



U.S. DEPARTMENT OF
ENERGY

Office of
Science

DOE Office of Science – Creating Opportunities and Breaking Down Barriers

Materials and Energy Solutions Workshop
Ames National Laboratory

May 31, 2023

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<https://science.osti.gov>

DOE Office of Science (SC) - by the Numbers



Shown is a portion of SLAC's two-mile-long linear accelerator (or linac), which provides the electron beam for the new Linac Coherent Light Source – the world's first hard x-ray, free-electron laser. For nearly 50 years, SLAC's linac had produced high-energy electrons for physics experiments. Now researchers use the very intense X-ray pulses (more than a billion times brighter than the most powerful existing sources) much like a high-speed camera to take stop-motion pictures of atoms and molecules in motion, examining fundamental processes on femtosecond timescales.

SC delivers scientific discoveries and tools to transform our understanding of nature and advance the energy, economic, and national security of the U.S.

Research

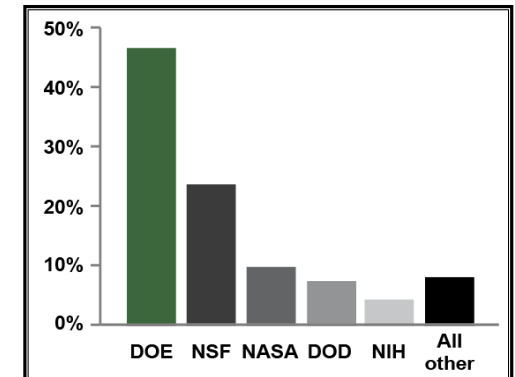
- Provides over 40% of the U.S. Federal support for basic research in the physical sciences; (**FY 2023 Enacted Budget: \$8.1 billion**)
- Supports over 29,000 Ph.D. scientists, graduate students, engineers, and support staff at over 300 institutions and all 17 DOE national laboratories;
- Maintains U.S. and world leadership in high-performance computing and computational sciences;
- Continues to be the major U.S. supporter of physics, chemistry, materials sciences, and biology - for discovery and for energy sciences.

Scientific User Facilities

- SC maintains the world's largest collection of scientific user facilities (currently 28 facilities) operated by a single organization in the world, used by more than 36,000 researchers each year.

DOE National Laboratories

- SC stewards 10 of the 17 DOE National Laboratories



Support for basic research in the physical sciences by agency.

Source: NSF Science and Engineering Indicators



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SC Program Offices

Advanced Scientific Computing Research

- Delivering world-leading computational and networking capabilities to extend the frontiers of science and technology

Basic Energy Sciences

- Understanding, predicting, and ultimately controlling matter and energy flow at the electronic, atomic, and molecular levels

Biological and Environmental Research

- Understanding complex biological, earth, and environmental systems

Fusion Energy Sciences

- Building the scientific foundations for a fusion energy source

High Energy Physics

- Understanding how the universe works at its most fundamental level

Nuclear Physics

- Discovering, exploring, and understanding all forms of nuclear matter

Isotope R&D and Production

- Supporting National Preparedness for isotope production and distribution

Accelerator R&D and Production

- Supporting new technologies for use in SC's scientific facilities and in commercial products

Each SC Research Program Office:

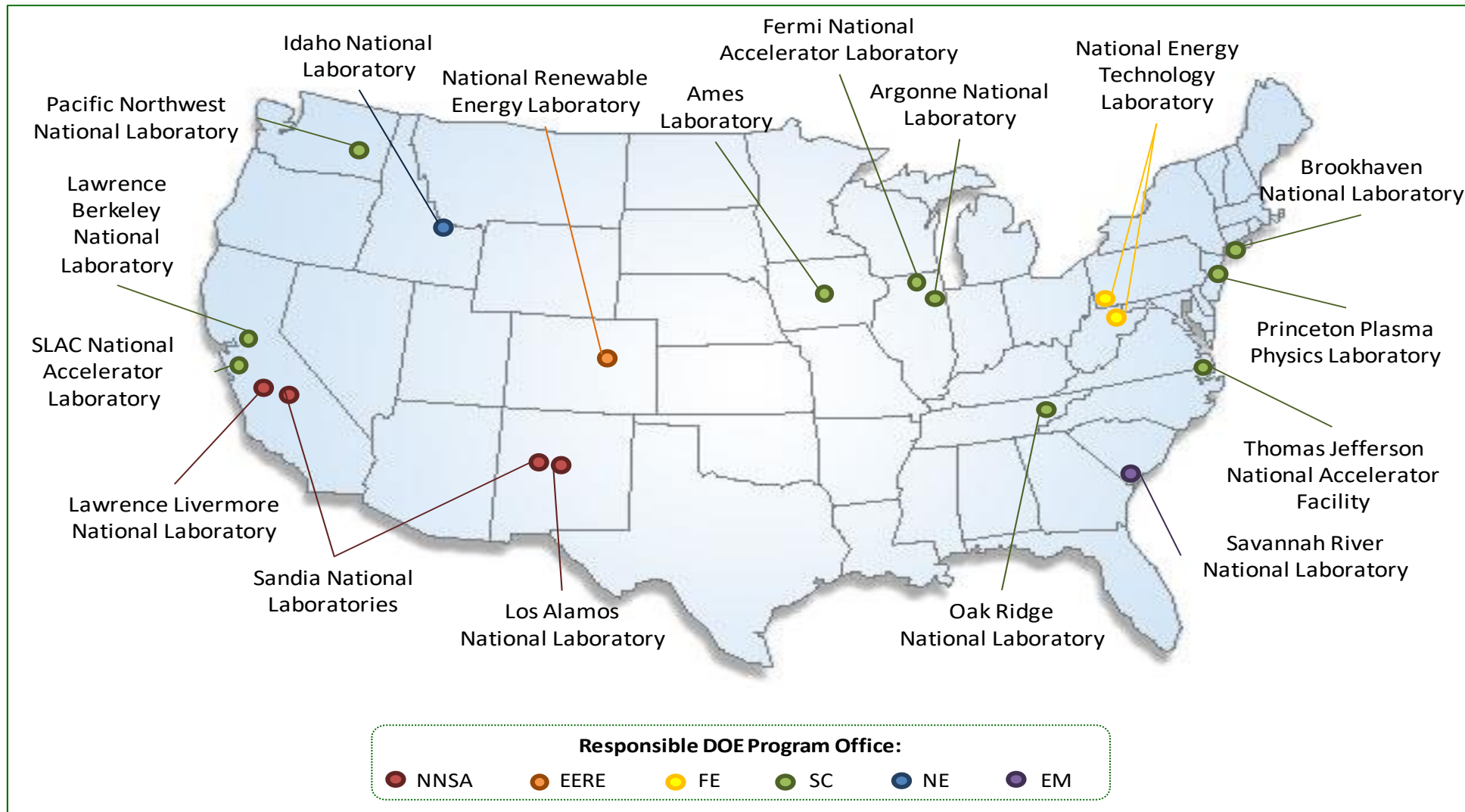
- Supports research and scientific user facilities
- Supports a portfolio of research at universities and DOE laboratories.
- Competitively awards all research.

Also includes:

- The **SBIR/STTR Programs Office**.
- The **Office of Workforce Development for Teachers and Scientists (WDTS)**



17 DOE National Laboratories – 10 SC DOE Labs



Understanding Barriers to Participation in SC Research

In December 2020, SC initiated a coordinated approach to increasing participation by individuals and institutions historically underrepresented in SC-sponsored opportunities.

SC launched a series of listening sessions and discussions with faculty, students, and DOE lab researchers to seek community input on barriers to participation in SC-sponsored research and input on opportunities for overcoming those barriers – 16 sessions between August – December 2021.

- SC conducted a synthesis of the comments that were recorded across the sessions; main themes and takeaways from the sessions are aligned with the discussions and feedback from similar public discussions hosted by NASEM and other federal agencies.
- The most frequent comments recorded were in the areas of systemic barriers, lack of awareness of opportunities, access to equipment, implicit bias. Some examples:

From faculty: funding for buying out teaching time, for administrative support, for equipment, for mentoring; bias in the peer review process; need more time to respond to solicitations; students need research opportunities to come back to after a research internship; “partnership” tokenism.

From students: lack of awareness of opportunities, application process; internships don’t pay enough; can travel to a laboratory (other responsibilities); uncertainty over whether they will feel welcome.



Reaching a New Energy Sciences Workforce (RENEW)

Building foundations through undergraduate and graduate training opportunities for students and institutions historically underrepresented in the SC research portfolio



- Listening sessions in 2021 and 2022 identified barriers to participation in SC opportunities and informed FY 2022 solicitations, including RENEW.

- **\$32M awarded in FY 2022.** Awards are piloting models of support that directly address barriers to participation in SC supported fields of research; models will be evaluated.
- 41 awards to 37 institutions, 24 MSIs.

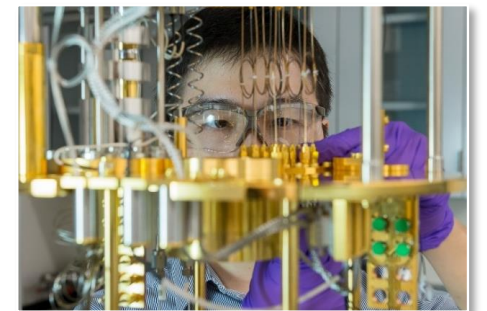
- **In FY 2023, SC has committed \$60M** to advance discovery and innovation by increasing the diversity of individuals and institutions supported. **SC requested \$107M in FY 2024.**



Funding for Accelerated, Inclusive Research (FAIR): FY 2023 \$36M

Enhancing research on clean energy, climate, and related topics at minority serving institutions (MSIs), including underserved and environmental justice regions

- Builds research capacity, infrastructure, and expertise at MSIs
- Develops mutually beneficial relationships between MSIs and DOE national laboratories and user facilities
- Complements the RENEW initiative (traineeships and internships at national laboratories for workforce development)
- Provides support of single PI or research teams, and includes an equipment or infrastructure element
- Majority of funds will go directly to HBCUs/MSIs, a portion will fund the partnering institution (Lab, university)



Funding for Accelerated, Inclusive Research (FAIR) FY 2023

FAIR aims to build research capacity, infrastructure, and expertise at minority serving institutions (MSIs) and emerging research institutions (ERIs).

- The technical scope spans the entire SC portfolio: ASCR, BES, BER, FES, HEP, NP, IP, ARDAP.
- The FY 2023 solicitation provides up to \$35M over 3 years.
- **Eligible Lead Institutions: non-R1 MSIs or ERIs**
- Eligible Partner Institutions: DOE Labs, SC User Facilities, or R1 MSIs; single partner required
- Award size is up to \$750K total. The partner is limited to between 15 and 25% of total funding.
- Applicant institutions are limited to one pre-application per PI and three pre-applications per program listed in the second bullet.
- Pre-applications are required.
- Informational webinar held on Friday, January 6, 2-3pm ET.
- Anticipate ~\$36 million in awards to be announced later this year;
- SC has requested \$49 million in FY 2024 for FAIR.



DOE Laboratory Research Opportunities through WDTS

Mission: to help ensure that DOE and the Nation have a sustained pipeline of highly skilled and diverse science, technology, engineering, and mathematics (STEM) workers.

Supports over 1,300 undergraduate internships, a visiting faculty programs, and a graduate training program at DOE Laboratories each year:

- **Science Undergraduate Laboratory Internship (SULI):** 2-/4-year colleges and universities (summer, spring, and fall terms).
- **Community College Internship (CCI):** dedicated to students at community colleges summer, spring, and fall terms).
- **Office of Science Graduate Student Research Program (SCGSR):** Graduate students spend 3-12 months conducting their graduate thesis research SC mission priority areas at DOE labs (2 solicitations per year).
- **Visiting Faculty Program (VFP):** focused on faculty at underrepresented institutions in STEM fields.

SULI, CCI, and VFP support research opportunities in all DOE mission areas.



Visiting Faculty Program (VFP)

The Visiting Faculty Program (VFP) seeks to enhance the research competitiveness and strengthen the STEM teaching of faculty members from institutions of higher education that are historically underrepresented in the research community to expand the workforce that addresses DOE mission areas.

- VFP appointees collaborate directly with research staff at DOE National laboratories on projects that are connected robustly to ongoing host lab research. Appointments are for 10 weeks.
- Faculty must establish a collaboration with a laboratory scientist to co-develop a 6-page research proposal before applying to VFP.
- Participants develop skills that are applicable to programs and STEM workforce development at their home institutions.

Award Benefits:

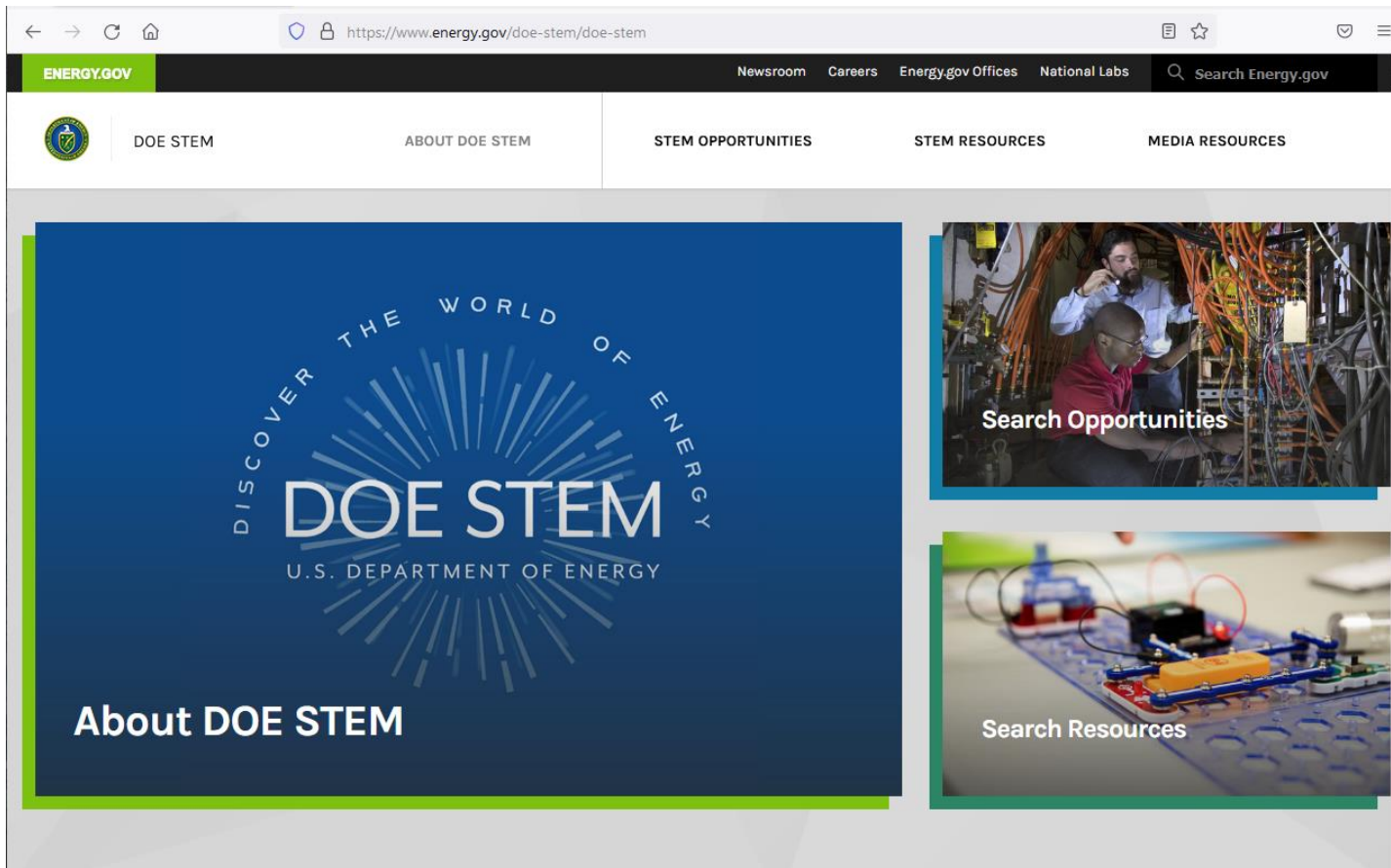
- Faculty: \$15,000 stipend; round-trip domestic travel to laboratory; housing covered; up to \$15,000 of teaching buyout for a non-summer term.
- Undergraduates (Summer only): Same as for SULI
- Graduate students (Summer only): Travel and housing, but no stipend
- Faculty may participate for three terms.

Eligibility for Faculty:

- U.S. citizens or lawful permanent residents at time of application.
- Must work full time at an accredited, degree-granting, postsecondary U.S. institution (including community colleges) at an institution that does NOT have a Carnegie Classification of “Doctoral/Research Universities ratings of Very High or High Research Activity”. Except all HBCUs eligible.
- Must work in an area of physics, chemistry, non-medical biology, engineering, environmental sciences, geology or geosciences, mathematics, materials sciences, or computer or computational sciences.

DOE STEM – *Discover the World of Energy!*

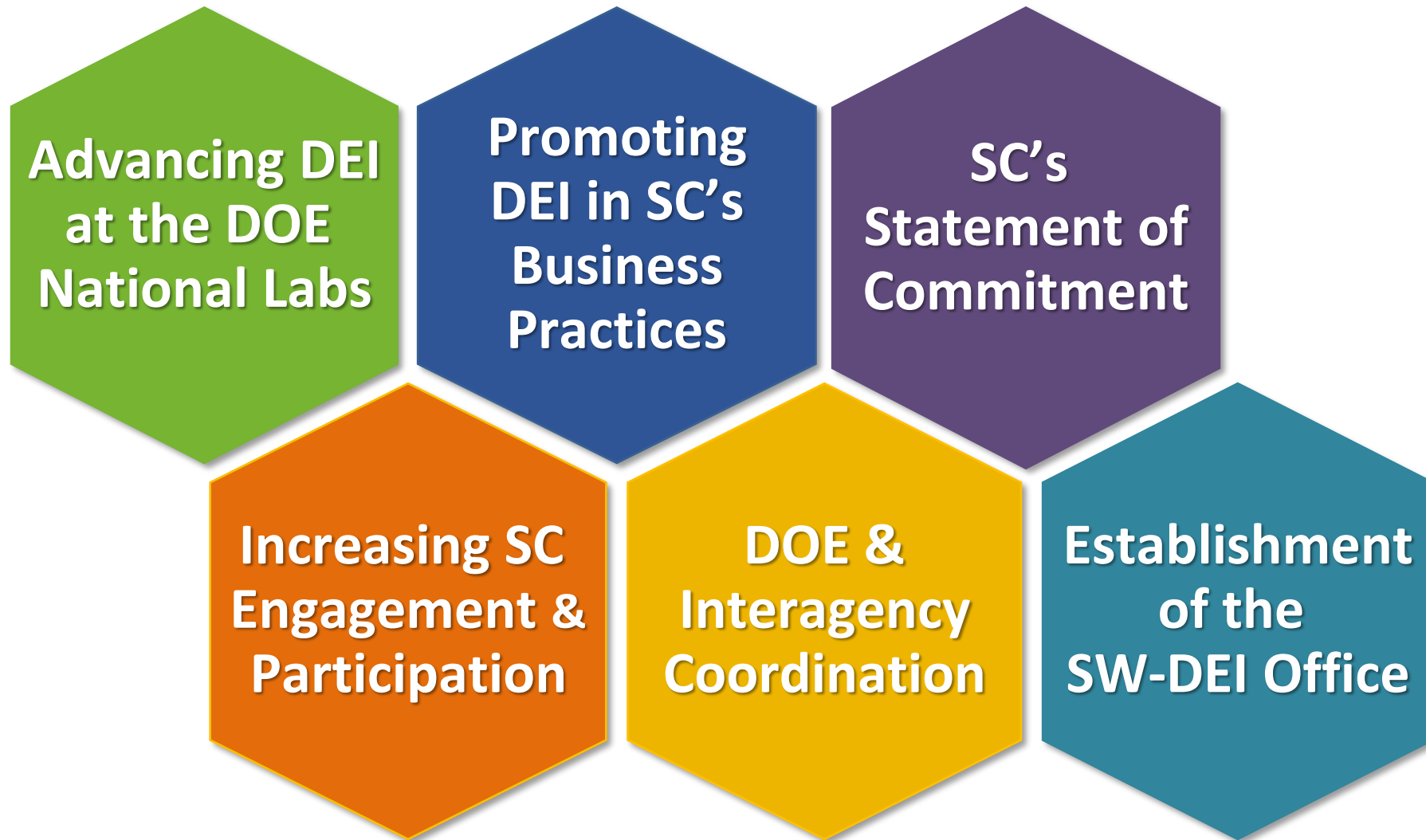
The DOE STEM site is a collaborative effort across all of DOE's R&D Programs.



For the first time ever, all STEM opportunities representing all of DOE's mission areas can be found on a single site.

- ✓ Searchable list of all DOE STEM training and educational programs.
- ✓ Funding opportunities for institutions to create STEM training and workforce development programs.
- ✓ Calendar of Events and Application Deadlines
- ✓ Searchable list of STEM Resources (free courses/workshops, career maps, materials for the classroom)

SC Diversity, Equity and Inclusion Initiatives



Advancing DEI at the SC DOE National Laboratories

In FY 2017, SC initiated a new annual process that required the 10 SC DOE Labs to develop and implement actionable DEIA strategies that would be reviewed by SC headquarters.

In FY 2020, SC conducted the first-ever external peer review of the SC Laboratories' DEI Strategies.

- Reviewers identified strengths and weaknesses of each Lab's DEI efforts, as well as laboratory-wide opportunities for improvement.
- Reviewers also provided recommendations to SC on how to improve our oversight and promote advancement of DEIA at the Labs.

In response to the FY 2020 DEI peer review:

- SC restructured the annual guidance to the laboratories on their annual DEIA strategies to address peer review recommendations.
- SC added a DEIA objective into the annual performance goals for all 10 SC laboratories.
- Required the SC DOE Laboratories to publicly post multiyear trend data on the demographics of the laboratory workforce.
- Initiated a triennial onsite peer review process. Beginning in 2023, SC will review 3-4 labs per year; each lab will be externally reviewed every three years.



Advancing DEIA in SC Business Practices

The 2019-20 internal review of SC's awards management practices resulted in 15 overarching recommendations (40+ actions) for advancing DEI in SC business practices. A new SC DEI Working Group was established to focus on implementation.

Some implementation actions to date:

- Beginning in FY 2021, all Funding Solicitations must include at least one DEI-promoting program policy factor.
- New public resources to increase awareness of existing flexibilities and support allowed under financial assistance awards (e.g., allowable costs, supplemental awards).
 - New page dedicated to applicant and awardee resources, including extensive list of FAQs <https://science.osti.gov/grants/Applicant-and-Awardee-Resources>
 - Standard FOA language on allowable costs; New section on Supplemental Awards in the [SC Open Call](#).
- Updated [SC Statement of Commitment](#), and associated [statement of potential consequences](#) of unprofessional behavior.
- Established a requirement for [Promoting Inclusive and Equitable Research](#) (PIER Plans) beginning in FY 2023.

Promoting Inclusive and Equitable Research (PIER) Plans

Everyone has a role to play in making science more equitable and inclusive!

Beginning in FY 2023, Office of Science solicitations now require that applicants submit a plan for **Promoting Inclusive and Equitable Research, or PIER Plan**, along with their research proposals.

- This is a requirement for proposals submitted to all Office of Science solicitations, as well as invited proposals from the DOE national laboratories.

PIER Plans are limited to 3 pages and should describe the activities and strategies that investigators and research personnel will incorporate to promote diversity, equity, inclusion, and accessibility **in their research projects**.

- The complexity and detail of a PIER Plan is expected to increase with the size of the research team and the number of personnel to be supported.
- The PIER Plans will be evaluated under a new merit review criterion as part of the peer review process.



Closing Remarks

- **Much work Remains:** Large percent increases in small numbers are still small numbers.
- **But the trend is encouraging.**

Engagement efforts such as this Workshop are a critical part of these initiatives.



SC Funding Opportunity Announcements

The Office of Science supports research through open competition and merit review.

- [Funding Opportunity Announcements](#) (FOAs) provide:
 - A technical description of the type of work to be funded
 - Information about the type, size, number, and duration of awards expected
 - Eligibility criteria instructions for submission of letters of intent (if required), preapplications or preproposals (if required), and applications or proposals; due dates and times
 - Review and selection information, including merit review criteria
 - SC points of contact
- The [Continuation of Solicitation for SC Financial Assistance Program Solicitation](#) is open all year.
 - Includes technical research topics that span all SC program areas
 - PIs are encouraged to discuss proposal ideas with topic area program managers before submitting a proposal.



Thank you!

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