

Opportunities and Initiatives for Building a More Diverse Scientific Community in DOE's Biological and Environmental Research Program

ESA Annual Meeting
August 5, 2024



U.S. DEPARTMENT OF
ENERGY

Office of
Science

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

Key Take-Aways

1. DOE's Office of Science (SC) is focused on basic (foundational) research, not applied research.
2. Recent initiatives and business practices promote broader participation in SC science and STEM fields.
3. Opportunities are available to explore and leverage BER capabilities and investments when developing research proposals.
4. Reach out to program managers for more information.



DOE is a Mission-Driven Agency

DOE Mission: To ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. (www.energy.gov/mission)

Office of Science Mission: To deliver scientific discoveries and major scientific tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States. (www.energy.gov/science/mission)

Biological & Environmental Research

Mission: To support transformative science and scientific user facilities to achieve a predictive understanding of complex biological, Earth and environmental systems for energy and infrastructure security, independence and prosperity.

(science.osti.gov/ber)



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Promoting DEI in DOE's Office of Science

SC's effective stewardship and promotion of diverse, equitable, and inclusive workplaces that value and celebrate a diversity of people, ideas, cultures, and educational backgrounds is foundational to delivering on the SC mission.

SC's Office of Scientific Workforce Diversity, Equity, and Inclusion (SW-DEI) is responsible for:

- Developing and coordinating SC-specific policies, plans, and procedures focused on advancing diversity, equity, and inclusion in SC-sponsored extramural research programs and facilities.
- Advancing organizational best practices for promoting diversity, equity, inclusion, and accessibility in SC business practices and at the SC National Laboratories.

Examples of practices for advancing diverse, equitable, and inclusive science:

- DEI-promoting Program Policy Factors and associated program guidance
- Increased outreach and engagement to involve new researchers, institutions, and stakeholders in SC research
- Promoting Inclusive and Equitable Research (PIER) plans and review criteria for applications
- SC Statement of Commitment to advancing belonging, accessibility, justice, equity, diversity, and inclusion (BAJEDI)

<https://science.osti.gov/SW-DEI>

SC's Statement of Commitment

- **SC Statement of Commitment** outlines DOE's expectation for professional behaviors and our commitment to a safe, diverse, and inclusive environment. All participants are expected to read and agree to as part of their participation in the meeting.
- **The DOE Office of Science (SC) is fully and unconditionally committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity...**
- ...SC's effective stewardship and promotion of safe, accessible, diverse and inclusive workplaces that value and celebrate a diversity of people, ideas, cultures, and educational backgrounds across the country and that foster a sense of belonging in our scientific community is foundational to delivering on our mission. We are committed to promoting people from all backgrounds, including individuals and communities that were historically underrepresented and minoritized in STEM fields and the activities we sponsor in recognition of our responsibility to serve the public. We also recognize that harnessing a broad range of views, expertise, and experiences drives scientific and technological innovation and enables the SC community to push the frontiers of scientific knowledge for U.S. prosperity and security..
- Discrimination and harassment undermine SC's ability to achieve its mission by reducing productivity, discouraging or inhibiting talent recruitment, retention, and career advancement, and weakening the integrity of the SC enterprise overall. SC does not tolerate discrimination or harassment of any kind, including sexual harassment, discrimination, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior in the federal workplace, including DOE field site offices, national laboratories, scientific user facilities, academic institutions, other institutions receiving SC funding, virtual DOE environments, geographically isolated research sites, and other locations where activities funded by SC are carried out....
- **SC expects the scientific community, particularly those engaging in SC-sponsored activities, to always conduct themselves in a manner that is respectful, ethical, and professional and inclusive.** This commitment to BAJEDI is part of SC's continuous effort to identify opportunities to improve policies, programs, practices, and communications in furtherance of its core values and its mission.

For the full SC Statement: <https://science.osti.gov/SW-DEI/SC-Statement-of-Commitment>

Promoting Inclusive and Equitable Research (PIER) Plans

- Beginning in FY 2023 a PIER plan is required for all proposals
- PIER plans should describe the activities and strategies of the PI/team to promote equity and inclusion as an intrinsic element to advancing scientific excellence in the research project within the context of the proposing institution and any associated research group(s).
- Merit review now includes a specific criterion on PIER plans

The 3-page plans may include, but are not limited to:

- strategies of your institution (and collaborating institutions) for enhanced recruitment of undergraduate students, graduate students, and early-stage investigators (postdoctoral researchers, and others), including individuals from diverse backgrounds and groups historically underrepresented in the research community;
- strategies for creating and sustaining a positive, inclusive, safe, and professional research and training environment that fosters a sense of belonging among all research personnel;
- and/or training, mentoring, and professional development opportunities.

<https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans>

An Introduction to Biological and Environmental Research (BER)

BER

BY THE NUMBERS



**\$909
MILLION**
FY24 BUDGET



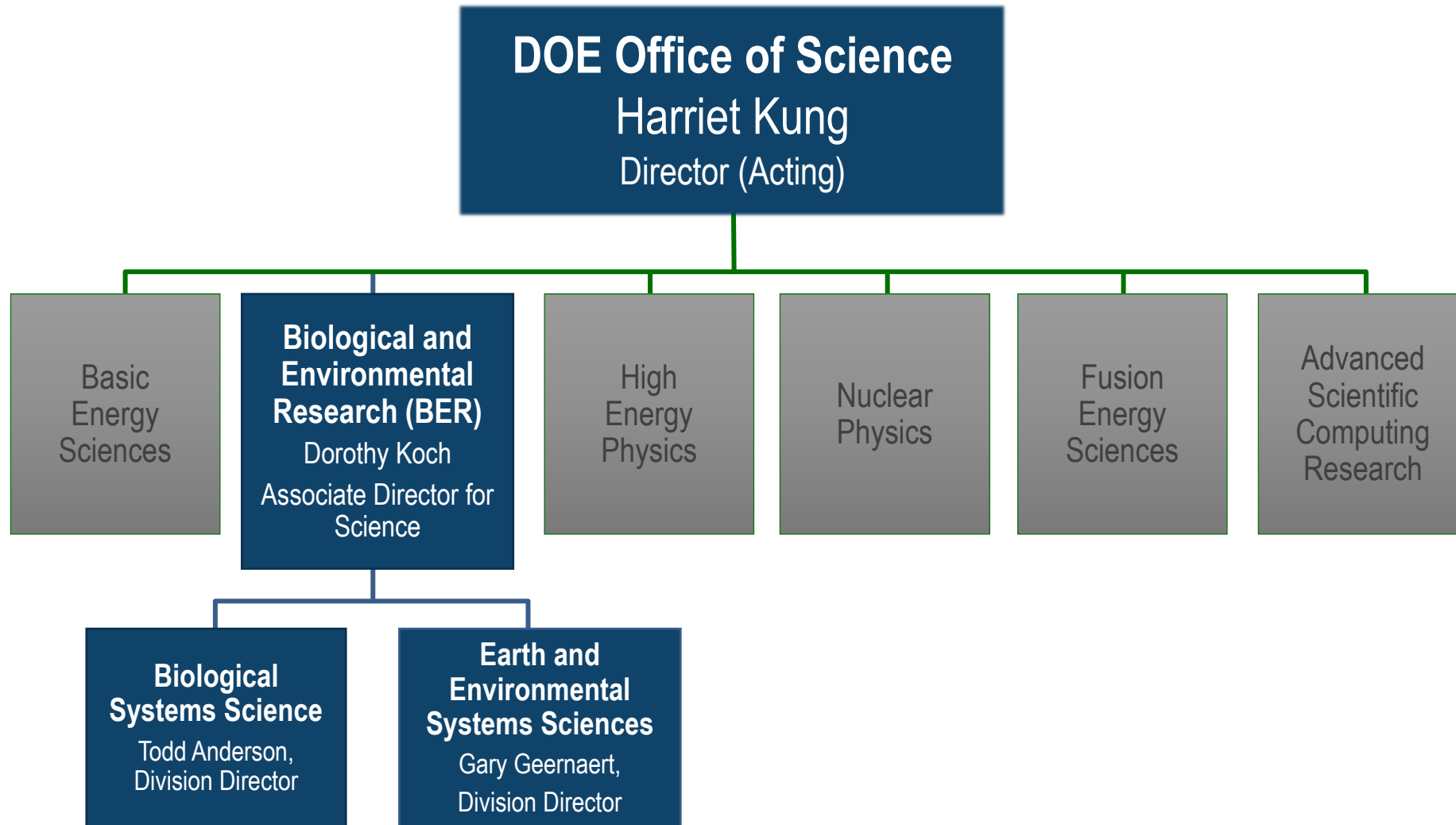
>2,000
PUBLICATIONS
IN FY23



>4,200 USERS AT
3 USER FACILITIES
DURING FY23



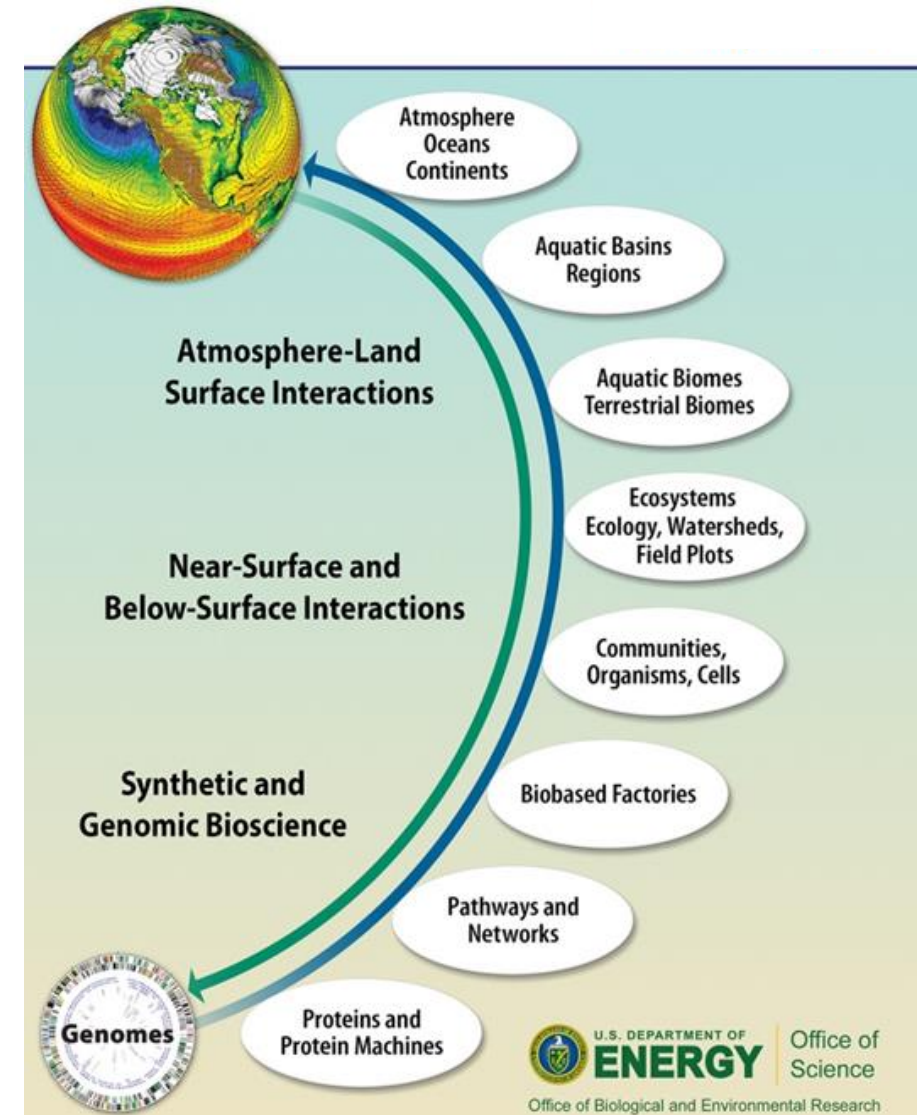
DOE Office of Science (SC)



Biological and Environmental Research (BER)

Understanding complex biological, Earth, and environmental systems

- Explore frontiers of genome-enabled biology
- Understand physical and biogeochemical Earth system processes
- Enable innovation and discovery through user facilities

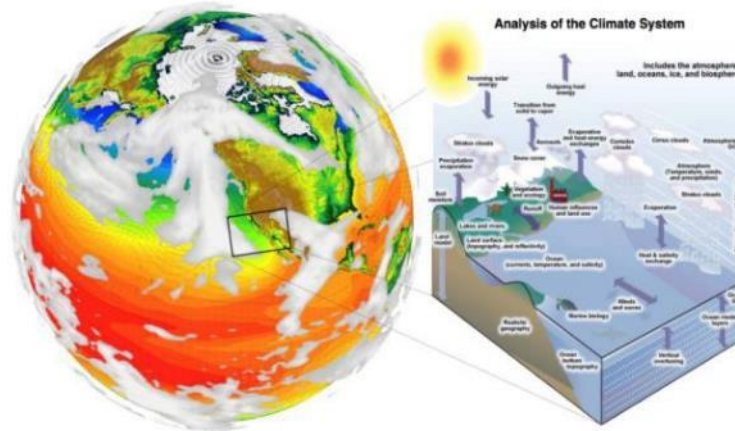


Earth and Environmental Systems Sciences Division (EESSD)



Atmospheric System Research

- Atmospheric Process Science
- Atmospheric Radiation Measurement (ARM) facility



Earth and Environmental Systems Modeling

- Climate, Earth System, and Multi-Sector Dynamics Model Development and Analysis



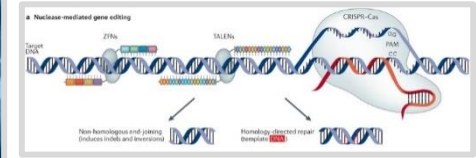
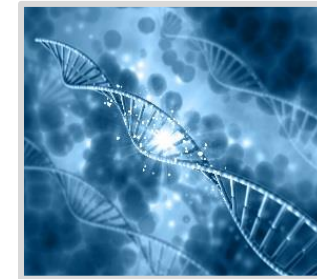
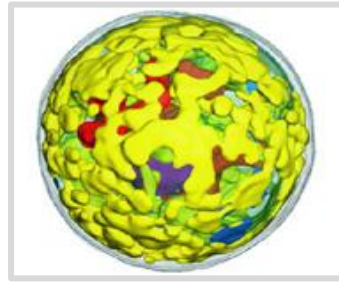
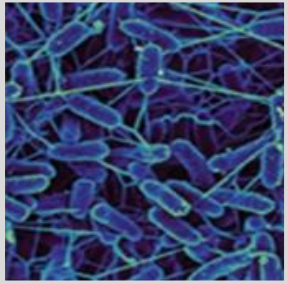
Environmental System Science

- Ecosystem and Watershed Sciences
- Environmental Molecular Sciences Laboratory (EMSL)

Data Management for Earth and Environmental Sciences

<https://science.osti.gov/ber/Research/eessd>

Biological Systems Science Division (BSSD)



Genomic Science

- Bioenergy
 - Sustainable Bioenergy
 - Plant Genomics
- Biosystems Design
 - Secure Biosystems Design
- Environmental Microbiome
- Computational Biology

Biomolecular Characterization and Imaging Science

- Bioimaging Technologies
 - Quantum Imaging
- Structural Biology
- Cryo-EM Resources

Scientific User Facilities and Enabling Capabilities

- Joint Genome Institute (JGI)
- Systems Biology Knowledgebase (KBase)
- National Microbiome Data Collaborative (NMDC)

<https://science.osti.gov/ber/Research/bssd>

BER User Facilities

The logo for the Atmospheric Radiation Measurement (ARM) facility, featuring the letters "ARM" in a bold, blue, sans-serif font with a light blue curved line underneath.

<https://arm.gov/>

The logo for the Environmental Molecular Sciences Laboratory (EMSL), featuring the letters "EMSL" in a green, sans-serif font next to an orange icon of a molecular structure with three spheres.

<https://www.emsl.pnnl.gov/>

The logo for the Joint Genome Institute (JGI), featuring the letters "JGI" in a bold, dark grey, sans-serif font next to a stylized DNA double helix icon with colorful spheres, and the text "JOINT GENOME INSTITUTE" below.

<https://jgi.doe.gov>

DOE Scientific User Facilities Provide researchers with the most advanced tools of modern science, including accelerators, colliders, supercomputers, light and neutron sources, as well as facilities for studying the nano world, the environment, and the atmosphere.

BER supports three world class scientific user facilities:

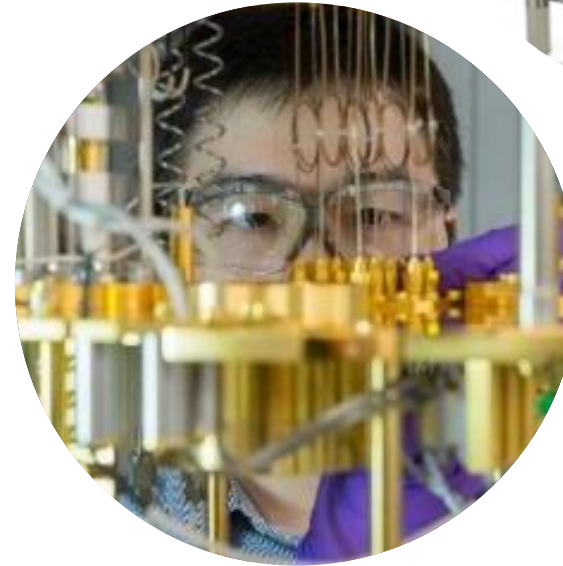
- **Atmospheric Radiation Measurement (ARM)**
- **Environmental Molecular Sciences Laboratory (EMSL)**
- **Joint Genome Institute (JGI)**

Free access to instruments and analysis via annual/regular user proposals.

Funding for Accelerated, Inclusive Research (FAIR)

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

- First solicitation issued in FY23
- Builds research capacity, infrastructure, and expertise at MSIs and Emerging Research Institutions (ERIs)
- Develops mutually beneficial relationships between institutions and DOE national laboratories and user facilities
- Majority of funds go directly to MSIs and ERIs, with a portion to fund the partnering institution (e.g., R1 university or DOE National Lab)



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



SC conducted outreach and listening sessions in FY21-22 on barriers to participation in SC opportunities to inform FY 2022 FOAs.



FY 2022 FOAs piloted models of support that directly address barriers to participation in SC supported fields of research.



FY 2023 doubled investment and commitment to advance discovery and innovation by increasing the diversity of individuals and institutions supported.

Climate Resilience Centers (CRC)

VISION: A network of climate resilience centers at HBCUs, MSIs, and Emerging Research Institutions (ERIs) for two-way translation of basic climate science towards equitable solutions

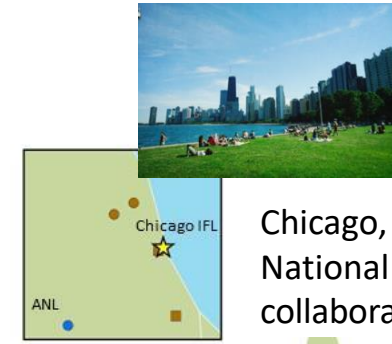
MISSION AND SCOPE:

- ▶ Engage basic research from across the DOE complex to focus on local climate impacts, resilience, and equitable energy solutions
- ▶ Resource and representation for local-level climate research
- ▶ Leverages ongoing foundational investments in BER research
- ▶ Identify basic science needs to inform future research priorities
- ▶ Provides outreach, community engagement, training, and collaboration opportunities among participants and community level stakeholders



Urban Integrated Field Laboratories (IFLs)

- Four 5-year projects; total IFL funding over \$90M.
- Each IFL encompasses interdependent environmental, ecological, atmospheric, infrastructure, and human components of their selected urban region.
- IFLs will develop innovations in observing and modeling urban systems, digital twins, integrate with DOE's climate modeling, and leverage capabilities from DOE and other agencies.
- Each project is strongly connected to their city through local and Minority Serving Institutions, community organizations, and previous work in the region.
- <https://ess.science.energy.gov/urban-ifls/>



Chicago, IL: led by Argonne National Lab with 13 (6 MSI) collaborators.



Baltimore, MD: led by JHU with 10 (3 MSI) collaborators



Tucson-Phoenix-Flagstaff, AZ: led by ASU with 4 (2 MSI) collaborators.



TX Gulf Coast: led by UT-Austin (MSI) with 4 (1 MSI) collaborators.

Brief Side-by-Side Comparison

Funding for Accelerated, Inclusive Research (FAIR)

- PI research capacity building to accelerate competitiveness

Reaching a New Energy Sciences Workforce (RENEW)

- Experiential training of students in SC science areas

Climate Resilience Centers (CRC)

- Pursuit and translation of basic climate science for climate resilience

Urban Integrated Field Laboratory (Urban IFL)

- Multi-institution projects focused on basic research in urban systems

National Virtual Climate Laboratory (NVCL)

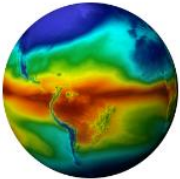


NVCL OBJECTIVES

1 CENTRALIZE ACCESS TO DOE CLIMATE RESEARCH

Offer a well-curated, easily accessible, plain-language inventory of DOE Biological and Environmental Research (BER) projects related to climate research and user facilities with continuously updated portal content.

[VIEW RESEARCH »](#)



2 LIST CLIMATE TRAINING OPPORTUNITIES

Provide students, faculty, and early career scientists access to lab-based education and training opportunities at the national laboratories, including coaching and mentoring opportunities in the skills they need to ensure success in their careers.



3 ENCOURAGE COLLABORATIONS

Facilitate robust, self-sustaining collaborations between national laboratories and interested organizations, including colleges and universities that serve underrepresented students.



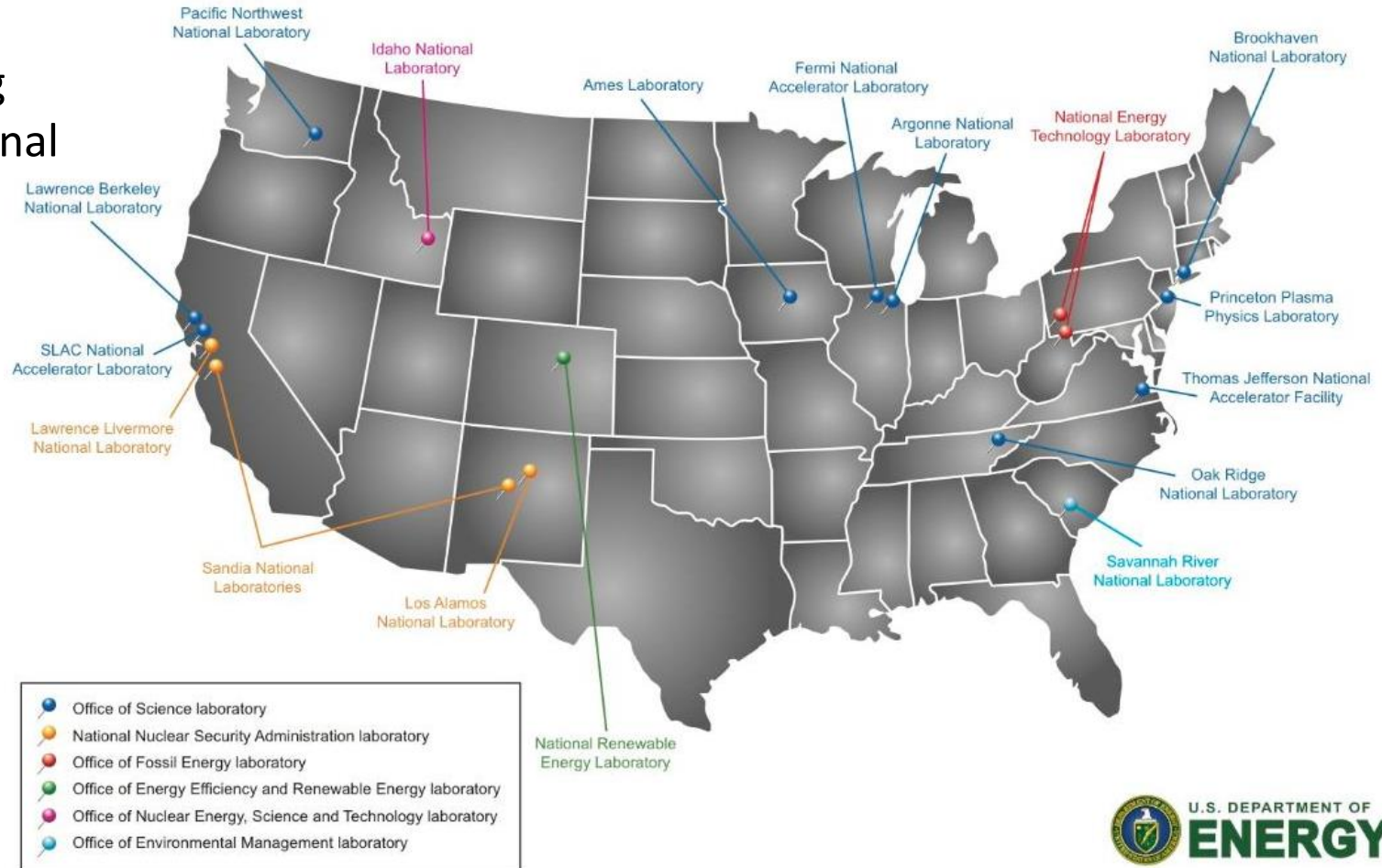
DOE's new portal (launched May 2023) will catalyze engagement with BER climate science, SC Scientific User Facilities, and DOE National Laboratory resources to train the next generation of climate scientists and professionals.

[NVCL.energy.gov](https://nvcl.energy.gov)

DOE Workforce Development for Teachers and Scientists (WDTS)

WDTS manages student and faculty training programs with partnerships with DOE national laboratories:

- Science Undergraduate Laboratory Internships - **SULI**
- Community College Internships - **CCI**
- Visiting Faculty Program - **VFP**
- Office of Science Graduate Student Research Program - **SCGSR**



Finding Opportunities

SC Funding Opportunities and Initiatives

‘Funding’ and ‘Initiatives’ top-menu: <https://science.osti.gov/>

BER Funding Opportunities Page

<https://science.osti.gov/ber/Funding-Opportunities>

Programmatic webpages/news lists

E.g., <https://ess.science.energy.gov/subscribe/>

GovDelivery

<https://public.govdelivery.com/accounts/USDOEOS/subscriber/new>

Grants.gov

<https://www.grants.gov/web/grants/manage-subscriptions.html>

Scientific User Facilities

<https://science.osti.gov/User-Facilities>

Workforce Development for Teachers and Students (WDTs)

<https://science.osti.gov/wdts>



Funding Solicitations and More Information

DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)
BIOLOGICAL AND ENVIRONMENTAL RESEARCH (BER)



ENVIRONMENTAL SYSTEM SCIENCE

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER:
DE-FOA-0002849

FOA TYPE: INITIAL
CFDA NUMBER: 81.049

Reaching a New Energy Sciences Workforce (RENEW) – Earth and Environmental Sciences



Announcement Number: DE-FOA-0002757

Fiscal Year: 2022


Post Date: 5/25/2022

Close Date: 8/24/2022 7:59:58 PM

The submission deadlines for this FOA are contained in the PDF version of the FOA.

The close date of an FOA refers to the date the FOA is removed from a list of open FOAs. Deadlines are provided within each FOA document.

A pre-application is required. Pre-applications must be submitted by June 29, 2022, at 5 PM Eastern. Pre-applications will be responded to by July 12, 2022.

RENEW Informational Webinar Slides 
(June 13 2022)

FOA Issue Date:	November 1, 2022
Submission Deadline for Pre-Applications:	December 1, 2022 at 5:00 PM ET A Pre-Application is required
Pre-Application Response Date:	December 22, 2022 at 6:00 PM ET
Submission Deadline for Applications:	February 23, 2023 at 11:59 PM ET

- ▶ Funding Opportunity Announcement (FOA)
- ▶ BER Funding Opportunities Page
 - ▶ <https://science.osti.gov/ber/Funding-Opportunities>
- ▶ Many FOAs have/had informational webinars
 - Recordings and/or slides available for current or closed FOAs

Remember to check and follow FOA requirements and deadlines

Talk to the Program Managers

- Contact the relevant program manager
 - <https://science.osti.gov/ber/About/Staff>

Earth and Environmental Systems Science Division



Biological Systems Science Division Staff



Become a Proposal Reviewer!

DOE's Biological and Environmental Research Program routinely needs scientists to serve as peer reviewers for funding proposals.

ess.science.energy.gov/become-a-proposal-reviewer



Where to find more information

Biological and Environmental Research (BER)

<https://science.osti.gov/ber>

Biological Systems Science Division (BSSD)

<https://science.osti.gov/ber/Research/bssd>

Genomic Science Program (GSP)

<https://genomicscience.energy.gov/>

Bioenergy Research Centers (BRCs)

<https://genomicscience.energy.gov/bioenergy-research-centers/>

Bioimaging Research

<https://science.osti.gov/ber/bioimaging-research>

Earth and Environmental Systems Sciences Division (EESD)

<https://science.osti.gov/ber/Research/eessd>

Atmospheric System Research (ASR)

<https://asr.science.energy.gov/>

Environmental System Science (ESS)

<https://ess.science.energy.gov/>

Earth and Environmental System Modeling (EESM)

<https://climatemodeling.science.energy.gov/>

Data Management

<https://science.osti.gov/ber/Research/eessd/Data-Management>

Atmospheric Radiation Measurement (ARM) user facility

<https://www.arm.gov/>

Environmental Molecular Sciences Laboratory (EMSL)

<https://www.emsl.pnnl.gov/>

Joint Genome Institute (JGI)

<https://jgi.doe.gov/>

List of National Lab and BRC contacts

https://science.osti.gov/-/media/ber/pdf/Funding/2023/BER_RENEW_Lab_POCs_Contact_Info_2023.pdf

Visit the ESS Booth #288

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Paul Bayer (Paul.Bayer@science.doe.gov)



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Backup Slides



DOE National Laboratory BER Investments

Team-oriented, collaborative research programs that take advantage of the unique scientific capabilities and resources of the National Laboratories

Science Focus Areas and Next Generation Ecosystem Experiments (NGEEs)

- Large, integrative science programs of the highest caliber in support of BER strategic goals and challenges.
- Unique and integrative science projects that target a specific scientific challenge or pilot opportunities.
- Support numerous programs across the National Laboratory complex in BER-relevant research

Short-term Projects

Opportunities for Collaboration and Leveraging

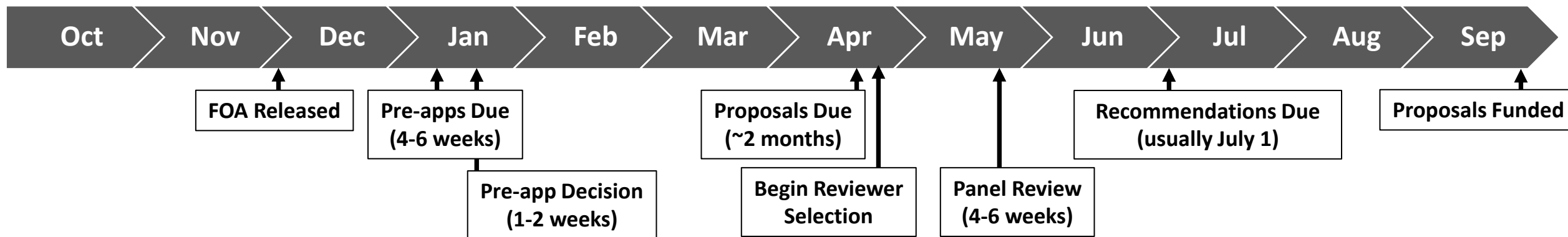
- Lab activities are often collaborative (a consortium of lab, federal and academic partners).
- Enable access to field, laboratory and modeling capabilities to collaborations



Research Grants provide funding opportunities targeting academic institutions for DOE mission-driven basic research performed by individual investigators or multidisciplinary teams

Funding Opportunity Announcements (FOAs) – Applications for financial assistance for new, renewal, or supplemental support of research in support of BER strategic goals and challenges.

- Released on annual (EESSD) or three-year (BSSD) cycles
- Wide range of scientific projects, questions and systems in the university portfolio.
- Some are collaborative, but independent, activities leveraging National Lab efforts
- Investigators are encouraged to familiarize themselves with existing BER investments and leverage (where appropriate), but not duplicate.
- Pre-applications are required
- <https://science.osti.gov/ber/Funding-Opportunities>



Pre-Applications (if required) – Due ~4-6 weeks after FOA released

Response to Pre-Applications – Due ~1-2 weeks after pre-applications submitted

Begin Reviewer Selection – PM develops list of potential reviewers screened for COIs, invitation emails sent

Proposals – Due ~4-10 weeks after pre-application decision made

Panel Review Process

- PM makes proposal assignments and sends with comments on the review process (reminder emails as needed)
- Panel Review run 4-6 weeks after proposals received; PM gives reviewer orientation prior to panel

After Panel Review

- Written reviewer comments and scores, panel discussions, and program policy factors are considered to make recommendations
- PM conducts silent negotiations, prepares selection and declination statements, requests budget changes, prepares documents for management on recommendations
- Traditionally all recommendations are due by July 1

Proposals Funded – DOE contracting offices in Chicago issues the award contracts before September 30 (end of fiscal year)

Applying to a FOA

Pre-Applications

- Read and follow the instructions
- Use the required title page template
 - Include the required information (and only the required information)
- [for ESS] The Science Research Area defines the topic criteria for evaluation
- Address the required components
- Mind the page limits and section requirements
 - Some FOAs require COI lists, collaboration letters, etc as part of pre-apps
- Check for errors
- Submit as early as possible
 - Typically by the PI via PAMS (but not always)
- Internal review for responsiveness (typically)
 - Encouraged or Discouraged

Full Applications

- Read and follow the instructions
- Typically, only 'Encouraged' pre-apps can submit full applications
- Incomplete applications are declined without review
- Make sure required components are included
 - Appendices (DMP, PIER Plan, Biosketch, C&P, Facilities, etc)
 - COI list
 - Budget forms and budget justification
- Whenever possible, use templates indicated in FOA
- Mind the funding limits, page limits, and formatting requirements
- Check for errors (spelling, formatting, etc)
- Submission is by the institution (e.g., Sponsored Research Office, SRO) via Grants.gov

Developing a Proposal

- Be responsive to the program and the topic
 - “Redefining” the topic rarely goes well
 - Neither does “shoehorning” a marginally responsive topic
- Think like a (cranky) reviewer
 - Get in front of potential criticisms
 - Don’t leave it up to them to interpret
- Balance between detail and clarity
 - Too much: ‘I can’t tell why they’re doing this or its importance’
 - Too little: ‘I don’t know how they’ll do this or if it will work’
- Keep it feasible
 - Over-producing is OK, but over-promising is not (and reviewers usually can tell the difference)
- The budget should match the scope
 - And both need to be within the FOA limits
- So should the team composition and roles

Other Helpful Reminders

- Sign up for PAMS early!!!
- Pre-applications are submitted into PAMS, whereas the full applications are submitted to Grants.gov

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

Portfolio Analysis And Management System

youssef | Logout

Proposals Institutions

Browse Guide Me Tuesday 22nd May 2012 03:12:07 P.M. ET

You are here: Home » Institutions » Browse

Institutions - List

✓ **Success:**
You have been successfully registered to the institution.

Register to Another Institution Detailed View

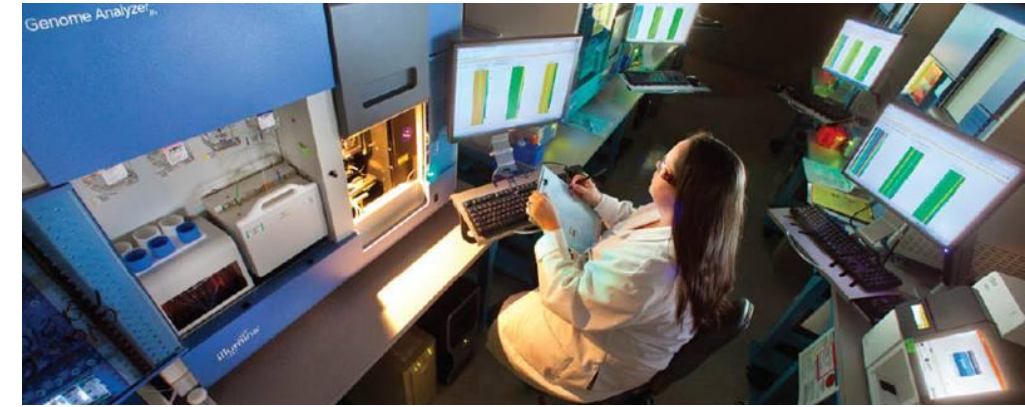
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Name	City	State	DUNS	Type	Options
Abilene Christian University	Abilene	TX	073171951	Private Institution of Higher Education	View

- New in FY 2023
 - New COI forms must be used
 - Promoting Inclusive & Equitable Research (PIER) Plan are required



Peer review of BER projects is performed to provide an independent assessment of the scientific and/or technical merit of the research by peers having knowledge and expertise equal to that of the researchers whose work they review.



Reviewer Selection

- Scientific expertise and experience of individual reviewers
- Avoidance of conflicts of interest of individual reviewers (collaborator, mentor-mentee, institutional)
- Provide an appropriate mix of scientific disciplines for complex proposals
- Mix of university, national laboratory, and if needed, private industry reviewers
- Try to balance demographics such as career level, gender, and location
- Program manager (PM) may consider applicants' suggested reviewers or requests to exclude certain individuals as reviewers, for instance due to personal conflicts

Tip for applicants:

- ✓ PMs always need more reviewers! Volunteering to review for a program is a great way to better understand the agency and program, and to see many examples of good (and bad) proposals.

- Applications are evaluated against the following criteria listed in descending order of importance as codified at 10 CFR Part 605.10.
 - Scientific and/or technical merit of the project
 - Appropriateness of the proposed method or approach
 - Competency of personnel & adequacy of proposed resources
 - Reasonableness and appropriateness of the proposed budget
 - Quality and Efficacy of the Plan for Promoting Inclusive and Equitable Research*
- Additional criteria may be added, e.g.,
 - Data Management
 - Software Sustainability
- Tips for applicants:
 - ✓ Read the criteria by which your proposal will be assessed!
 - ✓ Make it easy for reviewers to find the info they need

*New merit review criterion. More information at
<https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans/Information-about-PIER-Plans>



Program Policy Factors

The Selection Official may consider any of the following program policy factors in making the selection, listed in no order of significance:

- Availability of funds
- Relevance of the proposed activity to SC priorities
- Ensuring an appropriate balance of activities within SC programs
- Performance under current awards
- Institutional history of training and mentoring early-career researchers
- Providing placement for postdoctoral researchers
- Training graduate students in conduct of basic research
- Presence of tenure-track or tenure-equivalent investigators
- Training the next generation of researchers
- Providing career pathways for the next generation of researchers
- Maximizing the use of DOE user facilities
- Ensuring opportunities to investigators not currently supported by DOE
- Commitment to sharing the results of research
- Promoting the diversity of supported investigators
- Promoting the diversity of institutions receiving awards
- Institutional history of hiring, promoting, and placing scientists from underrepresented communities in the scientific workforce

- Final funding recommendations are based on peer review comments, PM assessments, available resources, and program policy factors
- Grant award packages are reviewed by Division Director, SC grants staff, the BER Associate Director, and SC contracts staff
- Final step of grant processing is handled by the Chicago Integrated Service Center who are the official “Contract Officers” for the awards



Tips for applicants:

- ✓ Read reviews carefully on both funded and declined proposals! Reviewers often have useful suggestions that will strengthen your research.
- ✓ Applicants often think “the reviewer just didn’t understand” – this is an indication that you may need to express your ideas more clearly next time.
- ✓ You can reach out to PMs to discuss a declined proposal if you have questions – but please use this as a learning opportunity not a complaint session!