understand direct and indirect rates, benefits, and restrictions
    - Establish a relationship with your budget office and/or sponsored research/program office; Remember they submit the proposal for you!
    - Reviewers will notice and call out:
      - Excessive or inappropriate requests
      - Arithmetic errors
      - Poorly justified expenses
      - Discrepancies between the project narrative and budgeted expenses
  - Worst case: Reviewers will start guessing if items are not adequately explained.

Comparative Review: Subprogram Panels

- **The Comparative Review process is very competitive and hard choices must be made based on the reviews and our available funding**
    - As this is a comparative process, some proposals/PIs will be ranked at the top while others will be in the middle or at the bottom

- **It is understood that the vast majority of people applying are working hard and their efforts are in support of the HEP program. Due to the rankings & comments by the reviewers and our constrained budgets, some people whose research activities and level of effort who are ranked lower in terms of priority and impact relative to others in the field will not be funded**
    - This does not necessarily mean the person cannot continue working on the experiments; they are not being funded by the grant to do it. It could be that the person has a critical role in the program, but this did not come out in the proposal or review process.
    - This is why it is imperative to respond to the FOA and detail each person's effort.

- **Members of subprogram review panels see all of the proposals and each member provides input and ranks proposals relative to the others. When panel members are faced with comparing efforts, impacts and limited budgets, rather than rank the whole proposal low, they may provide guidance regarding details of the proposals.**
    - e.g., Section A looks good but Section B looks weak and shouldn't be supported at the requested level.