

Research Experiences for Undergraduates (REU)

Through its [Awards to Stimulate and Support Undergraduate Research Experiences \(ASSURE\) Program](#), the U.S. Department of Defense (DoD) supports undergraduate research in DoD-relevant disciplines. For this purpose, since FY2003, DoD has contributed several million dollars per year (through an interagency agreement with NSF) to support particular REU Sites that focus on research relevant to DoD's interests.

Institution	Project Title	Abstract Summary	Point of Contact
Boston University	Control of Gene Expression for Biological Effect	Students will be trained primarily by mentors in the Biology Department at Boston University and will carry out research related to the control of gene expression for biological impact. Research will be conducted using a variety of organismal and cell-based models and will use state-of-the-art methods for examining gene expression. In addition to research, students will be trained in responsible conduct of research (scientific ethics), diversity in the workplace, and career development. Sample research projects include the effects of climate change on gene expression patterns in coral and sea anemone models, gene networks in basal and stimulated immune cells, and gene programs involved in the development of muscle cells, sea urchin embryos, and plant structures.	Thomas Gilmore 617-353-5444 gilmore@bu.edu https://www.bu.edu/surf/
California State Polytechnic University – Pomona	Research Experience for Undergraduates in UAV Technologies	Undergraduates will have opportunities to conduct research during a 10-week summer program on cutting edge topics in unmanned aerial vehicles (UAV) flight dynamics and control, increased UAV autonomy, collision detection and avoidance, computer vision, artificial intelligence, and aerospace robotics. Students will also get opportunities to learn about federal regulations pertaining to the operation of UAVs. In addition to their research, students will participate in weekly research seminars, research meetings, and professional development seminars that are designed to prepare a	Subodh Bhandari 909-869-2612 sbhandari@cpp.edu https://www.cpp.edu/cppuasreu/index.shtml

		<p>strong workforce for the needs of industry and academia. The seminars will include topics such as literature review, writing a scientific paper, improving written and oral communication skills, technical presentations, applications to graduate schools, opportunities for research/teaching assistantships and fellowships, career paths, resume building, team building, and ethics in science and engineering. The participants will also engage in outreach activities and give presentations on UAV technologies to K-12 students at local schools.</p>	
<p>California State University – Monterey Bay</p>	<p>From the Intertidal to the Deep Ocean – Monterey Bay Regional Ocean Science</p>	<p>The program leverages the scientific and educational assets of the Monterey Bay Region to increase the diversity and number of students prepared for careers in Ocean Science. The program will: 1) recruit participants with an emphasis on students from underrepresented groups and those from research limited institutions; 2) prepare students in advance of the 10-week REU for the rigors of undertaking original research; 3) engage students in innovative research in Oceanography, Marine Biology and Ecology, Ocean Engineering, and Marine Geology; 4) provide rigorous research and professional development support for students during and after the REU to maintain interest and involvement in the Ocean Sciences.</p>	<p>Corey Garza 831-582-3024 cogarza@csumb.edu https://ifame.csumb.edu/single-project-intertidal-deepocean.html</p>
<p>Coe College</p>	<p>Spectroscopy at Coe College</p>	<p>Undergraduates will participate in research on topics in optics, glass science, acoustics, molecular biology, detector physics, modeling, and biomaterials, all under the common focus of spectroscopy. In addition to participating in research with an experienced and dedicated mentor, the REU students will engage in activities such as seminars and lectures and give</p>	<p>Susan Noreuil 319-399-8524 snoreuil@coe.edu https://sites.google.com/a/coe.edu/coe-reu/</p>

		<p>two oral presentations. The participants will be exposed and trained in a variety of techniques and equipment, including Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy, Nuclear Magnetic Resonance, Scanning Electron Microscope, absorption and fluorescence spectroscopies, x-ray fluorescence, calorimetry, and others.</p> <p>This project includes a Research Experiences for Teachers (RET) site, where each summer two high school teachers from nearby school districts participate in a research project. During the academic year, the teachers are invited to bring their students to Coe College to learn about the work they carried out. The teachers will use their experience to motivate their students to better understand the physical world and prepare them to become the future generation of scientists.</p>	
Colorado State University	Advancing Chemistry with Cross-Disciplinary Collaboration – Chemical Sciences	<p>Students will pursue collaborative research projects across all flavors of chemistry to understand how posing fundamental research questions can be translated to addressing real world problems in collaborative environments. Students also take part in a professional development and ethics training program, with a focus on science communication and preparation for graduate school or industrial careers. Through independent research projects and workshop and seminar series, this site broadens participation in STEM.</p>	<p>Garret Miyake Garret.miyake@colostate.edu https://www.chem.colostate.edu/summer-program/summer-programs/</p>
Hampton University	Atmospheric Measurements and Data Analysis at Hampton University	<p>This program is aimed primarily at under-represented minority students to conduct research centered on the broad theme of Measurement and Analysis of Atmospheric Properties. Students will work</p>	<p>Dr. William Moore 757-728-6240 William.moore@hamptonu.edu</p>

		<p>with mentors from the Department of Atmospheric and Planetary Sciences, with support from its associated research center, the Center for Atmospheric Sciences. Research projects will include several broad themes. Satellite image analysis will be applied to the detection of flood waters on normally dry land and to the appearance and growth of harmful algal blooms in local rivers. Students will participate in the collection of atmospheric measurements from a variety of instruments, apply fundamental data analysis techniques, develop basic research skills (literature review, instrument calibration, data validation, model fitting, coding), and participate in a research team to develop collaboration skills (active listening, leadership, communication, delegation). The students will also receive professional development training including topics such as paper and proposal writing, peer review, and oral presentation skills. This REU program, by instilling confidence in under-represented minority participants in their pursuit of STEM degrees and careers, will enhance the contribution of Hampton University to the diversification of the nation's STEM workforce. Research topics students may work on are related to three major themes: 1. Satellite mission design, 2. Observational Analysis of Planetary Atmospheres, and 3. Critical analysis of aerosol measurements.</p>	<p>https://home.hamptonu.edu/science/aps-summer-program/</p>
<p>Harvard Smithsonian Center for Astrophysics</p>	<p>Solar Physics at the Harvard Smithsonian Center for Astrophysics</p>	<p>Students will carry out individual research projects in solar physics under the supervision of Center for Astrophysics (CfA) senior staff scientists and engineers for ten weeks during the summer. The student projects involve numerical modeling, data analysis from space</p>	<p>Dr. Katharine Reeves (617) 496-7563 kreeves@cfa.harvard.edu</p> <p>Sandy Daly (617) 496-7089 sdaly@cfa.harvard.edu</p>

		<p>missions currently being supported at the CfA, such as Hinode, SDO, IRIS, Wind, DISCOVER, and Parker Solar Probe or engineering projects related to solar instrumentation being built at the CfA, depending on the students' interests and abilities. With its strong Space Weather component this program has the benefit to society of adding to our understanding of potential space hazards. Moreover, this program will provide exposure to professional research in a university environment with a goal of helping students to decide whether to continue their education in graduate school, and whether or not to pursue research as a profession. A student outreach component of the program will bring educational activities to the local community. The target group of students consists of undergraduates in Science, Technology, Engineering and Math (STEM) disciplines, with a preference for underrepresented groups in STEM fields and students from small colleges where there are few research opportunities.</p>	<p>https://pweb.cfa.harvard.edu/opportunities/graduate-undergraduate-programs/heassp-solar-physics-reu-program</p>
<p>Iowa State University</p>	<p>Launching Aerospace's Underrepresented Students into the Next Chapter- Unmanned Aerial Systems (LAUNCH-UAS)</p>	<p>Students will participate in one of multiple independent research projects relating to unmanned aerial systems (UAS), such as developing onboard hardware that continuously monitors essential UAS components for safe and autonomous operation; model and simulate low-altitude traffic management systems for autonomous UAS; model and simulate the operation of UAS and examine their ethical, legal, societal, and environmental implications; develop an inductive charging capability for supplying power to UAS while in operation; design, build, and experiment with onboard spray systems for UAS and characterize the spray</p>	<p>Benjamin Ahn (515) 294-6491 bahn@iastate.edu</p> <p>https://www.aere.iastate.edu/launchuas/</p>

		<p>droplets; develop low-power anti-/de-icing techniques and examine various icephobic coatings for safer long-term autonomous UAS flights; and create an educational module that increases engineers' awareness of ethical issues surrounding the operation of UAS. In addition to conducting independent research on UAS, students will participate in a number of LAUCH-UAS site components that include professional development workshops, field trips and lab tours, research luncheon seminars, and social activities. There is also a series of assignments intended to give students opportunities to prepare presentations and documents typical of those that they would be expected to complete as independent researchers and as graduate students.</p>	
<p>Kent State University</p>	<p>Research Experience for Undergraduates in Robotics and Autonomous Systems</p>	<p>Robotics and autonomous systems have revolutionized the way we approach many mundane and some highly sophisticated tasks. From robotic vacuum cleaners to self-driving cars and robotic surgeries, autonomous and robotic systems promise to increasingly shape the way society gets things done. Students will be provided with a transformative experience to stimulate their intellectual curiosity, cultivate enthusiasm, and build capacity for scientific exploration and research. Ten students each year will engage in innovative and cutting-edge research projects over a ten-week summer program. These kinds of efforts and projects can increase the number of U.S. students exposed to research in robotics and autonomous systems and educated on the merits of attending graduate school. This broader impact is vitally important to students pursuing careers in autonomy and AI-related fields.</p>	<p>Ye Lu 330-672-0791 Ylu16@kent.edu</p>

<p>Montana State University</p>	<p>Quantum and Materials Physics</p>	<p>Student participants will be guided in research projects closely associated with ongoing research activities in Quantum Information Science and other Quantum Physics projects and teamed with experienced researchers who will mentor them during the program. Weekly meetings will be used to develop an awareness of ethical conduct in science, current research, the importance of science in society, and career opportunities in science and engineering. These meetings will also be used to develop communication skills and will foster additional periods of interaction among the REU students and MSU faculty mentors. Assessment will be exercised throughout the program to make certain that each participant is appropriately mentored and reaches their goals.</p>	<p>Dr. Brian D'Urso (406) 994-3456 URSO@montana.edu</p> <p>https://physics.montana.edu/reu.html</p>
<p>New Jersey Institute of Technology</p>	<p>Solar, Terrestrial, and Space Weather Sciences at New Jersey Institute of Technology</p>	<p>Space Weather is a relatively new and highly interdisciplinary field. Student training in this field is currently offered at a very limited number of U.S. universities. The program will recruit students from institutions with limited research infrastructure and from underrepresented groups. Many research mentors are accomplished solar astronomers, terrestrial physicists, and computer scientists. Each REU participant will be paired with at least one research mentor to work on a specific research project. The participants will attend a series of lectures and workshops and participate in other career development activities throughout the program. They will present their final results at New Jersey Institute of Technology's (NJIT) International Undergraduate Summer Research Symposium and a professional conference.</p>	<p>Hyomin Kim (973) 596-5844 hmkim@njit.edu</p> <p>Bin Chen (973) 596-3565 bin.chen@njit.edu</p> <p>https://spaceweather.njit.edu/reu</p>

<p>Pepperdine University</p>	<p>Biological Adaptations to Stress -- Molecular, Cellular, Ecological</p>	<p>The Pepperdine REU program focuses on the biological adaptation to stress. Projects vary by discipline, but include ecological/genetic studies in the Santa Monica Mountains and Pacific Ocean adjacent to the Pepperdine campus, cellular and biochemical studies of the consequences of environmental toxins, mathematical modeling of biological systems, and the impact of environmental stress upon soil microbial diversity. The program specific aims are to: 1) enhance the maturation of undergraduate students as young scientists; 2) engage students in full-time, authentic biological research and the effective communication of research findings; 3) introduce students to bioinformatics and mathematical modeling; 4) train students to engage non-scientists and the public through service and clear communication; and 5) provide research opportunities for students from underrepresented groups and from schools that lack research opportunities.</p>	<p>Jay Brewster (310) 506-4321 Jay.Brewster@pepperdine.edu</p> <p>Courtney Davis (310) 506-4582 courtney.davis2@pepperdine.edu</p> <p>https://seaver.pepperdine.edu/surb/</p>
<p>Rutgers University</p>	<p>Research Internships in Ocean Sciences</p>	<p>Through independent projects and team research experiences, students focus on process-oriented concepts and techniques applicable in any marine ecosystem. The goal of RIOS is to enable students interested in ocean sciences to participate in meaningful, interactive research directed by an enthusiastic, experienced group of mentors. Group activities and independent research are embedded within ongoing programs, many of which are focused on the New Jersey continental shelf and adjacent estuaries. At the beginning of each summer internship, a four-day orientation introduces students to ongoing research, focusing on the Raritan River-Raritan Bay and the Mullica River-Great Bay systems. The two estuaries</p>	<p>Dr. Josh Kohut (848) 932-3496 kohut@marine.rutgers.edu</p> <p>Olaf Jensen ojensen@marine.rutgers.edu</p> <p>https://marine.rutgers.edu/rios/</p>

		<p>provide a sharp contrast in their human impacts on coastal ecosystems. During the first week, students also consult with mentors, and attend workshops on how to formulate a research question and write a proposal. Students then begin research projects either at the main campus in New Brunswick, NJ or at the Rutgers University Marine Field Station (RUMFS) in Tuckerton, NJ. Students make oral progress reports of their research in a mid-program workshop, receive instruction on how to write up and analyze their data, and how to prepare a poster for the final poster session.</p>	
<p>South Dakota State University</p>	<p>PLAINS (Promoting Leadership in Advanced Research Computing for INterdisciplinary Sectors)</p>	<p>STEM undergraduates engage in collaborative group projects that use High Performance Computing, Big Data, and computationally-intensive models as a central organizing theme. They will gain a competitive edge in the STEM workforce by combining a broad perspective on the theory and application of computing with training in research integrity and the development of professional skills, such as technical communication and leadership.</p> <p>Each student will work closely with graduate assistant and faculty mentors every day, and with industry mentors several times per week. Participants will learn how high fidelity models can be used to represent physical phenomena, how the models are implemented within a large computing environment, and how the simulation results are analyzed, interpreted, and used to gain insight for theoretical and applied problems. Students will gain valuable experience with simulation tools in the context of engineering analysis, state-of-the-art research tools in computation, statistical</p>	<p>Stephen Gent (605) 688-5337 Stephen.Gent@sdstate.edu</p> <p>Jung-Han Kimn (605) 688-5842 Jung-Han.Kimn@sdstate.edu</p> <p>https://www.sdstate.edu/mechanical-engineering/research-experience-undergraduates</p>

		analysis based on real datasets and simulations, and advanced numerical methods including parallel algorithms in HPC.	
University of California – Berkeley Space Science Lab (SSL)	Advancing Space Sciences through Undergraduate Research Experiences (ASSURE)	Undergraduate students are provided with an immersive experience in space science research and engineering. Students are exposed to a multidisciplinary research laboratory setting, conducting cutting edge research alongside leaders in the field. Students involved in the program acquire experience required for design and management of experimental research programs and support a range of on-going geospace missions. The research staff at SSL is composed of a diverse international community working on a range of space physics missions in radio astronomy, magnetospheric physics, heliophysics, planetary science, high energy astrophysics, and maintains robust engineering facilities. The range of work at SSL provides ASSURE students with the opportunity to gain a comprehensive exposure to a range of geospace research, including space weather and other phenomena of national importance. The program includes a bootcamp to develop student skills early in the program, careful consideration to mentor matching, an independent project, and the opportunity to present research at a national conference.	Matthew Fillingim 510-643-8485 matt@ssl.berkeley.edu https://www.ssl.berkeley.edu/assure/
University of Colorado - Boulder	Physics/JILA	Undergraduate students are paired up with preeminent faculty to do cutting-edge research in many fields of physics, including atomic, molecular, and optical physics, biophysics, condensed matter physics, high energy physics, nuclear physics, plasma physics, quantum physics, quantum information science, and physics education research. While the	Dr. Michael Litos (303) 492-6453 reuphys@colorado.edu https://www.colorado.edu/physics-jila-reu

		<p>main emphasis of the summer is centered on each student's individual research lab, where the students are expected to master at least a part of a large task, a variety of other activities take place during the program. These include ethics, electronics, and machining classes, a program on "Getting Into Grad School," as well as lab tours and a weekly science seminar series aimed at the students.</p>	
<p>University of Colorado - Boulder</p>	<p>Solar and Space Physics with the Boulder Solar Alliance</p>	<p>Students will be introduced to authentic research in solar and space physics. It will begin with a one week summer school on the Sun, Earth's magnetosphere and atmosphere, the heliosphere, and the Sun-Earth connection. This week also includes a practical course in scientific computing and a cohort-building group project. The students will spend the remaining nine weeks working on individual research projects guided by scientist mentors from the participating institutes in Boulder, Colorado. The program concludes with each student giving a 20 minute oral presentation of their work as well as a poster or manuscript of their findings. The students learn to work independently on cutting-edge research and to communicate their results effectively. In addition to research, weekly professional development sessions teach the students about career options in science, applying to graduate school, ethics and impostor syndrome, creating a CV, and scientific communication (talks, posters, proposals, and manuscripts).</p>	<p>Willow Reed (303) 492-6827 Willow.Reed@Colorado.edu</p> <p>Dr. Daniel N Baker (303) 492-4509 Daniel.Baker@lasp.colorado.edu</p> <p>https://lasp.colorado.edu/information/undergraduates/reu/</p>
<p>University of Illinois – Urbana-Champaign</p>	<p>Applying the Tools of Physicians to Explore the Macroscopic, Microscopic and Quantum Worlds</p>	<p>Students will be integrated into senior-faculty-led research groups and contribute to on-going research projects in a variety of physics areas. The REU projects at UIUC are neither "cookbook" exercises nor simple manual labor. Students will have</p>	<p>Dr. Irene Lira-Andsager (217) 333-6186 andsager2@illinois.edu</p> <p>https://physics.illinois.edu/research/reu</p>

		<p>opportunities to write code that is subsequently used in real experiments, simulate and test components for real instruments, build and characterize novel devices, grow samples that are used in original research, and analyze real data. They will be exposed to principles of the responsible conduct of research and data management and preservation. They will receive instruction in professional technical communication skills and practice leadership and teamwork skills essential to their success as future scientists and engineers. They will experience a holistic program that teaches them not only how to do physics research, but also how to be successful physicists.</p>	
<p>University of Michigan</p>	<p>Program in Climate and Space Science Observation (PICASSO) at the University of Michigan</p>	<p>The Program in Climate and Space Science Observation (PICASSO) at the University of Michigan seeks to engage a diverse cohort of students with hands-on exposure to a broad range of climate and space science topics, including meteorology and climate variability, atmospheric-biosphere exchange, aerosols and atmospheric chemistry, remote sensing, computational modeling, space weather and planetary atmospheres. Through these projects, students will have the opportunity to learn technical skills, such as: (a) research project development and management, (b) data collection, quality assurance, analysis, and visualization, (c) computational model development, application and evaluation, and (d) assessment and consideration of uncertainties in the interpretation of research results. In addition to the technical skill-building elements of the program, students will participate in a series of professional development</p>	<p>Frank Marsik (734) 763-5369 marsik@umich.edu</p> <p>Tonya Thompson (734) 763-4611 tyb@umich.edu</p> <p>https://clasp.engin.umich.edu/academics/undergraduate-research/reu-clasp/</p>

		<p>activities which will focus on: (a) understanding practices associated with the responsible and ethical conduct of research, (b) developing skills for the communication of scientific research results to their peers and the general public, (c) learning the nuances of selecting, applying to, and succeeding in graduate school, and (d) developing a greater sense of self-understanding and self-authorship in support of professional and personal decision-making. In doing so, we will seek to improve the confidence of these students regarding their continued participation in science, technology, engineering and mathematics (STEM) fields.</p>	
<p>University of Michigan</p>	<p>Summer Intensive Research Experiences in Neuroscience (SIREN)</p>	<p>Students will gain expertise in the conduct of research while building an array of transferrable professional skills. Participants will present their research in an end-of-summer symposium, and many will present their work at additional scientific conferences. Research opportunities will span several neuroscience sub-disciplines including behavioral, cognitive, cell/molecular, developmental, sensory, and computational neuroscience. Projects tend to focus on the basis of neurological development or disease, and utilize a wide range of in silico, in vitro, and in vivo model systems. Journal clubs, presentations, and discussions will intersect these subareas to further explore interdisciplinary approaches to science. Weekly workshops will help develop the transferable skills required for success in long-term research careers; topics include current methods in neuroscience, rigor and reproducibility, research skills, and career planning.</p>	<p>R. Keith Duncan (734) 763-2129 rkduncan@umich.edu</p> <p>Shelly Flagel (734) 936-2033 sflagel@umich.edu</p> <p>https://neuroscience.med.umich.edu/reu-site-summer-intensive-research-experiences-neuroscience-siren</p>

<p>University of Missouri</p>	<p>Summer Research Projects in Neuroscience</p>	<p>Undergraduates will be trained in interdisciplinary neuroscience, with a focus on computational methods. The program starts with a one-week boot-camp on computational tools and technical writing. Neuroscience faculty members from the Colleges of Arts & Science, Engineering, Vet Med, and Medicine train undergraduates in research, in projects that range across the neuroscience spectrum, e.g., neuronal homeostasis and compensation (intracellular), mechanisms of exocytosis (cellular), fear memory formation in amygdala (cellar and network), cortico-basal ganglia system (network/systems), attention in human cognition (cognitive), and neural processing of motivated behaviors (behavioral).</p>	<p>Satish Nair (573) 882-2964 nairs@missouri.edu</p> <p>David Schulz (573) 882-4067 schulzd@missouri.edu</p> <p>https://nairs.mufaculty.umsystem.edu/research/nsf-neural-reu-project</p>
<p>University of Nebraska - Lincoln</p>	<p>Lasers and Optics</p>	<p>Students will conduct research under the direct supervision of faculty who are established experts in their fields. Recruitment focuses on underrepresented groups in physics, chemistry, and engineering and on academic institutions with insufficient scientific research resources. In addition to research in state-of-the-art laboratories, the program includes student professional development and community outreach. Unique to this site, suitable student projects will be selected to create virtual or augmented reality presentations for a general audience to stimulate public engagement with science and technology. The first-hand research experience the REU students will have gained will prepare them for scientific careers and strengthen the nation's competitiveness on a global scale.</p> <p>A team of eight scientific experts will</p>	<p>Dr. Cornelis J. Uiterwaal (402) 472-9010 cuiteraal2@unl.edu</p> <p>https://www.unl.edu/summerprogram/reu-lasers-and-optics</p>

		<p>mentor students in a broad range of topical research projects. This includes cutting-edge research with laser-driven multi-fiber nanotip electron sources, imaging of femtosecond molecular dynamics, generation of femtosecond X-ray pulses, spectroscopy, meta-materials for photonic and optical applications, the propagation of laser pulses in liquids, programmable spatial light modulation, and femtosecond laser surface processing. Students will also create virtual and augmented reality projects. Publications co-authored by REU students, their poster presentations, and their talks will advance and spread knowledge in this broad field of research and applications. The project also includes workshops for professional preparation and development, including preparation for graduate school.</p>	
<p>University of Nebraska - Lincoln</p>	<p>Undergraduate Research Opportunities in Unmanned Systems Foundations and Applications</p>	<p>Students engage in professional development activities to better prepare them for Science, Technology, Engineering or Mathematics (STEM) careers. Students from computer science, computer engineering, mechanical engineering, electrical engineering, and other related majors are considered. Particular attention is given to students from underrepresented groups and from institutions in the Midwest that lack research opportunities to support broader educational goals and diversity in the STEM workforce.</p> <p>Each student's research project focuses on unmanned systems with topics including close interactions of aerial robots with the environment; proficiency development in operating robotic systems; vision-based control for collaborative</p>	<p>Justin Bradley (402) 472-5072 justin.bradley@unl.edu</p> <p>Dung Hoang Tran (402) 472-5029 dtran30@unl.edu</p> <p>https://www.unl.edu/summerprogram/unmanned</p>

		<p>robotic systems; multi-agent design, control, and applications; and resilient, synergistic communication systems. Projects build on ongoing faculty research but are crafted for participants to gain experience in all aspects of research, from conducting a literature review and prototyping, to understanding the broad potential impact of the technology being investigated.</p>	
<p>University of North Dakota</p>	<p>Genes & the Environment: Research Experiences for Undergraduates from Rural & Tribal Colleges</p>	<p>Students may select from research that represents a wide array of biological fields including cell biology, developmental biology, genetics, molecular biology, neuroscience, and systems biology. Students will also participate in weekly seminars and workshops on topics such as scientific writing and presentations, responsible and ethical conduct of research, diversity and inclusion in STEM, mentoring and applying to graduate programs. Students will present their research during a poster symposium at the end of the program.</p>	<p>Van Doze (701) 777-6222 van.doze@med.und.edu</p> <p>Rebecca Simmons (701) 777-3439 rebecca.simmons@und.edu</p> <p>http://ndinbre.org/NSF-REU/</p>
<p>University of Notre Dame</p>	<p>Integrative Cell and Molecular Biology</p>	<p>Students will receive a comprehensive introduction to scientific research. It will give students experience in generating and analyzing their own research results as well as effectively reporting scientific information. It will also educate them on the important issues of professionalism, ethical conduct, collaboration, and other skills needed to succeed in the scientific arena. The recruitment of underrepresented minority students, and students without access to research will be a high priority to increase the diversity of students pursuing research careers. Students will learn how research is conducted, and many will present the results of their work at scientific conferences.</p>	<p>Xuemin Lu (574) 631-0883 xlu1@nd.edu</p> <p>Michelle Whaley (574) 631-9343 Michelle.A.Whaley.3@nd.edu</p> <p>https://www3.nd.edu/~biosreu/</p>

<p>University of South Florida</p>	<p>Cryptography and Coding Theory at the University of South Florida</p>	<p>Students are given the opportunity to explore different angles of post-quantum cryptography, which consists in the design of cryptosystems that will resist attacks from future quantum computers. Research projects available to the students include the design and analysis of cryptosystems based on Euclidean lattices, on error-correcting codes, as well as the technical aspects pertaining to their practical deployment. Students are also given the opportunity to explore the mathematical aspects of block cipher design through projects on Almost Perfect non-Linear (APN) functions, as well as the design of error correcting codes that optimize the redundancy effort to mitigate the impact of the unavailability of servers. Students are given opportunities for personal development such as training in cryptography and coding theory by an interdisciplinary team of senior personnel, and professional workshops on intellectual property and graduate school applications. In addition, participants take part in an REU Site research symposium at the end of the summer that brings together REU Site participants from all disciplines across the University of South Florida.</p>	<p>Jean-Francois Biasse biasse@usf.edu</p> <p>Dmytro Savchuk savchuk@usf.edu</p> <p>https://www.usf-crypto.org/reu-program/</p>
<p>University of Washington</p>	<p>Sensorimotor Neural Engineering</p>	<p>The scientific theme will focus on the emerging domain of neural engineering. This research area encompasses the development of concepts and devices used to assist, understand, and interact with neural systems. Because neural engineering is an interdisciplinary topic, students will be assigned to laboratories in several departments including Bioengineering, Biology, Physiology and Biophysics, Psychology, Rehabilitation Medicine, Computer Sciences and Engineering, Electrical Engineering and</p>	<p>Eric Chudler (206) 616-6899 chudler@u.washington.edu</p> <p>Rajesh Rao (206) 685-9141 rao@cs.washington.edu</p> <p>https://centerforneurotech.uw.edu/content/research-experience-undergraduates</p>

		<p>Mechanical Engineering. In addition to laboratory work, students will participate in a communications course and workshops to improve their presentation and writing skills. All REU participants will complete a Responsible Conduct of Research Training including discussions about the ethical conduct of research. A special workshop will be provided about how ethical issues might arise in the field of sensorimotor neural engineering. Talented undergraduates, especially those from under-represented groups and who have completed their freshman and sophomore years, are encouraged to apply.</p>	
<p>University of Washington</p>	<p>UNOLS-MATE At-Sea Technical Internship</p>	<p>University National Oceanographic Laboratory System - Marine Advanced Technical Education (UNOLS-MATE) interns work with marine technicians and scientists onboard research vessels. These experiences provide interns with the opportunity to develop their technical, scientific, seamanship and interpersonal skills. Ships that are part of the UNOLS and the United States Coast Guard (USCG) fleets will serve as internship hosts. While the program is open to all U.S. undergraduates, recruitment efforts are focused on community college students enrolled in marine technology programs and university students interested in marine technical careers. This training effort is important for the continued operation of the U.S. academic research fleet and for the marine industries that benefit by hiring the highly skilled technicians who graduate from the program. With a focus on recruiting students from community colleges who are interested in careers as marine technicians, the MATE internship program fills a unique need in the continuum of</p>	<p>Doug Russell 206-543-5062 dgruss@uw.edu https://www.marinetech.org/internships/</p>

		support for undergraduate students in marine sciences.	
Virginia Polytechnic Institute and State University	Glyco-Tree: Glycomaterial Training, Research and Education Experiences	<p>Glycomaterials is a term that broadly encompasses sugars and larger molecules derived from sugars. Applications of glycomaterials include structural products such as lumber, textiles, biofuels (derived from corn and wood), food additives, and nutrition. Glycomaterials also play important roles in biology including immune response, cell-to-cell communication and as a fundamental component of DNA. In 2020, the National Science Foundation funded GlycoMIP, a Materials Innovation Platform (MIP) at Virginia Tech and partner institutions, to concentrate expertise in characterization, modeling, and synthesis of glycomaterials with state-of-the-art facilities and instrumentation. Virginia Tech will host a Research Experiences for Undergraduates (REU) site that leverages GlycoMIP to afford undergraduate students with team-based research projects, participation in GlycoMIP Summer School, a week-long dive into glycomaterial characterization, modeling and synthesis, and leadership opportunities through Youth Experiencing Science (YES), a K-12 summer outreach program at Virginia Tech.</p>	<p>Alan Esker 540-231-4601 aesker@vt.edu</p> <p>https://glycotree.chem.vt.edu/</p>
Yale University	Research training in biomedical sciences and engineering	<p>Undergraduates will receive convergent, hands-on research experiences and professional development skills at a large research institution that will enable them to pursue STEM careers. The REU Site has three focus research areas: A) Biological imaging and data science, B) Biomechanics, and C) Systems biology. Each REU participant conducts research in one of these research areas. Enrichment activities develop students'</p>	<p>Corey O'Hern (203) 432-4258 corey.ohern@yale.edu</p> <p>Dorottya Noble (203) 432-2751 dorottya.noble@yale.edu</p> <p>https://physics-engineering-biology.yale.edu/nsf-reu-site</p>

		<p>written and oral communication skills aimed at science and lay audiences, networking skills, and understanding of the graduate application process, STEM careers, and scientific ethics. REU participants will gain a deeper understanding of interdisciplinary and quantitative research and how wet-lab experiments inform computational and theoretical approaches, and vice versa. This REU Site helps students determine if they want to pursue graduate studies, the field they want to pursue during graduate studies, and the STEM careers that are available to them. Many participants will have the opportunity to present their research at scientific conferences, and, when possible, contribute to the preparation of scientific publications.</p>	
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