

DOE Office of Science Office Hours: Opportunities for Early Career Researchers

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Program Managers
Office of High Energy Physics



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[Energy.gov/science](https://energy.gov/science)

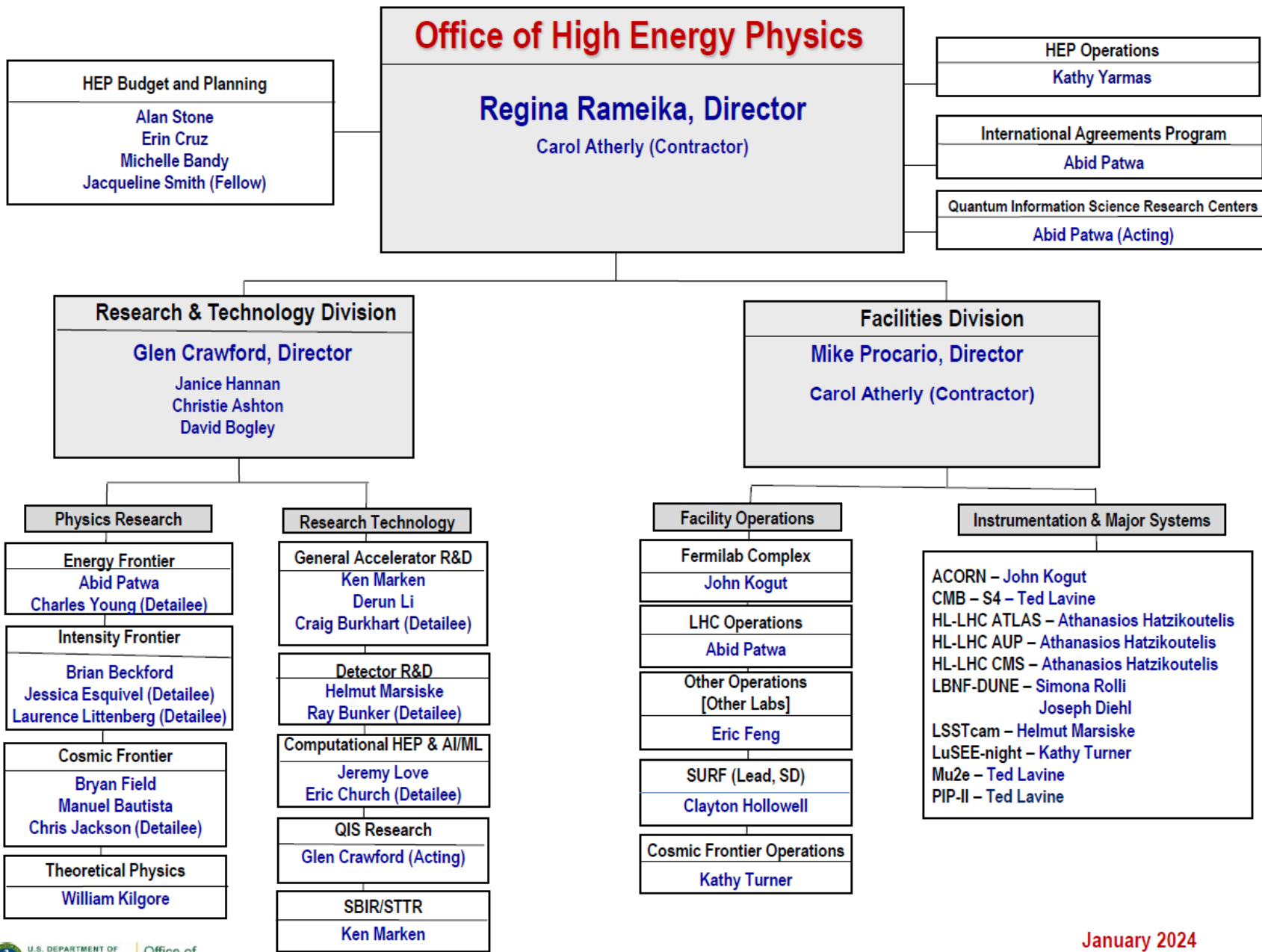
Office of Science Statement of Commitment & other Guidance

- ◆ **SC Statement of Commitment** – SC is fully and unconditionally committed to fostering safe, diverse, equitable, inclusive, and accessible work, research, and funding environments that value mutual respect and personal integrity. <https://science.osti.gov/SW-DEI/SC-Statement-of-Commitment>
- ◆ **Expectations for Professional Behaviors** – SC’s expectations of all participants to positively contribute to a professional, inclusive meeting that fosters a safe and welcoming environment for conducting scientific business, as well as outlines behaviors that are unacceptable and potential ramifications for unprofessional behavior. <https://science.osti.gov/SW-DEI/DOE-Diversity-Equity-and-Inclusion-Policies/Harassment>
- ◆ **How to Address or Report Behaviors of Concern**– Process on how and who to report issues, including the distinction between reporting on unprofessional, disrespectful, or disruptive behaviors, and behaviors that constitute a violation of Federal civil rights statutes. <https://science.osti.gov/SW-DEI/DOE-Diversity-Equity-and-Inclusion-Policies/How-to-Report-a-Complaint>
- ◆ **Implicit Bias** – Be aware of implicit bias, understand its nature – everyone has them – and implicit bias if not mitigated can negatively impact the quality and inclusiveness of scientific discussions that contribute to a successful meeting. <https://kirwaninstitute.osu.edu/article/understanding-implicit-bias>

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, Technology, and Facilities Divisions
 - This talk will focus on the **Research & Technology Divisions**
 - The Facilities 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.





January 2024

Understanding DOE HEP's Mission and Priorities

- ◆ All proposals requesting Office of Science support should be written in the context of the agency mission
 - Proposals to HEP should align with at least one of the P5 science drivers
 - Several subprograms have additional guiding documents such as Basic Research Needs or Roadmap Reports that help shape program priorities
 - These documents can be found on the [HEP Website](#), along with more detailed [program descriptions](#)
- ◆ Talking to senior colleagues and program managers can also help give an understanding of HEP research priorities.
 - When talking to Program Managers understand we **cannot comment on specifics of a proposal**. We can help answer questions about program priorities and goals, and help interpret feedback from reviewers
 - Program Managers tend to have many demands on their schedules, please respect this and contact your relevant program manager early in the proposal writing process
- ◆ The HEP and subprogram priorities are how proposals are prioritized when funding decisions are being made
- ◆ In addition to the program priorities the DOE Office of Science has identified key scientific areas worth special emphasis as Scientific Initiatives
 - The two largest in HEP are Quantum Information Sciences and Artificial Intelligence
 - Research to any program that is aligned with these Initiatives should be identified and described in detail

Research Opportunities



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Research Opportunities

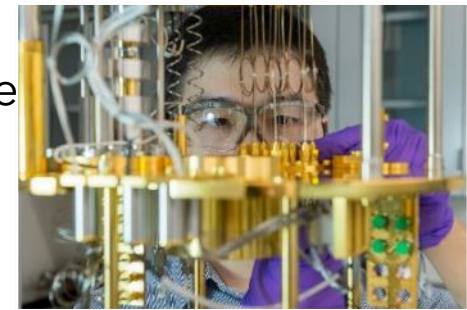
- ◆ Early Career Scientists are encouraged to participate in any relevant funding opportunity, you are not confined to the Early Career Research Program
- ◆ Three categories of research support:
 - **Base programs** – University Comparative Review (now reviewed through the Open Call) and Lab Base FWP and subprogram reviews
 - Seek guidance from experienced Faculty/Staff at your institution or Program Managers
 - **Targeted Opportunities** – Programs seeking to support specific types of activities or scientific scope.
 - **SC Office of [Workforce Development for Teachers and Students](#)** runs programs to support Undergrads ([SULI](#)), Grad Students ([SCGSR](#)), and Faculty ([VFP](#)) to carry out research at DOE Labs
 - **Targeted Research Topics:** periodic Funding Opportunity Announcements ([FOAs](#))
 - **EC Relevant Initiatives:** [FAIR](#), [EPSCoR](#) supports research at institutions in eligible jurisdictions, and **DOE Traineeships** in Accelerator R&D, Detector Development, and Computing are periodically re-competed and support graduate students to take dedicated coursework and carry out thesis research at national labs.
 - Contact PM for questions, if unsure Jeremy Love (Jeremy.Love@science.doe.gov)
 - **Early Career Research Program** – End of this talk.

WDTS Opportunities Description

- ◆ The Office of Science 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 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
 - **Office of Science Graduate Student Research fellowships ([SCSGR](#))**
 - Supplemental awards to supports grad student research at a DOE lab, 3 to 12 months while conducting their PhD research
 - Students must be a PhD candidate in a qualified grad program and a US Citizen or lawful permanent resident
 - Research must be aligned with the SCSGR 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
 - Next applications are due **May 1st 2024 at 5pm ET**

Funding for Accelerated, Inclusive Research (FAIR)

- ▲ Build research capacity, infrastructure, expertise, and experience at institutions historically underrepresented in the Office of Science (SC) portfolio
 - HEP goal is for FAIR to be an on-ramp to our program that puts awardees in a better position to apply for funding through our core program
- ▲ Support mutually beneficial relationships between applicants and partnering institutions
 - Partner institution may be DOE National Lab, SC Scientific User Facility, or an R1 Minority Serving Institution (MSI)
 - Points of contact are available on the [FAIR webpage](#)
- ▲ Lead application must be from non-R1 emerging research institutions (ERIs) or non-R1 MSIs
 - Institutional designations are available on the [FAIR webpage](#)
 - All applications must be submitted on behalf of a lead institution and include a single partnering institution as subrecipient
 - Lead institution should show clear scientific leadership
 - Application should explain the research capacity, infrastructure, expertise, or experience that will be developed as part of a FAIR award
 - Pre-applications are due **April 23rd**



<https://science.osti.gov/initiatives/FAIR>

Proposal Writing



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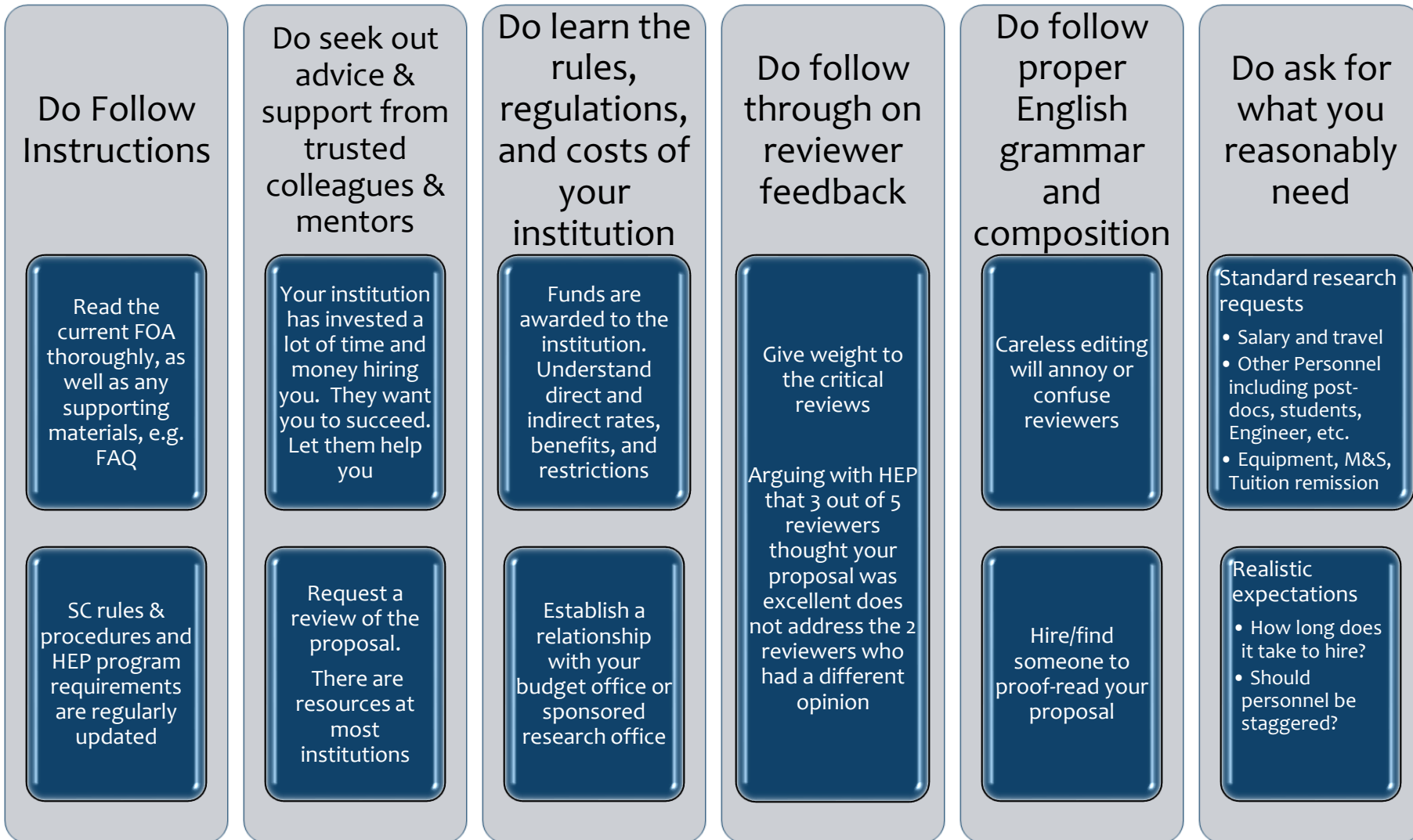
[Energy.gov/science](https://energy.gov/science)

Tell a Story

- ◆ Begin with “Why?”
 - **Why** tends to **reach an emotional chord with audiences** that can inspire the actions you desire. When communicating about vision, values, broad concepts, start with the why
 - **What** – once inspired, **adults have a strong desire to know** more about the what
 - **Who** refers to the breakdown of your research team as you pose your questions. Be mindful to think cross functionally
 - **Where** needs a thoughtful, detailed analysis for your efforts to be most successful
 - **When** will give you a sense of direction and sometimes urgency
 - **How** is usually the “work horse” of your planning team and guides your project planning with tasks and tactics
- ◆ The best compliment that you can get from a reviewer
“This was a pleasure to read.”
 - **Avoid the trap of “narrow casting.”** Readers of your proposal will come from many disciplines within particle physics, accelerator science, and related fields
 - Provide enough detail to satisfy the experts without losing the broader audience.
- ◆ Intersperse graphics to stimulate and illustrate
 - A single compelling image is often more impactful than paragraphs of narrative
 - Avoid using low-resolution, collages of tiny plots, or graphics that are outdated



Proposals: What To Do



Proposals: What Not To Do

Do Not submit a proposal late

You should assume that applications received after the deadline will not be reviewed or considered for award

Use the weeks or months after the FOA is made public to prepare and then submit your proposal early

Do Not brag or exaggerate

Be professional and objective.

Fully list your accomplishments in the bio. Include your mentoring.

Accurately and reasonably describe research plan

Do Not bury the message

The narrative should be accessible to a review panel with a wide range of expertise

Avoid jargon when possible. Same with acronyms.

Describe in clear and concise language. Tell a story.

Do Not dwell on the past

Majority of proposal narrative should be forward looking

General rule of thumb (1/3:2/3). No more than one-third of proposal devoted to past efforts.

Do Not submit a sloppy budget

The budget sheets and justification should be prepared with the same care as the narrative

Reviewers will call out any:

- Excessive or inappropriate requests
- Arithmetic errors
- Poorly justified expenses

Do Not be discouraged

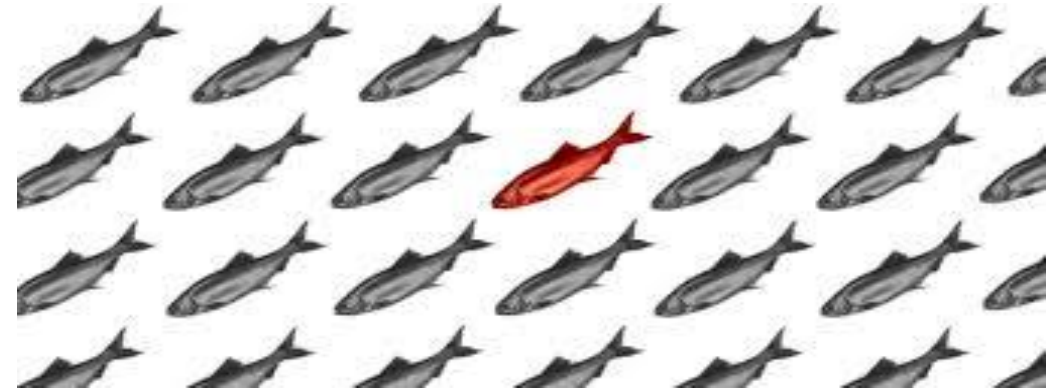
Competition is strong.

Good proposals are declined due to limited resources.

Feedback is always valuable.

Beware of Red Herrings

- ◆ A **red herring** is something that misleads or distracts from a relevant or important issue.
 - Keep your narrative focused.



▶ Examples of distractions include:

- ▶ Vague narrative descriptions, details that are not relevant to the proposed research, poorly described tables and figures, or dubious budget requests that lead reviewers/panel to make their own interpretations
- ▶ Other (funded) research that is not crisply delineated from the proposed research
 - ▶ Make clear why the scope of funded activities are distinct
- ▶ Unclear explanations of supported personnel, required resources, and timeline for deliverables
- ▶ Poor grammar

Avoid Confusing the Reviewer

- ◆ Avoid starting sentences – and especially paragraphs – with **“It is...”**
 - You can confuse the reader. What exactly does “it” refer to?
- ◆ **Constrain the usage of conjunctive adverbs** (see table below)
 - Trimming these “filler” words down will free up space for constructive narrative. Use search and count. We’ve received proposals with >20 uses of “finally”
- ◆ Be precise and **quantitative** – eliminate the usage of significantly, substantially, very, really, more, etc.
 - Instead, be specific: try “increase signal by a factor of 2” or “reduce background by 20%”
- ◆ Use the Oxford comma.
 - ▶ Use the active voice. Expressing what you **WILL** do is much more important than what you can or may do
 - ▶ Search/replace usages: can, could, may, might
 - ▶ Jargon, Acronyms, and Initializations
 - ▶ Always define. Not every reader is an expert in your sub-field
 - ▶ If only used once or twice, can you drop it entirely?
 - ▶ Keep in mind that each instance of an unfamiliar word, phrase, or term will interrupt the reader’s comprehension

A conjunctive adverb connects two independent clauses.

| Cause or effect | Sequence | Time | Contrast |
|---|---|---|---|
| Therefore Hence Accordingly Then Thus | Next Furthermore In addition Finally Moreover | Before Meanwhile Now Since Lately | However Instead Rather In spite of |
| Emphasis | Summarize | Illustrate | Comparison |
| Indeed Of course Certainly | Finally In conclusion In summary | For example Namely For instance | Also Likewise Similarly |

Early Career Research Program



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Early Career Research Program

- ◆ ERCP Launched in 2009 across all Office of Science.
 - Successor to and replacement of highly successful DOE-HEP-OJI program (1978-2009), upon which it is modelled.
- ◆ Open to university tenure-track professors and laboratory scientists holding equivalent appointments who are within ten years of receiving their PhD.
 - FY 2024 opportunity closes **April 25th**. Awards announced TBD.
 - FY 2025 cycle begins TBD.
 - According to past practice, FOA should be open to candidates obtaining Ph.D. in year 2014 or later. In recent years, eligibility extensions have been considered for “major life events”.
- ◆ Common Office of Science criteria:
 - Mandatory five-year program.
 - \geq \$875k for university PIs, \geq \$2,500K for lab PIs.
 - Funding does not need to be flat across years, it can be front (or back) loaded as appropriate
- ◆ Program designed to be highly competitive with high impact.
 - Identify and support the future HEP research leaders
 - Over 14 years, 158 HEP awards made from 1286 submitted proposals: **~12.3% success rate.**

HEP Review Procedure

◆ Three-step merit review process:

- **Stage 1:** Three to six mail-in reviews collected for each candidate in each research subprogram*.
 - * Advanced Accelerator R&D, Cosmic Frontier, Detector R&D, Energy Frontier, Intensity Frontier, Theoretical, Computational HEP, and HEP Quantum Information Science.
- **Stage 2:** Finalists selected by each subprogram based on mail-in reviews, programmatic priorities, and panel discussions.
- **Stage 3:** HEP-wide Panel review of ~24 proposals selected from subprogram reviews, with a super-panel evaluating all proposals together.

◆ "Super Panel" approach:

- Lab and university proposals are reviewed together.
- All eight subprograms reviewed together.
 - We do not expect panelists to be experts in all proposal topics, but they should take a "big picture" view of which proposals/PIs are most likely to impact HEP.

Early Career Research vs. Core Research

- ◆ There are many overlaps between proposals to the HEP Early Career program and the HEP core research program.
 - All proposals are subject to similar scientific/technical merit and program policy factors, and a comparative review is used to select the strongest proposals.
 - **Alignment** with programmatic priorities is extremely important
 - The Strongest proposals offer a compelling research program over the entire course of the project period
 - ✓ Interesting? Novel? Significant? Plausibly achievable?
 - ✗ Incremental? Implausibly ambitious? Poorly presented?
 - **A Balanced program** of R&D/design, support of construction or operations, data analysis, ...
- ◆ There are important differences, however:
 - The Early Career proposal success rate is **much lower** (~ 12%) than for core research proposals
 - The Strong competition favors extremely clear, well-written proposals that leave no question about the PI's scientific vision and capability, and appeal to general HEP reviewers.
 - Reviewers tend to reward scientific **Vision, Innovation, and Leadership** over steady, reliable progress.

ECRP Merit Review Criteria

- ◆ Seven merit review criteria for all proposals across Office of Science:
 1. Scientific and/or Technical Merit of the Project.
 2. Appropriateness of the Proposed Method or Approach.
 3. Competency of Research Team and Adequacy of Available Resources.
 4. Reasonableness and Appropriateness of the Proposed Budget.
 5. Quality and Efficacy of the Promoting Inclusive and Equitable Research (PIER) Plan.
 6. Relevance to the mission of the specific program (HEP).
 7. Potential for leadership within the scientific community.
- ◆ All are important; the blue ones typically provide more differentiation between proposals.
- ◆ “Mission relevance” is important; HEP does not like to use the Early Career award to launch a new Project.
- ◆ There are many styles of “Leadership”. Stress those that describe you!

Develop a Personal Roadmap

- ◆ Timescales for HEP projects from conception to first data will only get longer in the continued pursuit of discovery science **due to cost, size and complexity**
- ◆ HEP academic research track (Univ. or Lab) will benefit from developing a near-, mid- and long-term research plan
 - Balance research between ongoing experiment, upgrades and R&D with future experiment
- ◆ A new university tenured-track faculty or lab scientist is likely to **“hit the ground running”** by continuing the research conducted during the most recent post-doc position
 - This is perfectly normal. Most people are hired with this consideration.
 - A rising trajectory, clear leadership positions, track record of accomplishments, mentoring, etc.
- ◆ **Before preparing that first proposal, map out your long-term strategic goals (10+ years)**
- ◆ Will you be working on that same experiment in 5 years? How about 10 years? In 20 years?!
- ◆ **Optimize your start-up or LDRD funds by expanding your research portfolio and seeding a future-looking project/experiment**
- ◆ With your strong participation, major projects like Mu2e, LBNF/DUNE, Vera Rubin Observatory, and HL-LHC CMS and ATLAS will complete on time and be poised to reap the physics data on Day 1
- ◆ **Can you envision yourself (and your colleagues) shepherding the next set of P5 projects?**

Additional Material



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August 15, 2023 | 2023 HEP PI Meeting - Early Career Q&A

[Energy.gov/science](https://www.energy.gov/science)

DOE Office of Science Graduate Student Research (SCGSR) Program

Supplemental awards to **outstanding graduate students** for spending 3-12 months conducting part of their **PhD thesis research** at a DOE National Laboratory in collaboration with a **National Laboratory scientist**

Award Benefits:

- Stipend up to **\$3,600/month**
- Reimbursement of inbound/outbound travel expenses of up to **\$2,000**

Eligibility:

- U.S. Citizen or Lawful Permanent Resident
- Qualified graduate program & PhD Candidacy
- Research aligned with an SCGSR priority area

2024 Solicitation 1 – Application Due May 1, 2024, 5:00 PM ET

Key Dates for 2023-2025

The online application system closes at 5:00 PM Eastern Time, after that date/time no additional materials will be accepted.

| | 2023 Solicitation 2 (Under Review) | 2024 Solicitation 1 (Ongoing) | 2024 Solicitation 1*** (Upcoming) |
|---|---------------------------------------|----------------------------------|--------------------------------------|
| On-line Application Opens | August 16, 2023 | February 7, 2024 | August 2024 |
| Applications Due (including all letters of support) | November 8, 2023 | May 1, 2024 | November 2024 |
| Offer Notification Period <i>Begins on or around</i> | April 1 – 12, 2024 | September 6 – 20, 2024 | April 2025 |
| <i>Earliest*</i> Start Date for Proposed Project Periods | June 10, 2024 | November 11, 2024 | June 2025 |
| <i>Latest**</i> Start Date for Proposed Project Periods | October 7, 2024 | March 3, 2025 | October 2025 |

**Proposed project periods may not begin before this date, and may be 3 to 12 consecutive months in duration.*

*** Proposed project period must begin no later than this date, and may be 3 to 12 consecutive months in duration.*

**** All Dates are tentative.*

SCGSR Priority Research Areas for 2024 S1

[Convergence Research Topical Areas](#)

- (a) Microelectronics (ASCR, BES, HEP, and NP)
- (b) Data Science (ASCR, BES, BER, FES, HEP, and NP)
- (c) Quantum Information Science (ASCR, BER, HEP, and NP)
- (d) Accelerator Science (ASCR, BES, BER, FES, HEP, NP, DOE IP, and ARDAP)

[Advanced Scientific Computing Research \(ASCR\)](#)

- (a) Applied Mathematics
- (b) Computer Science
- (c) Advanced Computing Technologies

[Basic Energy Sciences \(BES\)](#)

- (a) Accelerator and Detector R&D
- (b) Basic Geosciences
- (c) Basic Science for Advanced Manufacturing
- (d) Basic Science for Clean Energy and Decarbonization
- (e) Chemical and Materials Sciences for Quantum Information Science (QIS)
- (f) Data and Computational Sciences for Materials and Chemical Sciences
- (g) Fundamental Electrochemistry for Chemical and Materials Sciences
- (h) Gas Phase Chemical Physics
- (i) Instruments R&D for Neutron and X-ray Facilities
- (j) Instruments and Techniques R&D for Electron and Scanning Probe Microscopy
- (k) Materials Sciences and Chemistry for Microelectronics
- (l) Nuclear Chemistry and Radiochemical Separations
- (m) Radiation Effects in Materials and Chemistry

[Biological and Environmental Research \(BER\)](#)

- (a) Computational Biology and Bioinformatics
- (b) Biomolecular Characterization and Imaging Science
- (c) Plant Science for Sustainable Bioenergy
- (d) Environmental Microbiology
- (e) Environmental System Science

- (f) Atmospheric System Research
- (g) Earth System Model Development
- (h) Regional and Global Model and Analysis

[Fusion Energy Sciences \(FES\)](#)

- (a) Burning Plasma Science & Enabling Technologies
- (b) Discovery Plasma Science

[High Energy Physics \(HEP\)](#)

- (a) Theoretical and Computational Research in High Energy Physics
- (b) Advanced Accelerator and Advanced Detector Technology Research and Development in High Energy Physics
- (c) Experimental Research in High Energy Physics

[Nuclear Physics \(NP\)](#)

- (a) Medium Energy Nuclear Physics
- (b) Heavy Ion Nuclear Physics
- (c) Fundamental Symmetries
- (d) Nuclear Structure and Nuclear Astrophysics
- (e) Nuclear Theory
- (f) Nuclear Data and Nuclear Theory Computing
- (g) Accelerator Research and Development for Current and Future Nuclear Physics Facilities
- (h) Quantum Information Science for Experimental and Computational Nuclear Physics
- (i) Artificial Intelligence and Machine Learning for Nuclear Physics
- (j) Advanced Detector Technology Research and Development in Nuclear Physics

[Isotope R&D and Production \(DOE IP\)](#)

- (a) Targetry and Isotope Production Research
- (b) Nuclear and Radiochemical Separation, Purification, and Radiochemical Synthesis
- (c) Biological Tracers, Imaging, and Therapeutics
- (d) Isotope Enrichment Technology

[Accelerator R&D and Production \(ARDAP\)](#)

- (a) Accelerator R&D and Production

Host Laboratories/User Facilities

All 17 US DOE National Laboratories and all 28 User Facilities can host SCGSR awardees

An opportunity to establish new collaborations, and for training and recruiting highly skilled workforce.

An SCGSR application is NOT a User Facility proposal

Applications proposing to use an SC user facility must apply for user facility time separately.

SCGSR projects may contribute to the R&D activities to advance the capabilities of facilities

Graduate students' extended residence at a user facility, instead of short, periodic visits through user proposal

Dedicated focus on research problems of mutual interest to student's PhD thesis and to the user facility at a host DOE national laboratory;

Staff scientists at user facilities (for instance, Instrument or Beamline Scientists) may serve as a *Collaborating DOE National Laboratory Scientist*, who provides supervision and research mentorship to graduate students.

<https://science.osti.gov/wdts/scgsr/information-for-collaborating-doe-laboratory-scientists-and-thesis-advisors/>

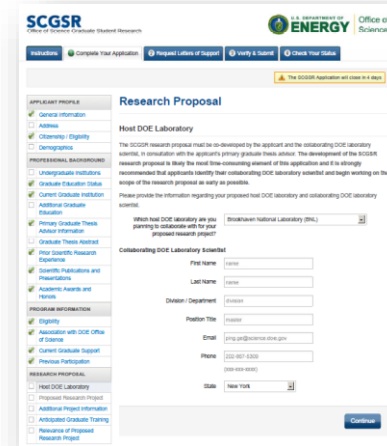
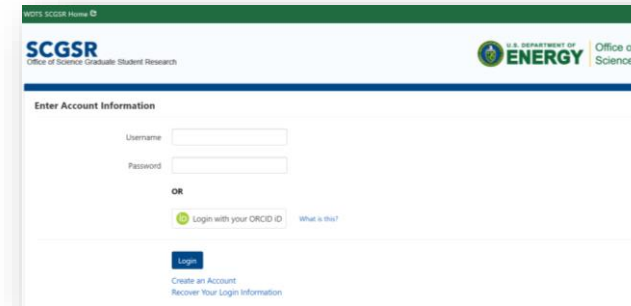
Applying to the Program

<https://apps.ornl.gov/SCGSR/Account>

1) Fields of the Online Application System include

- ✓ Contact Information
- ✓ Academic Information
- ✓ Current graduate funding
- ✓ Professional Information
- ✓ Scientific Publications and Awards
- ✓ Alignment of proposed research to one of the SCGSR Priority Research Areas

<http://science.energy.gov/wdts/scgsr/how-to-apply/priority-sc-research-areas/>

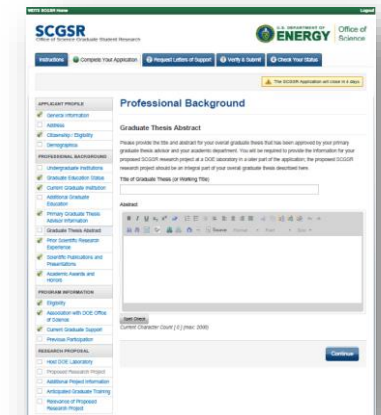


2) Official Graduate Transcripts and proof of PhD Candidacy

3) Letters of Support from thesis advisor, and collaborating DOE National Laboratory scientist

4) SCGSR Research Proposal developed by the student, with support of the advisor and collaborating DOE National Laboratory scientist (3-pages maximum)

<http://science.energy.gov/wdts/scgsr/how-to-apply/research-proposal-guidelines/>



*Applications proposing to use an SC user facility must **apply for user facility time** separately.

Merit Review Criteria

1. Scientific and/or Technical Merit of the Proposed Research*

- a. Is the proposed research well-conceived, and does it demonstrate a clear understanding of the scientific and technical challenges involved?
- b. Is the proposed method and approach for the proposed research appropriate?
- c. Is the applicant (graduate student) sufficiently well prepared to conduct the proposed research?
- d. Are the DOE laboratory resources adequate? If applicable, has the necessary access to a scientific user facility been secured by the DOE laboratory collaborating scientist?

2. Relevance of the Proposed Research to Graduate Thesis Research and Training

- a. Does the proposed research have the potential to make a significant contribution to the applicant's (graduate student's) thesis research project?
- b. Will the proposed research enhance the applicant's graduate training and research skills?

<https://science.osti.gov/wdts/scgsr/how-to-apply/application-evaluation-and-selection/>

Resources

- Website: <https://science.osti.gov/wdts/scgsr/>
- Frequently Asked Questions
- Application Assistance Workshops
 - Workshop 1: “Overview of the SCGSR Program and Application process”
 - March 7, 2024, 2:00 PM – 3:30 PM ET
 - Workshop 2: “Q&A, Application and Proposal Guidance” – April 18, 2024, 2:00 PM – 4:30 PM ET
- Video guides
- Office hours: Tuesdays 4:00 – 5:00 PM ET
- Database of collaborating scientists
- Proposal guidelines
- Email us at: SC.SCgsr@science.doe.gov



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SCGSR Program by the Numbers

Since **2014**

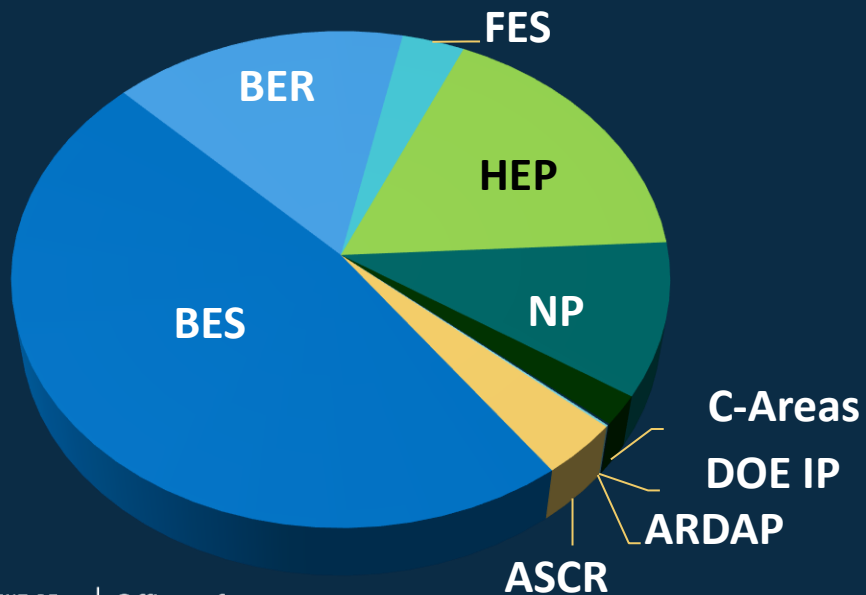
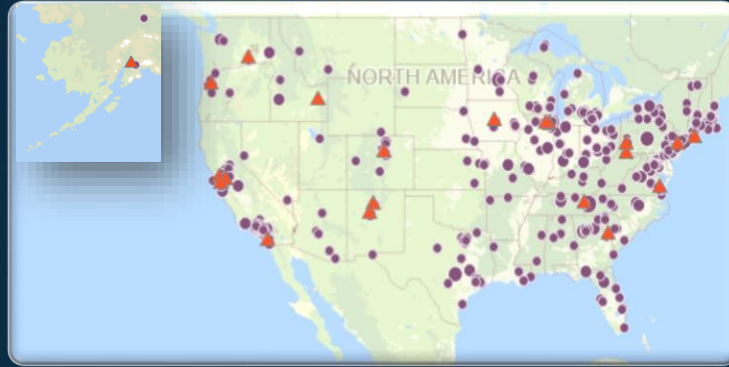
1066 awardees from

443 hometowns in

47 States + DC,
pursuing PhDs at

161 Universities,
working with

779 National Laboratory scientists



50 % of the awardees
working at least at
one of the

28 scientific user
facilities and

18 DOE National Labs
and Sites

30 % Of the awardees
are women

30

WHAT AWARDEES SAY ABOUT SCGSR

99 % Received training not
available at their
universities

99 % Expanded their
networks

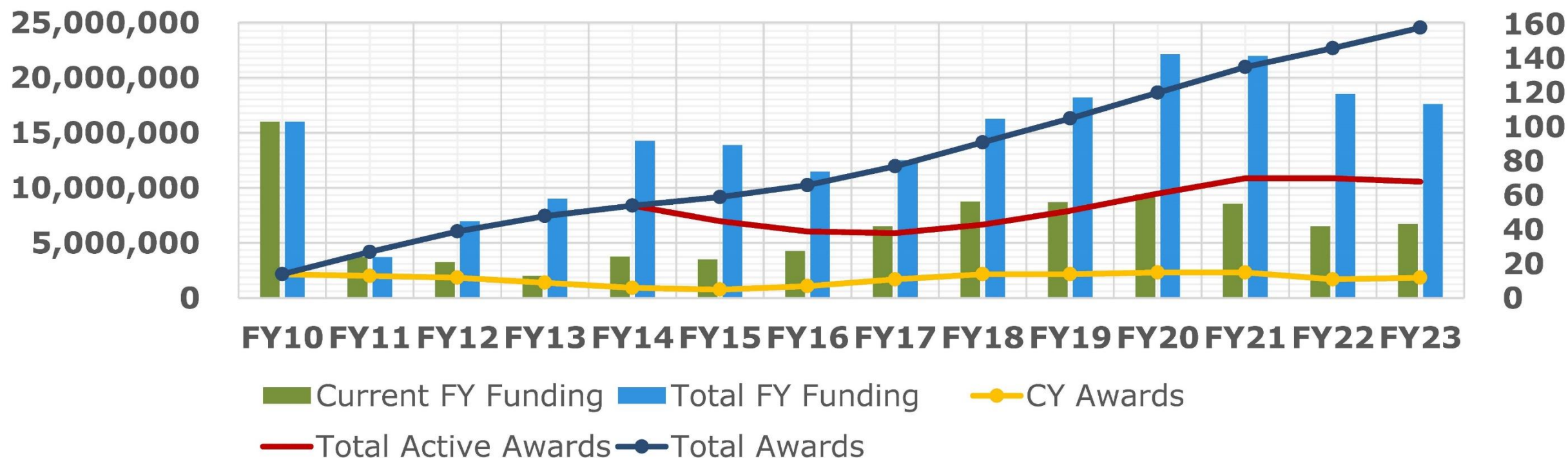
>78 % Interested in employment
or postdoctoral positions
at DOE National Labs

99 % Stated SCGSR introduced
them to careers outside
academia

100 % SCGSR enabled completion
of an important part of
their dissertation

HEP ECRP Award History

HEP ECRP funding & awards/year



HEP Proposal and Award Statistics

| | FY10 | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 | FY23 | Total |
|------------------------------|------|-------|-------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|--------------|
| HEP Awards | 14 | 13 | 12 | 9 | 6 | 5 | 7 | 11 | 14 | 14 | 15 | 15 | 11 | 12 | 158 |
| HEP Proposals | 154 | 128 | 89 | 78 | 77 | 73 | 84 | 83 | 93 | 92 | 85 | 86 | 77 | 83 | 1282 |
| Proposal Success Rate | 9.1% | 10.2% | 13.5% | 11.5% | 7.8% | 6.8% | 8.3% | 13.3% | 15.2% | 15.2% | 17.6% | 17.4% | 14.3% | 14.4% | 12.0% |
| HEP Awards (Lab) | 4 | 5 | 4 | 2 | 3 | 1 | 4 | 7 | 7 | 7 | 5 | 6 | 5 | 8 | 68 |
| HEP Awards (Univ) | 10 | 8 | 8 | 7 | 3 | 4 | 3 | 4 | 7 | 7 | 10 | 9 | 6 | 4 | 90 |
| HEP Proposals (Lab) | 47 | 43 | 34 | 29 | 36 | 27 | 27 | 26 | 36 | 28 | 26 | 37 | 39 | 44 | 479 |
| HEP Proposals (Univ) | 107 | 85 | 55 | 49 | 41 | 46 | 57 | 57 | 57 | 64 | 59 | 49 | 38 | 39 | 803 |

Explain why YOU are the one to solve the Problem

- ▲ Provide compelling argument backed up with evidence: simulations, LDRD, startup, letters of support, track record
- ▲ Explain how the proposed research:
 - Exceeds currently supported effort
 - Is not supported by baseline project
 - Is not duplicative (Federal funding)

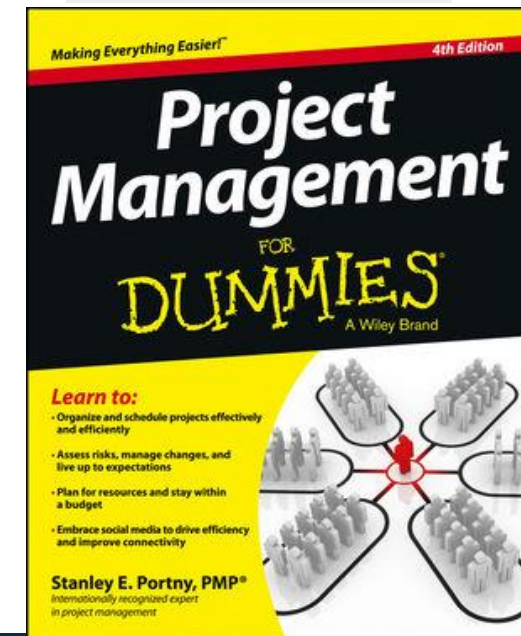
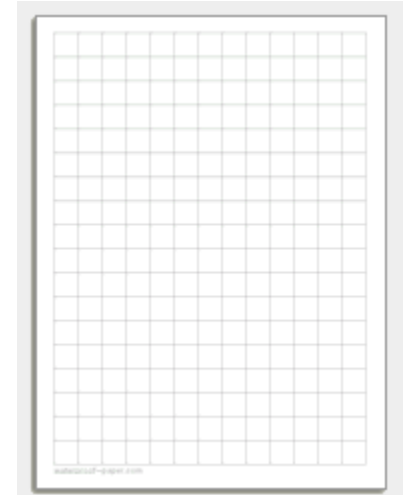
What Is Your “Unfair Competitive Advantage?”

- ◆ This question has greater weight for the proposals submitted from the DOE National Laboratories.
 - How does the proposal leverage a lab’s unique facilities and capabilities?
 - If absent, a lab proposal has a lower chance in getting funded.
- ▶ For experimental and technology proposals submitted from Universities:
 - ▶ How does the proposal leverage the Universities facilities and resources?
- ▶ Reminder: Grants are financial assistance agreements and do not cover all costs.



Validate: Costs, Resources, Schedule

- ◆ Outline a five year timeline, with yearly key deliverables, all personnel, roles and responsibilities
 - Consider month by month plan
 - What is a credible hiring plan?
 - Do you need to front-load funding to support engineering and equipment?
 - For example: 225/225/175/125/125
 - Can you delay the hire of a post-doc?
 - Do you have external dependences, and if so, does your schedule and deliverables make sense?
 - For example: Will the widget arrive too late for the project baseline decision?
 - Have you validated all expenses?



Demonstrate Leadership



- ▶ Presidential Early Career Awards for Scientists and Engineers (PECASE)
- ▶ PECASE-eligible candidates are selected from the pool of Early Career awardees

<http://science.energy.gov/about/honors-and-awards/pecase/>

- ◆ Scientific leadership can be defined very broadly and can include direct research contributions
 - How has the PI demonstrated the potential for scientific leadership and creative vision?
 - How has the PI been recognized as a leader (collaboration, institution, community service)?
 - Does the PI have a track record for mentoring students and post-docs?
- ◆ Ensure the CV is correct and current
- ◆ Polish up your public-facing online presence
 - Do you have a professional, PR-friendly photo posted on your institution's web site?

Final Word: Engagement

- ▲ Review criteria for HEP Comparative Review and Early Career includes "Potential for leadership within the scientific community."
 - Important to seek out and/or volunteer for roles and responsibilities which increase visibility and provide career advancement opportunities
 - Editorial Boards, Sub-detector systems, Physics Working Groups, Run Coordinator, Analysis Coordinator, etc.
 - Service work for community is also valued, e.g. co-chairing a conference committee or serving on a DOE or NSF review panel
- ▲ When asked to review, co-chair, attend, speak, etc. **try NOT to say no!**
 - You need the experience
 - Ask for feedback (if possible)
 - Respond promptly to all communication
- ▲ Talk to your community representatives
- ▲ HEPAP: High Energy Physics Advisory Panel
 - <http://science.osti.gov/hep/hepap/>
- ▲ AAAC: Astronomy and Astrophysics Advisory Committee
 - <https://www.nsf.gov/mps/ast/aaac.jsp>
- ▲ APS Division of Particles and Fields
 - <https://www.aps.org/units/dpf/>
- ▲ HEP Organization
 - Introduce yourself to the DOE Program Managers
- ▲ Ask questions

Early Career Proposal Framework

1. What are the problems you are trying to solve?
2. Is someone else doing it? Is that already being funded?
3. How does this research exploit/engage the unique capabilities of your institution?
4. What are the resources you need to do this project?
5. Outline a five-year timeline, with key deliverables and personnel.
6. Why you are a future leader in high energy physics?

- ▲ **Grab the attention of the reader**, by providing the **Why** within a few sentences in the very first paragraph using Plain English
 - Do not bury the lede with paragraphs on the history of the relevant physics or the experiment
 - The context to the thesis of your project should be deferred to the narrative section, and in some cases, the appendix.
 - Ask non-physicists to read your narrative, and see if they can paraphrase your opening paragraph. **Does it pass the “parent test”?**
- ▲ Drawing an analogy to films, TV, and novels. Starting with the answer builds **Suspense**
 - **Readers feel suspense when they are deeply curious** about what will happen next, or when they know what is likely to happen **but don't know how it will happen**. Even in historical fiction, with characters whose life stories are well known, the **why** usually brings suspense to the novel.
 - Every film needs suspense. At the foundational level, a story poses a question in the beginning and answers it by the end. The suspense is the anticipation for that answer. A filmmaker who puts the **ending at the beginning** is hoping to entertain us with **HOW events unfold**

