

Webinar: Idaho National Laboratory - Providing Access to High-Quality Education and Training by Increasing Diversity, Equity, and Inclusion in STEM

Michelle Bingham

Director of University Partnerships, Idaho National Laboratory

Jennifer Jackson

Program Manager K-12 STEM, Idaho National Laboratory



Feedstock



Algae



Conversion



Systems



Data

July 15, 2021



Webinar Housekeeping

- Attendees will be in listen-only mode
- Audio connection options:
 - Computer audio
 - Dial in through your phone (best connection)
- Technical difficulties? Contact us through the chat section, lower right of your screen
- Use the Q&A window to ask questions
- Today's webinar will be recorded and posted to "BETO Webinars":
energy.gov/eere/bioenergy/beto-webinars

NOTICE: This webinar, including all audio and images of participants and presentation materials, may be recorded, saved, edited, distributed, used internally, posted on DOE's website, or otherwise made publicly available. If you continue to access this webinar and provide such audio or image content, you consent to such use by or on behalf of DOE and the Government for Government purposes and acknowledge that you will not inspect or approve, or be compensated for, such use.

About the Bioenergy Communicators (BioComms) Working Group

Sponsor:

- U.S. Department of Energy (DOE)
Bioenergy Technologies Office (BETO)



BETO & DOE National Laboratory Members:

- Bioenergy communicators, laboratory relationship managers, BETO tech team, and education and workforce development professionals



Purpose:

- Communications strategy for BETO-funded bioenergy research and development

Photo by iStock

Today's Speakers



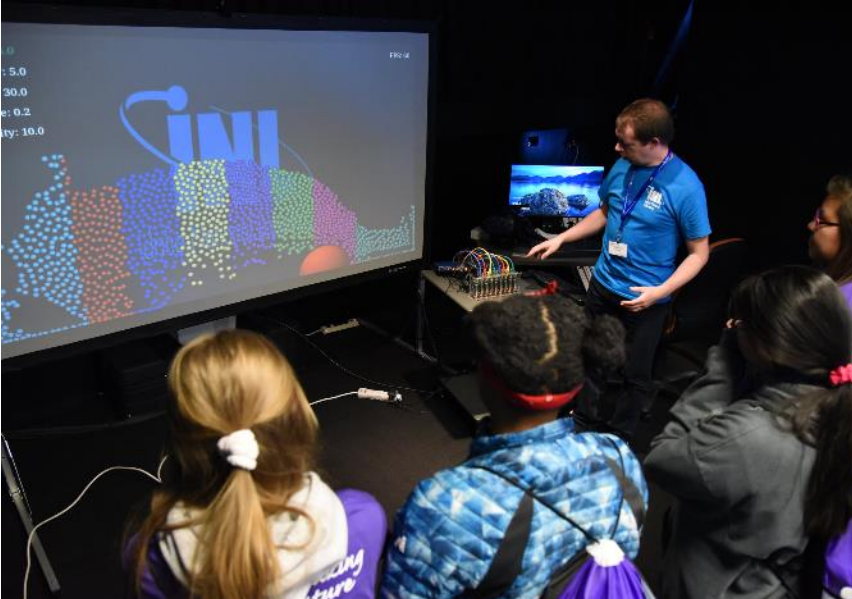
Jennifer Jackson

**Program Manager K-12 STEM
Idaho National Laboratory**



Michelle Bingham

**Director of University Partnerships
Idaho National Laboratory**



STEM in the Lab

INL Education Program

Jennifer Jackson
Manager, K-12 Education Program

Equitable Access to High Quality Learning Opportunities

- Increase diversity, equity, and inclusion in STEM.
- Target these historically underrepresented populations in STEM fields:
 - Rural & remote
 - Economically disadvantaged
 - Female
 - Ethnic/racial minority.



2020 INL STEM Education Impact

More than
17,751
Students

817 Teachers
and
Principals

138 STEM
Events
(virtual and
in Person)

56 INL STEM
Ambassador
Engagements



Nearly 50% of INL education programs and initiatives specifically target underrepresented student populations



Every Job is a STEM Job at INL



STEM: Researchers and Engineers



STEM-Adjacent: Technicians, Operators, Trades, Crafts, Skilled Laborers



STEM Support: Business, Communication, Human Resources

STEM Self-Efficacy

We believe that students must see themselves as scientists, technicians, engineers, and mathematicians by engaging in experiential learning and by solving real world problems.

Learning Continuum



STEM in the lab

Inspiring Idaho's future STEM workforce



INL Idaho National Laboratory **RURAL STEM COLLABORATIVE**



Work Based Learning (WBL)

Academics + Employability Skills = Work Experiences

Successful WBL Programs:

- Alignment of classroom and workplace learning
- Application of academic, technical, and employability skills in a workplace
- Support from classroom or workplace mentors.



Work Based Learning



WBL Framework
Click on the components to learn more



ALIGNMENT OF CLASSROOM AND WORKPLACE LEARNING

APPLICATION OF ACADEMIC, TECHNICAL, AND EMPLOYABILITY SKILLS IN A WORK SETTING

SUPPORT FROM CLASSROOM OR WORKPLACE MENTORS



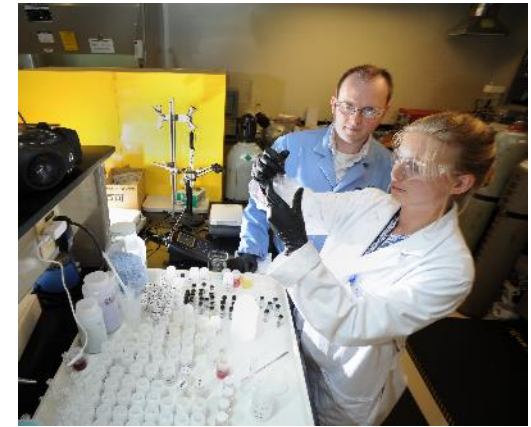
Career Technical Pathway High School Pre-Apprenticeships

- Career Technical Education
- Grades 11-12
- 6-week paid onsite
- Real-world application
- Mentoring.



Science & Engineering Pathway High School Internships

- Science & Engineering
- Grades 11-12
- 6-week paid onsite
- Real-world application
- Mentoring.



Shoshone-Bannock Students and Programs:

American Indian Services Pre-Freshman Engineering Program (AIS PREP)

- 7-9th grade Tribal Students
- 6-week rigorous STEM Learning
- Classroom and Field Work
- Career exploration
- Mentoring and advocacy
- Scholarships.



Beginning of a Historic Partnership in Education and Workforce Development between INL and Shoshone-Bannock Tribes



Build STEM prepared workforce pipelines of future



Become an officially designated STEM School in Idaho

Primary Objectives of Official Partnership with Shoshone-Bannock Tribes:

1. Implement STEM curriculum and instructional practices in grades 6-12 leading to STEM school designation from State Board of Education.
2. Create workforce development pipelines into high demand careers by designing and implementing career technical education coursework at Sho-Ban Jr/Sr High School and work-based learning opportunities at Idaho National Laboratory.
3. Create pathways into STEM in higher education through mentoring, scholarships, and internships.



The Future:

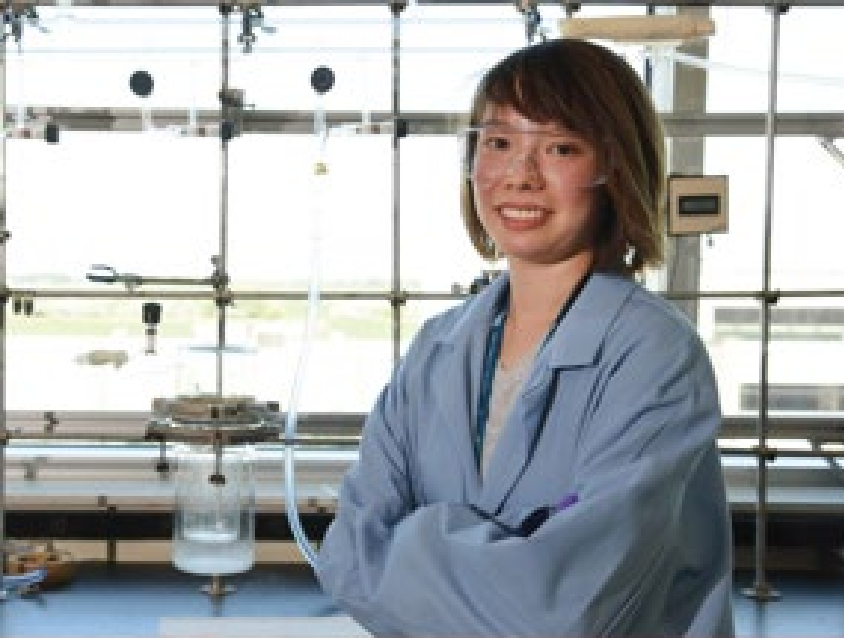
- Workforce Development Model
- Create a DOE Demonstration Site
- Impact Study.





To learn more about our STEM education and workforce development programs, including access to our online resource library:

STEM.INL.gov



Building Tomorrow's Pipeline

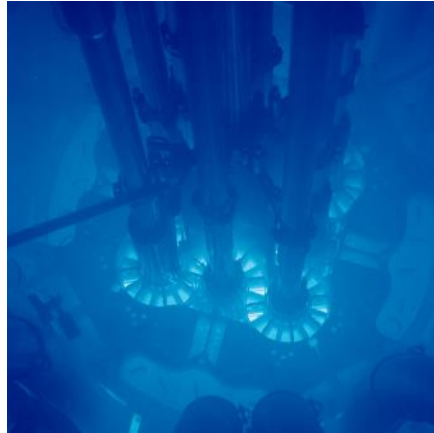
Michelle Bingham
Director, University Partnerships

What We Do



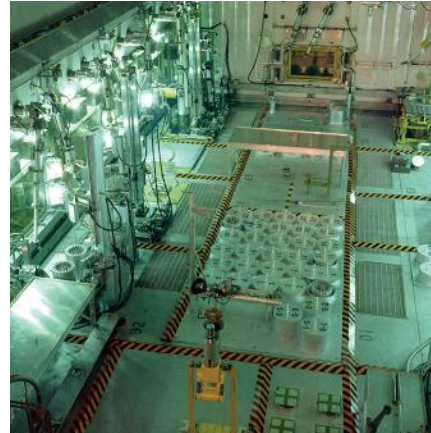
Nuclear S&T

- Advanced reactor design and optimization
- Nuclear fuels and materials
- Fuel cycle technologies
- Light water reactor fleet sustainability



Advanced Test Reactor

- Steady state neutron irradiation of materials and fuels
 - Naval Nuclear Propulsion Program
 - Industry
 - National laboratories and universities



Materials & Fuels Complex

- TREAT – Transient testing
- Analytical laboratories
- Post-irradiation examination
- Advanced characterization
- Fuel fabrication
- Space nuclear power and isotope technologies



Energy & Environment S&T

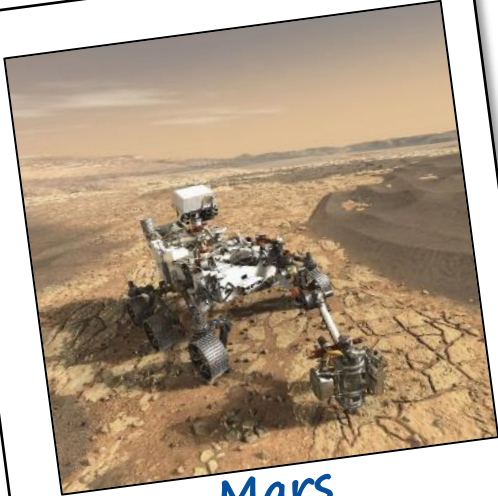
- Advanced transportation
- Environmental sustainability
- Clean energy (biomass, wind, solar, nuclear, water)
- Advanced manufacturing



National & Homeland Security

- Critical infrastructure protection and resiliency
- Nuclear nonproliferation
- Physical defense systems

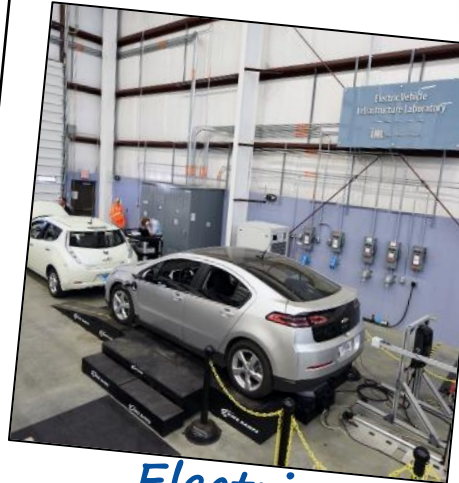
What We're Working On



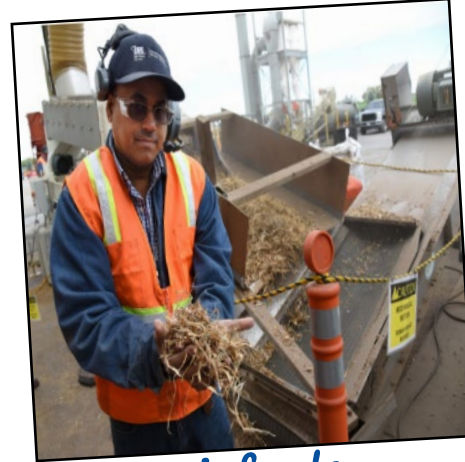
Mars
Perseverance Rover



Small Modular
Reactors



Electric
Vehicles



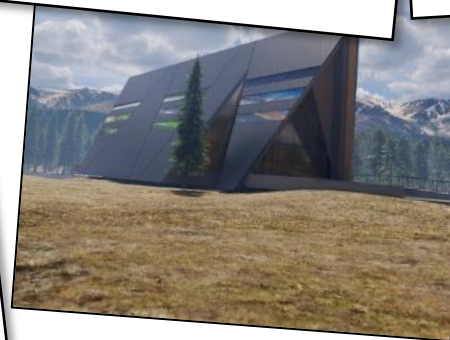
Biofuels
Research



Power Grid
Resilience



High Performance
Computing



Microreactors



Wireless
Test Bed

Discipline Examples

Science, Engineering and Technician Opportunities

Advanced Technician/Skills: Welding,
Operations, Radiological and Lab
Technicians

Advanced Energy Systems

Advanced Manufacturing

Biological Processing

Catalysis

Chemistry/Chemical Engineering

Computational Science

Control Systems Cyber Security

Critical infrastructure analysts

Cyber Security

Electrical Engineering

Electrochemistry

Industrial Controls/Control Systems

Material Science (*including Ceramics*)

Materials Engineering

Mechanical Engineering

Membrane Science/Separations

Nuclear Engineering/Science
(*multi sub disciplines*)

Power Engineering

Reactor Physics

Supercritical Fluids/Pressure Chemistry

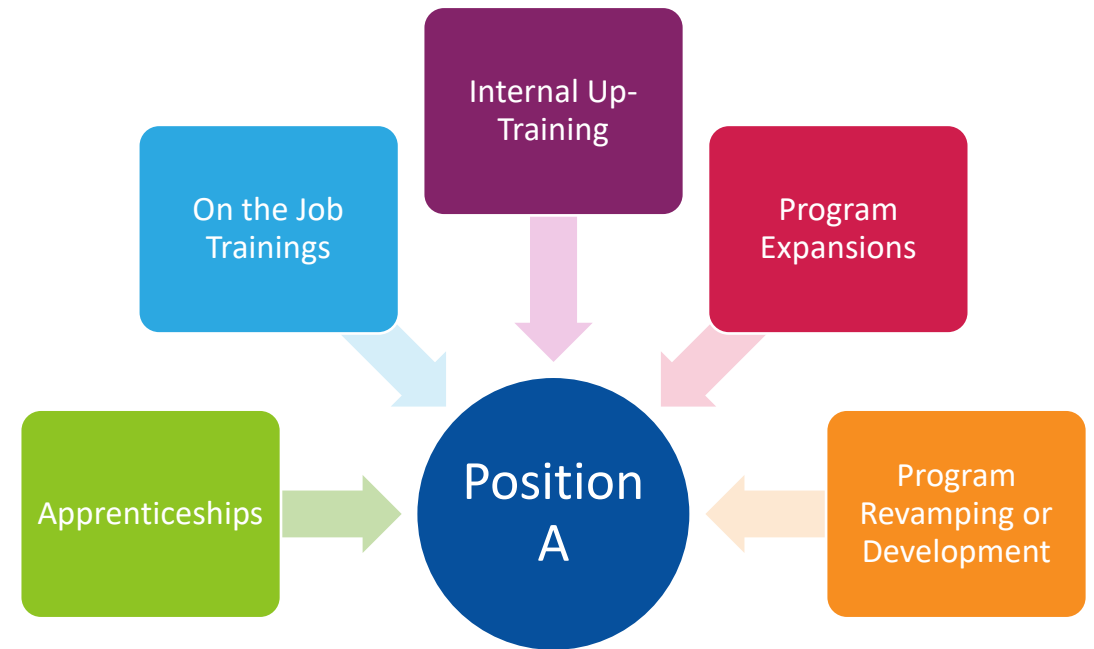
Wireless Communications Engineers



Developing Workforce Pipelines



Step One: Understanding Our Needs



INL VALUES

“We have so much to learn from those whose experiences and backgrounds differ from our own. Our work is difficult and complex. Producing the positive outcomes expected of us will only happen if everyone performs at their best.”

—INL lab director John Wagner





The East Idaho Lifestyle

- Participants enjoy unparalleled access to the region's world-class skiing, hiking, camping, climbing, mountain biking, hunting, fishing, and much more
- Attracts top talent from elsewhere, encourages locals to stay local



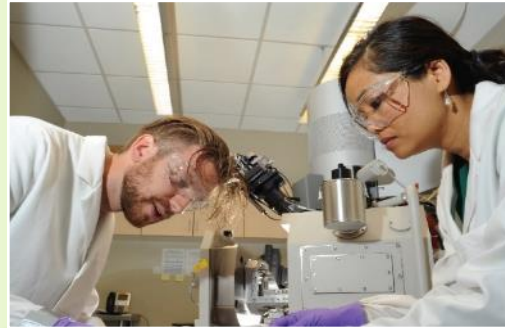
University Partnerships' Distinct Programs Build the Future Talent Pipeline

Developing skills and a talent pipeline to support INL's strategic objectives



Student Programs

- Interns
- Co-Ops
- Practicums
- Service Academy Interns



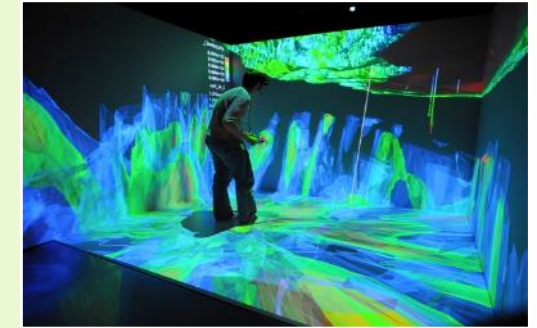
Research Enablement

- INL Graduate Fellowships
- Postdocs
- Joint Appointments
- International Researchers
- Academic Visitors
- Faculty Researchers



Workforce Development

- Workforce Planning
- University & Community College Support
- Employee Education
- Mentoring Workshops
- Veterans & Military Fellowships



Strategic Partnerships

- CAES (*Idaho Universities*)
- NUC (*MIT, NC State, Ohio State, Oregon State, New Mexico*)
- SUPER (*Texas A&M and UTSA*)

Participants from Around the World

FY-21 University Partnership Participants

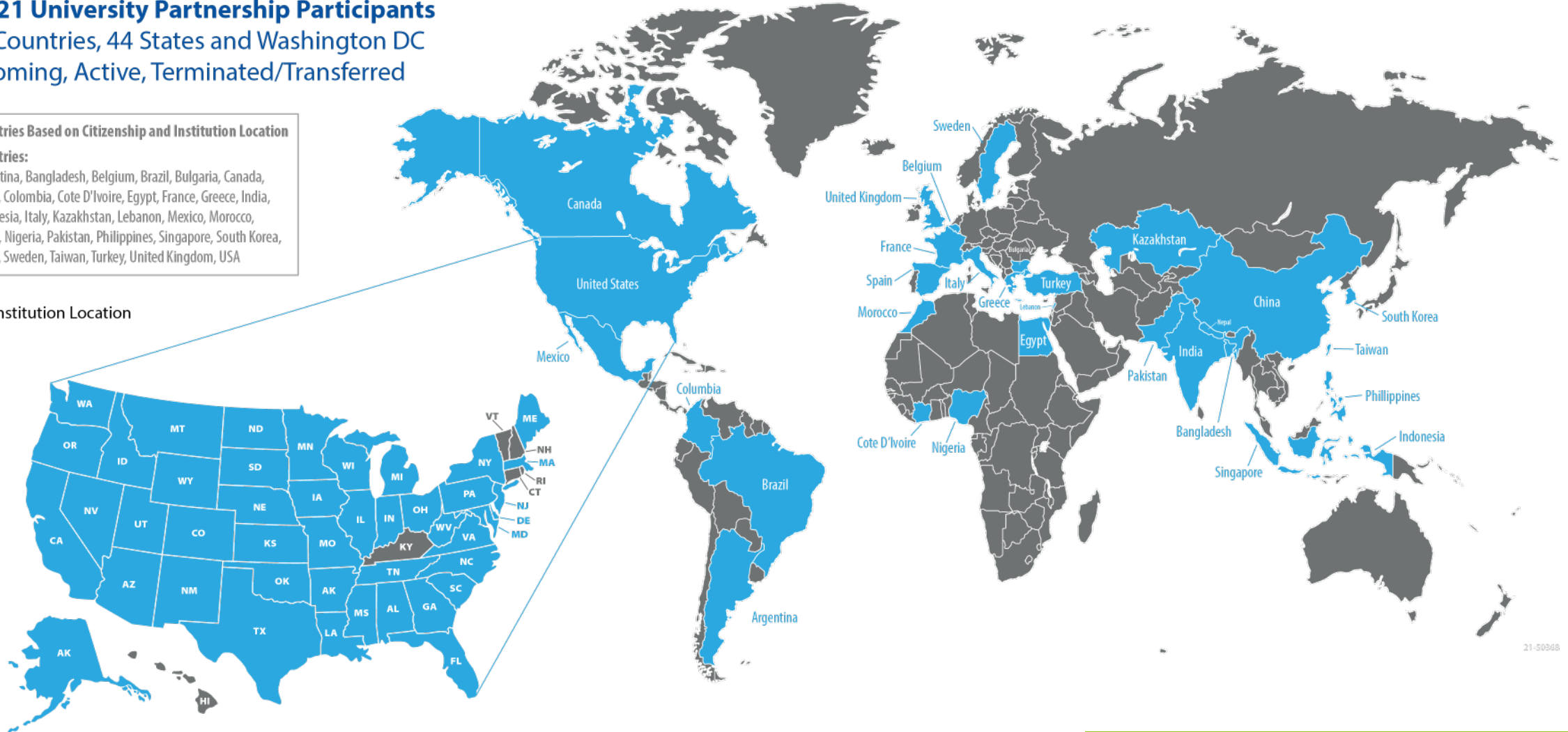
31 Countries, 44 States and Washington DC
Incoming, Active, Terminated/Transferred

Countries Based on Citizenship and Institution Location

Countries:

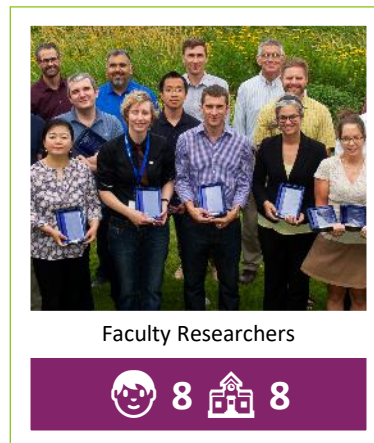
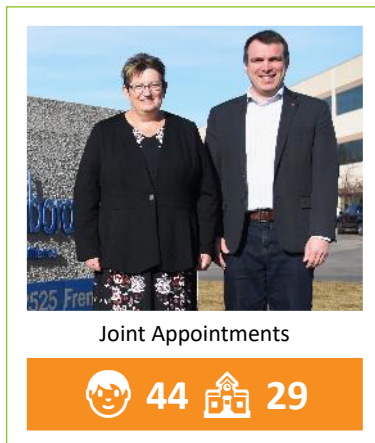
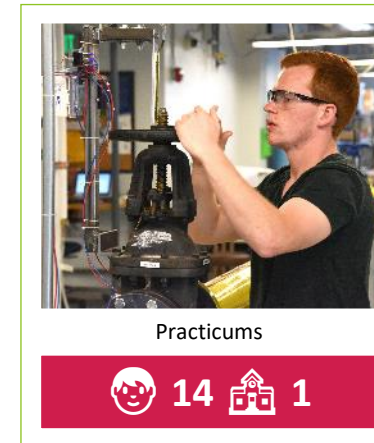
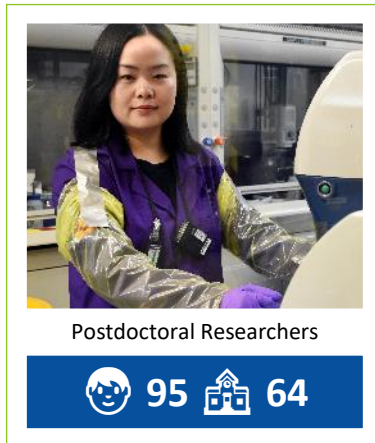
Argentina, Bangladesh, Belgium, Brazil, Bulgaria, Canada, China, Colombia, Cote D'Ivoire, Egypt, France, Greece, India, Indonesia, Italy, Kazakhstan, Lebanon, Mexico, Morocco, Nepal, Nigeria, Pakistan, Philippines, Singapore, South Korea, Spain, Sweden, Taiwan, Turkey, United Kingdom, USA

Institution Location

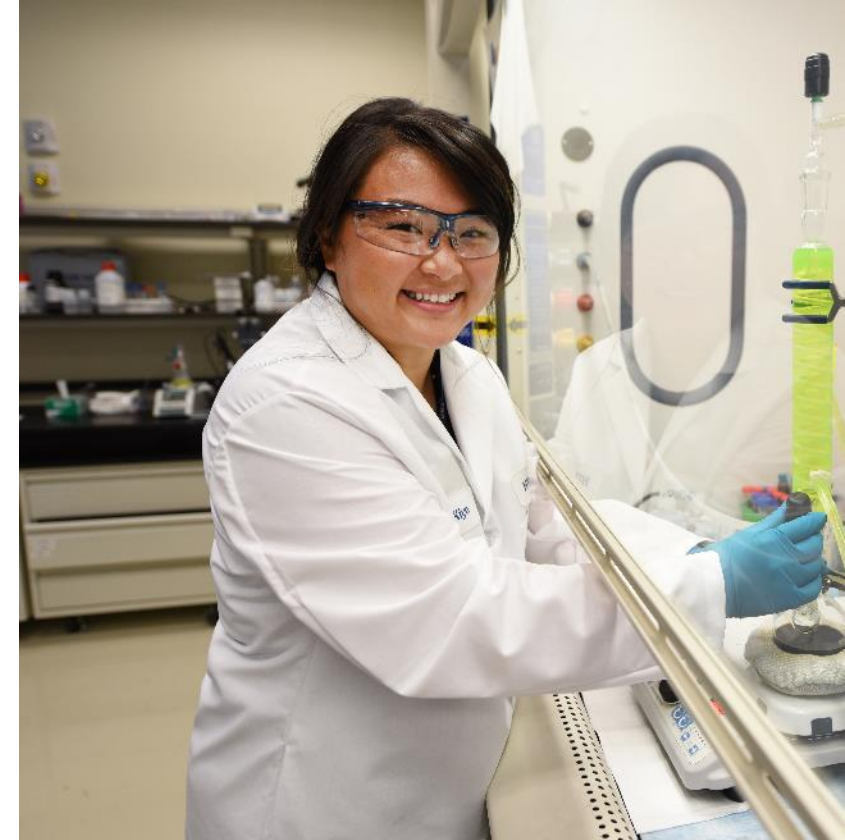


21-50368

FY-21 YTD: 975 Participants at 181 Institutions



All figures as of June 14, 2021



Holistic Approach to Talent Development

- Programs for undergraduate and graduate students, early career researchers and faculty enable collaboration with experienced scientists and engineers and serve as a talent pipeline
- Program Specialists are more than just recruiters: they serve as important liaisons and advocates for program participants throughout their time at the lab

Resources for Mentors

- Good experiences for our program participants require trained and engaged mentors. University Partnerships offers a broad suite of tools to ensure that mentors are well-prepared to guide their mentees' development.

*Meaningful Mentoring
Workshop*

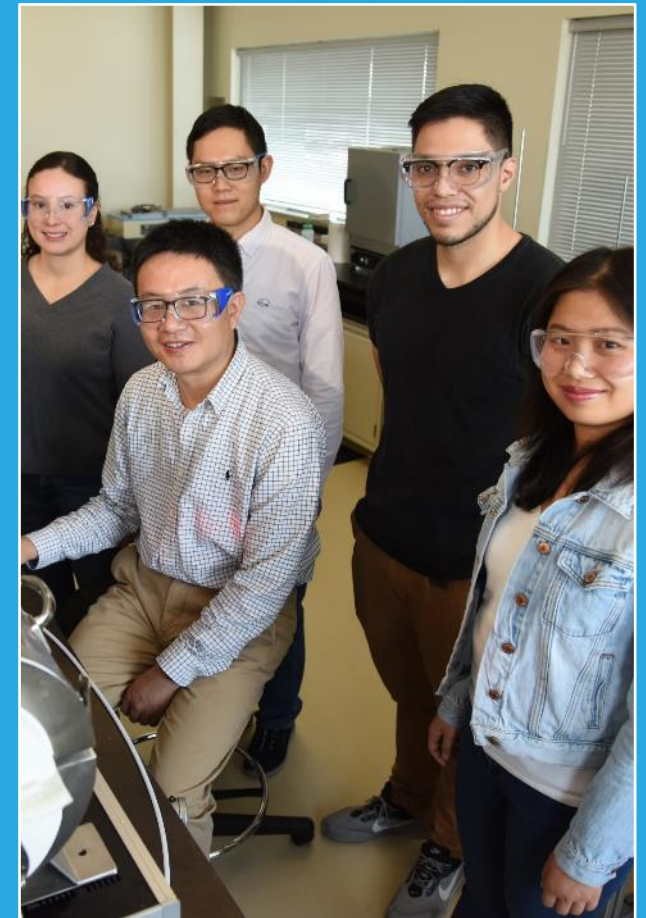
*Good Experiences are
Good Business
Workshop*

*Mentoring in a Virtual
Environment
Workshop*

*Managers Setting
Expectations for
Mentors
Guidance*

*INL Mentoring
Guide*

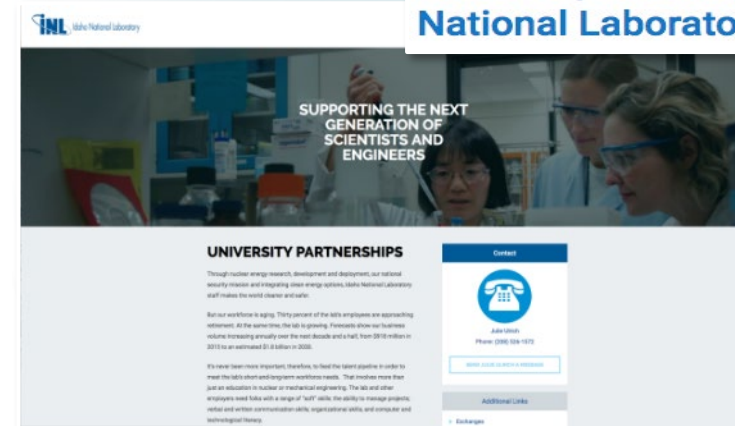
*Communication Styles
Quiz & Tips*



*INL Mentor Dong Ding
with his interns*

Resources

- **University Partnerships Annual Report**
<https://public.inl.gov/public/UniversityPartnerships2019/index.aspx?page=1>
- **Recruiting Video**
<https://www.youtube.com/watch?v=rRUTW5UbbLc&feature=youtu.b>
- **University Partnerships Page:**
<https://www.inl.gov/inl-initiatives/education/>
- **Director Contact: Michelle Thiel Bingham**
michelle.bingham@inl.gov or 208-520-9875
- **UP Communications Liaison: Matt Meehan**
matthew.meehan@inl.gov or 631-848-5598



Thank you!



Questions about INL Education and Workforce
Development Programs?

Email:

jennifer.jackson@inl.gov | michelle.bingham@inl.gov

Learn more about the
Idaho National Laboratory:

inl.gov

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

Webinar recording located on the BETO Webinars
site: energy.gov/eere/bioenergy/beto-webinars