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STEM /
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FEDERAL
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NITRD News Brief

We are pleased to continue NITRD's News Brief that offers insight into the activities NITRD's member agencies are conducting to achieve the Nation's priorities through the lens of the public-facing news sources. These are divided into networking and information technology topics that have been identified as of great importance for improving Americans' daily lives.

For ease of access, under NITRD's logo, the title of each section is listed as a link to that section. The titles of the articles under the section's heading are links that provide immediate access to the news article listed. We hope you find this informative and helpful in your daily activities.

Do you know someone who would like to receive NITRD's weekly news brief? They can email NITRD's IT aficionados at nco@nitrd.gov and voilà they will receive the news brief with the cool technology articles each week!

From The White House

EXECUTIVE OFFICE OF THE PRESIDENT: Multi-Agency Research and Development Priorities for the FY 2025 Budget

...This memorandum outlines the Administration's multi-agency R&D priorities for formulating fiscal year (FY) 2025 Budget submissions to the Office of Management and Budget (OMB). These priorities should be addressed within the FY 2025 Budget guidance levels provided by OMB. Clear choices will be required given constrained discretionary funding caps. Agency budget submissions should include an addendum that details how each request level addresses these priorities. Agencies engaged in complementary activities are expected to consult with one another during the budget formulation process to maximize impact by coordinating resources and avoiding unnecessary duplication. * Advance trustworthy artificial intelligence (AI) technology that protects people's rights and safety, and harness it to accelerate the Nation's progress. * Lead the world in maintaining global security and stability in the face of immense geopolitical changes and evolving risks. * Step up to the global challenge of meeting the climate crisis by reimagining our infrastructures, renewing our relationship with nature, and securing environmental justice. * Achieve better health outcomes for every person. * Reduce barriers and inequities. * Bolster the R&D and industrial innovation that will build the Nation's future economic competitiveness from the bottom up and middle out. * Strengthen, advance, and use America's unparalleled research to achieve our Nation's great aspirations...

The White House - Aug 17, 2023

Federal Agency Funding Opportunities

Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science (SCH)

...The purpose of this interagency program solicitation is to support the development of transformative high-risk, high-reward advances in computer and information science, engineering, mathematics, statistics, behavioral and/or cognitive research to address pressing questions in the biomedical and public health communities. Transformations hinge on scientific and engineering innovations by interdisciplinary teams that develop novel methods to intuitively and intelligently collect, sense, connect, analyze and interpret data from individuals, devices and systems to enable discovery and optimize health. Solutions to these complex biomedical or public health problems demand the formation of interdisciplinary teams. Projects will be funded for up to four years for a total of \$1,200,000 (\$300,000 per year). Deadline date for full proposal: November 9 2023...

National Science Foundation - Aug 10, 2023

HPC

NOAA completes upgrade to weather and climate supercomputer system

...The Department of Commerce and NOAA expanded the capacity of the nation's Weather and Climate Operational Supercomputing System (WCROSS) by 20% this week. The increased computing power and storage will help improve forecast model guidance for years to come and allow for other weather prediction advances. Faster supercomputing will allow NOAA to run more complex forecast models while increased storage space will enable more data to be fed and assimilated into the system. These improvements will permit upgrades to NOAA's weather forecasting systems and models over the next few years, including: * Upgrades to the U.S. Global Forecast System will make it higher-resolution. * A new Rapid Refresh Forecast System, which will allow for larger ensembles with more data. * Upgrades to the Global Ensemble Forecast System, which will more accurately capture what is known as radiatively active aerosols. * Expansion in compute power and storage, which will provide operational capacity to implement research and development advancements...

National Oceanic and Atmospheric Administration - Aug 10, 2023

Department of Energy Announces \$112 Million for Research on Computational Projects in Fusion Energy Sciences

...The U.S. Department of Energy's (DOE) Office of Science (SC) announced \$112 million in funding for 12 projects that focus on collaborations among fusion scientists, applied mathematicians, and computer scientists to maximize the use of high performance computing, including exascale computers. The Scientific Discovery through Advanced Computing (SciDAC) program pairs the Fusion Energy Sciences (FES) program with the Advanced Scientific Computing Research (ASCR) program to explore solving complex problems through computing. Projects funded through this program will use computing resources to model plasmas, study turbulence, and use artificial intelligence to predict and solve problems like energy losses. "The SciDAC program and the FES-ASCR SciDAC partnerships have advanced scientific discovery in fusion and plasma sciences over the last two decades," said Ceren Susut, DOE Acting Associate Director of Science for Advanced Scientific and Computing Research. "The current awards leverage this past research as well as codes developed on the ASCR Exascale Computing Project to address the new and broader 2023 portfolio."...

Department of Energy - Aug 14, 2023

AFRL opens state-of-the-art Extreme Computing facility, announces \$44 million in additional funding

...The Air Force Research Laboratory's, or AFRL, new Extreme Computing Facility at the Information Directorate in Rome, New York, is a vital component to national defense research, and AFRL is using the most cutting-edge Quantum Computing technology available to protect the nation and deliver game-changing technologies to the warfighter. The Extreme Computing Facility, or ECF, has a wide range of science and technology capabilities that collaborators from private industry, federal agencies and state and local governments leverage to address pressing technical issues and gain a competitive advantage. The complimentary AFRL and Griffiss Institute facilities afford AFRL the ability to do basic research off-installation that can be transitioned to analogous facilities on-installation for classified defense research vital to national security, and vice versa. This provides a streamlined mechanism for collaboration and technology transfer between DoD, industry partners and academia. In 2021, the Information Directorate was designated as the Quantum Information Science Research Center for the U.S. Air Force and U.S. Space Force. This laid the foundation for the "Quantum Computing Test Bed" at the Innovare Advancement Center, which aims to be a global catalyst to converge world-class talent in areas including artificial intelligence, cybersecurity and quantum...

Air Force Materiel Command - Aug 14, 2023

Department of Energy Announces \$11 Million for Exploratory Research in Extreme-Scale Science

...The U.S. Department of Energy (DOE) announced \$11 million in funding for 15 projects in exploratory research for extreme-scale science that will leverage emerging trends and advances in high-end computing, massive datasets, scientific machine learning, artificial intelligence, and novel computing architectures. "There is a wide expanse of exciting opportunities as we reach beyond exascale computing," said Ceren Susut, DOE Acting Associate Director of Science for Advanced Scientific Computing Research. "These projects will help us find promising directions to realize the full potential of scientific computing from emerging technologies." Disruptive technology changes are occurring across science applications, algorithms, and computer architectures and ecosystems, and these projects will explore exciting directions in advanced digital, analog, and quantum computing. Projects include modeling cryogenic and photonic beyond-exascale supercomputing systems. Projects will also develop innovative techniques for converting quantum circuits into dynamic quantum walks and map the converted circuits onto different kinds of quantum computers...

Department of Energy - Aug 10, 2023

Artificial Intelligence / Machine Learning

DOD Announces Establishment of Generative AI Task Force

...The Department of Defense (DoD) announced the establishment of a generative artificial intelligence (AI) task force, an initiative that reflects the DoD's commitment to harnessing the power of artificial intelligence in a responsible and strategic manner. Led by the Chief Digital and Artificial Intelligence Office (CDAO), Task Force Lima will assess, synchronize, and employ generative AI capabilities across the DoD, ensuring the Department remains at the forefront of cutting-edge technologies while safeguarding national security. Leveraging partnerships across the Department, Intelligence Community and other government agencies, the task force will help minimize risk and redundancy while pursuing generative AI initiatives across the Department...

U.S. Department of Defense - Aug 10, 2023

U-M gets \$9.7M from NASA to use machine learning to develop a new tool that will help forecast harmful space weather

...NASA is providing \$9.7 million to establish a Space Weather Center of Excellence at the University of Michigan, tasked with developing better forecasts. Lulu Zhao will lead an effort to provide that notice through the Center for All-Clear Solar Energetic Particle Forecast, or CLEAR Center. The CLEAR Center will build tools that give space instrument operators and astronauts more advanced notice of harmful space weather in any given region of the solar system. The new tool will provide forecasts "similar to the weather app on your phone." In Zhao's "best case scenario," their improved forecasting tool will be ready in time for the Artemis mission's lunar landing, which is scheduled to begin during a phase of heightened activity in the sun's regular cycle. That look into the future will come from a machine-learning algorithm that predicts what the sun's surface will look like based on real-time images of the sun and how the sun has behaved in the past. The researchers plan to compile all of the existing measurements of solar energetic particles and related data from the sun from that is gathered from about 20 different space instruments that have been collecting them since 1973. The new dataset not only will train the machine-learning algorithms to predict our solar system's space weather, but will serve as a benchmark dataset for the entire scientific community to develop and validate space weather forecasting tools...

University of Michigan News Service - Aug 15, 2023

NSF grant to research 3D graphs and accelerate discovery in artificial intelligence for science

...Dr. Shuiwang Ji, at Texas A&M University, recently received a National Science Foundation grant to research 3D graphs and artificial intelligence. Using artificial intelligence, Dr. Shuiwang Ji plans to make predictions from graphs that could be used to help areas such as science, fluid dynamics, chemistry, physics and biotechnology. The professor aims to develop a methodology to represent molecules and proteins using 3D or geometric graphs to predict their behavior and properties. Once created, this methodology could help solve problems in physics, fluid dynamics and biotechnology. The applications of this project include not only drug discovery but also material science, partial differential equations and aerospace engineering, to name a few. Ji plans to focus on the methodology rather than one area of study, inviting collaboration from experts in a wide range of fields to lend insight into this work and solve many problems...

Texas A&M University College of Engineering - Aug 11, 2023

Texas A&M Professor Receives NSF Grant To Study AI-Powered Data Compression

...Dr. Zixiang Xiong, at Texas A&M University, received a National Science Foundation grant to research the fundamental limits of learned source coding — or data compression that uses machine learning — now that new machine learning methods have permeated the scene. This project aims to understand what types of machine learning algorithms can compress data well and how many samples are needed to learn compression well. While gaining a fundamental understanding of data compression that utilizes machine learning, Xiong hopes to develop more powerful compression methods, leading to more efficient use of wireless communication and less energy consumption by mobile devices. This project aims to develop boundaries for the performance of machine learning for both compression methods...

Texas A&M Today - Aug 14, 2023

Robotics / Autonomous Vehicles

NSF supports device to allow electrical skin of robot to expand and contract like a human

...Northeastern University researchers are exploring how to bring versatility and tactility to robotics. As part of a new research project supported by the National Science Foundation, Ravinder Dahiya will explore the feasibility of bringing the robotics community one step closer to achieving that goal. Dahiya will work to create a device that would enable electronic skin used in robots to expand and contract similar to the way human skin does. The device will consist of a “touch sensor integrated with a soft electromagnetic coil-based flexible ultra-thin actuator. The potential applications the device could enable are vast, for example, it could enhance robots’ ability to handle items of varying densities, shapes and weights. The technology could also be used in rehabilitation settings, assisting those learning to regain function in their extremities and those who have lost limbs...

Northeastern Global News - Aug 14, 2023

Quantum

More institutions to participate in quantum science and engineering with \$38M from NSF

...The U.S. National Science Foundation is investing \$38 million to expand its support for quantum information science and engineering (QISE). From advancing the ways in which we create sustainable energy to improving cyber security, NSF’s Expanding Capacity in Quantum Information Science and Engineering (ExpandQISE) program is funding cutting-edge research across 22 grants. NSF awarded a total of \$38 million across 22 grants spanning a variety of subjects, including physics, computer sciences, materials research, engineering and chemistry....

National Science Foundation - Aug 15, 2023

ONR/NSF/ARO/DOE/NIH funds research on arrays of quantum rods could enhance TVs or virtual reality devices

...Flat screen TVs that incorporate quantum dots are now commercially available, but it has been more difficult to create arrays of their elongated cousins, quantum rods, for commercial devices. Quantum rods can control both the polarization and color of light, to generate 3D images for virtual reality devices. Using scaffolds made of folded DNA, MIT engineers have come up with a new way to precisely assemble arrays of quantum rods. By depositing quantum rods onto a DNA scaffold in a highly controlled way, the researchers can regulate their orientation, which is a key factor in determining the polarization of light emitted by the array. This makes it easier to add depth and dimensionality to a virtual scene. Mark Bathe’s lab, at MIT, has developed computational methods that allow researchers to simply enter a target nanoscale shape they want to create, and the program will calculate the sequences of DNA that will self-assemble into the right shape. They also developed scalable fabrication methods that incorporate quantum dots into these DNA-based materials. ... The research was funded by the Office of Naval Research, the National Science Foundation, the Army Research Office, the Department of Energy, and NIH’s National Institute of Environmental Health Sciences.

MIT News - Aug 11, 2023

Cybersecurity / Privacy

DARPA AI Cyber Challenge Aims to Secure Nation’s Most Critical Software

...At Black Hat USA 2023, DARPA issued a call to top computer scientists, AI experts, software developers, and beyond to participate in the AI Cyber Challenge (AIxCC) – a two-year competition aimed at driving innovation at the nexus of AI and cybersecurity to create a new generation of cybersecurity tools. As software enables modern life and drives productivity, it also creates an expanding attack surface for malicious actors. This surface includes critical infrastructure, which DARPA experts say is especially vulnerable to cyberattacks given the lack of tools capable of securing systems at scale. AIxCC represents a first-of-its-kind collaboration between top AI companies, led by DARPA, to create AI-driven systems to help address one of society’s greatest challenges – cybersecurity. AIxCC will allow two tracks for participation: the Funded Track and the Open Track. Funded Track competitors will be selected from proposals submitted to a Small Business Innovation Research solicitation. AIxCC brings together leading AI companies that will work with DARPA to make their cutting-edge technology and expertise available to challenge competitors. Anthropic, Google, Microsoft, and OpenAI will collaborate with DARPA to enable competitors to develop state-of-the-art cybersecurity systems...

DARPA - Aug 10, 2023

New Database Arms DHS with Better Resources to Mitigate Explosive Threats

...The Science and Technology Directorate (S&T) will soon roll out a state-of-the-art database that will give the Department of Homeland Security (DHS) subject matter experts (SMEs) and frontline personnel access to information that is essential to mission success. ExPRT will provide SMEs, first responders, and members of the explosives research community with quick and easy access to relevant scientific and research, development, test, and evaluation data spanning from the early 2000's to present. S&T's Explosives Threat Assessment (ETA) Program Manager Dr. Anna Tedeschi and SMEs from S&T's Modeling and Simulation Technology Center (MS-TC) performed a series of evaluations to derive a solution that would accomplish this goal and at the same time facilitate new conversations about how to best address potential explosives threats as we look to the future. After determining a best path forward to share this vital information, ETA and MS-TC SMEs approached the Cybersecurity and Infrastructure Security Agency's Office for Bombing Prevention (OBP) to collaborate on the opportunity. OBP was immediately interested, proposing the Technical Resource for Incident Prevention (TRIPWire) Portal as a platform for developing, prototyping and hosting ExPRT to ensure it remains a secure, web-based one-stop-shop for the explosives research community. This spring, the ExPRT development team released a minimum viable product for both the landing page and database...

Homeland Security - Aug 10, 2023

Cyber Safety Review Board Releases Report on Activities of Global Extortion-Focused Hacker Group Lapsus\$

...The U.S. Department of Homeland Security (DHS) released the Cyber Safety Review Board's (CSRB) report summarizing the findings of its review into the activities associated with a threat actor group known as Lapsus\$. The CSRB found that Lapsus\$ leveraged simple techniques to evade industry-standard security tools that are a lynchpin of many corporate cybersecurity programs and outlined 10 actionable recommendations for how to better protect against Lapsus\$ and similar groups. The CSRB engaged with nearly 40 organizations and individuals — including representatives from threat intelligence firms, incident response firms, targeted organizations, international law enforcement organizations, as well as individual researchers and subject matter experts, and companies targeted in the attacks — to better understand the incidents and recommend safety improvements for the future. The CSRB found that Lapsus\$ and related threat actors used primarily simple techniques, like stealing cell phone numbers and phishing employees, to gain access to companies and their proprietary data. The Board calls for organizations to immediately switch to more secure, easy-to-use, password-less solutions by design. The report also includes recommendations for cell phone carriers to better protect their customers by implementing stringent authentication methods, and for the Federal Communications Commission (FCC) and Federal Trade Commission (FTC) to mandate and standardize best practices to combat SIM swapping...

Homeland Security - Aug 10, 2023

Department of Homeland Security's Cyber Safety Review Board to Conduct Review on Cloud Security

...The Cyber Safety Review Board (CSRB) will conduct its next review on the malicious targeting of cloud computing environments. The review will focus on approaches government, industry, and Cloud Service Providers (CSPs) should employ to strengthen identity management and authentication in the cloud. The CSRB will assess the recent Microsoft Exchange Online intrusion, initially reported in July 2023, and conduct a broader review of issues relating to cloud-based identity and authentication infrastructure affecting applicable CSPs and their customers. The Board will develop actionable recommendations that will advance cybersecurity practices for both cloud computing customers and CSPs themselves...

Homeland Security - Aug 11, 2023

Microelectronics

NIST Demonstrates a New 'Primary Standard' for Measuring Ultralow Pressures

...Semiconductor manufacturers create microchips in vacuum chambers that must be almost entirely devoid of atomic and molecular contaminants, and so they need to monitor the gas pressure in the chamber to ensure that the contaminant levels are acceptably low. Now, scientists at the National Institute of Standards and Technology (NIST) have validated a new approach to measuring extremely low gas pressures called CAVS, for cold atom vacuum standard. They have established that their technique can serve as a "primary standard." Not only can CAVS make measurements as good as those in traditional pressure gauges, but it can also reliably measure the much lower vacuum pressures — a trillionth of the Earth's sea-level atmospheric pressure and below — that will be required for future chip manufacturing and next-generation science. And its operation, based on well-understood quantum physics principles, means that it can make accurate readings "right out of the box," without requiring any adjustments or calibration to other reference pressure sources or techniques...

National Institute of Standards and Technology - Aug 10, 2023

The CHIPS and Science Act: A Game-Changer in its First Year

...The Chips and Science Act has injected fresh momentum into the semiconductor industry, investing over \$230 billion. The Chips and Science Act has recognized the critical role of semiconductor technology in national security. The law's focus on domestic chip production and supply chain security will diminish reliance on foreign manufacturers. The United States Department of Commerce and Department of Defense signed a Memorandum of Agreement to expand collaboration and strengthen the U.S. semiconductor defense industrial base. As a result, the country is poised to become more resilient to supply chain disruptions and potential cyber threats. This heightened security has profound implications for defense systems, communication infrastructure, and data protection...

Department of Energy - Aug 10, 2023

DARPA Grant Powers Team's Tool To Design Nanoscale Computer Chips

...The tiniest transistors on integrated circuits now measure just a few nanometers wide — 33,000 times smaller than the thickness of a sheet of paper. At that size, however, the components can behave in unexpected ways due to quantum physics. The emergence of chips with transistors at that scale has created a need for computer modeling tools that can simulate and predict the material performance of devices so small they defy traditional design rules. Currently, only supercomputers can calculate material properties such as size, shape and density of device structures in the nanometer range, and a single simulation can take days or weeks. A team of five University of Texas at Dallas researchers received a \$1 million grant from the Defense Advanced Research Projects Agency (DARPA). They are working to develop computational modeling tools that use artificial intelligence to do the work 1,000 times faster than simulations processed by supercomputers. The AI-based tools will aid in the design of smaller, faster devices — specifically the development of high-performance terahertz (THz) devices for DARPA applications...

The University of Texas at Dallas - Aug 11, 2023

Climate Change / Green Energy & IT

NASA Study Reveals Compounding Climate Risks at Two Degrees of Warming

...If global temperatures keep rising and reach 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels, people worldwide could face multiple impacts of climate change simultaneously. This is according to a NASA-led study that analyzed the projected impacts of such warming to understand how different climate effects might combine. A 2-degree rise in global temperatures is considered a critical threshold above which dangerous and cascading effects of human-generated climate change will occur. To investigate potentially compounding effects of rising temperatures, the study's authors worked with a specially processed set of climate predictions. The predictions were originally generated by 35 of the world's leading climate models — specifically, contributors to the Coupled Model Intercomparison Project (CMIP), which includes models developed by the NASA Goddard Institute for Space Studies. CMIP provides climate projections that help the Intergovernmental Panel on Climate Change and other international and national climate groups understand historical, current, and future climate changes. Researchers at the NASA Earth Exchange (NEX) then took the output from CMIP6 models and used advanced statistical techniques to “downscale” them, improving the resolution significantly. NEX uses supercomputers at NASA's Ames Research Center to analyze vast amounts of data collected by aircraft and satellites or projections produced by climate models. The resulting NEX dataset supporting this research is available to the public...

National Aeronautics and Space Administration - Aug 10, 2023

Digital Health

Lighting the Way on FHIR Implementation

...The ONC Cures Act Final Rule (Cures Rule) supports patients' and providers' access to electronic health information through Health Level Seven (HL7®) Fast Healthcare Interoperability Resources (FHIR®) application programming interfaces (APIs). To ensure that secure, standardized FHIR APIs certified through the ONC Health IT Certification Program can be accessed and used “without special effort,” the Cures Rule included a requirement to ensure that app developers could readily lookup the service base URLs (i.e., “FHIR endpoints”) associated with enabling patient access. These FHIR endpoints make it possible for an app to “know where to go” to help a patient request their health information...

Health IT - Aug 14, 2023

Neutrons seek to stop cancer from hijacking a metabolic highway

...The Department of Energy's Oak Ridge National Laboratory's team used neutrons and X-rays to draw a roadmap of every atom, chemical bond and electrical charge inside a key enzyme that belongs to a metabolic pathway that cancer cells dramatically overuse to reproduce. This new information essentially helps pave the way for developing new drugs that act as roadblocks along the metabolic pathway to cut off the supply of vital resources to cancer cells. The drugs would be designed to target highly aggressive tumor-forming cancers that too often become terminal, such as lung, colon, breast, pancreatic and prostate cancers. The team used a combination of neutron and x-ray scattering experiments to map the location of every atom in the enzyme structure as well as the network of chemical bonds and the corresponding electrical charges. Neutrons are especially important in that hydrogen atoms make up approximately 50% of all atoms in biological systems, and their presence also plays a significant role in determining the strength of chemical bonds between a drug molecule and an enzyme. To track the hydrogen atoms, the researchers used the neutron instruments MANDI and IMAGINE at ORNL's Spallation Neutron Source, or SNS, and High Flux Isotope Reactor, or HFIR. The neutron research is part of a larger effort funded by the National Institutes of Health to study a broad class of enzymes similar to SHMT that rely on a single derivative of vitamin B6 to perform more than 140 different chemical reactions...

Oak Ridge National Laboratory - Aug 14, 2023

Other IT Related

Understanding the Economics of Investing in America: A Collection of Resources

...The three pillars of Bidenomics—making smart investments in America, empowering workers, and promoting competition to lower costs and help small businesses—were born from mounting evidence of the magnitude of these challenges. This post provides resources on the first pillar—investing in America—which is grounded in economic research about what investments need to be made and how those investments should be implemented in order to ensure sustained, equitable growth. The pillar includes investments in building the clean energy economy, manufacturing semiconductors domestically, and updating our infrastructure...

The White House - Aug 11, 2023

OSTP Director Prabhakar and NSF Director Panchanathan Celebrate One Year Anniversary of President Biden's Bipartisan CHIPS and Science Act in Reno, Nevada

...The White House Office of Science and Technology Policy Director Arati Prabhakar and U.S. National Science Foundation Director Sethuraman Panchanathan visited the University Nevada, Reno (UNR), for a roundtable discussion to highlight how President Biden's bipartisan CHIPS and Science Act is fueling innovation and private sector investments that are creating good-paying jobs and opportunity in communities in every corner of Nevada and across America. Prabhakar discussed how the CHIPS and Science Act, a key piece of Bidenomics, is doing more than revitalizing American leadership in semiconductor manufacturing—it is driving investments in research and development (R&D) and regional innovation. Panchanathan lauded the CHIPS and Science Act as once-in-a-generation legislation that established a bold vision for accelerating U.S. leadership in innovation. He also praised the law's authorization of new, critical investments in NSF's mission and its codification of NSF's first new directorate in over 30 years: the Directorate for Technology, Innovation and Partnerships (TIP). Directors Prabhakar and Panchanathan highlighted the NSF Regional Innovation Engines (NSF Engines) program that is led by TIP...

The White House - Aug 11, 2023

Pivotal discovery in sensor technology to combat water contamination and more

...A team of researchers from the U.S. Department of Energy's Argonne National Laboratory, along with the Pritzker School of Molecular Engineering at the University of Chicago and the University of Wisconsin — Milwaukee, has devised a pathway for the mass manufacture of sensors able to simultaneously detect lead, mercury and E. coli. in flowing tap water. The team's innovation promises to help safeguard public health by providing early warning for contamination. One of the major challenges in mass manufacturing these sensors has been assessing their quality. Tiny areas of undesired porosity can form in the ultra-thin insulating layer. This porosity allows electrons from the bottom graphene layer to escape into the top insulating layer. This leakage compromises its effectiveness as an insulator and results in unreliable sensor responses. The team describe a screening method to identify defective devices before mass production. The method involves measuring the electrical response of the insulating layer while the sensor is submerged in water. Key is that the screening does not damage the sensor. By employing this technique, the team identified structural defects in the insulating layers. They were then able to establish criteria to easily detect faulty devices...

Argonne National Laboratory - Aug 10, 2023

STEM / Workforce & IT

NASA Selects Four University Teams to Develop Technologies to Enhance Moon to Mars Missions

...NASA and the National Space Grant Foundation have selected four university teams to develop advanced and innovative design ideas that will help solve Moon to Mars Program challenges. The selections are part of the sponsored by NASA's Mars Campaign Office Advanced Exploration Systems Program. The 2023-2024 M2M X-Hab Academic Innovation Challenge is an opportunity for NASA to build strategic partnerships with universities and tap into the ingenuity of the future Artemis Generation workforce. The challenge provides STEM (Science, Technology, Engineering and Mathematics) students interested in aerospace careers with hands-on development and research experience, while strengthening NASA capability for missions to the Moon, Mars, and beyond. Past student participants have gone on to careers in the aerospace industry, including at NASA...

National Aeronautics and Space Administration - Aug 11, 2023

NASA Research Challenge Selects 6th Round of Student Participants

...NASA has selected a sixth round of university student teams to participate in real-world aviation research challenges meant to transform the skies above our communities. The awards were made through NASA's University Student Research Challenge (USRC), which provides students with opportunities to contribute to NASA's flight research goals. Students will manage their own research projects, utilize state-of-the-art technology, and work alongside accomplished aeronautical researchers. Though each team of students selected receives a partial grant from NASA, the rest of their USRC funding is secured from the public through student-led crowdfunding. The process helps students develop skills in entrepreneurship and public communication...

National Aeronautics and Space Administration - Aug 11, 2023

NASA funds new teaching technology that opens a world of possibilities

...A new interactive video technology at UC Riverside's XCITE Center for Teaching and Learning allows students to explore countless learning opportunities. The Immersive Design for Educational Advancement, or IDEA, Wall was installed last fall, with instructors offered the opportunity to test out its uses over the past year. The IDEA Wall is made of up 12 high-quality video screens bordered by an infrared grid that creates a touch panel that can be used by 25 simultaneous users. The wall features a surround sound system with two subwoofers and left, center, and right speakers. It's connected to a 5G high-speed network, runs on a high-performance research computer, and has its own server room with a power rack and cooling system behind the wall. Another use of the wall is to display a map with data such as weather conditions or population and expand or move around to focus on a particular region. Medical students can use it to explore anatomy while math students can solve equations. The idea and funding for the IDEA Wall came from a NASA grant that Bahram Mobasher, a UCR professor of physics and observational astronomy, helped secure. In June, Mobasher hosted a six-week STEM summer camp, funded through a NASA educational grant, using the IDEA Wall to teach about 40 high school students a variety of science topics ranging from computer coding to virtual reality...

University of California,Riverside - Aug 14, 2023

Clemson University students debut autonomous off-road vehicle with far-reaching impact for natural disaster relief

...To expedite the delivery of supplies and to gather real-time data for emergency responders, Clemson University students at the International Center for Automotive Research in Greenville, S.C. developed an off-road reconnaissance and relief vehicle that can navigate all on its own. Equipped with lidars, cameras and high-accuracy GPS, the autonomous vehicle can sense and navigate on unknown terrain. The vehicle can reach 45 mph, scale 18-inch high obstacles, maneuver 60% grade surfaces and pivot 360 degrees in place in two seconds. When the vehicle arrives at its destination, it can deliver emergency supplies and act as a mobile generator in case of electricity disruptions. Students worked with faculty and staff at Clemson's International Center for Automotive Research, along with the project's primary sponsor U.S. Army DEVCOM Ground Vehicle Systems Center (GVSC). Clemson announced its strategic partnership with GVSC in 2020 when the University founded its Virtual Prototyping of autonomy-enabled Ground Systems center, backed by the U.S. Department of Defense. The partnership was designed to propel research breakthroughs in off-road vehicle autonomy, powertrain electrification, and digital engineering tools to more effectively support the mission of GVSC...

Clemson University - Aug 14, 2023

UB awarded \$3.4 million from NSF's CyberCorps program for expanded cybersecurity training program

...UB received a \$3.4 million grant from the National Science Foundation (NSF) to continue CyberCorps: Scholarship for Service (SFS), a program aimed at training the next generation of cybersecurity experts. The grant will provide funding for UB's Center of Excellence in Information Systems Assurance Research and Education (CEISARE) — a designated National Center of Excellence in cybersecurity education and cybersecurity research — to graduate 24 cybersecurity specialists over the next five years. For the first time since receiving the CyberCorps SFS grant in 2008, CEISARE will include students enrolled in technical and managerial disciplines in undergraduate programs. CEISARE has received over \$10 million to run the CyberCorps program since 2008. The program has graduated over 45 scholars who work for the FBI, CIA, Department of Homeland Security, National Security Agency, Federal Trade Commission, Office of the Inspector General and several other agencies... University at Buffalo - Aug 11, 2023

STEM / Workforce Resources & Opportunities

R&D WORKFORCE TRAINING: FEDERAL AGENCIES' STEM INTERNSHIPS, SCHOLARSHIPS, AND TRAINING OPPORTUNITIES

...Increasing the availability of STEM opportunities is a priority in the Biden Harris Administration. To help facilitate this, the team at NITRD developed a STEM Portal that allows anyone to search for internships and other training opportunities at Federal agencies. The NITRD STEM PORTAL is a searchable database that includes a description, link, and contact information for each program listing. Government sponsored internships and training programs are competitive, but there are many Federal opportunities and the NITRD STEM Portal is here to help...

The Networking and Information Technology Research and Development (NITRD) Program - Jun 21, 2023

FEDERAL HIGH END COMPUTING INFORMATION PORTAL

...Networking and Information Technology Research and Development (NITRD) has a portal that provides information about U.S. Federal government high performance computing activities, including available computing resources; HEC relevant publications; fellowship and training opportunities; and technology transfer, licensing, and industry engagement opportunities. The HEC IWG (Interagency Working Group on High End Computing) agencies provide the information contained in this portal. HEC IWG agencies are involved in various Federal activities in the HEC area including R&D and providing infrastructure and application. Take a look at it!

Networking and Information Technology Research and Development - Jun 14, 2023

Federal Register: Request for Information (RFI)

CISA/ONCD/NSF/DARPA/OMB Want Your Input to Help Secure Open Source Software

...The Cybersecurity and Infrastructure Security Agency (CISA), the Office of the National Cyber Director (ONCD), the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), and the Office of Management and Budget (OMB) are announcing a request for information (RFI) to receive your input on where the government should focus areas for prioritization to secure open source software. This represents a continuation of the National Cybersecurity Strategy's focus on open source software security and CISA's related Secure by Design work. If you are a member of the open source software community or work to secure open source software, we want to hear from you. ... The responses to the RFI are due by 5:00 p.m. EDT on October 9th, 2023.

CISA - Aug 10, 2023

Note: Any mention in the text of commercial, non-profit, academic partners, or their products, or references is for information only; it does not imply endorsement or recommendation by any U.S. Government agency.

Innovation Through NITRD Coordination

Networking and Information Technology Research and Development - National Coordination Office, Washington, DC USA

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