U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Historically Black Community Colleges Webinar

Presenters:

- Trina Bilal, Program Manager, Office of Economic Impact & Diversity, U.S. Department of Energy (DOE)
- Brandi Toliver, Program Manager, DOE Office of Science
- Sheila Dillard, Communications and Stakeholder Engagement Lead, DOE Bioenergy Technologies Office
- Jennifer Jackson, K-12 STEM Program Manager, Idaho National Laboratory
- Kelly Sturner, Learning Center Program Coordinator, Argonne National Laboratory
- Ashley Lovett, Communications Fellow, DOE Bioenergy Technologies Office

August 31, 2023

Webinar Housekeeping

- Audio connection options:
  - Computer audio
  - Dial in through your phone (best connection)
- There will be two Q&A sessions
- Automated closed captions are available
- Technical difficulties? Contact me through the chat section, lower right of your screen

Sign up for BETO news, events, and funding opportunities:
energy.gov/eere/bioenergy/beto-newsletter

Trina Bilal

Program Manager, Office of Economic Impact & Diversity, U.S. Department of Energy

Department of Energy

OFFICE OF SCIENCE

Presenter: Dr. Brandi Toliver
Program Manager

U.S. DEPARTMENT OF ENERGY | Office of Science

U.S. DEPARTMENT OF ENERGY | Office of Science

SC Mission:

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

Nearly **29,000** Researchers Supported at **>300** Institutions and **17** DOE Labs

Steward **10** of the 17 DOE National labs

Nearly **34,000** Users of **28** SC Scientific Facilities

$8.1B
(FY 23 enacted)

U.S. DEPARTMENT OF ENERGY | Office of Science

Driving Discovery Science for the Nation

Discovery science supported by the Office of Science builds the foundation for ensuring America's future prosperity and competitiveness by addressing its energy, environment, and national security challenges.

Fostering Great Minds and Great Ideas

The Office of Science addresses the world's most challenging scientific problems, supporting innovation from America's brightest minds, across multiple disciplines, and at universities, DOE's national laboratories, and other research institutions.

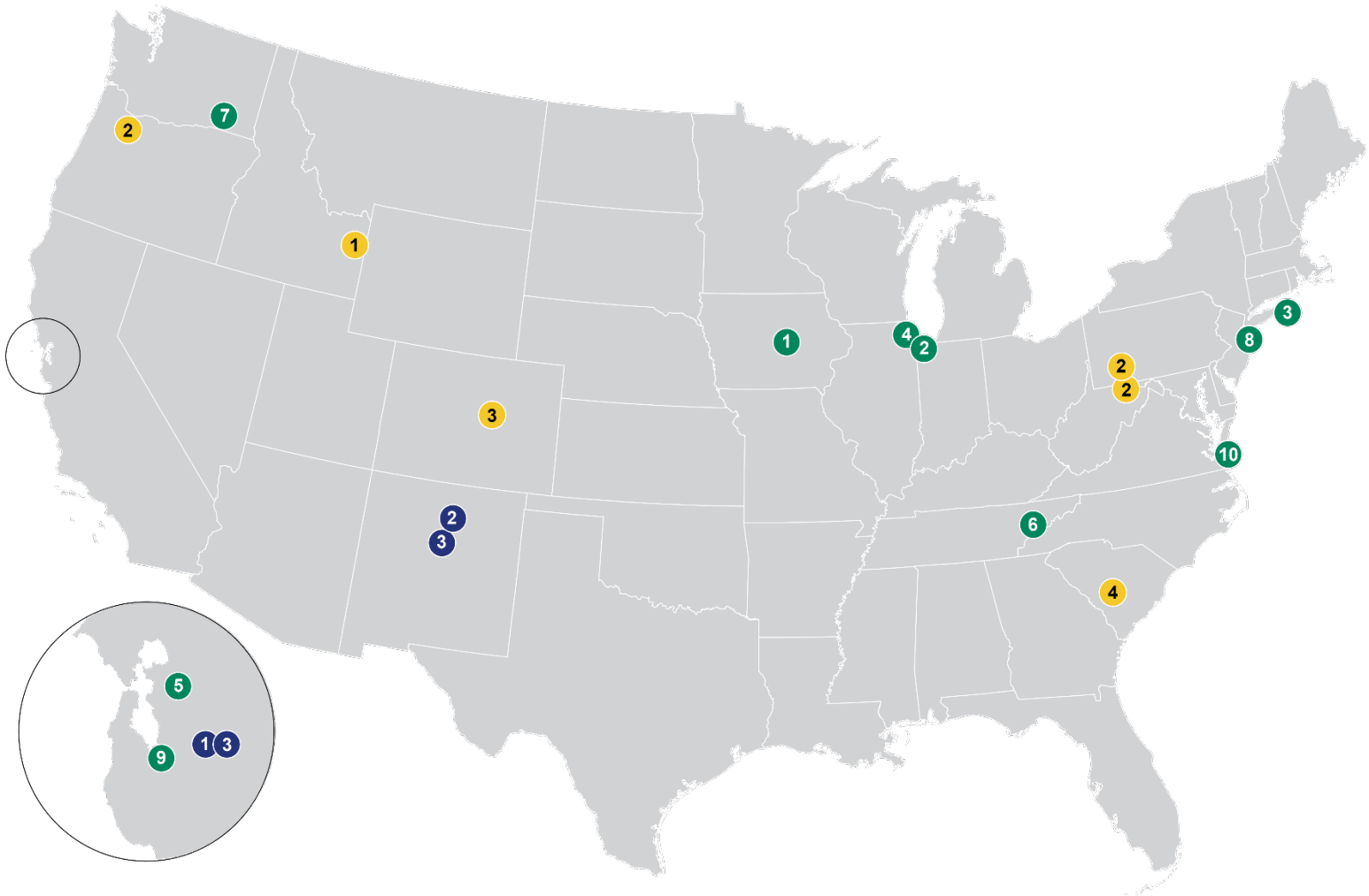
Providing Unique, World-Class Facilities

The Office of Science stewards a suite of scientific user facilities that provide the broad scientific community with world-leading capabilities for research - from physics, materials science, and chemistry to genomics and medicine.

Seventeen DOE National Laboratories

Office of Science Laboratories

1. **Ames National Laboratory**
   Ames, Iowa
2. **Argonne National Laboratory**
   Argonne, Illinois
3. **Brookhaven National Laboratory**
   Upton, New York
4. **Fermi National Accelerator Laboratory**
   Batavia, Illinois
5. **Lawrence Berkeley National Laboratory**
   Berkeley, California
6. **Oak Ridge National Laboratory**
   Oak Ridge, Tennessee
7. **Pacific Northwest National Laboratory**
   Richland, Washington
8. **Princeton Plasma Physics Laboratory**
   Princeton, New Jersey
9. **SLAC National Accelerator Laboratory**
   Menlo Park, California
10. **Thomas Jefferson National Accelerator Facility**
    Newport News, Virginia



Other DOE Laboratories

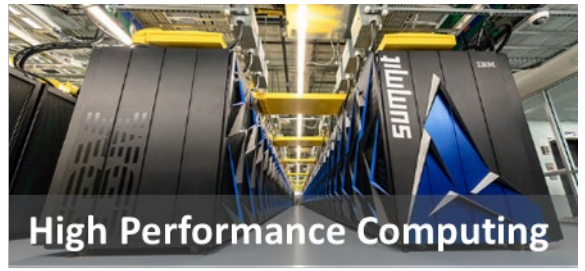
1. **Idaho National Laboratory**
   Idaho Falls, Idaho
2. **National Energy Technology Laboratory**
   Morgantown, West Virginia
   Pittsburgh, Pennsylvania
   Albany, Oregon
3. **National Renewable Energy Laboratory**
   Golden, Colorado
4. **Savannah River National Laboratory**
   Aiken, South Carolina

NNSA Laboratories

1. **Lawrence Livermore National Laboratory**
   Livermore, California
2. **Los Alamos National Laboratory**
   Los Alamos, New Mexico
3. **Sandia National Laboratory**
   Albuquerque, New Mexico
   Livermore, California

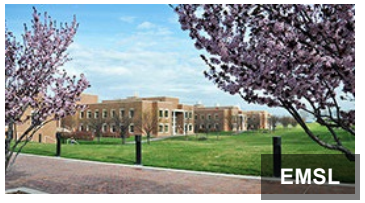
Office of Science User Facilities

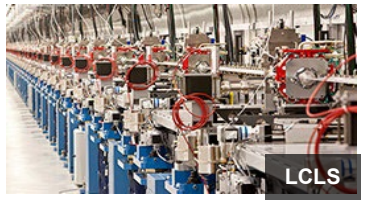
- Open to all interested potential users without regard to nationality or institutional affiliation
- Each facility manages the allocation of facility resources through merit-based peer review of research proposals
- User fees are not charged for non-proprietary work if the user intends to publish the research results in the open literature
- Full cost recovery is required for proprietary work

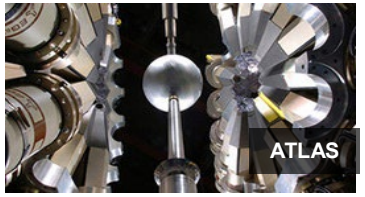


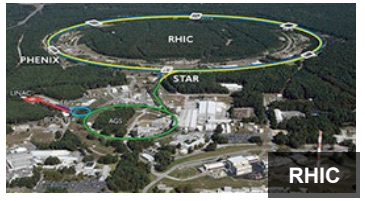
DOE Office of Science – Scientific User Facilities

FY 2023
28 scientific
user facilities
~34,000 users

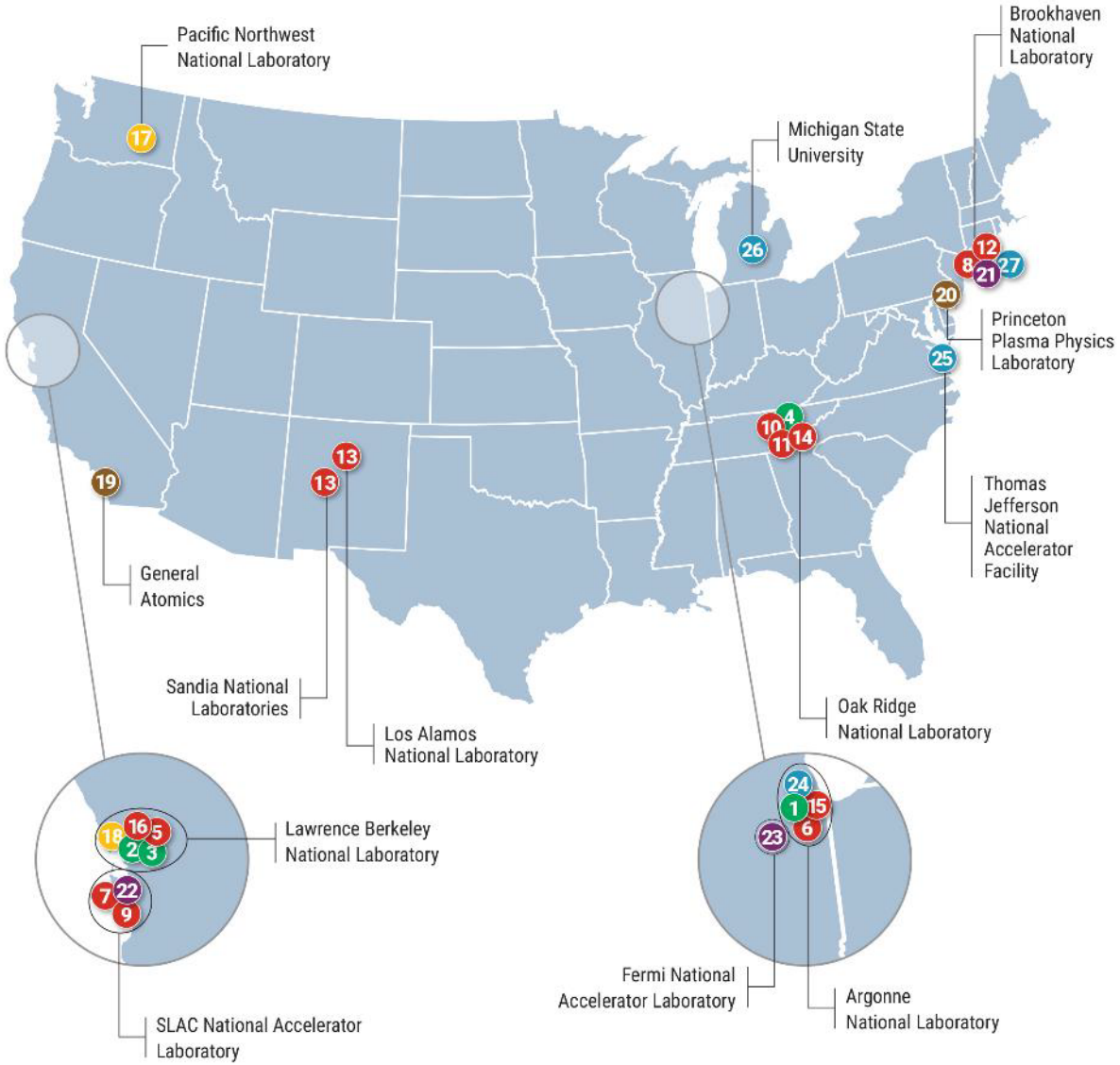








U.S. Department of Energy
Office of Science User Facilities



Advanced Scientific Computing Research (ASCR)

1. **Argonne Leadership Computing Facility (ALCF)**
   Argonne National Laboratory
2. **Energy Sciences Network (ESnet)**
   Lawrence Berkeley National Laboratory
3. **National Energy Research Scientific Computing Center (NERSC)**
   Lawrence Berkeley National Laboratory
4. **Oak Ridge Leadership Computing Facility (OLCF)**
   Oak Ridge National Laboratory

Basic Energy Sciences (BES)

LIGHT SOURCES

5. **Advanced Light Source (ALS)**
   Lawrence Berkeley National Laboratory
6. **Advanced Photon Source (APS)**
   Argonne National Laboratory
7. **Linac Coherent Light Source (LCLS)**
   SLAC National Accelerator Laboratory
8. **National Synchrotron Light Source II (NSLS-II)**
   Brookhaven National Laboratory
9. **Stanford Synchrotron Radiation Lightsource (SSRL)**
   SLAC National Accelerator Laboratory

NEUTRON SOURCES

10. **High Flux Isotope Reactor (HFIR)**
    Oak Ridge National Laboratory
11. **Spallation Neutron Source (SNS)**
    Oak Ridge National Laboratory

NANOSCALE SCIENCE RESEARCH CENTERS

12. **Center for Functional Nanomaterials (CFN)**
    Brookhaven National Laboratory
13. **Center for Integrated Nanotechnologies (CINT)**
    Sandia National Laboratories and Los Alamos National Laboratory
14. **Center for Nanophase Materials Sciences (CNMS)**
    Oak Ridge National Laboratory
15. **Center for Nanoscale Materials (CNM)**
    Argonne National Laboratory
16. **The Molecular Foundry (TMF)**
    Lawrence Berkeley National Laboratory

Biological and Environmental Research (BER)

17. **Atmospheric Radiation Measurement (ARM) User Facility**
    Multi-Site Global Network
17. **Environmental Molecular Sciences Laboratory (EMSL)**
    Pacific Northwest National Laboratory
18. **Joint Genome Institute (JGI)**
    Lawrence Berkeley National Laboratory

Fusion Energy Sciences (FES)

19. **DIII-D National Fusion Facility**
    General Atomics
20. **National Spherical Torus Experiment Upgrade (NSTX-U)**
    Princeton Plasma Physics Laboratory

High Energy Physics (HEP)

21. **Accelerator Test Facility (ATF)**
    Brookhaven National Laboratory
22. **Facility for Advanced Accelerator Experimental Tests (FACET)**
    SLAC National Accelerator Laboratory
23. **Fermilab Accelerator Complex**
    Fermi National Accelerator Laboratory

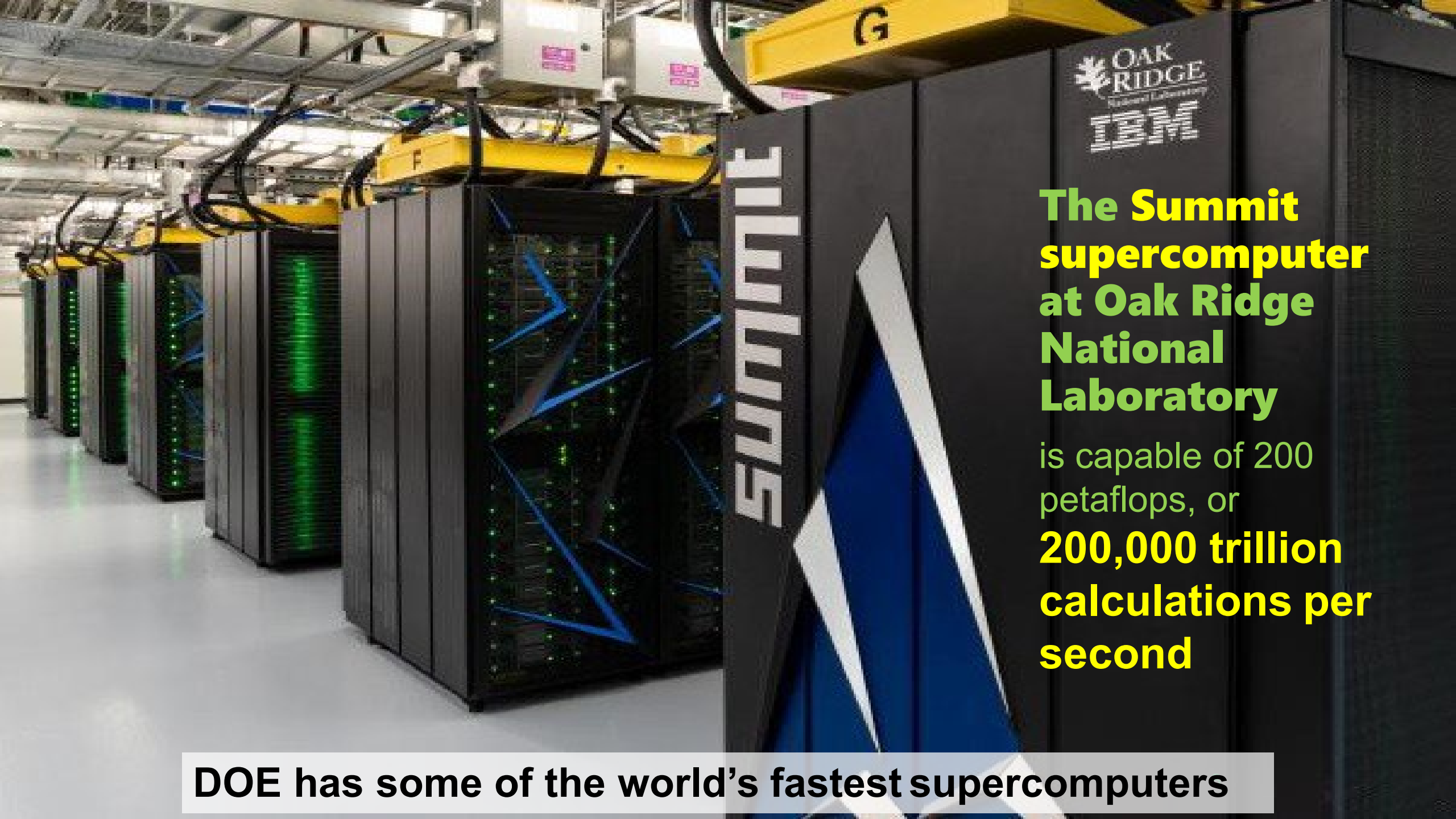
Nuclear Physics (NP)

24. **Argonne Tandem Linac Accelerator System (ATLAS)**
    Argonne National Laboratory
25. **Continuous Electron Beam Accelerator Facility (CEBAF)**
    Thomas Jefferson National Accelerator Facility
26. **Facility for Rare Isotope Beams (FRIB)**
    Michigan State University
27. **Relativistic Heavy Ion Collider (RHIC)**
    Brookhaven National Laboratory

The Office of Science Research Portfolio

https://science.osti.gov/Programs/

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 during national crisis
Accelerator R&D and Production	• Supporting new technologies for use in SC's scientific facilities and in commercial products



The Summit supercomputer at Oak Ridge National Laboratory

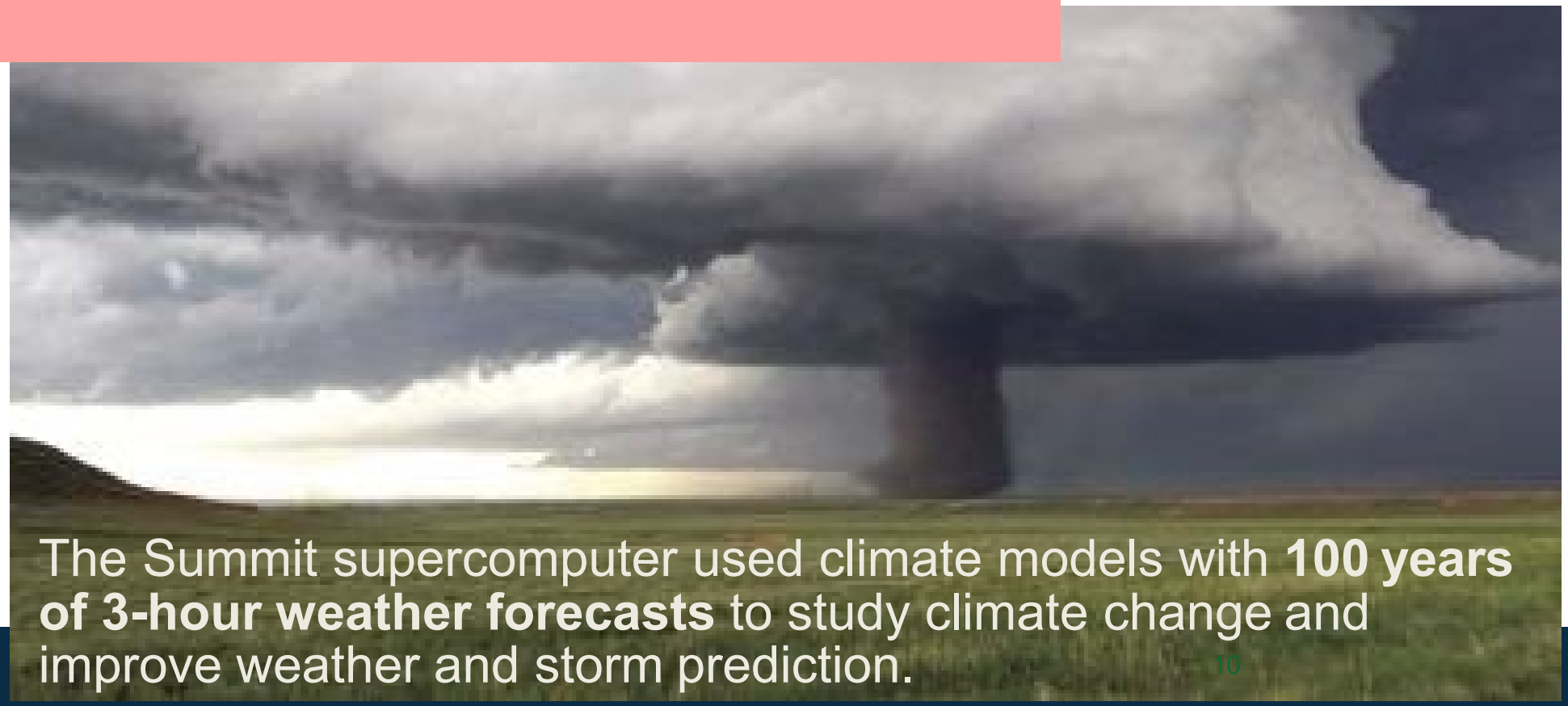
is capable of 200 petaflops, or

200,000 trillion calculations per second

DOE has some of the world's fastest supercomputers

https://www.wired.com/story/worlds-fastest-supercomputer-breaks-ai-record/, 1/31/2019

THE WORLD'S FASTEST SUPERCOMPUTER BREAKS AN AI RECORD



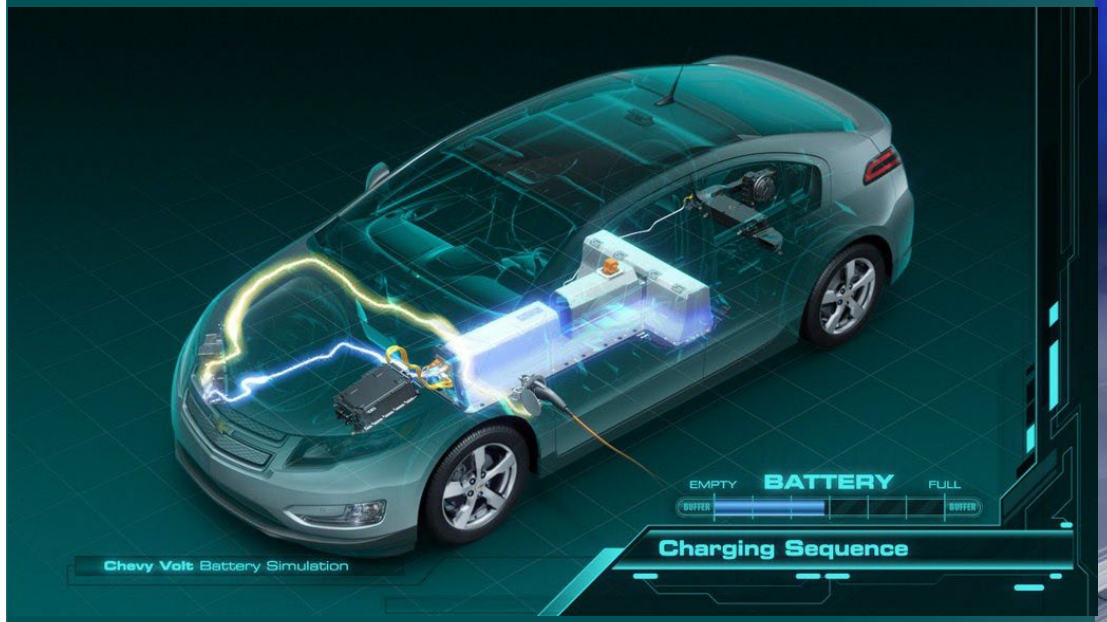
The Summit supercomputer used climate models with **100 years of 3-hour weather forecasts** to study climate change and improve weather and storm prediction.

https://youtu.be/etVzy1z_Ptg

Advanced Photon Source

Argonne NATIONAL LABORATORY

Generates **ultra-bright x-ray beams**
used for research in almost all scientific disciplines



The chemistry used in the
Chevy Volt battery
was developed through X-ray experiments at the Advanced Photon Source

The Periodic Table of Elements is larger as a result of the contributions at the DOE national labs..

- The most recent discovery was Element 117 which was named “tennessine” (Ts) in recognition of the team of scientists at ORNL and other institutions who worked on the research. It’s the second-heaviest known element on Earth, and though its use is limited to research, scientists believe it is a critical steppi Element 117 was officially named “tennessine” (Ts). It’s the second-heaviest known element on Earth, and though its use is limited to research, scientists believe it is a critical stepping stone toward the creation of future superheavy elements.ng stone toward the creation of future superheavy elements.

Introduction to the Workforce Development for Teachers and Scientists (WDTS) Programs

Why does the Office of Science Sponsor Workforce Development Programs?

- Generate new and innovate ideas.
- Encourage collaborations between to the DOE national laboratories and colleges/universities.
- Develop a diverse and skilled talent pool of technicians, scientists, engineers, and technologists.
- Sustain the DOE's technical and scientific workforce.

Workforce Development for Teachers and Scientists (WDTS)

The Office of Science is deeply committed to:

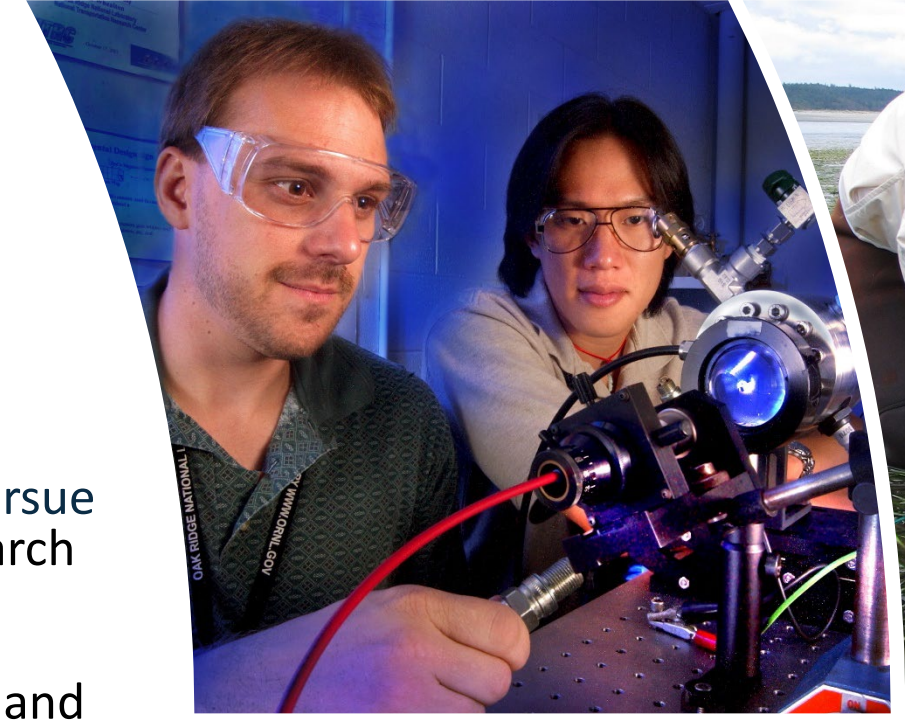
- Building STEM competence and accelerating growth through equitable opportunities
- Diversifying the STEM pipeline via multiple pathways
- Be a productive partner for mission-driven workforce development

science.osti.gov/WDTS

Community College Internships (CCI)

- Prepare for technical careers and/or pursue 4-year degrees through authentic research experiences.
- Hands-on research, discovery learning, and professional development guided by mentors.
- Open to current community college student; Stipend of $650/week + round trip travel to host laboratory + lodging allowance
- Fall, Spring, Summer Terms

CCI website: https://science.osti.gov/wdts/cci



Science Undergraduate Laboratory Internships (SULI)

- Prepare for STEM careers through authentic research experiences
- Hands-on research, discovery learning, and professional development guided by mentors
- Open to undergraduate students and recent graduates; Stipend of $650/week + round trip travel to host laboratory + lodging allowance
- Fall, Spring, Summer Terms

Credit: **Lawrence Berkeley National Laboratory**

CCI and SULI: Eligibility Requirements

- **Citizenship**-Must be a United States Citizen or Lawful Permanent Resident at the time of applying.
- **Age**-Must be 18 years or older at the time the internship begins.
- **Academic Status**-Must be currently enrolled as a full-time student at an accredited two-year or four-year college and completed at least one semester at the time of applying. Note: Recent graduates who have received their associate or bachelor degree within 2-years of starting their internship are eligible to apply to SULI.
- **High School Diploma or GED**- Must have earned a high school diploma or General Educational Development (GED) equivalent at the time of applying.
- **Grade Point Average (GPA)**-Must have an undergraduate cumulative minimum Grade Point Average (GPA) of 3.0 on a 4.0 scale for all completed courses taken as a matriculated student at the applicant's current (or recently-graduated) institution and at any undergraduate institutions attended as a matriculated postsecondary student during the 5 years preceding the start of the current enrollment. College courses completed during high school are not required to be reported.
- **Coursework**-Must have completed at least 6 credit hours in science, mathematics, engineering, or technology course areas, and completed at least 12 credits hours towards a degree.

CCI and SULI: Application Components

- Responses to application questions
  - Personal Information
  - Academic Affiliation
  - Awards/Honors
  - Work Experience
  - Laboratory Preference
- Essays (Personal Interest, Research Interest, Professional Interest)
- Transcripts: Must submit transcripts from all universities/colleges attended in 5 years prior to enrollment at current institution.
- Two recommendation letters

Visiting Faculty Program (VFP)

- Enhance research competitiveness and strengthen STEM teaching
- Research collaboration with and access to facilities/resources at DOE national laboratories
- Offers Two Tracks: (1) Research Track and (2) Teaching Initiative Track.
- Application Periods:
  *Fall, *Spring, and Summer Terms

* indicates prior participation in VFP required

VFP: Eligibility Requirements

- **Eligibility for Academic Institutions:**
  - School must not have Carnegie Classification of Doctoral/Research Universities ratings of Very High or High Research Activity. All HBCUs are eligible.
- **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). Adjunct or visiting faculty are ineligible
  - Must work in a STEM field

VFP Application Process

- Identify potential collaborator at a host DOE national laboratory
- Develop a 6-page proposal with potential collaborator at the DOE national laboratory. Note: Format for proposal is listed on the VFP website.
- Responses to application questions.
  - Curriculum Vitae for Applicant and Co-PI at the DOE laboratory
- Two Recommendation Letters
- Considering the VFP Teaching Initiative Track? In addition to the items above, a 1-page teaching statement is required.

Key Dates

SULI/CCI/VFP Application Activity	Term: Summer 2024
On-line Application Opens	October 17, 2023
Applications including recommendations due	**January 9, 2024 5:00 PM EDT**
Offer Notification Period Begins on or around	January 31, 2024
All DOE Offers and Notifications Complete	On or around April 10, 2024

*****The Application System closes at 5:00 PM Eastern Daylight Time. Materials will not be accepted after the system has closed.**

Tips for Successfully Applying to WDTS Programs

- Verify you meet the eligibility requirements.
- Plan early. Submit your application ahead of the deadline!
- Make sure all the fields in the application have a response.
- Notify letter writers for recommendations of your intent to apply to the program early and inform them that the letter must be submitted through the application portal. Letters are not accepted by e-mail.
- Transcripts are required to be submitted for all universities/colleges attended after high school and within 5-years of enrollment at current institution.
- Visit the website to learn about the program and review available resources.
- Ask questions! We're available to assist you. ☺

Join Us for An Application Assistance Workshop!!

- **Next Workshop**
- **Alumni Panel Discussion-September 6, 2023, at 2:00 pm (EDT)**
- Register here. More info available on CCI/SULI website.
- Offered each application cycle.
  - Workshops for the Summer Term will be announced mid-October 2023 on WDTS website.

Join us for the Summer Internship Fair on November 8, 2023.

My Internship Experience at a Federal Laboratory

Dr. Toliver receiving her certificate of completion during her appointment as an intern at NASA's Johnson Space Center.

Connect with us…..

- After this session, e-mail:
  - Brandi.Toliver@science.doe.gov
  - sc.cci@science.doe.gov for questions about CCI
  - sc.suli@science.doe.gov if you have questions about SULI.
  - sc.vfp@science.doe.gov if you have questions about VFP.
- Connect with us on LinkedIn
  - Office of Science
  - Office of Workforce Development for Teachers and Scientists (WDTS)
- Follow the Department of Energy on Twitter
- Subscribe to the YouTube Channel
- Visit the CCI, SULI, and VFP websites

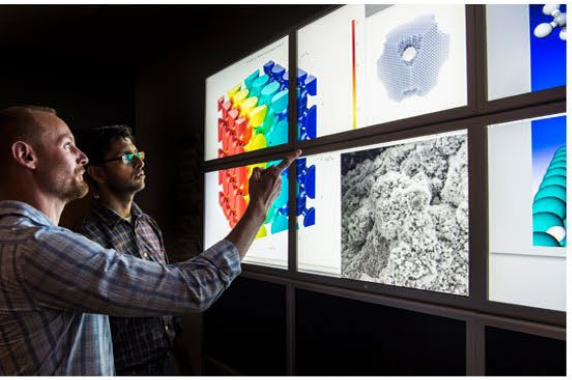
Questions?

Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Bioenergy Research and Education BRIDGES Program

August 2023

BETO BRIDGES Team




Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

BRIDGES Team








Sheila Dillard, Communications and Stakeholder Engagement Lead, U.S. Department of Energy Bioenergy Technologies Office
Ashley Lovett, Communications Fellow, U.S. Department of Energy Bioenergy Technologies Office
Andrew Taylor, Communications Specialist, U.S. Department of Energy Bioenergy Technologies Office / The Building People
Michelle Frederic, Sr. Communications & Stakeholder Engagement Specialist, U.S. Department of Energy Bioenergy Technologies Office / The Building People
Sara Leonard, Communications Project Lead, NREL Communications Office
Jennifer Jackson, Program Manager, STEM Education & Tribal Engagement, Idaho National Laboratory
Cait McGraw, STEM Education & Outreach Coordinator, Idaho National Laboratory
Kelly Sturner, Learning Center Program Coordinator, Argonne National Laboratory
Annemarie Duncan, Bioenergy Curriculum Writer, Argonne National Laboratory, not pictured

How was BETO BRIDGES created?

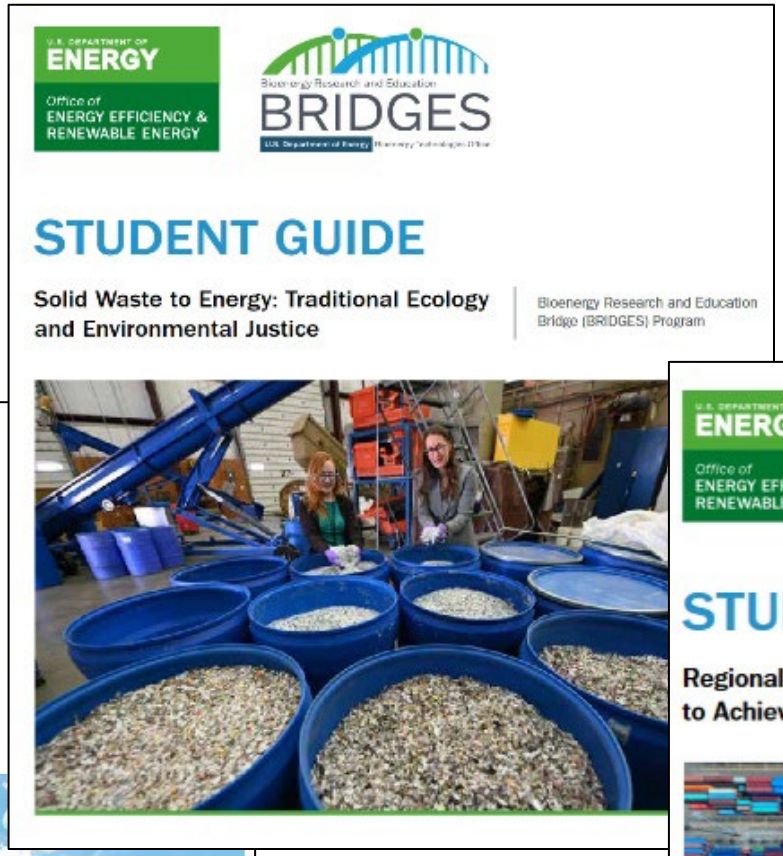
Photo by iStock

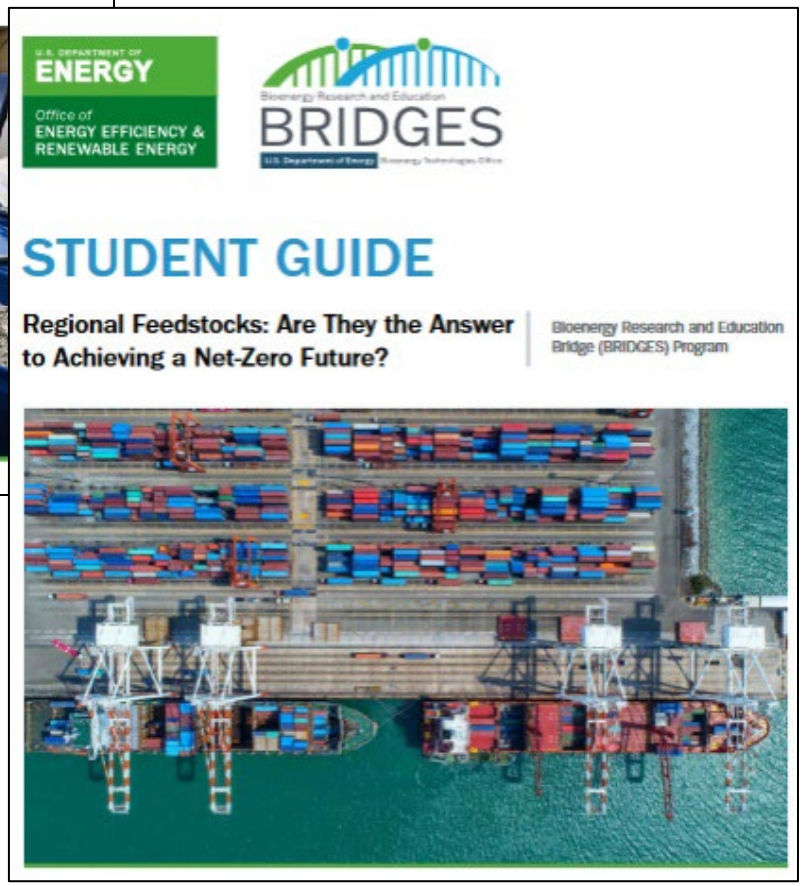
BRIDGES: A Bioenergy Toolkit for Educators

Resources for Educators to Introduce Bioenergy Topics and Prepare a National Workforce

- Bring current U.S Department of Energy scientific research to the classroom
- Create awareness of bioenergy topics and careers
- Ease the transition from academics to industry
- Provide equitable access to high-quality bioenergy learning materials.

BRIDGES Student and Instructor Guides Now Available





Materials that Support BRIDGES

Fact Sheets and Primer:

U.S. DEPARTMENT OF ENERGY
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Municipal Solid Waste-to-Energy: Traditional Ecology and Environmental Justice

Bioenergy Research and Education Bridge (BRIDGES) Program Case Study Fact Sheet

...otection Agency (EPA) we generate 292.4 million tons of trash in one year and 146.1 million tons ...rom Idaho National Laboratory.

...inform potential solutions while being culturally responsive.

In this case study, students will be introduced to the Shoshone-Bannock Tribes, located on the Fort Hall Indian Reservation in southeastern Idaho.[1] Like many communities, the Tribes face the challenge of identifying sustainable practices to deal with their municipal solid waste (MSW), also known as landfill waste.

Students will assume the role of a chemical engineer at Idaho National Laboratory, who will assist the Tribal Youth Council in exploring sustainable solutions for managing waste streams while applying principles of environmental justice.

Activity Highlights

- Eligible students and instructors will receive a classroom kit with waste stream samples and other hands-on learning materials.
- Students will practice essential skills in synthesizing information, analyzing data, and communicating ideas.
- Materials are designed with scientists and industry professionals.
- Students will learn about bioenergy-related career paths.

...a sustainable waste management strategy, and the unique challenges experienced by an over-burdened and underserved community. Students will focus on the ways that science and technology can

What is BETO?

The Bioenergy Technologies Office within the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy supports the research, development, and demonstration of technologies aimed at mobilizing domestic renewable carbon resources for the reduction of greenhouse gas emissions across the U.S. economy.

Bioenergy can help ensure an economically sound and secure future while reducing environmental impacts by:

- Developing affordable domestic fuels and coproducts.
- Advancing clean energy sources.
- Generating domestic jobs to support the growth of the U.S. bioeconomy.

Get involved! For more information about the BRIDGES program or to access BRIDGES materials, visit energy.gov/BRIDGES, or email Bioenergy_Bridges@ee.doe.gov.

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
BIOENERGY TECHNOLOGIES OFFICE

Argonne | BRIDGES | INL Idaho National Laboratory

For more information, visit: energy.gov/bridges

DOE/EE-2699 • March 2023

College photos from the National Renewable Energy Laboratory, the Algae Foundation, and Unsplash.

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Bioenergy Research and Education BRIDGES Program Prepares a National Bioenergy Workforce

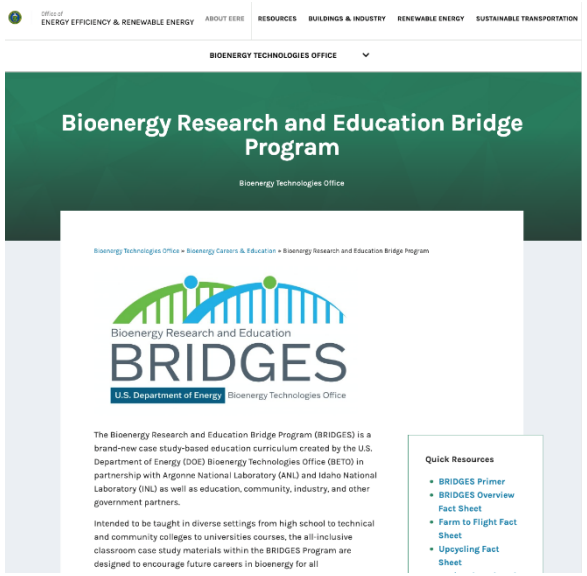
What is BRIDGES?

The U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) Bioenergy Research and Education Bridge (BRIDGES) is an educational development program designed to assist educators in teaching bioenergy topics to help prepare the future bioenergy workforce.

The bioenergy-themed case studies are based upon foundational bioenergy research at DOE national laboratories. Specific goals for the BRIDGES program include:

- Translating DOE scientific research for the classroom setting
- Creating awareness of bioenergy topics and careers
- Accelerating the transition from academics to industry
- Providing equitable access to high-quality bioenergy learning materials.

Web Portal for Digital Download:



Office of ENERGY EFFICIENCY & RENEWABLE ENERGY | ABOUT EERE | RESOURCES | BUILDINGS & INDUSTRY | RENEWABLE ENERGY | SUSTAINABLE TRANSPORTATION

BIOENERGY TECHNOLOGIES OFFICE

Bioenergy Research and Education Bridge Program

Bioenergy Technologies Office

Bioenergy Technologies Office » Bioenergy Careers & Education » Bioenergy Research and Education Bridge Program

Bioenergy Research and Education BRIDGES

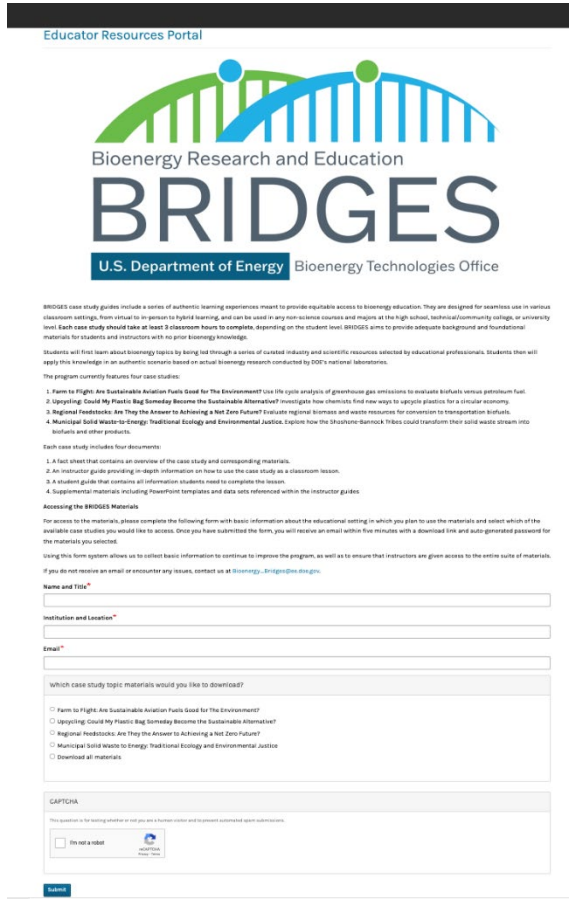
U.S. Department of Energy | Bioenergy Technologies Office

The Bioenergy Research and Education Bridge Program (BRIDGES) is a brand-new case study-based education curriculum created by the U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) in partnership with Argonne National Laboratory (ANL) and Idaho National Laboratory (INL) as well as education, community, industry, and other government partners.

Intended to be taught in diverse settings from high school to technical and community colleges to universities courses, the all-inclusive classroom case study materials within the BRIDGES Program are designed to encourage future careers in bioenergy for all

Quick Resources

- BRIDGES Primer
- BRIDGES Overview Fact Sheet
- Farm to Flight Fact Sheet
- Upcycling Fact Sheet



Educator Resources Portal

Bioenergy Research and Education BRIDGES

U.S. Department of Energy | Bioenergy Technologies Office

BRIDGES case study guides include a series of authentic learning experiences meant to provide equitable access to bioenergy education. They are designed for seamless use in various classroom settings, from virtual to in-person to hybrid learning, and can be used in any non-science courses and majors at the high school, technical/community college, or university level. **Each case study should take at least 3 classroom hours to complete**, depending on the student level. BRIDGES aims to provide adequate background and foundational materials for students and instructors with no prior bioenergy knowledge.

Students will first learn about bioenergy topics by being led through a series of curated industry and scientific resources selected by educational professionals. Students then will apply this knowledge in an authentic scenario based on actual bioenergy research conducted by DOE's national laboratories.

The program currently features four case studies:

1. **Farm to Flight: Are Sustainable Aviation Fuels Good for The Environment?** Use life cycle analysis of greenhouse gas emissions to evaluate biofuels versus petroleum fuel.
2. **Upcycling: Could My Plastic Bag Someday Become the Sustainable Alternative?** Investigate how chemists find new ways to upcycle plastics for a circular economy.
3. **Regional Feedstocks: Are They the Answer to Achieving a Net Zero Future?** Evaluate regional biomass and waste resources for conversion to transportation biofuels.
4. **Municipal Solid Waste-to-Energy: Traditional Ecology and Environmental Justice.** Explore how the Shoshone-Bannock Tribes could transform their solid waste stream into biofuels and other products.

Each case study includes four documents:

1. A fact sheet that contains an overview of the case study and corresponding materials.
2. An instructor guide providing in-depth information on how to use the case study as a classroom lesson.
3. A student guide that contains all information students need to complete the lesson.
4. Supplemental materials including PowerPoint templates and data sets referenced within the instructor guides

Accessing the BRIDGES Materials

For access to the materials, please complete the following form with basic information about the educational setting in which you plan to use the materials and select which of the available case studies you would like to access. Once you have submitted the form, you will receive an email within five minutes with a download link and auto-generated password for the materials you selected.

Using this form system allows us to collect basic information to continue to improve the program, as well as to ensure that instructors are given access to the entire suite of materials.

If you do not receive an email or encounter any issues, contact us at Bioenergy_Bridges@ee.doe.gov.

Name and Title*

Institution and Location*

Email*

Which case study topic materials would you like to download?

- Farm to Flight: Are Sustainable Aviation Fuels Good for The Environment?
- Upcycling: Could My Plastic Bag Someday Become the Sustainable Alternative?
- Regional Feedstocks: Are They the Answer to Achieving a Net Zero Future?
- Municipal Solid Waste to Energy: Traditional Ecology and Environmental Justice
- Download all materials

CAPTCHA

This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.

I'm not a robot

Submit

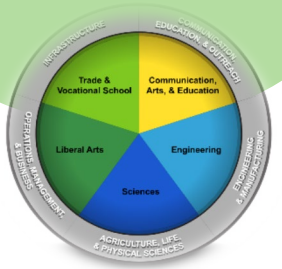
Inside a BRIDGES Case Study ...

Topic Introduced with Authentic Scenario

Students Explore Resources

Students Demonstrate Learning

Career Exploration



Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

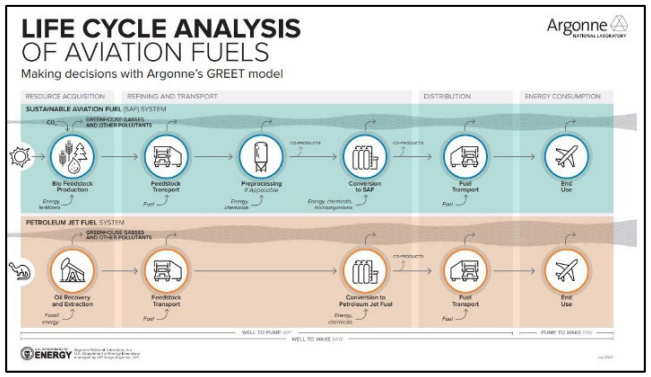
Topic Introduced with Authentic Scenario

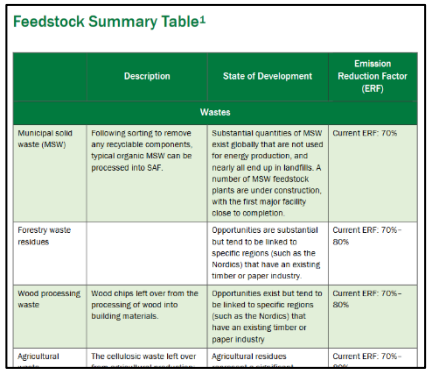
- Students play role of a sustainability specialist
- Phone call comes in from an airline CEO saying the board of directors is concerned.
- The board requires an expert analysis … are sustainable aviation fuels good for the environment?

Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Students Explore Bioenergy Resources

- **Part 1: Bioenergy and Lifecycle Analysis**
  - Guide students through resources and background information

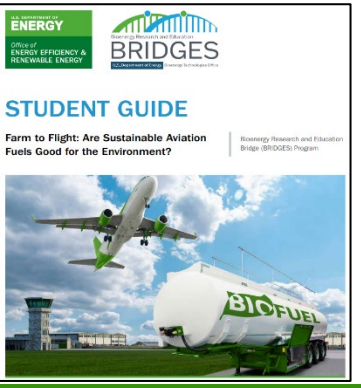


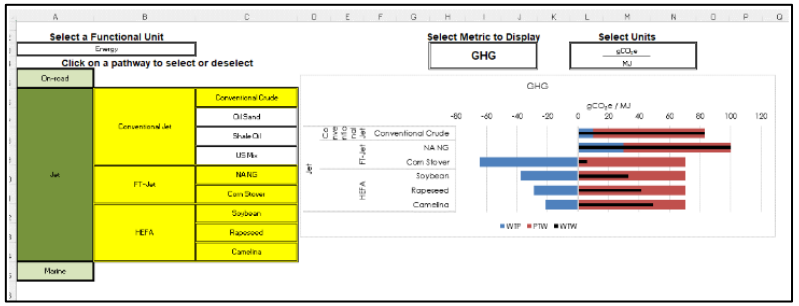


Feedstock Summary Table[1]

	Description	State of Development	Emission Reduction Factor (ERF)
Wastes			
Municipal solid waste (MSW)	Following sorting to remove any recyclable components, typical organic MSW can be processed into SAF.	Substantial quantities of MSW exist globally that are not used for energy production, and nearly all end up in landfills. A number of MSW feedstock plants are under construction, with the first major facility close to completion.	Current ERF: 70%
Forestry waste residues		Opportunities are substantial but tend to be linked to specific regions (such as the Nordics) that have an existing timber or paper industry.	Current ERF: 70% - 80%
Wood processing waste	Wood chips left over from the processing of wood into building materials.	Opportunities exist but tend to be linked to specific regions (such as the Nordics) that have an existing timber or paper industry	Current ERF: 70% - 80%
Agricultural	The cellulosic waste left over	Agricultural residues	Current ERF: 70% -

- **Part 2: Working with a Computational Model as a Life Cycle Analyst**
  - Students use GREET (Greenhouse gases, Regulated Emissions, and Energy use in Technologies)





Bioenergy Research and Education BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Students Demonstrate Learning

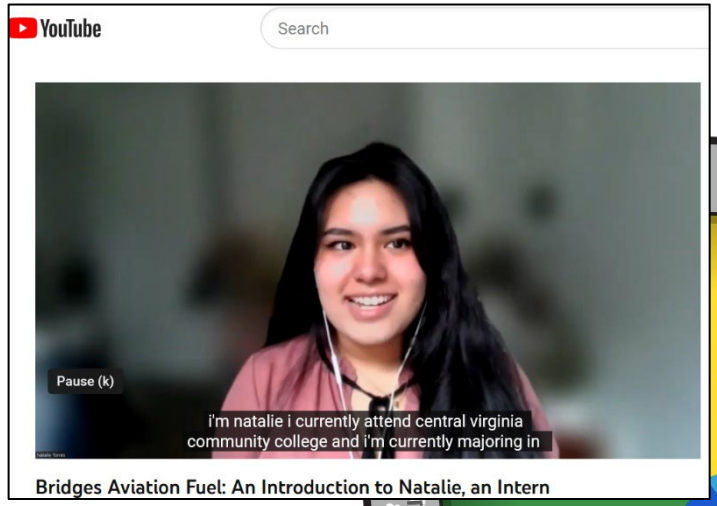
- Students develop and communicate their findings as presentations for a board of directors.
- Students demonstrate understanding of bioenergy, sustainable aviation fuels, life cycle analysis.
- Students are supported in making professional presentations that communicate technical knowledge and findings to a non-technical audience.

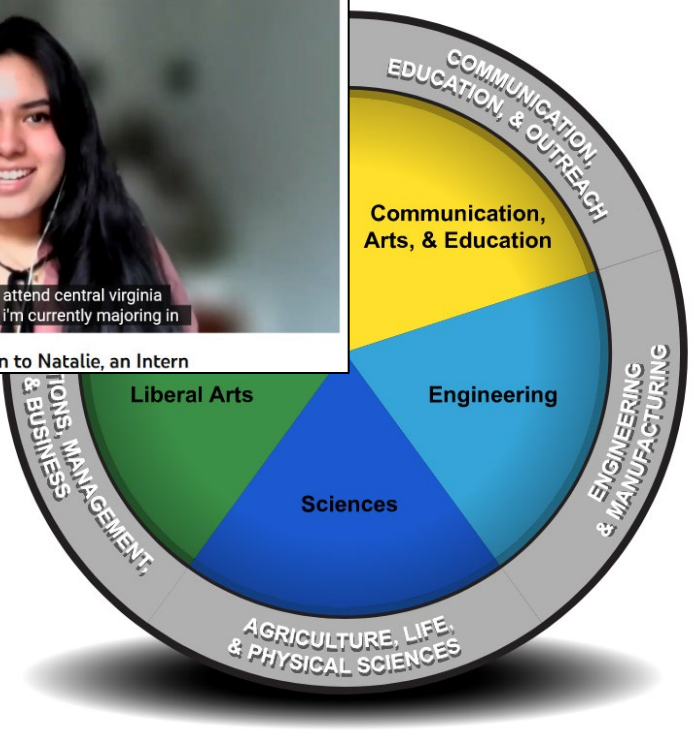
Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

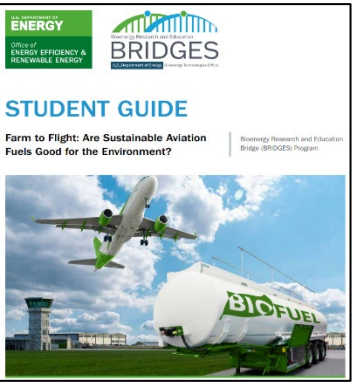
Students Explore Bioenergy Careers

Career Highlight: Sustainability Specialist

- Average salary
- Common majors for this position
- Responsibilities of a sustainability specialist
- Students then explore the career wheel to identify a career of interest to them

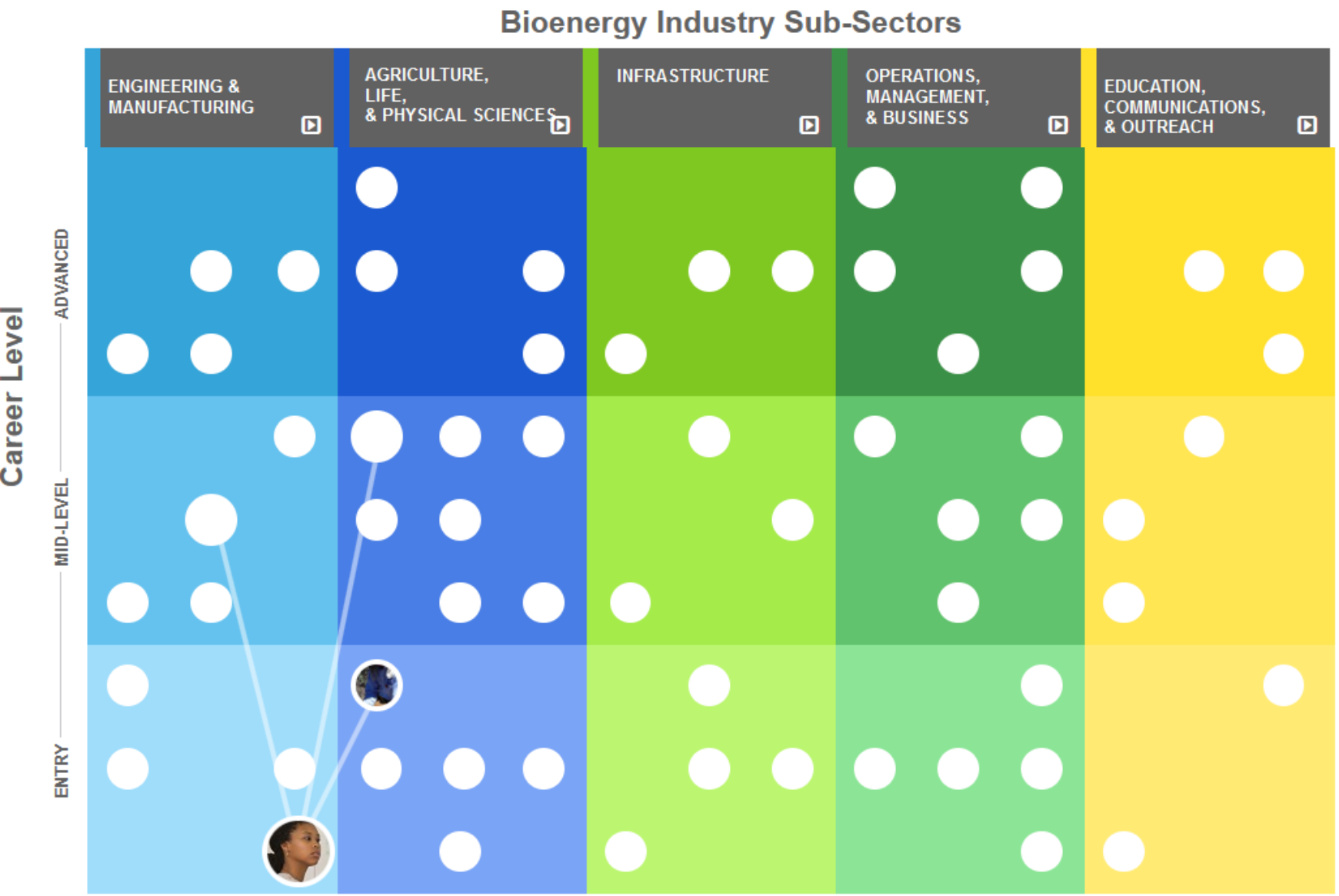


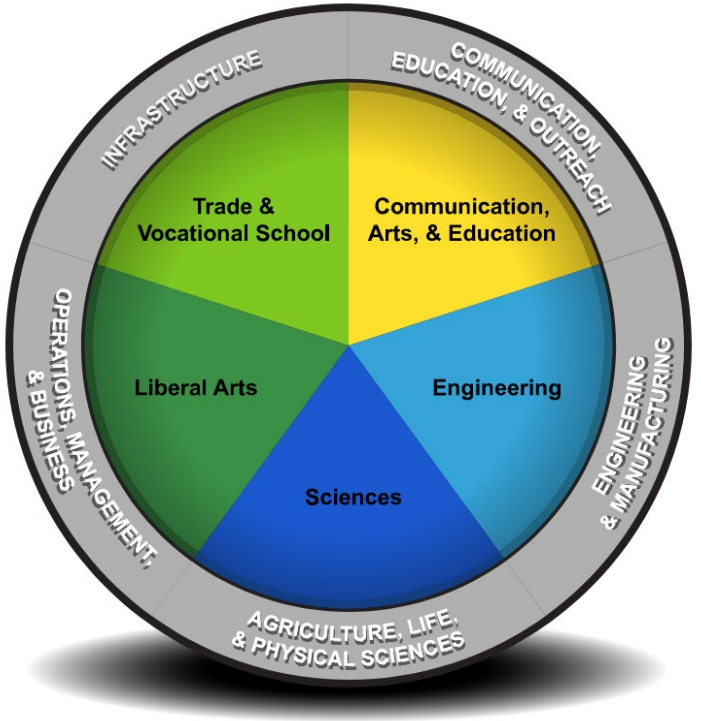




Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

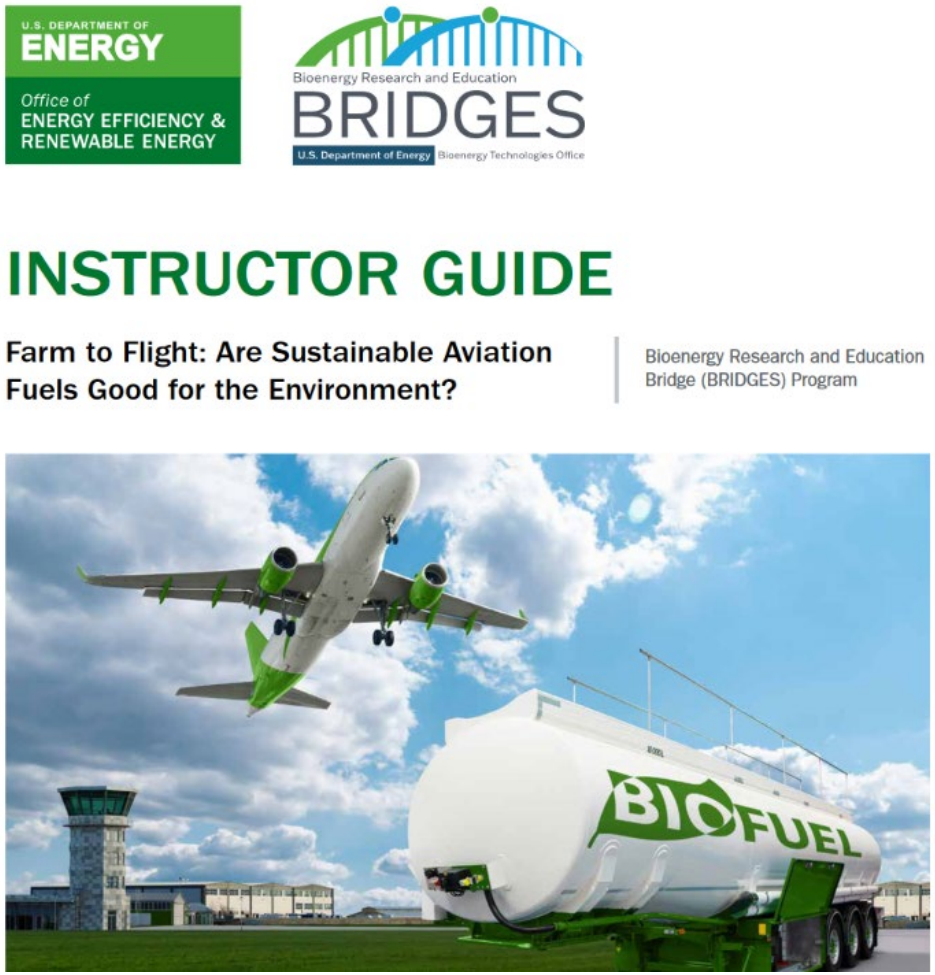
Bioenergy Career Wheel





Bioenergy Research and Education BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Comprehensive Instructor Guide



Assumes No Bioenergy Background

- Case Study Introduction/Background
- Learning Objectives
- Prerequisite Knowledge
- Classroom Implementation Strategies
- Rubrics
- Example answers to background questions
- Additional resources

Testimonials from Students & Educators

Photo by iStock

BETO BRIDGES National Advisory Board

Board Membership

- Members recruited from community colleges, primarily undergraduate universities, minority-serving institutions, government, and state or national-level K-12 educational organizations

Commitments

- Members committed to helping us reach out through their networks
- Members gave great feedback on networks to target and how to reach their communities
- Members also committed to helping with future case study development and testing and getting the word out about professional development opportunities.

Partnerships

Smithsonian Learning Lab

nsta
National Science Teaching Association

UNITED

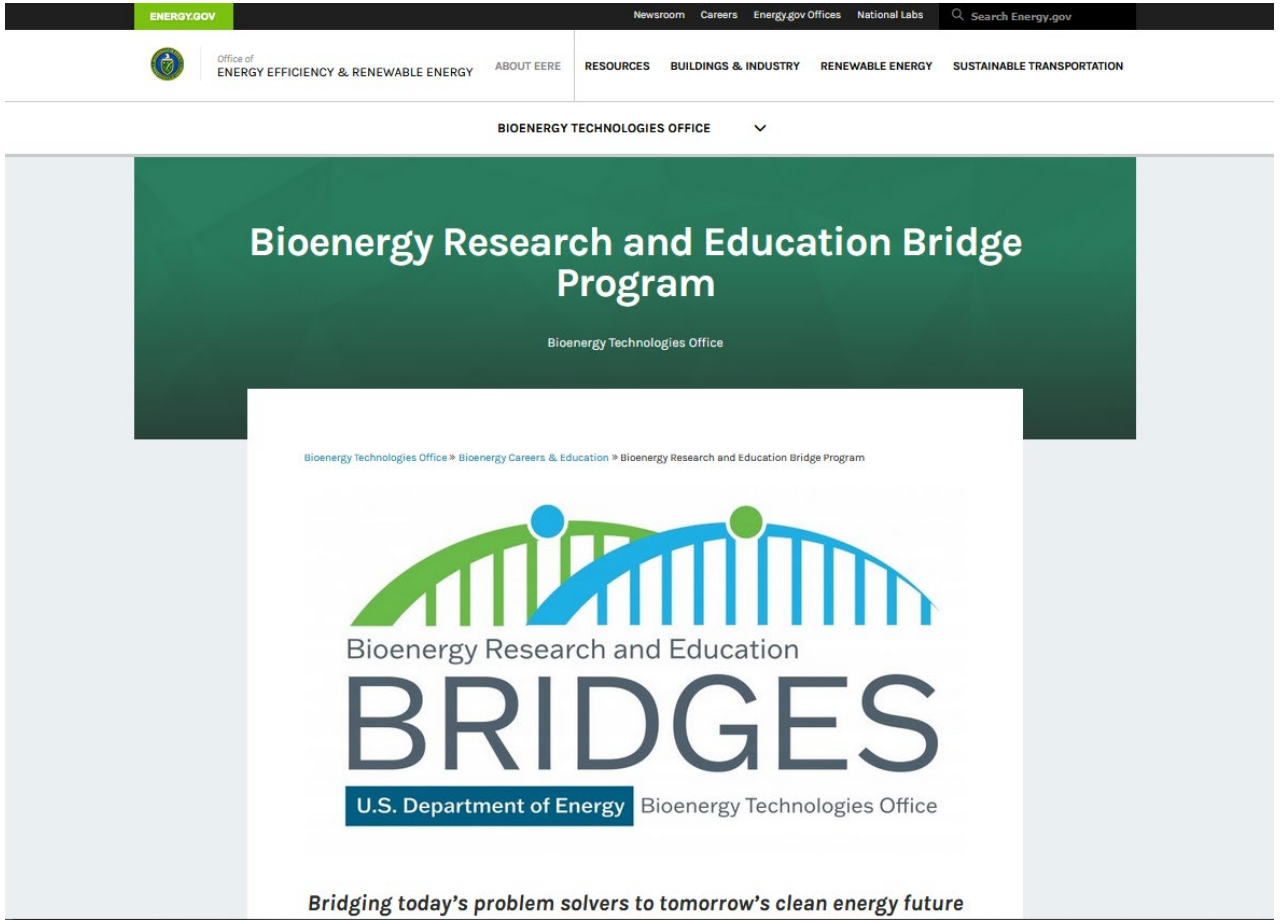
FIRST CHESAPEAKE
DISTRICT OF COLUMBIA • MARYLAND • VIRGINIA

NABT
National Association of Biology Teachers

Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Demonstration of the Portal for Downloading BRIDGES Case Studies

https://www.energy.gov/eere/bioenergy/bioenergy-research-and-education-bridge-program



Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Next Steps…

Nominate faculty from your institution to be a part of our first cohort of BETO BRIDGES Bioenergy Certified Educators

Nominate a department head or chair to serve on our DOE BETO BRIDGES National Advisory Board

Send nominations to: Bioenergy_BRIDGES@ee.doe.gov

Bioenergy Research and Education BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

Upcoming Events to Support Educators in Teaching BRIDGES Case Studies

Webinars

- Webinar for Historically Black Community Colleges, August 31
- **BRIDGES Bioenergy 101 Webinar for Educators, Sept 14**
- Cross-Advertised Webinar from the Bioenergy Technologies Office & National Association of Biology Teachers, Oct 5

Office Hours

- With the National Science Foundation Advanced Technical Education (ATE Central), Sept 7
- BETO BRIDGES Biweekly Office Hours, Sept 6, Sept 21, Oct 19, Nov 2, Nov 16, Nov 30, Dec 7

Questions?

U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Historically Black Community Colleges Webinar

Presenters:

- Trina Bilal, Program Manager, Office of Economic Impact & Diversity, U.S. Department of Energy (DOE)
- Brandi Toliver, Program Manager, DOE Office of Science
- Sheila Dillard, Communications and Stakeholder Engagement Lead, DOE Bioenergy Technologies Office
- Jennifer Jackson, K-12 STEM Program Manager, Idaho National Laboratory
- Kelly Sturner, Learning Center Program Coordinator, Argonne National Laboratory
- Ashley Lovett, Communications Fellow, DOE Bioenergy Technologies Office

August 31, 2023