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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](mailto:nco@nitrd.gov) and voilà they will receive the news brief with the cool technology articles each week!

### Federal Agency Funding Opportunities

#### NSF launches EducateAI initiative

...The U.S. National Science Foundation is excited to announce the EducateAI initiative. The goal of the initiative is to enable educators to make high-quality, audience-appropriate artificial intelligence educational experiences available nationwide to K-12, community college, four-year college and graduate students, as well as adults interested in formal training in AI. "EducateAI is about empowerment and inclusivity, ensuring that every student has the opportunity to not only understand AI but to actively contribute to its positive evolution," said Margaret Martonosi, NSF assistant director for Computer and Information Science and Engineering (CISE). To ensure that educators are well-equipped to teach AI concepts effectively, the EducateAI initiative will offer professional development opportunities and foster communities of practice that will provide teachers with the knowledge and skills required to integrate AI into their teaching practices. EducateAI also aligns with the National AI Research Resource pilot initiative, contributing to democratizing access to resources for AI research and education by establishing collaborative networks among educators, researchers and industry professionals to facilitate the exchange of ideas, best practices and real-world insights to enhance AI education in high schools. As a first step in the initiative, NSF has published the EducateAI Dear Colleague Letter, which is jointly funded by the agency's CISE and STEM Education directorates...

National Science Foundation - Dec 5, 2023

### **Chief Digital and Artificial Intelligence Office to Host Hackathon in Hawaii**

...The Office of the Secretary of Defense Chief Digital and AI Office, Defense Innovation Unit, U.S. Indo-Pacific Command, U.S. Army Pacific Command and the U.S. Air Force will host a multi-classification hackathon open to all U.S. citizens. Any American citizen is eligible to apply, regardless of whether they currently work for the federal government or possess a security clearance. Starting in 2021, the U.S. Air Force began organizing multi-service prototyping events, known as BRAVO hackathons, to expedite learning and capability development from classified and protected operational data. This year's BRAVO 11 Bits2Effects, the fourth BRAVO hackathon and first-held inside a combatant command, is seeking to produce solutions to combatant command challenges utilizing Indo-Pacific operational theater data. BRAVO utilizes a permissive software development environment that permits the co-mingling of classified and protected data with untrusted open-source and commercial software otherwise not approved for production systems within minutes...

U.S. Department of Defense - Dec 7, 2023

## **HPC**

### **Argonne's Aurora supercomputer to help scientists advance dark matter research**

...Dark matter makes up more than five times the amount of visible matter in the universe. Despite its crucial role in forming galaxies and shaping the cosmos, scientists still have little idea about the nature of this mysterious substance. The "dark" in dark matter simply refers to the fact that it does not reflect or emit light, making it extremely challenging to detect. MIT researchers are preparing to use Argonne's Aurora exascale supercomputer and artificial intelligence (AI) to perform massive simulations that provide accurate predictions and insights into the behavior of particles and forces involved in experiments. To enable the simulations, Aurora ESP project is helping bring a well-established physics theory known as Lattice QCD, an application with a long history in high performance computing, into the exascale era. The team is working to use machine learning to enhance the efficiency of sampling gluon field configurations within the mathematical framework of Lattice QCD. This capability will help improve the speed and accuracy of calculations to explore particle interactions and fundamental physics phenomena, providing insights relevant to the study of dark matter...

Argonne National Laboratory - Dec 11, 2023

### **USDA and DOE fund a novel tool that informs land use and nutrient control in troubled waters**

...In watersheds degraded by runoff of nutrients from farmland, land managers struggle to pinpoint the best locations to install riparian buffer strips along streams or other pollution-reduction practices, but a cross-disciplinary team of researchers has developed a computer model that can simulate the underground and overland movement of water — and, consequently, that of nutrients such as nitrogen and phosphorus or pollutants — in entire watersheds with far greater spatial resolution than previous hydrologic models. Their model, called Cycles-L, is capable of simulating water flows and feedback loops among land, streams and groundwater. Unlike models that simulate processes in one field without considering what the neighboring fields are doing, Cycles-L can represent every field in a watershed, a true virtual representation of a watershed suitable for in-silico [conducted by computer modeling] experiments that are not viable in the field. The team calibrated the model using stream discharge data, crop-yield data and nitrogen-water-quality data collected by the U.S. Department of Agriculture's Agricultural Research Service team. The U.S. Department of Energy, the U.S. Environmental Protection Agency and the U.S. Department of Agriculture's National Institute of Food and Agriculture provided funding for this research.

Pennsylvania State University - Dec 7, 2023

## **Artificial Intelligence / Machine Learning**

### **NTIA Kicks Off Public Engagement on Executive Order AI Work**

...The Department of Commerce's National Telecommunications and Information Administration (NTIA) launched public engagement with its review of openness in artificial intelligence models. AI tools that are "open" such that their key components, such as their model weights, are available and therefore replicable or manipulable, broaden AI's availability to small companies, nonprofits, and individuals. This increases access to this technology's benefits, but also increases the possible sources of AI risk. The dual-use foundation models with widely available model weights that the EO directs NTIA to investigate are highly capable models that are generally useful for many purposes. Model weights govern how AI algorithms evaluate data by providing instructions as to which factors matter a great deal and which matter less or not at all. Machine language algorithms assess large volumes of data and learn – or are taught – which relative weightings of the many data points available will lead to the most accurate determinations...

National Telecommunications and Information Administration - Dec 13, 2023

### **NSF-funded scientists spice up genetic research through habanero peppers and AI**

...An artificial intelligence study at West Virginia University is focused on habanero peppers for now, but the work could one day support prevention or treatment of genetic disease. Adjeroh and his team are developing artificial intelligence capable of predicting the effect of genetic modifications on an organism. Currently, they're exploring AI's ability to predict key attributes of habanero peppers, such as size, color and taste, and later to facilitate control of those attributes through genome manipulation. A National Science Foundation grant of \$249,999 supports the three-year project, which will use genetically modified habaneros to test the predictions of AI models developed at WVU...  
WVU - Dec 11, 2023

## Robotics / Autonomous Vehicles

### **Pipe Crawling Robot Helps Paducah Prepare for Demolition**

...Identifying which sections of piping to be removed from the C-333 Process Building at EM's Paducah Site can be like trying to find a needle in a haystack. With more than 20 miles of piping, some of which is as large as 42 inches in diameter, the Paducah project team recently deployed a new tool to improve the efficiency of visually inspecting sections of piping: a robotic pipe crawler. The robotic pipe crawler reduces the amount of time and effort to visually inspect the piping by using sophisticated detectors and a high resolution camera to identify deposits. The project team has proven the effectiveness of the robotic pipe crawler using data from external scans in correlation with the data obtained by the machine...  
Department of Energy - Dec 5, 2023

## Quantum

### **Electrical control of quantum phenomenon could improve future electronic devices**

...A new electrical method to change the direction of electron flow in some quantum materials could have implications for the development of next-generation electronic devices and quantum computers. The researchers fabricated a QAH insulator with specific, optimized properties. They found that applying a five-millisecond-current pulse to the QAH insulator impacts the internal magnetism of the material and causes the electrons to change directions, an ability critical for optimizing information transfer, storage and retrieval in quantum technologies. According to the researchers, this shift from magnetic to electronic control in quantum materials is similar to a shift that has occurred in traditional memory storage. The U.S. National Science Foundation supported the research through two awards...  
National Science Foundation - Dec 5, 2023

### **DARPA-Funded Research Leads to Quantum Computing Breakthrough**

...A team of researchers working on DARPA's Optimization with Noisy Intermediate-Scale Quantum devices (ONISQ) program has created the first-ever quantum circuit with logical quantum bits, a key discovery that could accelerate fault-tolerant quantum computing and revolutionize concepts for designing quantum computer processors. The ONISQ program began in 2020 seeking to demonstrate a quantitative advantage of quantum information processing by leapfrogging the performance of classical-only supercomputers to solve a particularly challenging class of problem known as combinatorial optimization. The program pursued a hybrid concept to combine intermediate-sized "noisy"— or error-prone — quantum processors with classical systems focused specifically on solving optimization problems of interest to defense and commercial industry...  
DARPA - Dec 6, 2023

### **Breakthrough synthesis method improves solar cell stability**

...Solar cell efficiency has soared in recent years due to light-harvesting materials like halide perovskites, but the ability to produce them reliably at scale continues to be a challenge. A U.S. National Science Foundation-supported process developed by Rice University chemical and biomolecular engineer Aditya Mohite and collaborators at Northwestern University, the University of Pennsylvania and the University of Rennes has yielded 2D perovskite-based semiconductor layers of ideal thickness and purity by controlling the temperature and duration of the crystallization process. The research instrumentation was supported through NSF's Soft and Hybrid Nanotechnology Experimental Resource, part of the National Nanotechnology Coordinated Infrastructure. The new process could help improve the stability and reduce the cost of halide perovskite-based emerging technologies like optoelectronics and photovoltaics. The researchers created a map — or phase diagram — of the process through characterization, optical spectroscopy and machine learning. This work pushes the boundaries of higher quantum well 2D perovskites synthesis, making them a viable and stable option for a variety of applications...  
National Science Foundation - Dec 7, 2023

### **A Partnership Forged in Diamond**

...Tina Brower-Thomas of Howard University and Kenneth Evans-Lutterodt of Brookhaven Lab's National Synchrotron Light Source II (NSLS-II), a DOE Office of Science User Facility, were

recently awarded a \$1.5 million grant through the Department of Defense's University Instrumentation Program (DURIP), sponsored by the Office of Naval Research, to study the growth of perfect diamond thin films for quantum information systems (QIS). Brower-Thomas, Evans-Lutterodt, and their collaborators at Brookhaven and Howard are poised to make significant strides in growing this material, which shows promise in applications like quantum computing, communications, and sensing. "The Office of Naval Research has a keen interest in developing and maintaining secure communications and networking," explained Brower-Thomas. "Some of the unique properties of diamond have made it one of the most promising candidates for implementing qubits, the way quantum information is stored, and other quantum technologies. Diamond of highest quality is essential for the development of secure communications and networking. Some of these unique diamond properties could also be used to make extremely sensitive magnetometers that may detect magnetic disturbances created by unfriendly submarines." ...

Brookhaven Lab - Dec 6, 2023

## Cybersecurity / Privacy

### **Joint Statement on the United States-European Union 9th Cyber Dialogue in Brussels**

...The United States and the European Union held the 9th U.S.-EU Cyber Dialogue in Brussels, Belgium, December 6-7, 2023. The United States and European Union reaffirmed their continued commitment to an open, free, interoperable, secure, and reliable Internet, respecting human rights and fundamental freedoms. We are committed to advancing international security and stability in cyberspace and enhancing the ability of all states to reap the benefits that modern technologies provide. Fortifying our strong partnership, the Cyber Dialogue also included exchanges on international cyber policy discussions, including in the United Nations, regional organizations such as the Organization on Security and Co-operation in Europe and the ASEAN Regional Forum, and the G7 and G20. Strengthening our ability to address malign behavior in cyberspace, the Cyber Dialogue included exchanges on cyber defense, and identified further action to strengthen our cooperation to hold states accountable for and to prevent, deter, and respond to malicious cyber activities. To enhance cyber security and resilience to address these challenges, the United States and the European Union exchanged updates on several key priorities, which included the security of digital products and related cybersecurity standards, cyber resilience of critical infrastructure, impact and opportunities of emerging technologies, and cooperation between the respective cybersecurity agencies. The Cyber Dialogue also included sector-specific discussions on space cybersecurity and the cybersecurity of energy infrastructures...

U.S. Department of State - Dec 8, 2023

### **NIST Offers Draft Guidance on Evaluating a Privacy Protection Technique for the AI Era**

...Helping data-centric organizations to strike this balance between privacy and accuracy is the goal of a new publication from the National Institute of Standards and Technology (NIST) that offers guidance on using a type of mathematical algorithm called differential privacy. Applying differential privacy allows the data to be publicly released without revealing the individuals within the dataset. Differential privacy is one of the more mature privacy-enhancing technologies (PETs) used in data analytics, but a lack of standards can make it difficult to employ effectively — potentially creating a barrier for users. This work moves NIST toward fulfilling one of its tasks under the recent Executive Order on AI: to advance research into PETs such as differential privacy. NIST's new guidance aims to help everyone from software developers to business owners to policy makers understand and think more consistently about claims made about differential privacy...

National Institute of Standards and Technology - Dec 11, 2023

### **NIST's Differential Privacy Blog Series**

...NIST has developed a blog series of 14 posts leveraging the differential privacy contributions in the de-identification tools section. This series is designed to help business process owners and privacy program personnel understand basic concepts about differential privacy and applicable use cases and to help privacy engineers and IT professionals implement the tools...

National Institute of Standards and Technology - Dec 14, 2023

### **2023 CyberStrike At-A-Glance: CESER Builds On-the-Ground Cybersecurity Knowledge**

...The Department of Energy's Office of Cybersecurity, Energy Security, and Emergency Response (CESER), directed the Idaho National Laboratory (INL) to design and develop a professional cybersecurity training for the energy workforce, specifically those in operational technology environments. We call this training CyberStrike. The office has offered 82 CyberStrike trainings since 2017 to more than 3,700 professionals in the U.S. and internationally, working to enhance the ability of energy sector owners and operators to prepare for a cyber incident impacting operational technology (OT)...

Department of Energy - Dec 7, 2023

## 5G, Wireless Spectrum, Networking & Communications

### **NASA Helps Study One of the World's Most Diverse Ecosystems**

...An international team of researchers spent October and November 2023 in the field studying one of the world's most biologically diverse areas – South Africa's Greater Cape Floristic Region. As part of the effort, researchers used NASA airborne and space-based instruments to gather complementary data to better understand the unique aquatic and terrestrial ecosystems in this region. Their findings will inform the capabilities of future satellite missions aimed at studying plants and animals. Known as the Biodiversity Survey of the Cape (BioSCape), the effort is a large collaboration led in the U.S. by NASA. The BioSCape team is testing how well airborne and satellite remote sensing can characterize the region's terrestrial, freshwater, and marine biodiversity. Three of the BioSCape aircraft sensors are imaging spectrometers, which observe different wavelengths of visible and infrared light reflected or emitted by various materials on Earth's surface and in the atmosphere. Remote sensing capabilities like these will be vital for future satellites. In addition, the BioSCape team is using observations from two JPL-managed instruments on the space station. NASA's ECOsystem Spaceborne Thermal Radiometer Experiment on Space Station measures land surface temperature and can be used to assess plant stress due to temperature or water availability. The imaging spectrometer EMIT, short for Earth Surface Mineral Dust Source Investigation, gathers data on surface minerals...

National Aeronautics and Space Administration - Dec 9, 2023

## **Microelectronics**

### **U.S. Department of Energy Leads Interagency Agreement with the Hopi Tribe and the Navajo Nation to Advance an Equitable Clean Energy Transition**

...The U.S. Department of Energy (DOE) and eight federal agencies announced two historic Memorandums of Understanding (MOUs) with the Hopi Tribe and an amended MOU with the Navajo Nation supporting the Tribes' economic revitalization efforts. The multiyear agreements aim to ease Tribal access to federal funding available through national policies including the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act, the Inflation Reduction Act (IRA), and the Bipartisan Infrastructure Law (BIL) along with programs offered annually by agencies. The MOUs are the cornerstone of the White House Council of Native American Affairs (WHCNA) initiative and spearheaded by DOE's Office of Indian Energy, which is dedicating staff time and resources to facilitate strategic energy and economic planning with Tribes...

Department of Energy - Dec 6, 2023

### **NSF funds chemists to create organic molecules that emit different colors of light and are useful as semiconductors**

...Chains of fused carbon-containing rings have unique optoelectronic properties that make them useful as semiconductors. These chains, known as acenes, can also be tuned to emit different colors of light, which makes them good candidates for use in organic light-emitting diodes. The color of light emitted by an acene is determined by its length, but as the molecules become longer, they also become less stable, which has hindered their widespread use in light-emitting applications. MIT chemists have now come up with a way to make these molecules more stable, allowing them to synthesize acenes of varying lengths. Acenes are rich in sharable electrons and can efficiently transport an electric charge, they have been used as semiconductors and field-effect transistors. To try to make acenes more stable, Robert Gilliard, at MIT, decided to use a ligand that his lab has previously worked with, known as carbodicarbenes. Gilliard says, "There are a lot of optoelectronic properties that can be dialed in that we have yet to explore, and we're excited about that as well." The research was funded by the National Science Foundation Major Research Instrumentation Program...

MIT News - Dec 5, 2023

### **NSF/DOE/ARO funds researchers to safely integrate fragile 2D materials into devices**

...Two-dimensional materials, which are only a few atoms thick, can exhibit some incredible properties, such as the ability to carry electric charge extremely efficiently, which could boost the performance of next-generation electronic devices. But integrating 2D materials into devices and systems like computer chips is notoriously difficult. Researchers from MIT have developed a new technique to integrate 2D materials into devices in a single step while keeping the surfaces of the materials and the resulting interfaces pristine and free from defects. They used this approach to fabricate arrays of 2D transistors that achieved new functionalities compared to devices produced using conventional fabrication techniques. Their method, which is versatile enough to be used with many materials, could have diverse applications in high-performance computing, sensing, and flexible electronics. ... This research is funded, in part, by the U.S. National Science Foundation, the U.S. Department of Energy, and the U.S. Army Research Office...

MIT News - Dec 8, 2023

## **Climate Change / Green Energy & IT**

### **DOE Releases First in Series of Reports Highlighting Pathways Toward Clean Hydrogen EarthShot**

...The U.S. Department of Energy (DOE) announced the findings of a report highlighting ways to achieve the Department's goal of making hydrogen an affordable, abundant source of clean energy and examining different pathways to get there through thermal conversion. The report is the first of three assessments of clean-hydrogen production pathways for the Department's Hydrogen Shot™. The Hydrogen Shot Technology Assessment: Thermal Conversion Approaches report, led by experts at DOE's National Energy Technology Laboratory, Office of Fossil Energy and Carbon Management, and in coordination with the Hydrogen and Fuel Cell Technologies Office, presents a snapshot of various thermal conversion pathways for clean hydrogen production, including technology status and envisioned approaches for achieving the Hydrogen Shot goals through research, development, and deployment (RD&D) advances...  
Department of Energy - Dec 5, 2023

## Digital Health

### **NSF advances technologies to improve quality of life for persons with disabilities**

...The U.S. National Science Foundation is investing in research solutions to address challenges faced by persons with disabilities, including the development of assistive and rehabilitative technologies to enhance their quality of life and provide greater opportunities for gainful employment. With a \$30 million investment, NSF has selected six multidisciplinary research teams to advance from Phase 1 to Phase 2 of the NSF Convergence Accelerator's Track H: Enhancing Opportunities for Persons with Disabilities. "Ensuring accessibility and inclusivity for persons with disabilities are both societal and economic imperatives," said Erwin Gianchandani, NSF assistant director for Technology, Innovation and Partnerships (TIP). The NSF Convergence Accelerator track builds upon NSF's mission of accelerating convergence research, in this case across assistive and rehabilitative technologies for diverse populations of persons with disabilities. Collectively, the selected Phase 2 teams will produce systems, technologies and tools to enable persons with disabilities to gain access places, jobs and experiences. Funded solutions include improvements to text-to-speech, applications for the hearing impaired, restored limb functions for the physically impaired, increased transportation efficiency for the visually impaired and more...

National Science Foundation - Dec 7, 2023

### **HHS Announces Next Steps in Ongoing Work to Enhance Cybersecurity for Health Care and Public Health Sectors**

...The U.S. Department of Health and Human Services (HHS) released a concept paper that outlines the Department's cybersecurity strategy for the health care sector. The paper details four pillars for action, including publishing new voluntary health care-specific cybersecurity performance goals, working with Congress to develop supports and incentives for domestic hospitals to improve cybersecurity, and increasing accountability and coordination within the health care sector. According to the HHS Office for Civil Rights (OCR), cyber incidents in health care are on the rise. The HHS concept paper outlines the following actions: \* Publish voluntary Health care and Public Health sector Cybersecurity Performance Goals (HPH CPGs). \* Provide resources to incentivize and implement cybersecurity practices. \* Implement an HHS-wide strategy to support greater enforcement and accountability. \* Expand and mature the one-stop shop within HHS for healthcare sector cybersecurity...

The U.S. Department of Health and Human Services - Dec 6, 2023

### **A Decade of Data Examined: Patient Access to Electronic Health Information**

...In 2013, 4 in 10 non-federal acute care hospitals and one-third of office-based physicians had adopted electronic health record (EHR) systems that enabled patients to view their online medical records. Fast forward just two years later and the proportion of EHRs with these patient access capabilities increased more than two-fold among hospitals and physicians. Today, nearly all non-federal acute care hospitals and two-thirds of office-based physicians have EHR systems that enable patients to view their electronic health information online, typically through patient portals or smartphone health apps. Nearly all patients visiting a hospital and many visiting their regular physician have the opportunity to become more engaged in their health and care. This rapid transformation in providers' capabilities to support patients' access to their electronic health information came about through federal programs implemented from the HITECH Act, which called for the widespread adoption and "meaningful use of certified EHR technology."...

Health IT - Dec 11, 2023

### **Mechanics of breast cancer metastasis discovered, offering target for treatment**

...The most lethal feature of any cancer is metastasis, the spread of cancer cells throughout the body. New research, led by Penn State, reveals for the first time the mechanics behind how breast cancer cells may invade healthy tissues. The U.S. National Science Foundation-supported discovery, showing that a motor protein called dynein powers the movement of cancer cells in soft tissue models, offers new clinical targets against metastasis and has the potential to fundamentally change how cancer is treated. The researchers used live microscopy to watch the migration of breast cancer cells in two different systems modeled after the human body. The first system, a 2D network of collagen fibers, revealed how cancer cells move through an extracellular matrix that surrounds tumors and showed that dynein was key. The second system was a 3D model designed to mimic soft tissue using a network of microscopic hydrogel particles or microgels linked together in tumor-like shapes...

National Science Foundation - Dec 5, 2023

## Other IT Related

### **Former NITRD Director Gives Insight into Fellowship and Fearlessness: Carrying On the Legacy of Rear Admiral Grace Hopper**

...As NIST technology researchers, we are inspired by Rear Admiral Grace Hopper because she broke barriers for women and was a pioneer in our field. Hopper joined the Navy Reserves and used her technical skills to work on the Mark I computer; she wrote a 500-page book on the history of the computer and how to program it. Her work helped pave the way for computers to be used in business and, eventually, for personal use. Former Director of the Networking and Information Technology Research and Development (NITRD) Program, Kamie Roberts, gave her insight into " ... what inspires me the most about Admiral Hopper was how much of her life she dedicated to public service. She left her career to join the military and serve the country, twice! As a 37-year NIST employee, I can relate to having a strong desire to dedicate your life to service." ... As Hopper was one of the most important people in the history of computer science, we will continue her legacy by encouraging a diverse talent pipeline here at NIST and in the technology industry in general...

National Institute of Standards and Technology - Dec 6, 2023

### **Collaborating Toward Integrated Commercial Lunar Infrastructure**

...DARPA has selected 14 companies for the 10-Year Lunar Architecture (LunA-10) Capability Study, which aims to catalyze the setup of a future civil lunar framework for peaceful U.S. and international use. LunA-10 seeks to study the rapid development of technology concepts for a series of shareable, scalable systems that can operate jointly, creating monetizable services for future lunar users. DARPA has a 65-year legacy of playing a crucial role in enabling the space technology research and development (R&D) ecosystem: de-risking technologies pivotal to civil space. DARPA civil space projects include the rocket technology in the Saturn V that took humans to the Moon for the first time; the Television and Infrared Observations Satellites (TIROS) program, which became the prototype for the current global systems used for weather reporting, forecasting, and research; and the recent DARPA-NASA partnership to enable faster space travel to the Moon and beyond with a nuclear thermal rocket engine, among others. The LunA-10 study aims to continue that tradition of technology initiatives that enable U.S. space leadership. LunA-10 program performers will work together over the course of the seven-month study in a highly collaborative environment, where they will design new integrated system-level solutions that span multiple lunar services...

DARPA - Dec 5, 2023

### **A Note on progress...NIST's Digital Identity Guidelines.**

...In August 2023 the Digital Identity Guidelines team hosted a two-day workshop to provide a public update on the status of revision. The goal remains to have the next version of each volume out by the Spring of 2024. NIST announces that all four volumes of Special Publication 800-63-4 will have a second public comment period, which will last at least 45 days...

National Institute of Standards and Technology - Dec 12, 2023

### **DOE Launches New Office to Coordinate Critical and Emerging Technology**

...The U.S. Department of Energy (DOE) announced the launch of the Office of Critical and Emerging Technology to ensure U.S. investments in areas such as artificial intelligence (AI), biotechnology, quantum computing, and semiconductors leverage the Department's wide range of assets and expertise to accelerate progress in these critical sectors. Critical and emerging technologies (CET) have broad applications throughout DOE, such as clean energy, national defense, and pandemic preparedness. Major advances in CET hold extraordinary potential for the economy and national security but also pose significant risks, and DOE's new office will focus the Department's efforts to ensuring that its capabilities are helping to solve critical science, energy, and security challenges. The Office of Critical and Emerging Technology will report to the Under Secretary for Science and Innovation and will focus collective efforts across the Department, including its 17 National Laboratories and numerous university research and development programs. The office will serve as a single point of contact on CET at the Department...

Department of Energy - Dec 12, 2023

### **Wearable Tech Mitigates First Responder Exposure to Chemical Threats**

...Every day, all types of emergency responders across the nation are dispatched to calls for situations ranging from industrial, agricultural, and commercial accidents to 5-alarm fires. In these moments, we rely on them to render aid swiftly and efficiently, even if it means risking their personal safety. This is why the Science and Technology Directorate (S&T) is leading a new effort to arm responders with state-of-the-art technology that alerts them to toxic industrial chemicals (TICs) that may be present in the field. Thanks to the Small Business Innovation Research (SBIR) Program, S&T joined forces with TDA Research inc. (TDA), the U.S. Naval Research Laboratory, the Fairmount Fire Department in Golden, Colorado, and additional government and private stakeholders to develop a portable chemical sensor that detects TICs (e.g., hydrogen sulfide, ammonia, phosphine, hydrogen cyanide, chlorine, and nitrogen dioxide) that firefighters and other similar emergency responders could potentially be exposed to during a response. TDA's wearable sensor badges will be much more portable, cost approximately \$200 each, and utilize easily replaceable colorimetric chemical sensor strips...

Homeland Security - Dec 7, 2023

### **DOE Announces \$42 Million for Inertial Fusion Energy Hubs**

...The U.S. Department of Energy (DOE) announced \$42 million for a program that will establish multi-institutional and multi-disciplinary hubs to advance foundational inertial fusion energy (IFE) science and technology, building on the groundbreaking work of the Department's researchers into harnessing the power of the sun and stars. The hubs will be led by researchers at Colorado State University, the University of Rochester, and Lawrence Livermore National Laboratory. Projects funded by the program—known as Inertial Fusion Energy Science and Technology Accelerated Research (IFE-STAR)—will bring together expertise and capabilities across DOE's National Laboratories, academia, and industry to advance IFE system components. Inertial confinement fusion is a leading approach to fusion that uses lasers or other technologies to compress and heat high-density plasmas...

Department of Energy - Dec 7, 2023

### **NSF funds UTSA to establish new hub to improve management of digital assets**

...UTSA has received a two-year, \$300,000 grant from the National Science Foundation (NSF) to establish the National DigiFoundry (NDF), a consortium that has the potential to redefine the management of digital assets such as cryptocurrencies. To develop the NDF, UTSA will create a new Decentralized Autonomous Organization (DAO), a national organization that promotes engagement and collaboration between the public and private sectors. The NDF will collaboratively explore global standards and best practices for the use and exchange of digital assets. The organization will leverage blockchain technologies to establish work groups, publish digital asset industry recommendations and advance other NDF sponsored activities such as conferences and speaker series. John Huggins, interim executive director of UTSA's National Security Collaboration Center (NSCC) said, "This NSF grant will allow UTSA to partner in unique ways with universities, industry, government, nonprofits and national labs to innovate in the digital asset ecosystem."...

The University of Texas at San Antonio - Dec 11, 2023

## **STEM / Workforce & IT**

### **Readout of White House Event on Inclusive Approaches to Education in Artificial Intelligence and Computer Science**

...On December 5, the Biden-Harris Administration hosted an event convening roughly 60 teachers, advocates, officials, and other education leaders to discuss inclusive approaches to artificial intelligence (AI) education in computer science. The event was co-hosted by the National Economic Council and U.S. National Science Foundation (NSF), and it was attended by officials from the Office of the Vice President, Office of Science and Technology Policy, Office of the National Cyber Director, the National Space Council, and the Department of Education. Panel participants discussed how leaders from government, labor, and private sector can partner with educators to advance inclusive AI education...

The White House - Dec 8, 2023

### **NSF/NIH Funds New HS Curriculum that Teaches Color Chemistry and AI Simultaneously**

...North Carolina State University researchers have developed a weeklong high school curriculum that helps students quickly grasp concepts in both color chemistry and artificial intelligence – while sparking their curiosity about science and the world around them. To test whether a short high school science module could effectively teach students something about both chemistry and artificial intelligence (AI), the researchers designed a relatively simple experiment involving pH levels, which reflect the acidity or alkalinity of a liquid solution. "We wanted to answer the question: 'Can we use machine learning to more accurately read pH strips than visually?'" said Yang Zhang, assistant professor of textile engineering, chemistry and science. "It turns out that the student-trained AI predictive model was about 5.5 times more precise than visual interpretations." Students entered data into free machine learning software called Orange, which has no lines of code, making it easy for novices to work with. The researchers also surveyed the students before and after the weeklong curriculum and found that they reported being more motivated to learn and more knowledgeable about both chemistry and AI. The work was supported by the National Science Foundation and the National Institutes of Health...

College of Education | NC State University - Dec 7, 2023

### **Applicants needed for paid STEM-based internship funded by AFOSR and NSF**

...The Akamai Internship Program offers college students an opportunity to gain paid summer work experience at an observatory, company or science/technical facility on Hawai'i Island, Maui or University of California, Santa Cruz while earning course credit at University of Hawai'i at Hilo. The internship program is led by the Institute for Scientist and Engineer Educators (ISEE). Upon acceptance into the program, Akamai interns are carefully matched with a project and a mentor within their field, who will supervise the intern throughout the summer. Since its inception in 2003, more than 500 college students have participated in the Akamai Internship Program and at least 125 alumni are working in Hawai'i and contributing to the local STEM workforce. This year the Akamai Internship Program is funded by Air Force Office of Scientific Research and the National Science Foundation...

The Magazine of the University of Hawaii - Malamalama - Dec 7, 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 - Sep 20, 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; relevant publications; fellowship and training opportunities; and technology transfer, licensing, and industry engagement opportunities. The High End Computing (HEC) Interagency Working Group (IWG) 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! The Networking and Information Technology Research and Development (NITRD) Program - Sep 13, 2023

## **Summer Undergraduate Research Fellowship (SURF)**

...The SURF 2024 application is open! It will close on January 31, 2024! NIST summer interns have improved MRI technology, studied medications, and more. Spend your summer with us for 11 weeks of hands-on lab experience with world-class mentors in one of NIST's six labs or other offices. National Institute of Standards and Technology - Aug 2, 2023

# **Federal Register: Request for Information (RFI)**

## **NIST Releases for Public Comment Draft Guidance on March-In Rights**

...The U.S. Department of Commerce's National Institute of Standards and Technology (NIST) released for public comment its Draft Interagency Guidance Framework for Considering the Exercise of March-In Rights, a tool to help agencies evaluate when it might be appropriate to require licensing of a patent developed with federal funding. The draft guidance will help agencies work through a range of policy considerations relevant to a potential march-in decision, including price. The proposed guidance is now available in the Federal Register. The 60-day comment period will close on Feb. 6, 2024, after which NIST will review and make publicly available all comments received, before finalizing the guidance... National Institute of Standards and Technology - Dec 7, 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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