Introduction to the BER Portfolio

DOE Office of Science: Office Hour Series

March 26, 2024

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Office of Biological and Environmental Research

U.S. DEPARTMENT OF ENERGY | Office of Science

Energy.gov/science

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HOUSEKEEPING REMINDERS

- Audience will have the ability to unmute themselves and come on camera during Q&A
- Please submit all questions using the Q&A function at the bottom of your screen
- Submit questions at any point during the presentation
- Every effort will be made to address all relevant questions

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The nation's largest supporter of basic research in the physical sciences

Principal roles:

- Direct support of scientific research
- Direct support of the development, construction, and operation of unique, open-access scientific user facilities available for use by external researchers

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Our Mission:

Deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic, and national security of the United States.

More than **34,000 r**esearchers supported at more than **300** institutions and **17** DOE national laboratories

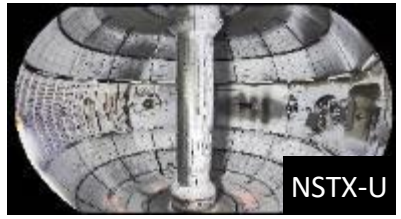
Steward **10** of the 17 DOE national laboratories

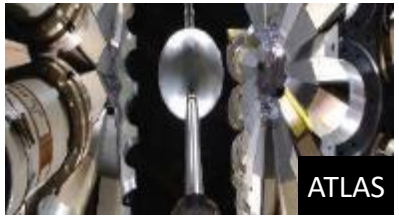
More than **37,000** users of **28** Office of Science scientific user facilities

$8.1B (FY 23 enacted)

Office of Science User Facilities

FY 2023
28 scientific
user facilities
>37,000 users



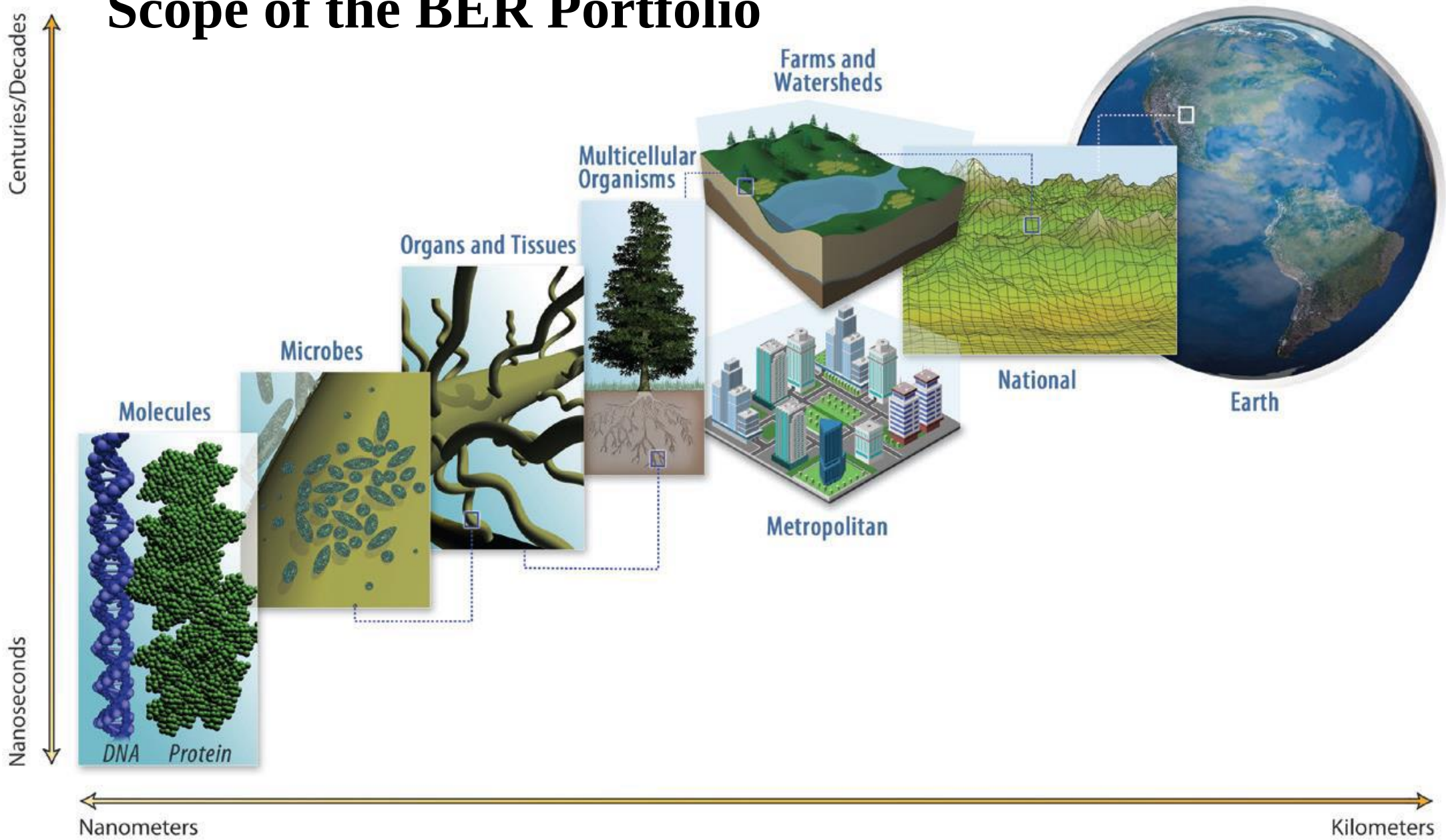


U.S. DEPARTMENT OF ENERGY
Office of Science

Office of Science Research Portfolio

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	• Supporting the development of a fusion energy source and supporting research in plasma science
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 isotope research, development, production, processing and distribution to meet the needs of the Nation
Accelerator R&D and Production	• Supporting new technologies for use in SC's scientific facilities and in commercial products

Scope of the BER Portfolio



DOE Office of Science

Biological and Environmental Research

Dorothy Koch, Associate Director

Todd Anderson, Director

Biological Systems Science

- Genomic Science
  - ➢ Bioenergy Research Centers
- Biomolecular Characterization and Imaging Science
- Facilities & Infrastructure
  - ➢ Joint Genome Institute

Gary Geernaert, Director

Earth & Environmental Systems Science

- Atmospheric System Research
- Environmental System Science
- Climate & Earth System Modeling
- Facilities & Infrastructure
  - ➢ Environmental Molec. Sciences Lab
  - ➢ ARM Climate Research Facility

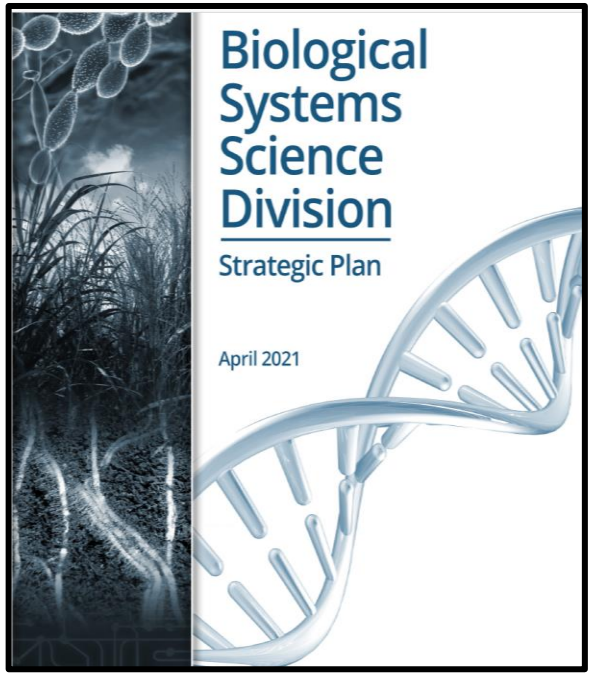
DOE BER Permanent Staff

Strategic Directions for Biological Systems Science

Overarching Goal

Provide the necessary fundamental science to understand, predict, manipulate, and design biological processes that underpin innovations for bioenergy and bioproduct production and to enhance the understanding of natural environmental processes relevant to DOE.

- What information is encoded in the genome sequence and how does this information explain the functional characteristics of cells, organisms, and whole biological systems?
- How do interactions among cells regulate the functional behavior of living systems and how can those interactions be understood dynamically and predictively?
- How do plants, microbes, and communities of organisms adapt and respond to changing environmental conditions (e.g., temperature, water and nutrient availability, and ecological interactions), and how can their behavior be manipulated toward desired outcomes?
- What organizing biological principles need to be understood to facilitate the design and engineering of new biological systems for beneficial purposes



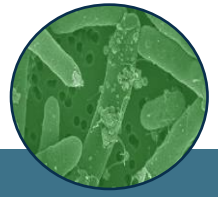
BSSD Strategic Plan - April 2021

Biological System Science Division (BSSD) Portfolio Elements

Main Research Topics*

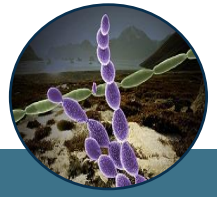
Bioenergy Research

Bioenergy Research Centers
Sustainable Bioenergy
Plant Genomics
Microbial Conversion
Biopreparedness (BRaVE)



Biosystems Design

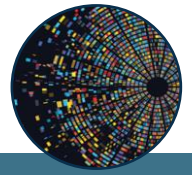
Biosystems Design
Secure Biosystems Design



Environmental Research

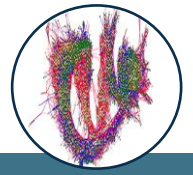
Microbiome Science
Energy Earthshot Research

Enabling Capabilities



Computational Biology

Academic Research
KBase
NMDC
PDB



Biomolecular Characterization and Imaging Science

Classical Bioimaging
Quantum Bioimaging
Structural Biology

User Facilities

Joint Genome Institute

*New Cross-cutting research efforts in FY22 and 23 : RENEW, FAIR and Accelerate efforts

Bioenergy Research

Goal: Provide the basic science needed to convert renewable biomass to a range of fuels chemicals, and other bioproducts in support of a burgeoning bioeconomy.

- *Plant Genomics*

Subgoal: *Gain a genome-level understanding of plant metabolism, physiology, and growth to develop new bioenergy feedstocks with traits tailored for bioenergy and bioproduct production.*

- *Microbial Conversion*

Subgoal: *Develop an understanding of microbial and fungal metabolism necessary to design new strains, communities, or enzymes capable of converting plant biomass components into fuels, chemicals, and bioproducts.*

Bioenergy Research Continued

- *Sustainable Bioenergy*

Subgoal: *Understand the genomic properties of plants, microbes, and their interactions to enable the development of new approaches that improve the efficacy of bioenergy crop production on marginal lands with few or no agricultural inputs, while minimizing ecological impacts.*

- ***New** Biopreparedness Research Virtual Environment (BRaVE)*

Subgoal: Develop the understanding, capabilities and modeling needed to address potential biothreats to a burgeoning bioeconomy.

Subgoal: Explore the use of advanced AI/ML computational techniques together with highly curated experimental datasets to mechanistically explain the biological effects of low dose radiation exposure and the implications for adverse health outcomes.

Biosystems Design Research

Goal: *Advance fundamental understanding of genome biology and develop the genome-scale engineering technologies needed to design, build, and control plants and microbes for desired beneficial purposes.*

Secure Biosystems Design

Subgoal: *Build on advances in genome science and synthetic biology to design and engineer DOE-relevant biological systems with built-in biocontainment measures and develop strategies to address risks of unintended consequences, while enabling a sustainable bioeconomy.*

Environmental Microbiome Research

Goal: *Develop a process-level understanding of microbiome function and be able to predict ecosystem impacts on the cycling of materials (carbon, nutrients, and contaminants) in the environment.*

Enabling Capabilities and User Facilities

*relevant to BSSD science

Joint Genome Institute (JGI)

Provides the global research community with access to the most advanced integrative genome science capabilities for advancing solutions to bioenergy & environmental grand challenges

National Microbiome Data Collaborative (NMDC)

Supports microbiome data exploration through a sustainable data discovery platform that promotes open science and shared-ownership across a broad and diverse community of researchers.

DOE Systems Biology Knowledgebase (KBase)

Empowers scientists via an open, FAIR biological data science platform to collaboratively drive discovery, for prediction, control and design of function in plants, microbes and their communities.

BER Structural Biology and Imaging Resources

Enables scientists to understand the relationships between plant and microbial genomes, protein structure and function, and environmental interactions using techniques available only at DOE User facilities.

Environmental Molecular Sciences Lab (EMSL)

Provides access to premier multimodal molecular science instruments, data analytics, production computing, and multiscale modeling to study biotic and abiotic process to under their function in a systems context.

Recent Workshops

Overcoming Barriers in Plant Transformation: A Focus on Bioenergy Crops

September 18-20, 2023 (draft report in prep)

- Basic science needs for advancing plant transformation techniques
- Capabilities needed to expand genomic editing of plant functional traits

Artificial Intelligence & Machine Learning (AI/ML) for BioEnergy Research Opportunities and Challenges (AMBER)

August 23-25, 2022 (Joint with EERE-BETO)

- What are the possibilities for incorporating AI/ML techniques into Biological Research?
- How could AI/ML techniques be more integral with experimentation and automation in the Laboratory?

Genomes to Structure and Function Workshop

October 27-28, 2021, December 15-16, 2021, January 26-27, 2022

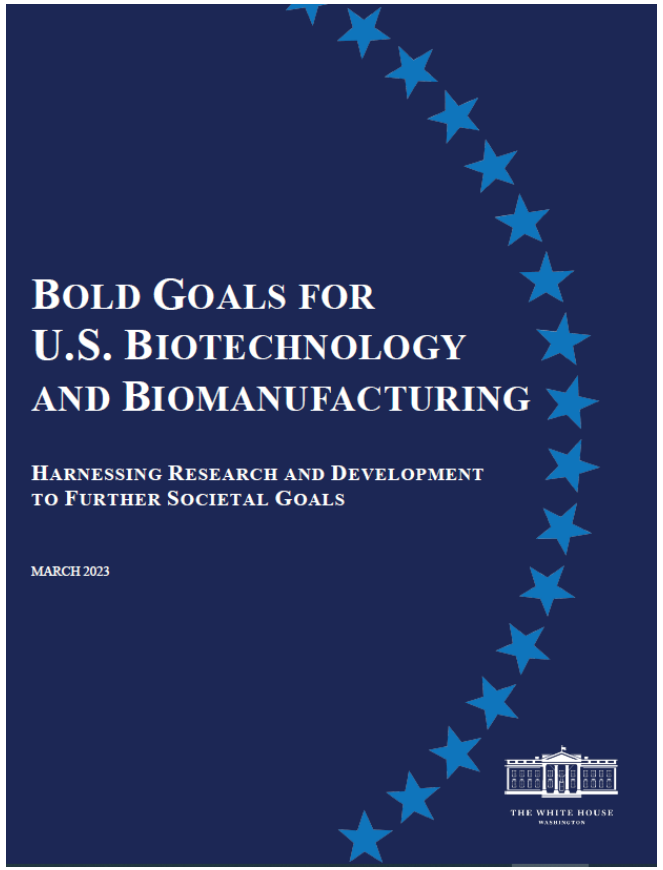
- Understand the needs of the BER research community to combine genomic, functional, and structural approaches to advance their research
- Three sessions:
  - Molecular Structures
  - Intracellular Organization and Material Synthesis and Decomposition
  - Imaging the Rhizosphere and Cellular Organization

Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe and Secure American Bioeconomy

September 12, 2022

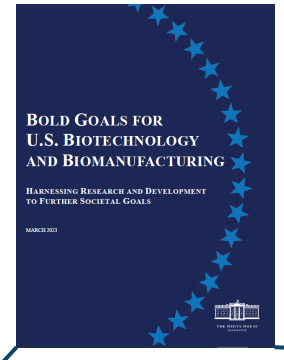
[Executive Order 9-12-2022]

[March 22-2023 fact-sheet-biden-harris-administration-announces-new-bold-goals-and-priorities-to-advance-american-biotechnology-and-biomanufacturing/]



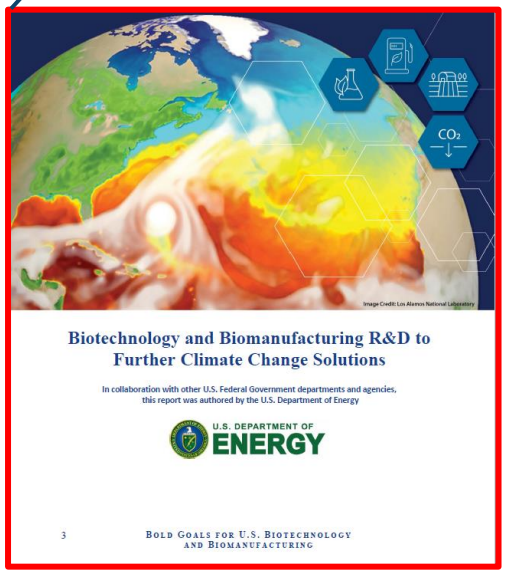
[Bold-Goals-for-U.S.-Biotechnology-and-Biomanufacturing-Harnessing-Research-and-Development-To-Further-Societal-Goals-FINAL.pdf]

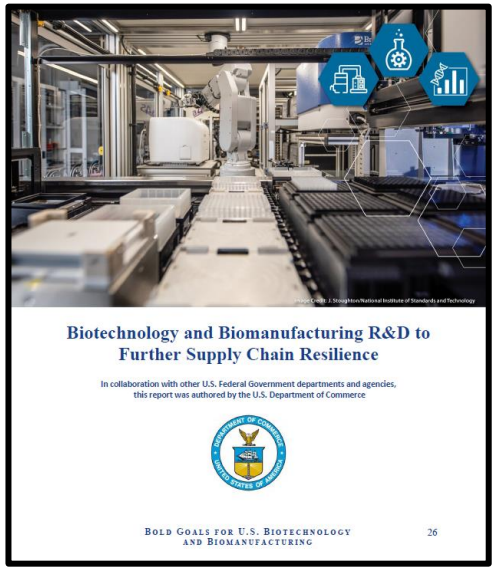
Executive Order acknowledges advances in biotechnology and seeks to establish US leadership in a very competitive global bioeconomy

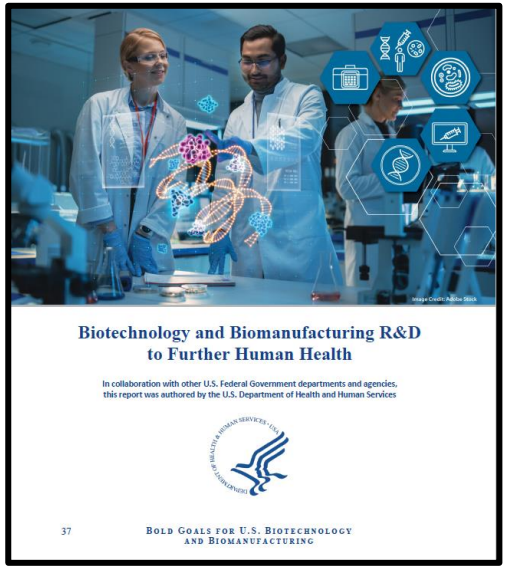


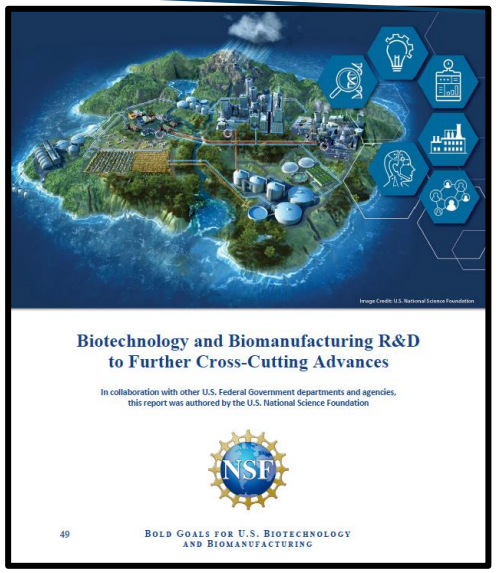
E.O. Reports: A Compilation of Five Reports Addressing:

Climate Change Solutions
Food and Agricultural Innovation
Supply Chain Resilience
Human Health
Cross-Cutting Advances









DOE led the Climate Change Solutions Report with SC-BER EERE-BETO, USDA

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Hydrogen Shot

Long Duration Storage Shot

Carbon Negative Shot

Clean Fuels and Products Shot

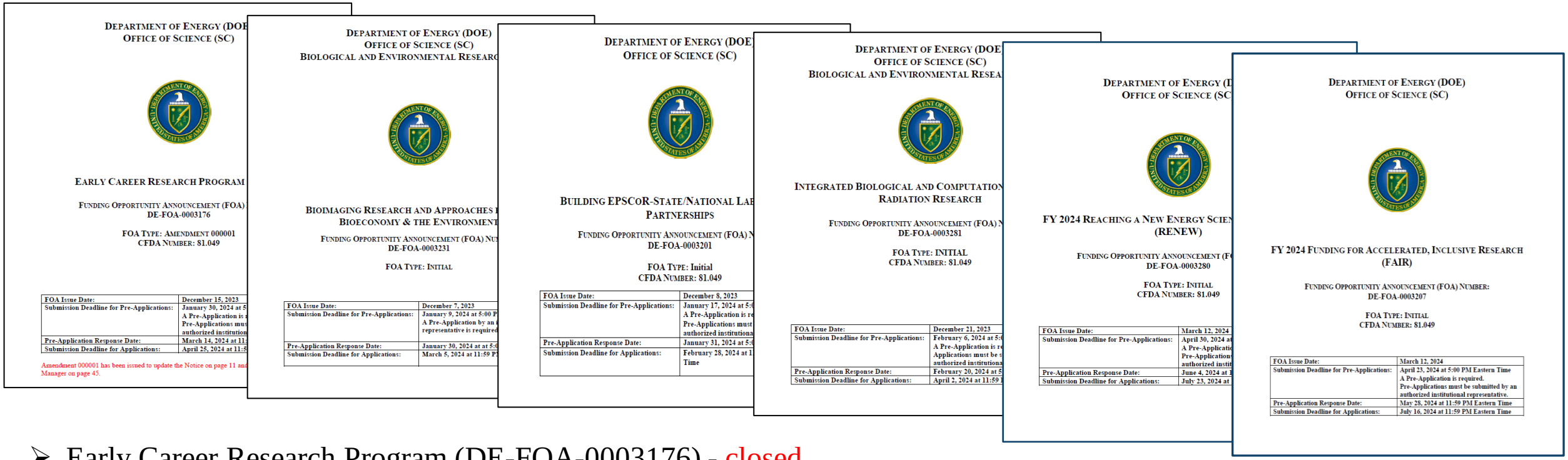
Enhanced Geothermal Shot

Industrial Heat Shot

Floating Offshore Wind Shot

Affordable Home Energy Shot

New Funding Opportunities for FY 2024



DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)

EARLY CAREER RESEARCH PROGRAM

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA)
DE-FOA-0003176

FOA TYPE: AMENDMENT 000001
CFDA NUMBER: 81.049

FOA Issue Date:	December 15, 2023
Submission Deadline for Pre-Applications:	January 30, 2024 at 5
Pre-Application Response Date:	March 14, 2024 at 11:
Submission Deadline for Applications:	April 25, 2024 at 11:5

Amendment 000001 has been issued to update the Notice on page 11 and Manager on page 45.

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

BIOIMAGING RESEARCH AND APPROACHES
BIOECONOMY & THE ENVIRONMENT

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NU
DE-FOA-0003231

FOA TYPE: INITIAL

FOA Issue Date:	December 7, 2023
Submission Deadline for Pre-Applications:	January 9, 2024 at 5:00 P A Pre-Application by an representative is required
Pre-Application Response Date:	January 30, 2024 at 5:0
Submission Deadline for Applications:	March 5, 2024 at 11:59 P

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BUILDING EPSCOR-STATE/NATIONAL LA
PARTNERSHIPS

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) N
DE-FOA-0003201

FOA TYPE: Initial
CFDA NUMBER: 81.049

FOA Issue Date:	December 8, 2023
Submission Deadline for Pre-Applications:	January 17, 2024 at 5: A Pre-Application is re Pre-Applications must authorized institutiona
Pre-Application Response Date:	January 31, 2024 at 5:0
Submission Deadline for Applications:	February 28, 2024 at 1 Time

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

INTEGRATED BIOLOGICAL AND COMPUTATION
RADIATION RESEARCH

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) N
DE-FOA-0003281

FOA TYPE: INITIAL
CFDA NUMBER: 81.049

FOA Issue Date:	December 21, 2023
Submission Deadline for Pre-Applications:	February 6, 2024 at 5: A Pre-Application is re Applications must be s authorized institutiona
Pre-Application Response Date:	February 20, 2024 at 5
Submission Deadline for Applications:	April 2, 2024 at 11:59

DEPARTMENT OF ENERGY (DOE)
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FY 2024 REACHING A NEW ENERGY SCIEN
(RENEW)

FUNDING OPPORTUNITY ANNOUNCEMENT (F
DE-FOA-0003280

FOA TYPE: INITIAL
CFDA NUMBER: 81.049

FOA Issue Date:	March 12, 2024
Submission Deadline for Pre-Applications:	April 30, 2024 at A Pre-Applicatio Pre-Application authorized instit
Pre-Application Response Date:	June 4, 2024 at 1
Submission Deadline for Applications:	July 23, 2024 at

DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)

FY 2024 FUNDING FOR ACCELERATED, INCLUSIVE RESEARCH
(FAIR)

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER:
DE-FOA-0003207

FOA TYPE: INITIAL
CFDA NUMBER: 81.049

FOA Issue Date:	March 12, 2024
Submission Deadline for Pre-Applications:	April 23, 2024 at 5:00 PM Eastern Time A Pre-Application is required. Pre-Applications must be submitted by an authorized institutional representative.
Pre-Application Response Date:	May 28, 2024 at 11:59 PM Eastern Time
Submission Deadline for Applications:	July 16, 2024 at 11:59 PM Eastern Time

- Early Career Research Program (DE-FOA-0003176) - closed
- Bioimaging Research Approaches to Bioenergy & the Environment (DE-FOA -0003231) - closed
- EPSCoR (DE-FOA-0003201) - closed
- Low Dose Radiation Research (DE-FOA-0003281) – closed

- RENEW (DE-FOA-0003280) – OPEN pre-apps due 4/30/24
- FAIR (DE-FOA-0003207) – OPEN pre-apps due 4/23/24

Online voluntary webinars (posted)
Webinar slides included in the RENEW and FAIR FOA announcement

Earth and Environmental Systems Science Portfolio Division Portfolio

Vision, Challenges, and priorities

Vision: Improve a systems level understanding and predictability of the earth system in support of DOE's mission, through integrative theory, modeling, and experiment, over a variety of spatial and temporal scales.

High level Grand Challenges

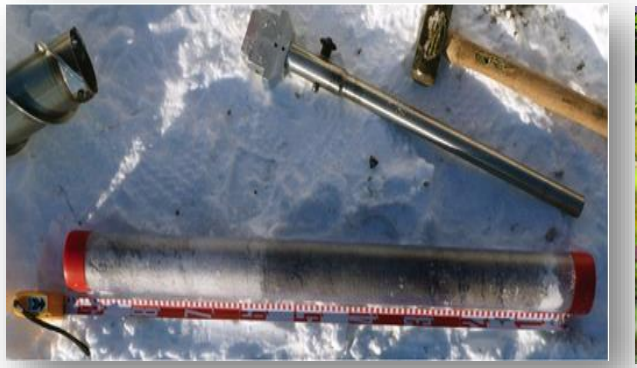
- Integrated water cycle
- Biogeochemistry
- High latitudes
- Drivers and responses
- Data-model integration

Priorities emphasize the most difficult issues: boundaries, interfaces, extremes

- Collaborative opportunities: NOAA; USGS; NGA; NSF; NASA; others
- Topics: disturbance, initialization, data analytics (e.g., machine learning), software, advanced technologies, Terrestrial-Aquatic Interfaces, Coastal, etc.

Strategic questions governing Earth and Environmental Systems Sciences Division

- How can we understand and predict cloud-aerosol-precipitation interactions, and their influence on the Earth's energy balance?
- Can we design Earth system models that accurately reflect advanced scale-aware process representations of Earth system observations, incorporating physical, chemical, biological, and human components?
- What do we need to know about terrestrial ecosystems, watersheds, urban, and coastal systems to improve how they are represented in Earth system models?
- How can we improve understanding of heterogeneous, climate-sensitive systems, such as urban communities, and their resilience to climate-relevant changes and disturbance?

Process Research in Earth and Environmental Sciences

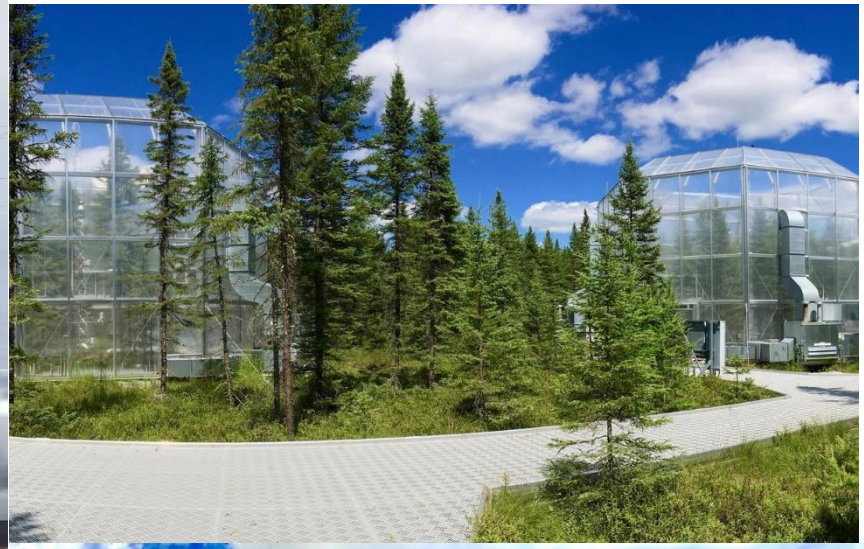
EESSD's approach advances basic understanding of ecosystems, watersheds, and the atmospheric system

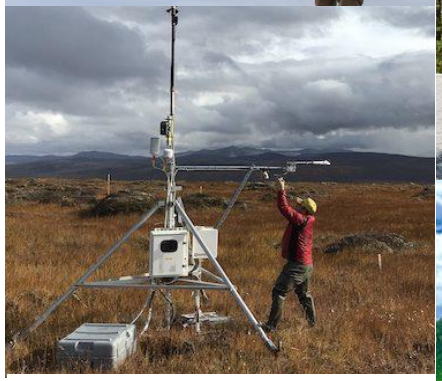
Primary U.S. research program addressing:

- Biogeochemical and hydrological drivers of terrestrial environmental systems in sensitive geographies
- Integrated carbon, nitrogen, and water cycles in the terrestrial-atmosphere system
- Use of ModEx (Model-experiment integration) as a research framework for investments

Using the following research approaches:

- Large-scale, long-term field studies and manipulations (e.g., SPRUCE, NGEE-Arctic, NGEE-Tropics)
- Intensive campaigns, deployments, and synthesis activities (e.g., ARM; SPRUCE; NGEEs; etc…)
- AI informed data analytics (extremes, complexity, etc.)
- Research questions framed in the context of addressing uncertainties, gaps, and needs, of process and Earth system models



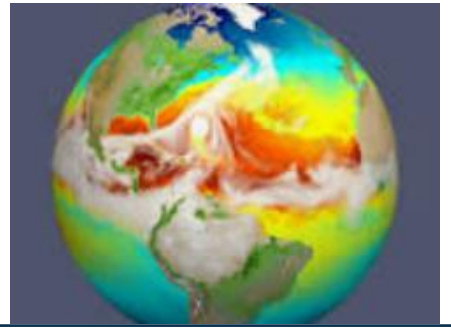


Earth and Environmental Systems Modeling

Goal: To develop and demonstrate the most advanced modeling and simulation capabilities, in order to enhance the predictability of the climate system in support of DOE's science and security mission.

Capabilities: Cutting-edge **model development of the ultra-high resolution E3SM**, **hierarchical and multi-model analyses** for deep scientific insights, and discovery at the interface of **natural and human systems**.

E3SM Energy Exascale Earth System Model



DOE's flagship climate model is the highest resolution prediction capability in the world and is the only model that includes details of infrastructures, urban systems, and economics

AI4ESP

New in FY2023! Development of exascale-class models with machine learning to reduce uncertainties

Applications: The capabilities help address high priority climate challenges and contribute to the IPCC and the NCA

Data Archives, management, and analytics for EESSD

ESS-DIVE
Deep Insight for Earth Science Data

Repository for environmental system data involving watershed, ecosystem, and manipulation studies, hosted at LBNL

Earth System Grid Federation
ESGF

Repository of model-generated data from all climate and Earth system models worldwide, hosted by ORNL-ANL

ARM
CLIMATE RESEARCH FACILITY

ARM data archive contains 2 PB of in-situ and remote sensing observations, model simulations, and tools for rapid access, host ORNL-ANL

MSD-LIVE: a cloud-based Multi-sector dynamics data and code management system and computing platform, for climate-human interactions, hosted by PNNL

BER/EESSD Climate Initiative Components

- **Urban Integrated Field Laboratories**: Advance underpinning science of integrated natural-human urban systems to assure resilience to climate extremes using equitable solutions

- **National Virtual Climate Laboratory (NVCL):** A single portal to DOE national lab climate science capabilities, to advance access to climate science through public engagement on local to regional scale climate science. In future years this will serve as the lab partner portal for RENEW.

- **Network of Climate Resilience Centers:** Initiate first centers in a network of climate resiliency research that accelerates basic climate system science towards equitable solutions at the local scale

Urban Integrated Field Laboratories

GOAL: Advance underpinning science of integrated natural-human urban systems to assure resilience to climate extremes using equitable solutions, e.g., accelerate the adoption of ecological solutions to optimize efficient, reliable energy systems; demonstrate benefits of energy efficiencies, and clean energy technologies to urban communities; and engage diverse communities in climate-energy design and deployment strategies.

In FY 2022-2023, four Urban IFLs were initiated by teams of academic and laboratory research institutions that include emerging research institutions and underserved HBCU and MSI communities, plus community partnerships:

- Chicago urban region: led by Argonne National Laboratory with 10 collaborators
- Baltimore urban region: led by Johns Hopkins University, with 7 collaborating institutions
- Texas gulf coast: led by University of Texas Austin, with 4 collaborating institutions
- Phoenix-Flagstaff corridor, led by Arizona State University with two collaborators

Recent developments with the Urban IFLs:

- All Urban IFLs continue with their third or fourth year of investment, with field research and modeling
- Engagement of other agency collaborations, e.g., NOAA, NASA, EPA, NSF, USACE, FEMA, and USDA
- Outreach events are organized to promote best practices across the Urban IFLs and new ideas entrained from the newly established climate resilience centers
- IFLs coordinate with other national and international efforts to promote U.S. leadership in climate leadership and urban sustainability

National Virtual Climate Laboratory

GOAL: Advance access to climate science through public engagement on local to regional scale climate science, equitable solutions, and partnerships with National Laboratories, emerging research institutions and underserved HBCU and MSI communities, and regional stakeholders.

- **The NVCL accelerates public access to DOE's major science investments underpinning energy technology innovations, to facilitate more rapid adoption into research activities and community strategies, e.g., including grid resilience, clean energy, and energy efficiencies.**
- **The NVCL went live in April 2023, with a portal that provides information on climate research activities across the DOE National Laboratories.**
- **Outreach activities will continue to be developed and launched that include RENEW, FAIR, Climate Resilience Centers, and Urban Integrated Field Lab awardees in FY 2022 through FY 2024.**
- **National Laboratory engagement in RENEW projects is facilitated by the NVCL to foster sustained scientific collaborations.**

Climate Resilience Centers

VISION: A network of climate resilience centers that are affiliated with emerging research institutions and underserved Historically Black Colleges and Universities (HBCUs) and Minority Serving Institution (MSIs) to accelerate basic climate system science towards equitable solutions, e.g., to accelerate the adoption of energy efficiencies and new energy technologies into disadvantaged communities and provide resilient adaptive strategies to climate and energy changes.

- Based on an FOA issued in FY 2023 and FY 2024, six climate resilience centers were initiated and placed at emerging research institutions and underserved HBCU and MSI communities.

  Michigan Tech; San Jose State; Northern Arizona Univ; Morgan State Univ; NC A&T; UC Merced

- Climate resilience centers have a unique focus on ecological, atmospheric, and/or modeling challenges, each with a risk analysis component.
- Centers leverage ongoing foundational investments in BER research.
- Centers develop demonstration research projects with multi-institutional collaborations.

Funding opportunities for universities

- FY24 already issued
  - Environmental System Sciences
  - Atmospheric System Research
  - Climate Resilience Centers
  - Climate Modeling and Analysis
  - Early Career Research Program (SC-wide; atmospheric sciences focus)

- FY25 (tentative) – next FOA opportunities
  - Southeastern US multidisciplinary science
  - Environmental System Sciences
  - Atmospheric System Research
  - Climate Resilience Centers
  - Early Career Research Program (SC-wide; environmental focus)

BER User Facilities: EESSD and BSSD

Atmospheric Radiation Measurement (ARM) user facility

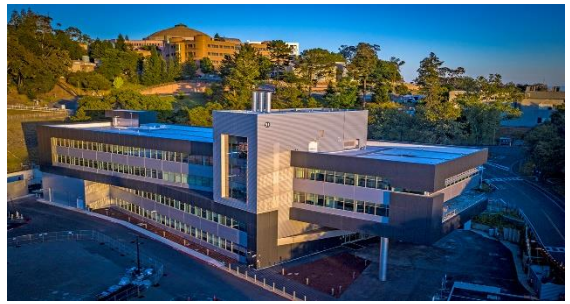
ARM is a multi-platform scientific user facility with instruments at fixed and varying locations around the globe for obtaining continuous field measurements of clouds, aerosols, precipitation, radiation, surface properties & the atmospheric state since 1992

Environmental Molecular Sciences Laboratory

EMSL provides users with capabilities to obtain a mechanistic understanding of physical, chemical, and intra- and inter-cellular processes and interactions, and to incorporate this information into numerical models to better understand how biological, environmental, atmospheric, and energy systems function at higher spatial- and temporal scales.

Joint Genome Institute

JGI provides advanced genome sequencing, genome data acquisition, and genome analyses in support of DOE mission needs in bioenergy, carbon cycling and biosequestration, and biogeochemical processes. It is the leading provider of plant, fungal, algal, & microbial community genomes and genomic analyses.



Examples of BER Collaborations with DOE Energy Technology Offices

Atmospheric Radiation Measurement (ARM) User Facility

- BER's ARM User Facility and modeling programs provide high resolution wind and turbulence data that informs the design and siting of wind energy systems. BER is assisting the EERE Wind Energy Technology Office (WETO) in strategic planning.

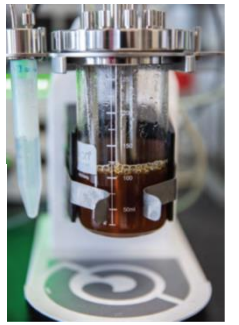
E3SM – Energy Exascale Earth System Model

- BER's Energy Exascale Earth System Model (E3SM) provides long term predictions of weather extremes to inform risk and resilience of the Nation's energy systems. BER is working with the Office of Electricity to provide an integrated capability that combines the North American Energy Resilience Model (NAERM) and E3SM for improved risk assessments.

- BER's JGI User Facility is working with the EERE Bioenergy Technology Office (BETO) to develop improved algal strains and for mid-scale fermentation capacity to support metabolomics and product characterization.

ABPDU
ADVANCED BIOFUELS AND BIOPRODUCTS PROCESS DEVELOPMENT UNIT

Agile BioFoundry



Other Office of Science (SC) Opportunities

Building a New Energy Workforce

SC Internship Programs and Opportunities

- Science Undergraduate Laboratory Internships Program
- The Community College Internships Program
- Office of Science Graduate Student Research
- Visiting Faculty Program

science.osti.gov/wdts

SC Initiatives and Programs to Broaden Participation

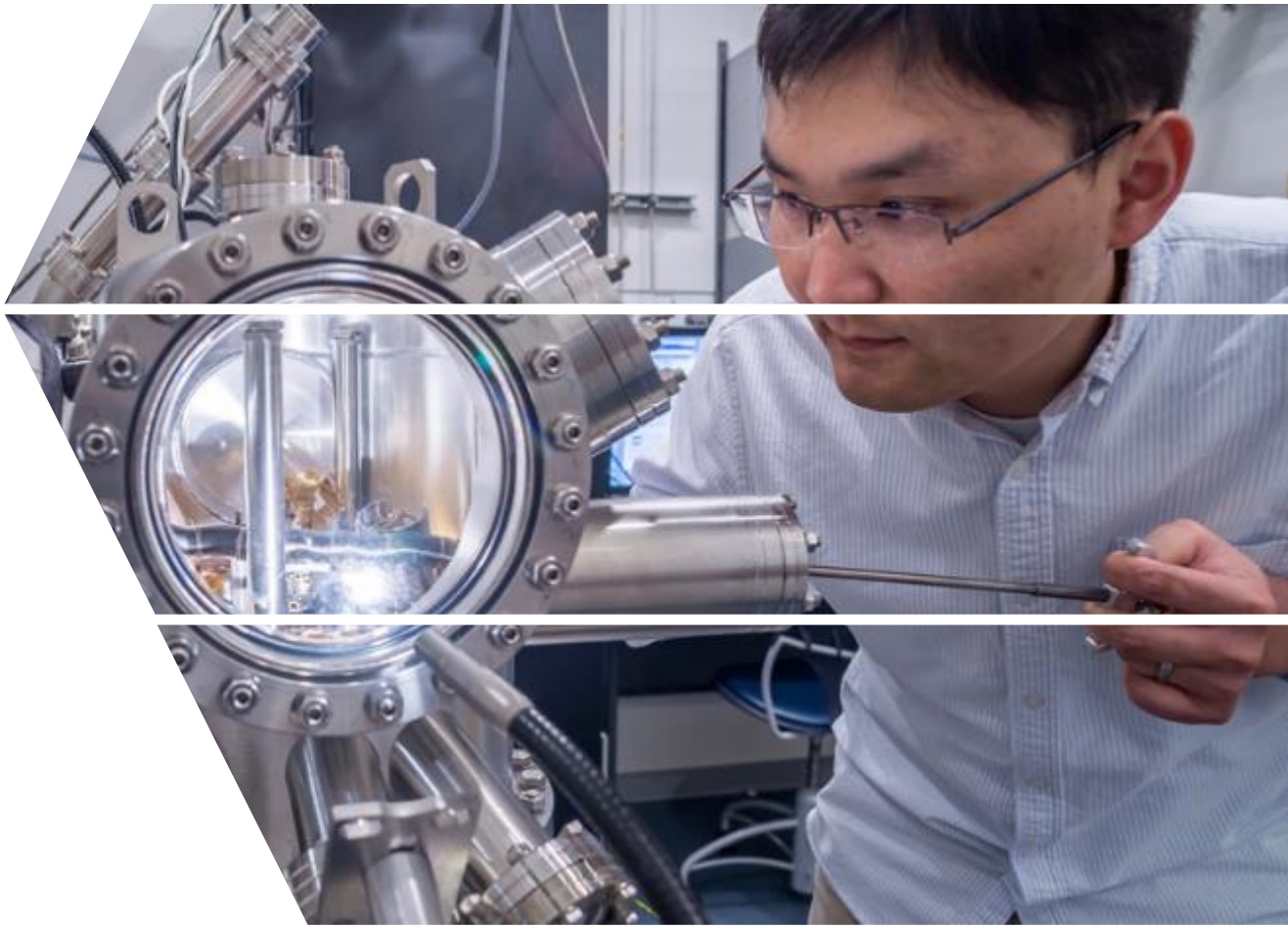
RENEW
Reaching a New Energy Sciences Workforce

FAIR
Funding for Accelerated, Inclusive Research

EPSCoR
DOE Established Program to Stimulate Competitive Research that promotes geographically inclusive and equitable research

Promoting Inclusive and Equitable Research (PIER) Plan

- All new and renewal proposals are required to submit a PIER Plan
- The complexity and detail of the plan is expected to increase with the size of the research team
- The PIER Plan will be evaluated under a new merit review criterion as part of the peer review process



Stay Connected

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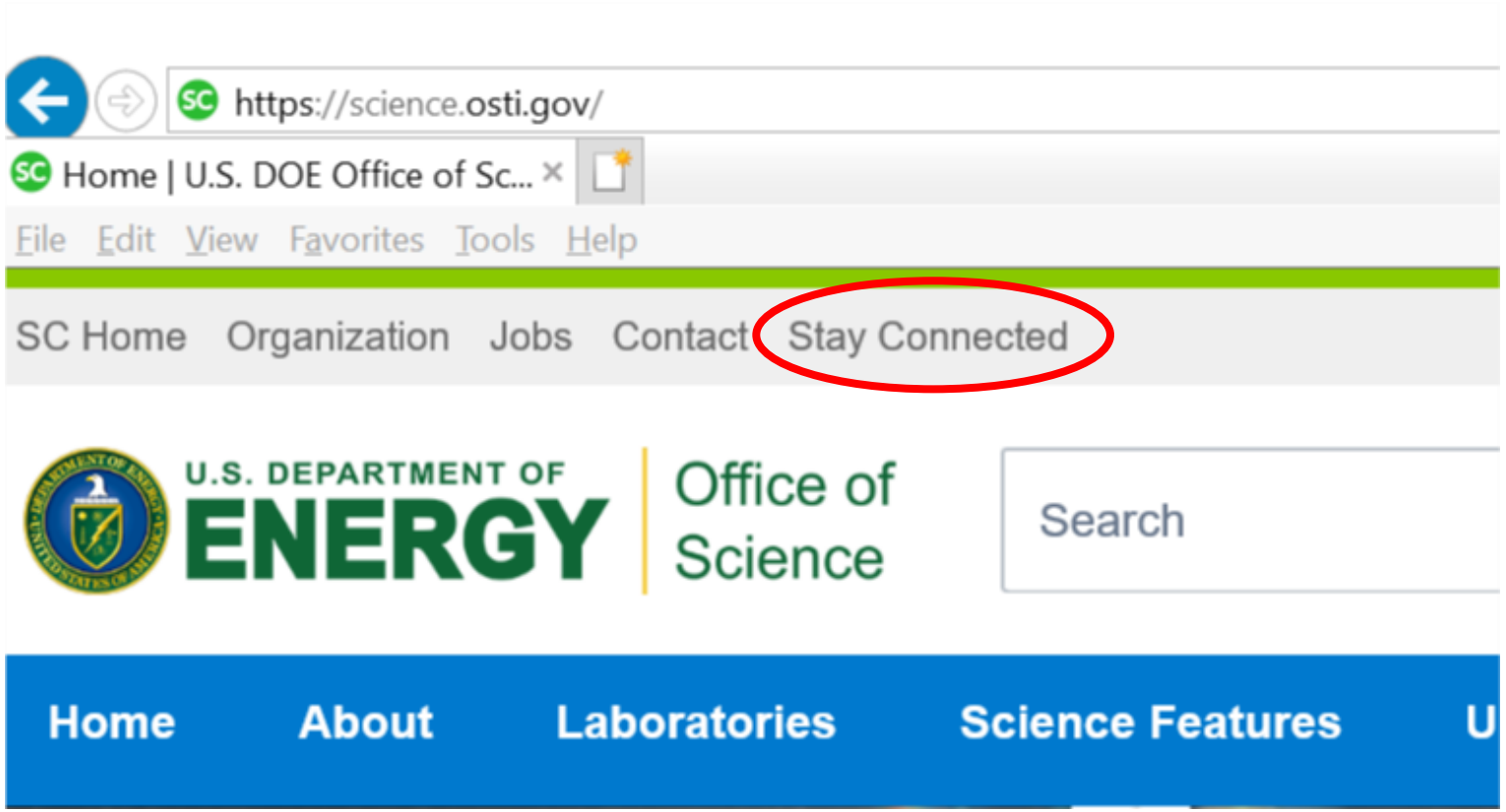
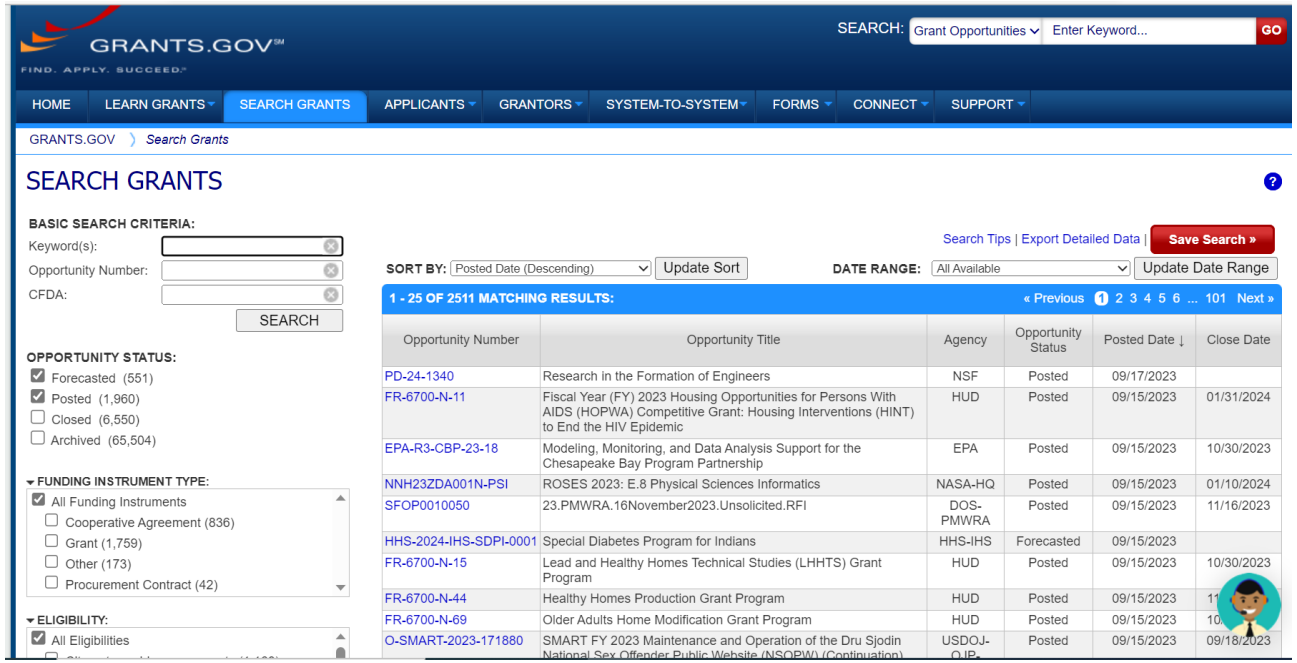


Funding Modalities Within the Office of Science

Funding Opportunities to:

- DOE National Laboratories
- Academic Community
- SBIR/STTR Funding Opportunities

User Facility Support



Grants.gov

[Tab] Department of Energy – Office of Science

Upcoming Office Hours/Topics

Biological and Environmental Research (BER)

BER will hold virtual office hours on the fourth Tuesday of the month, 2-3 pm ET. Upcoming topics include:

- Tuesday, April 23, 2024 at 2pm ET – Introduction to the BER Biological Systems Science portfolio
- Tuesday, May 28, 2024 at 2pm ET – Introduction to the BER Earth and Environmental Systems Science portfolio

See the links for registration to the online webinars.

Later topics for June and July - TBD

BER Information and Contact info

Biological and Environmental Res... | U.S. DOE Office of Science (SC) (osti.gov)
BER Staff | U.S. DOE Office of Science (SC) (osti.gov)


THANK YOU!