RWFI E-NOTE MONTHLY

REGIONAL WORKFORCE INITIATIVE • DECEMBER 2020

Welcome Message

Greetings NETL RWFI stakeholders,

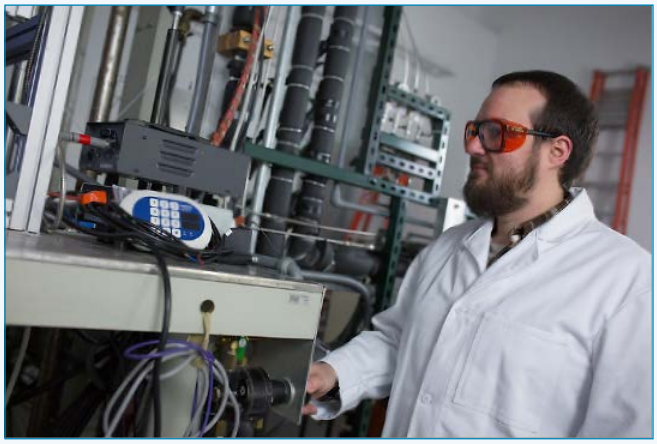
In this month's funding in focus is a Funding Opportunity Announcement from the Department of Energy for University Training and Research for Fossil Energy Applications. In the "Reports and Resources" section of this E-Note is released U.S. Jobs Data from the Energy Futures Initiative from their annual U.S. Energy and Employment reports.

As always, feel free to reach out to us at *NETL.RWFI@netl.doe.gov* if you have any suggestions for information to present in future E-notes.

– Sincerely, The NETL Regional Workforce Initiative Team

Workforce Funding Announcements

FUNDING SPOTLIGHT



University Training and Research for Fossil Energy Applications

Department of Energy, Deadline, February 15, 2021

This funding opportunity will encompass two separate university programs, each with its own requirements and each with restricted eligibility. The two programs are the University Coal Research (UCR) Program and the Historically Black Colleges and Universities (HBCU) and Other Minority Institutions (OMI) Program. Each section of this document will be subdivided into a UCR section and an HBCU-OMI section to clearly address the requirements for each program. Through this FOA, the UCR Program supports the DOE's Office of Fossil Energy (FE) and the NETL mission by supporting long-term, high-risk meritorious fundamental research that advances the science of coal technologies at U.S. colleges and universities.

Research on the Science and Technology Enterprise: Statistics and Surveys — R&D, U.S. Science and Technology (S&T) Competitiveness, STEM Education, S&T Workforce

National Science Foundation, Deadline, Jan. 15, 2021

The Center would like to enhance its efforts to support analytic and methodological research in support of its surveys, and to engage in the education and training of researchers in the use of large-scale nationally representative datasets. The National Center for Science and Engineering Statistics (NCSES) of the National Science Foundation (NSF) welcomes efforts by the research community to use NCSES data for research on the science and technology enterprise, to develop improved survey methodologies for NCSES surveys, to create and improve indicators of S&T activities and resources, and strengthen methodologies to analyze and disseminate S&T statistical data. To that end, NCSES invites proposals for individual or multi-investigator research projects, doctoral dissertation improvement awards, workshops, experimental research, survey research, and data collection and dissemination projects under its program for Research on the Science and Technology Enterprise: Statistics and Surveys.

Training-based Workforce Development for Advanced Cyberinfrastructure (CI)

National Science Foundation, Deadline, Jan. 20, 2021

This solicitation calls for innovative, scalable training, education, and curriculum/instructional materials — targeting one or both of the solicitation goals — to address the emerging needs and unresolved bottlenecks in scientific and engineering research workforce development, from the postsecondary level to active researchers. The funded activities, spanning targeted, multidisciplinary communities, will lead to transformative changes in the state of research workforce preparedness for advanced CI-enabled research in the short- and long-terms. As part of this investment, this solicitation also seeks to broaden CI access and adoption by increasing or deepening accessibility of methods and resources of advanced CI and of computational and data-driven science and engineering by a wide range of scientific disciplines and institutions with lower levels of CI adoption to date and harnessing the capabilities of larger segments of diverse underrepresented groups. Proposals from, and in partnership with, the aforementioned communities are especially encouraged.

Buildings Energy Efficiency Frontiers & Innovation Technologies

U.S. Department of Energy, Deadline, Jan. 20, 2021

The objective of this Funding Opportunity Announcement (FOA) is to research and develop next generation building technologies that have the potential for significant energy savings and improved demand flexibility, affordability, and occupant comfort. An additional goal is to advance building construction, remodeling, and retrofit practices and associated workforces.

Women and Minorities in STEM Fields Program (WAMS)

U.S. Department of Agriculture, Deadline, Jan. 21, 2021

The purpose of this program is to support research, education/teaching, and extension projects that increase participation by women and underrepresented minorities from rural areas in STEM. The U.S. Department of Agriculture's National Institute of Food and Agriculture intends this program to address educational needs within broadly defined areas of food, agriculture, natural resources, and human (FANH) sciences. Applications recommended for funding must highlight and emphasize the development of a competent and qualified workforce in the FANH sciences. WAMS-funded projects improve the economic health and viability of rural communities by developing research and extension initiatives that focus on new and emerging employment opportunities in STEM occupations. Projects that contribute to the economic viability of rural communities are also encouraged.

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES)

National Science Foundation, Deadline, Jan. 26, 2021

NSF INCLUDES is a comprehensive national initiative to enhance U.S. leadership STEM discoveries and innovations focused on NSF's commitment to diversity, inclusion, and broadening participation in these fields. The vision of NSF INCLUDES is to catalyze the STEM enterprise to work collaboratively for inclusive change, resulting in a STEM workforce that reflects the population of the Nation. More specifically, NSF INCLUDES seeks to improve collaborative efforts aimed at enhancing the preparation, increasing the participation, and ensuring the contributions of individuals from groups that have been historically underrepresented and underserved in the STEM enterprise such as African Americans, Alaska Natives, Hispanics, Native Americans, Native Hawaiians, Native Pacific Islanders, persons with disabilities, persons from economically disadvantaged backgrounds, and women and girls. Significant advancement in the inclusion of underrepresented groups in STEM will result in a new generation of STEM talent and leadership to secure our Nation's future and long-term economic competitiveness.

Hispanic-Serving Institutions (HSI) Education Grants Program

U.S. Department of Agriculture, Deadline, Jan. 28, 2021

This competitive grant program is intended to promote and strengthen the ability of HSIs to carry out higher education programs in the food and agricultural sciences. Programs aim to attract outstanding students and produce graduates capable of enhancing the Nation's food and agricultural scientific and professional work force.

Improving Undergraduate STEM Education: Education and Human Resources

National Science Foundation, Deadline, Feb. 2, 2021

The NSF Improving Undergraduate STEM Education initiative seeks to support projects that have high potential for broader societal impacts, including improved diversity of students and instructors participating in STEM education, professional development for instructors to ensure adoption of new and effective pedagogical techniques that meet the changing needs of students, and projects that promote institutional partnerships for collaborative research and development. IUSE: EHR especially welcomes proposals that will pair well with the efforts of NSF INCLUDES to develop STEM talent from all sectors and groups in our society. For all the above objectives, the National Science Foundation invests primarily in evidence-based and knowledge-generating approaches to understand and improve STEM learning and learning environments, improve the diversity of STEM students and majors, and prepare STEM majors for the workforce. In addition to contributing to STEM education in the host institution(s), proposals should have the promise of adding more broadly to our understanding of effective teaching and learning practices.

Workforce Pathways for Youth grant program

Department of Labor, Employment and Training Administration, Deadline, Feb. 4, 2021

This announcement solicits applications for the Workforce Pathways for Youth grant program. The purpose of this program is to increase alignment between workforce and out of school programs and expand job training and workforce pathways for youth and disconnected youth including soft skill development, career exploration, job readiness and certification, summer jobs, year-round job opportunities, and apprenticeships.

Improving Undergraduate STEM Education: Hispanic Serving Institutes (HSI's)

National Science Foundation, Deadline, Feb. 10, 2021

The goals of the program are to enhance the quality of STEM education and to increase the recruitment, retention, and graduation rates of students pursuing associate's or baccalaureate degrees in STEM. Achieving these, given the diverse nature and context of the HSIs, requires additional strategies that support building capacity at HSIs through innovative approaches to incentivize institutional and community transformation and to promote fundamental research that is on engaged student learning, is about what it takes to diversify and increase participation in STEM effectively, and improves our understanding of how to build institutional capacity at HSIs. Intended outcomes of the HSI program include broadening participation of students that are historically underrepresented in STEM and expanding students' pathways to continued STEM education and integration into the STEM workforce.

Centers of Research Excellence in Science and Technology (CREST) and HBCU Research Infrastructure for Science and Engineering (HBCU-RISE)

National Science Foundation, Deadline, Feb. 11, 2021

CREST Center awards provide multi-year support (typically five years) for eligible minority-serving institutions that demonstrate a strong research and education base, a compelling vision for research infrastructure improvement, and a comprehensive plan with the necessary elements to achieve and sustain national competitiveness in a clearly defined area of national significance in science or engineering research. Successful Center proposals will demonstrate a clear vision and synergy with the broad goals of the CREST Program and the Human Resource Development Division with respect to development of a diverse STEM workforce. CREST Centers are expected to provide leadership in the involvement of groups traditionally underrepresented in STEM at all levels (faculty, students, and postdoctoral researchers) within the Center. Centers are required to use either proven or innovative mechanisms to address issues such as recruitment, retention, and mentorship of participants from underrepresented groups.

Research Traineeships to Broaden and Diversify Nuclear Physics

Department of Energy, Deadline, Feb. 24, 2021

The DOE Office of Science's Nuclear Physics (NP) program hereby announces its interest in receiving applications for Research Traineeships to Broaden and Diversify Nuclear Physics along with applications for related vehicles (e.g. a program support center, as described below) to provide support for program participants nationwide. This pilot program is intended to support training and research experiences for members of underserved communities with the goal of increasing the likelihood that participants from underrepresented populations, such as those present at minority serving institutions, will pursue a career in a STEM-related field, particularly in NP.

National Science Foundation Research Traineeship (NRT) Program

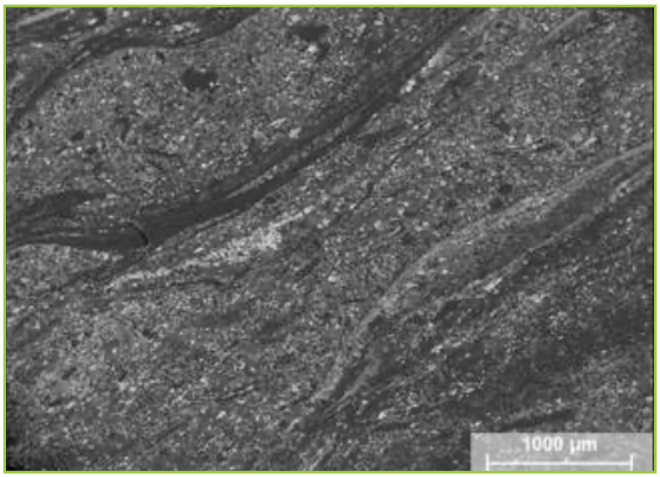
National Science Foundation, Deadline, Feb. 25, 2021

The NRT program addresses workforce development, emphasizing broad participation, and institutional capacity building needs in graduate education. The program encourages proposals that involve strategic collaborations with the private sector, non-governmental organizations, government agencies, national laboratories, field stations, teaching and learning centers, informal science centers, and academic partners. NRT especially welcomes proposals that include partnership with NSF INCLUDES and leverage INCLUDES project efforts to develop STEM talent from all sectors and groups in our society. For more information, *click here*.

NETL News

U.S. Department of Energy to Invest $6.4 Million to Develop Hydrogen-Fueled Turbines

The U.S. DOE's FE has announced $6.4 million in federal funding for cost-shared research and development projects under the FOA FE-FOA 0002397, University Turbines Systems Research (UTSR) — Focus on Hydrogen Fuels. The UTSR Program conducts cutting-edge research to increase the efficiency and performance of gas turbines while lowering emissions. There is renewed interest in the use of hydrogen, a clean-burning fuel, for turbine-based electricity generation. Hydrogen production from fossil fuels, coupled with carbon capture, utilization, and storage, can generate low-cost hydrogen with net-negative carbon emissions. Waste plastics could be added to the fuel mix to produce large quantities of hydrogen and to mitigate the impact of plastics in the environment.



NETL-Supported Virginia Tech Project Wins American Energy Society (AES) 2020 Energy Award

NETL-supported research at Virginia Tech has been recognized by the AES as one of the top energy and technology developments of the year for its game-changing economic potential to supply the United States with a steady domestic source of vitally important rare earth elements. The project, titled "Development of a Cost-Effective Extraction Process for the Recovery of Heavy and Critical Rare Earth Elements from the Clays and Shales Associated with Coal," was chosen by AES as one of the energy technologies of the year in its 2020 Energy Awards. Judges found the project was one of the three "most interesting energy-tech developments of 2020," with respect to the projected fastest-to-market and long-term impact. AES recognized Virginia Tech's research as a step forward in developing a domestic supply chain of rare earth elements, which are vital to the manufacturing of personal electronics, energy infrastructure and defense technologies, among many other high-tech applications.

DOE Announces More Than $7 Million for Carbon-Based Building Projects

The U.S. DOE FE announced plans to make more than $7 million in federal funding available for cost-shared research and development to support the design, validation, and fabrication of a prototype carbon-based building. DE-FOA-0002438 — Design, R&D, Validation, and Fabrication of a Prototype Carbon-Based Building — seeks to solicit and competitively award research and development to validate carbon-based materials suitable for construction purposes. The FOA will include a single topic area that will focus on the design and build of a partial structure using carbon-based building materials.

DOE Invests $8.7 Million to Foster New Uses for Domestic Coal Resources

The U.S. DOE's FE and NETL has selected 14 projects to receive $8.7 million in federal funding for cost-shared research and development under FOA DE-FOA-0002185, Coal-Derived Materials for Building, Infrastructure, and Other Applications, with the goal of fostering new uses for domestic coal resources. NETL will manage the projects, which will support the Lab's Advanced Coal Processing Technologies Program. The program is focused on improving coal feedstock for power production and steel-making, producing high-value solid products from coal, and alternative technologies to produce high-performance carbon material from coal.

Lab Initiative Leads Innovation in Novel Hybrid Energy Systems

Future novel hybrid energy systems could lead to paradigm shifts in clean energy production, according to a paper published last week in Joule. Researchers from the U.S. DOE's three applied energy laboratories — Idaho National Laboratory, the National Renewable Energy Laboratory, and NETL — co authored the paper describing such integrated energy systems. Their effort outlines novel concepts to simultaneously leverage diverse energy generators — including renewable, nuclear, and fossil with carbon capture — to provide power, heat, mobility and other energy services. The historic collaboration between the nation's Nuclear Energy, Renewable Energy, and Fossil Energy labs aims to address a grand national challenge from an objective, holistic perspective.

Artificial Intelligence (AI) and Machine Learning (ML) Advancements Underscore NETL's 2020 Computational Science and Engineering Successes

AI refers to algorithms that can — for a given set of human-defined objectives — learn, predict and make decisions, significantly increasing the speed and efficacy of decision-making. Most AI applications use ML to find patterns in massive amounts of data. The patterns are then used for making predictions. AI and ML have factored prominently in the Lab's computational science and engineering (CSE) work in 2020 through the development of science-based simulation models, mathematical methods and algorithms and software tools required to address the technical barriers to the development of next-generation technologies. This research helps to generate information and understanding beyond the reach of experiments alone, saving time, money and materials.

Reports and Resources

U.S. Jobs data from the Energy Futures Initiative, National Association of State Energy Officials, and BW Research

Energy Futures Initiative

The Energy Futures Initiative, the National Association of State Energy Officials, and BW Research Partnership (BWRP) today published a new resource for policymakers: an online repository of key data sets detailing energy, energy efficiency, and motor vehicles employment characteristics by sector, subsector, and technology area at the national and state levels as reported to BWRP by survey respondents for the 2017-2020 editions of the U.S. Energy and Employment Report, as well as county-level data used for the 2017 report. The public release of these data sets — covering petroleum, coal, nuclear, natural gas, renewables, energy efficiency, motor vehicles, and other key technology areas — is critical to policymakers, academic researchers, and other practitioners seeking a deeper understanding of U.S. energy and energy-related jobs and strategies to support job creation, workforce development, and energy resilience. This data can be found at *www.usenergyjobs.org*.

COVID-19 in Appalachia

Appalachian Regional Commission

As COVID-19 continues to impact the Nation, the Appalachian Regional Commission (ARC) is carefully monitoring its effects in Appalachia. ARC's goal during this crisis is to be a resource hub for the region. Explore the maps, data, and webinars collected from the federal government, the 13 appalachian state governments, and ARC partners.

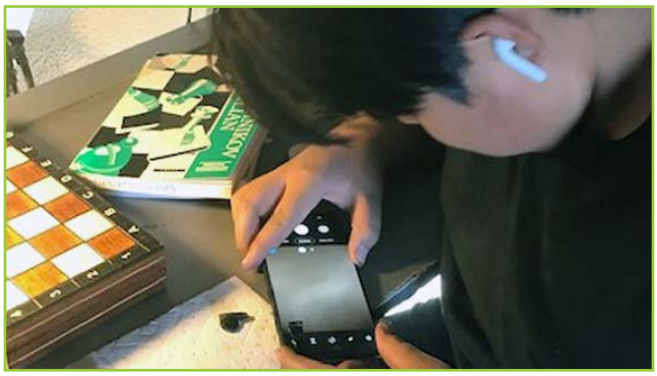
DOE STEM Rising

Fermilab scientist Anna Grassellino named 'Woman of the Year' by Italy's D La Repubblica

On Dec. 10, 2020, the Italian magazine D La Repubblica named Anna Grassellino, scientist at the U.S. DOE's Fermi National Accelerator Laboratory, as "*Woman of the Year*." Grassellino was selected from a list of *50 excellent Italian women in different fields* who left an impression on 2020. She is the director of the new *Superconducting Quantum Materials and Systems Center* based at Fermilab.

Princeton Plasma Physics Laboratory (PPPL) Receives International Recognition for Platform to Conduct Educational Experiments Remotely by Anyone, Anywhere

A computer platform developed by PPPL physicist Arturo Dominguez and others that allows users all over the world to operate a real plasma experiment from their living rooms was among 10 winners chosen by an international science committee as a cutting-edge digital education technology.



This Smartphone Microscope is Changing the Way U.S. Tribal Students View Nuclear Energy

Two engineers from Pacific Northwest National Laboratory *invented a 3D-printed clip* that turns your smartphone or tablet into a microscope with the ability to magnify items by 100 times. It was first developed to help first responders quickly identify unknown substances found in the field. Now, the microscope is being used as a simple, low-cost tool to engage thousands of students in STEM education.

Department of Energy Announces $3 Million for Pilot Diversity Program

The U.S. DOE announced a plan for a pilot program to provide $3 million for research traineeships to broaden and diversify the nuclear physics research community. The planned funding will support training and research experiences for undergraduates, with the goal of increasing the likelihood that participants from underrepresented populations will choose to pursue a graduate degree in nuclear physics or STEM-related field.

ABOUT NETL

NETL, owned and operated by DOE, is one of the Department's 17 National Laboratories. NETL supports DOE's mission to advance the national, economic, and energy security of the United States.

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