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National Laboratories' Research Experience Opportunities for Diverse Scholars

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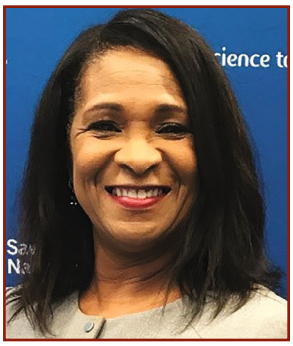

Vivian Holloway

The Positive Influence of National Labs

Education has been the foundation for advancement of civilizations since the beginning of time. It sparks curiosity, and curiosity drives discovery. Quality education is the combination of systematic theoretical instruction and enlightened experiences.

Colleges and universities are excellent student resources for generalized scientific academia and do an incredible job of specializing in scientific fields. As the world's undergraduate and graduate students continue to reach unprecedented levels of advanced academic theoretical education never thought possible centuries ago, these scholars must also be nurtured and inspired to think creatively in an applied environment. Graduate and undergraduate practicums available at U.S. national laboratories can supplement college and university programs, maximizing the growth of students in applied fields of science, technology, engineering, and mathematics (STEM) arenas. National laboratories' commitments to fostering and integrating underserved disciplines and populations can further ensure unparalleled advancements in scientific discovery.

Under the umbrella of the U.S. Department of Energy (DOE), 17 national laboratories located throughout the United States drive critical scientific and technological advances that solve the nation's strategic needs. These distinguished federal facilities are equipped with state-of-the-art equipment and facilities that enable the brightest scientific and engineering minds to develop and implement innovative ideas, ensuring America's homeland security and continued prosperity.

Myriad science and literacy programs, including internships, fellowships, outreach events, and trainings, are offered at national laboratories. These programs educate and inspire the next generation of trailblazers in scientific innovation and leadership. Through the complexities of undergraduate and graduate internships, national laboratories can achieve a level of scientific advancement that cannot flourish through academia alone. Internships are among the most advanced methods of applied education. National laboratory internships offer research experience in valuable, tangible, first-hand practical work, thus harnessing and complementing students' theoretical education and background from colleges and universities.

As national laboratories sponsor internships, they positively influence the development of a diverse scientific community that represents all facets of society, while focusing on a common vision of advancement in the STEM fields. The engagement of underrepresented groups in STEM education is a social and moral imperative. As we continue through the 21st century, it is essential to diversify our perspectives in STEM-related fields to ensure our progress toward solving many of mankind's scientific mysteries. National laboratory internship programs can focus students on underrepresented

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segments of the scientific community at the early onset of applicants' undergraduate and graduate careers. This ensures cognitive stimulation in STEM and, through some programs, offers accessibility for minority populations to these sciences. Internship populations representing minorities will enhance the diversity of future scientific research in STEM fields for generations.

Creating Opportunities through the MSIPP

The Mission of the U.S. Department of Energy Office of Environmental Management (DOE-EM) is to complete the safe cleanup of the environmental legacy brought about from more than five decades of nuclear weapons development and government-sponsored nuclear energy research. The DOE-EM has recognized the potential and importance of providing project-based learning opportunities in the fields of STEM and mentoring underrepresented groups for some time.

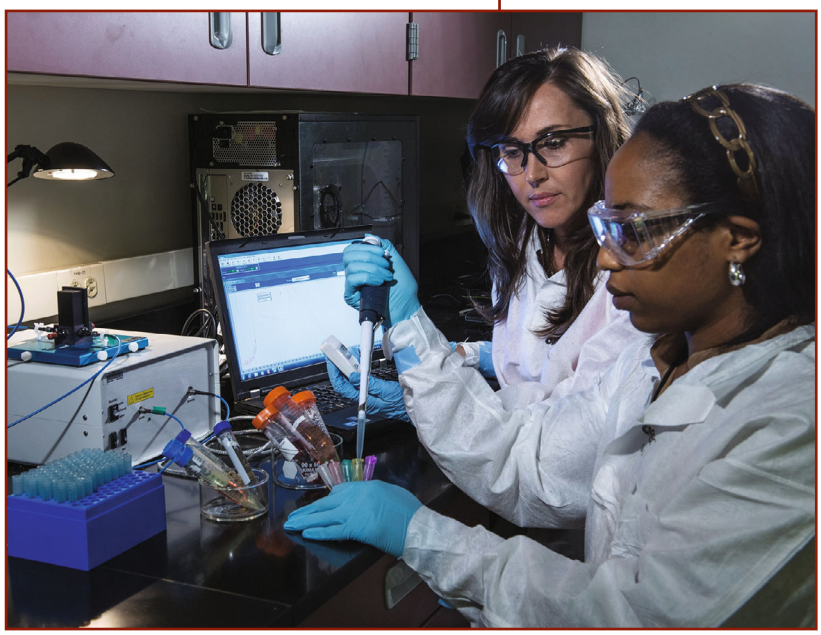
In 2014, a groundbreaking initiative called the Minority Serving Institutions Partnership Program (MSIPP) was created. The MSIPP was designed to enhance and promote awareness and educational training opportunities for the next generation of diverse scientists and engineers by exposing them to research and development activities aligned to current and future missions of the DOE-EM. The MSIPP is managed by Savannah River National Laboratory (SRNL). An applied research and development laboratory at the DOE Savannah River Site (SRS), SRNL offers practical, high-value, cost-effective solutions to complex technical problems. It is also the lead national laboratory for the DOE-EM, whose mission is to address the nation's Cold War environmental legacy initiatives.

Academic institutions of higher education that enroll student populations with significant percentages of undergraduate and graduate minority students or postdoctoral researchers are qualified to participate in the MSIPP. Additionally, these minority-serving institutions must award bachelor's degrees in STEM disciplines, be an accredited postsecondary public or private institution, and be a nonprofit institution in order to be a part of the MSIPP.

Two different opportunities are available under MSIPP initiatives that create and foster a sustainable STEM pipeline, preparing a diverse workforce of world class talent. These are:

a) financial assistance through competitive research contract awards-based proposal submissions; through strategic partnerships between minority serving institutions and the DOE's national laboratories, faculty members can compete for funding to conduct R&D activities in relevant fields at their institutions that are aligned with DOE-EM mission; and
b) internship opportunities for graduate and undergraduate students in national laboratory settings that promote the education and development of the next generation workforce in critical STEM-related disciplines complementing current and future missions of DOE-EM and the national laboratories.

Internships through the MSIPP provide the unique opportunity to bridge the transition between undergraduate and graduate academia and the real-world applications required to make significant advances in scientific discovery. Qualified MSIPP graduate and undergraduate



Simona Murph (left) works with an intern as a part of the Minority Serving Institutions Partnership Program (MSIPP) at Savannah River National Laboratory.

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students are given the opportunity to complete summer internships under the direction of a host national laboratory.

Currently, six laboratories host MSIPP students. Through MSIPP internships, national laboratories facilitate creative scientific learning and trainings through project-focused educational environments. Interns can embrace and drive the direction of learning, while continuing to grow their creativity. These paid internships are performed at host laboratories, utilizing their facilities and equipment under the guidance of a senior research staff member. Interns can familiarize themselves with state-of-the-art instrumentation not readily available at traditional colleges and universities. These experiences also provide interns knowledge on the application of environmental and safety regulations that may not be as stringent in colleges and universities. National laboratories have some of the highest standards for environmental and safety regulations, offering a unique opportunity to instruct the next generation of scientists in proper safety and regulatory guidelines and protocols.

Since its inception, the MSIPP has supported and trained hundreds of graduate and undergraduate students through summer internships at national laboratories. These include SRNL, Argonne National Laboratory, Oak Ridge National Laboratory, Los Alamos National Laboratory, Idaho National Laboratory, and Pacific Northwest National Laboratory. Interns can also train with mentors and scientists at the headquarters offices of the DOE-EM in Washington, D.C. The sustainable MSIPP initiative has led to numerous successes for many young scholars, including postdoctoral opportunities, graduate school acceptances, technical manuscript publications, conference presentations, media outlet disseminations, and job offers at national laboratories and beyond.

Preparing for A Diverse Future

Education is a complex process in our ever-changing diverse global society. Continued advancements in the ability to create relationships among a vast array of traditionally underrepresented minority populations of the scientific community is essential to an influx of creativity, discovery, and advancement in STEM innovation. Through the combination of well-prepared undergraduates and graduates in academic settings and applied internships that spark creativity and discoveries, we will be well-equipped to provide the world its greatest advancements now and in the future.

If you are a graduate or undergraduate student interested in a MSIPP summer internship, feel free to explore https://www.srs.gov/general/srnl/msipp/internships.htm and learn how to apply.

Simona E. Hunyadi Murph is a fellow scientist at Savannah River National Laboratory (SRNL) and the program manager for SRNL's Laboratory Directed Research and Development Program. She is also a special Government employee to the U.S. Department of Energy. A TMS member for many years, Murph has had an active role on several technical committees and is currently a representative for the Education Committee on the Functional Materials Division Council.

Vivian Holloway is the program manager for the U.S. Department of Energy-Office of Environmental Management's Minority Serving Institutions Partnership Program managed by SRNL. Holloway has held various positions of responsibilities in her 33 years at SRNL, including in management, chemical management, and environmental/regulartory compliance.