



## NITRD News Brief

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NITRD's News Brief 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. 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.

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### Federal Agency Funding Opportunities

**Technology Modernization Fund seeking proposals for Artificial Intelligence projects**

...The Technology Modernization Fund (TMF) today announced a call for project proposals to help federal agencies implement President Biden's Executive Order on the safe, secure, and trustworthy development and use of Artificial Intelligence (AI) in the federal government. Agency proposals seeking \$6 million or less and having a project timeline of no more than 1.5 years will receive an expedited review process for investment in an effort to help agencies achieve positive outcomes and impact quickly. There are more than 700 use cases of where AI is being deployed across the federal government, from its use in anticipating and mitigating prescription drug shortages and supply chain issues to assisting cyber forensic specialists in detecting anomalies and potential threats in federal civilian networks. All proposals must include a clear plan for user testing, risk mitigation, evaluation metrics, and senior executive support, but agencies have flexibility in how they approach their project and potential solutions. Interested agencies may contact the TMF Program Management Office to discuss their project and apply for this funding...  
 U.S. General Services Administration - Feb 8, 2024

**NASA Awards Inaugural Grants to Support Emerging Research Institutions: Applications still open!**

...NASA has awarded \$3.7 million to 11 teams to support new collaborations between the agency and United States institutions not historically part of the agency's research enterprise. These are the first awards given through a new program from the agency's Science Mission Directorate (SMD) to improve diversity, equity, inclusion, and accessibility in the science and engineering communities, as well as NASA's workforce. NASA's SMD Bridge Program provides seed funding for research projects that will build strong foundations for long-lasting relationships with the agency. The projects offer hands-on training and mentorship for students, as well as new research opportunities for faculty. The teams are led by faculty at institutions that represent new collaborations for NASA. These include Hispanic-serving institutions, Historically Black Colleges and Universities, Asian American and Native American Pacific Islander-serving institutions, and primarily undergraduate institutions. There is an additional opportunity to apply for seed funding through the SMD Bridge Program. Applications are open until Friday, March 29...  
National Aeronautics and Space Administration - Feb 8, 2024

### **U.S. DOT Launches \$15 Million Complete Streets Artificial Intelligence Initiative for Small Businesses**

...The U.S. Department of Transportation opened a new opportunity for American small businesses to leverage advancements in Artificial Intelligence (AI) to improve transportation. The Complete Streets AI Initiative is being offered through the Department's Small Business Innovation Research (SBIR) Program. It is a multi-phase effort to develop powerful new decision-support tools for state, local, and tribal transportation agencies that assist in the siting, design, and deployment of Complete Streets, which are streets and networks that prioritize safety, comfort, and connectivity to destinations for all people who use them. Initially, up to 10 Phase I contracts will be awarded to small businesses to develop data and analytics capabilities that drive insights for agencies developing complete streets. To review the pre-solicitation, send us your technical questions, find instructions on finding a team and more at <http://its.dot.gov/CSAI...>  
Department of Transportation - Feb 1, 2024

## **HPC**

### **National Science Foundation grant will expedite high-performance computing research across all of the California State University's 23 campuses**

...Cal State San Bernardino is part of an effort, led by San Diego State University, that will upgrade high-performance computing capabilities and increase access to advanced computing for faculty and student researchers across the 23-campus California State University. The Technology Infrastructure for Data Exploration (TIDE) project, backed by a \$991,749 grant from the National Science Foundation's Office of Advanced Cyberinfrastructure, will use high-performance graphical processing computing servers to expedite artificial intelligence and machine learning calculations, which previously required days to complete on less powerful machines. In addition to purchasing new equipment, the grant aims to broaden access to high-performance computing (HPC) by providing high-quality training to staff, faculty and student researchers. Access to these advanced computers and their faster analysis will enable researchers to identify antibiotic-resistant tuberculosis strains, program robots to be more human in their interactions and digitally reconstruct archaeological artifacts....  
CSUSB - California State University, San Bernardino - Feb 2, 2024

### **UNM computer scientist wins NSF CAREER Award to optimize supercomputer performance**

...Amanda Bienz, an assistant professor in the Department of Computer Science at The University of New Mexico, has received a five-year, \$557,000 National Science Foundation CAREER Award for a project that seeks to ensure that the performance of parallel computer applications matches the performance of the hardware. The project addresses the reality that each generation of supercomputers is more powerful than the previous version, with computing speeds for massive numbers of operations that can be completed in the blink of an eye. But as powerful as the hardware on these high-performance computers is, for them to work to maximum capacity, the applications need to match that speed and performance, which has long been a problem. Bienz is tackling that with this project...  
UNM Newsroom - Feb 5, 2024

### **Metzler Receives NSF CAREER Award to Develop Ways for Computers to See Through Objects**

...Christopher Metzler, an assistant professor of computer science has received funding from the National Science Foundation (NSF) to advance his work in "descattering," which involves developing novel ways for computers to "see through" objects and obstructions that scatter light. Metzler's project looks to develop a "neural computational imaging" framework capable of solving challenging, high-dimensional, non-stationary computational-imaging problems. The framework consists of three key innovations: functional neural signal representations will be used to capture and exploit a signal's low-dimensional structure and temporal regularity without explicit models. Second, neural forward operators will provide an interpretable, computationally efficient, and easy-to-calibrate approach to model non-stationary imaging inverse problems. Finally, self-supervised learning will be used to extract data-driven priors in imaging applications where ground-truth images/signals are not available. The NSF-funded project will develop a collection of signal processing and machine learning innovations to broadly address this challenge and will also build a portable imaging-through-scattering demonstrator that can be used to engage high-school and undergraduate students in STEM...  
UMIACS - Feb 9, 2024

### **NSF Career award will support DNA computing research**

...Dominic Scalise, assistant professor in WSU's School of Chemical Engineering and Bioengineering, has received a \$500,000 National Science Foundation Faculty Early Career Development (CAREER) award for his work in developing DNA-powered computing. Scalise is working to develop a robust, DNA computer that can be readily programmed to execute several tasks. DNA computers use DNA instead of electronics to process information. Because they run on DNA, the computers have the potential to integrate directly with materials where the metals and materials of traditional computing wouldn't work. The novel technology could someday revolutionize computing in fields such as intelligent medicine, robotics, or biosensing. Scalise aims to develop an easily programmable DNA computer that, like electronics-based computers, can do any task. His lab is also working to create a "power supply" for the computer — DNA reactions that can replenish chemical reactants and sustain the biochemical computers to run for extended periods...

Washington State University - Feb 12, 2024

## **Artificial Intelligence / Machine Learning**

### **Biden-Harris Administration Announces First-Ever Consortium Dedicated to AI Safety**

...U.S. Secretary of Commerce Gina Raimondo announced the creation of the U.S. AI Safety Institute Consortium (AISIC), which will unite AI creators and users, academics, government and industry researchers, and civil society organizations in support of the development and deployment of safe and trustworthy artificial intelligence (AI). The consortium will be housed under the U.S. AI Safety Institute (USAISI) and will contribute to priority actions outlined in President Biden's landmark Executive Order, including developing guidelines for red-teaming, capability evaluations, risk management, safety and security, and watermarking synthetic content. The consortium represents the largest collection of test and evaluation teams established to date and will focus on establishing the foundations for a new measurement science in AI safety. The consortium also includes state and local governments, as well as non-profits, and will work with organizations from like-minded nations that have a key role to play in developing interoperable and effective tools for safety around the world...

National Institute of Standards and Technology - Feb 8, 2024

### **Machine learning identifies federally protected waters**

...The Clean Water Act (CWA) of 1972 protects the "Waters of the United States," however deciding what the CWA protects has been left open to interpretation by the courts and executive agencies. A NIH-funded team of researchers developed a machine learning model that they call Waters of the United States Machine Learning, or WOTUS-ML. The model incorporates aerial imagery along with data on soil variables, weather, and wetland and stream coverage to determine how likely a given site is to fall under CWA protection. The researchers suggest their model could provide immediate estimates of how likely a site is to be protected. This study is just one example of how machine learning could be used to help clarify how to implement complex regulatory laws...

National Institutes of Health - Feb 6, 2024

### **Researchers Receive \$5 Million NSF Award to Develop AI Platform to Strengthen Regional Food Systems**

...A team of researchers will receive up to \$5 million in additional funding for a Phase 2 investment from the NSF Convergence Accelerator to continue development of Cultivate IQ, an AI-driven platform designed to empower smaller farms and strengthen the resiliency of regional food systems. To deliver tangible solutions that have a nation-wide societal impact and at a faster pace, the U.S. National Science Foundation (NSF) launched the Convergence Accelerator program in 2019. Aligned to the Directorate for Technology, Innovation and Partnerships (TIP), the Convergence Accelerator is a unique program designed to leverage a convergence approach to transition basic research and discovery into practice using innovation processes. Driven by artificial intelligence and machine learning, Cultivate IQ integrates sales and production data from across the farm-to-market supply chain to help plan and manage regional food supplies...

News - University of Arkansas - Feb 9, 2024

### **NSF/NIST-Funded TRAILS AI Institute Announces First Round of Seed Funding**

...The Institute for Trustworthy AI in Law & Society (TRAILS) has unveiled an inaugural round of seed grants designed to integrate a greater diversity of stakeholders into the AI development and governance lifecycle, ultimately creating positive feedback loops to improve trustworthiness, accessibility and efficacy in AI-infused systems. TRAILS was launched in May 2023 with a \$20 million award from the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). "NIST and NSF's support of TRAILS enables us to create a structured mechanism to reach across academic and institutional boundaries in search of innovative solutions," said David Broniatowski, an associate professor of engineering management and systems engineering at GW who leads TRAILS activities. The new seed grant program funds research and innovation that is centered around TRAILS' primary research thrusts—participatory design, methods and metrics, evaluating trust and participatory governance...

The George Washington University - Feb 5, 2024

### **Argonne NL, Cornell and Stanford researchers detect elusive 'Bragg glass' phase with machine learning tool**

...Cornell researchers have detected an elusive phase of matter, called the Bragg glass phase, using large volumes of x-ray data and a new machine learning data analysis tool. The discovery settles a long-standing question of whether this almost—but not quite—ordered state of Bragg glass can exist in real materials. The research was conducted in collaboration with scientists at Argonne National Laboratory and at Stanford University. The researchers present the first evidence of a Bragg glass phase as detected from X-ray scattering, which is a probe that accesses the entire bulk of a material, as opposed to just the surface of a material, in a systematically disordered charge density wave (CDW) material, PdxErTe3...

Cornell University - Feb 9, 2024

## **Robotics / Autonomous Vehicles**

### **AUKUS Defense Scientists Test Robotic Vehicles**

...Defense scientists from Australia, the United Kingdom and the United States collaboratively tested a range of robotic vehicles and their sensors. The Trusted Operation of Robotic Vehicles in a Contested Environment (TORVICE) trial was to identify and resolve vulnerabilities faced by autonomous systems in a congested electronic warfare environment. A network of robotic ground vehicles from the United Kingdom and the United States were configured to represent autonomous Multi-Domain Launchers and Uncrewed Ground Vehicles conducting Long Range Precision Fires and associated missions. The vehicles carried no weapons during the trial. TORVICE is part of the United States, United Kingdom, and Australia's commitment to the AUKUS Advanced Capabilities Pillar, known as Pillar II, under the Artificial Intelligence and Autonomy Working Group. Through AUKUS, Australia, the UK, and the United States have collaborated to accelerate collective understanding of AI and autonomy technologies, and how to rapidly field robust, trustworthy AI and autonomy in complex operations, while adhering to the shared values of safe and responsible AI...

U.S. Department of Defense - Feb 5, 2024

### **DARPA's REMA Program to Add Mission Autonomy to Commercial Drones**

...Commercial drone technology is advancing rapidly, providing cost-effective and robust capabilities for a variety of civil and military missions. DARPA's Rapid Experimental Missionized Autonomy (REMA) program aims to enable a drone to autonomously continue its predefined mission when connection to the operator is lost. The program is focused on constantly providing new agnostic drone autonomy capabilities for transition in one-month intervals to outpace adversarial countermeasures. REMA progressed from program announcement to contract awards in just 70 business days. The 18-month, single-phase program is divided into two technical areas: 1) A drone-autonomy adapter interface and 2) mission-specific autonomy software. REMA will be able to agnostically detect the drone type when connected and apply autonomy to increase the drone's capability. REMA will be completed in development cycles starting at three-month intervals and accelerating to one-month intervals, to repeatedly provide new and improved autonomy for direct transition. The performers are expected to demonstrate a full working solution to the first challenge in March 2024...

DARPA - Feb 8, 2024

### **AFWERX Autonomy Prime partners demonstrate autonomous flight capabilities, make history at AGILE FLAG**

...AFWERX Autonomy Prime partner Xwing Inc. made history by flying the first autonomous logistics mission as part of the Air Force exercise AGILE FLAG 24-1 at McClellan Airfield. The flight was one of several autonomous demonstrations conducted during the exercise by Autonomy Prime partners Reliable Robotics and Xwing. Autonomy Prime is a new technology program in Prime, a division within AFWERX, and partners with the private sector to accelerate testing and affordably deliver game-changing technology to the warfighter. AFWERX has awarded both Reliable Robotics and Xwing Small Business Innovation Research Phase Two and Phase Three contracts to conduct autonomous flight trials and demonstrate the capability in an operationally relevant environment. Both companies have autonomous flight technology that allows their aircraft to taxi, take off, fly to a destination and land...

Air Force Link - Feb 9, 2024

### **DOD Funds UC Davis to Establish Bird Flight Research Center to Inform the Design of Uncrewed Aerial Systems**

...Motion capture technology uses multiple infrared cameras to track reflective markers on the moving subject. To track the bird's movements, markers can be placed on the bird's wings, body and tail, as well as on obstacles to assess how a bird may maneuver around each obstacle. However, due to the sparse placement of the markers, motion capture technology cannot be used to create detailed 3D models, which are necessary for experiments in computational fluid dynamics. Photogrammetry, on the other hand, uses specialized algorithms to combine multiple calibrated 2D camera images to create a 3D model, but the heavy data processing load requires such high-resolution imagery. Christina Harvey, an assistant professor of mechanical and aerospace engineering at UC Davis, and Michelle Hawkins, a professor in the School of Veterinary

Medicine and director of the California Raptor Center, are launching the bird flight research center with a nearly \$3 million grant from the Department of Defense. The new center will utilize motion capture and photogrammetry — which uses photography to determine the distance between objects — technologies to image birds in flight and create 3D models of the wing shapes to inform the design and capabilities of the next generation of uncrewed aerial systems, or UAS. This will inform the development of next-generation drones and other uncrewed aerial systems to deliver packages, detect and fight wildfires, and more...

UC Davis - Feb 1, 2024

### **One person can supervise 'swarm' of 100 unmanned autonomous vehicles, DARPA-funded research shows**

...Research involving Oregon State University has shown that a "swarm" of more than 100 autonomous ground and aerial robots can be supervised by one person. The results stem from the Defense Advanced Research Project Agency' program known as OFFSET, short for Offensive Swarm-Enabled Tactics. During the course of the four-year project, researchers deployed swarms of up to 250 autonomous vehicles – multi-rotor aerial drones, and ground rovers – able to gather information in "concrete canyon" urban surroundings where line-of-sight, satellite-based communication is impaired by buildings. The information the swarms collect during their missions at military urban training sites have the potential to help keep U.S. troops and civilians more safe. Collaborators with Smart Information Flow Technologies developed a virtual reality interface called I3 that lets the commander control the swarm with high-level directions...

Oregon State University - Feb 4, 2024

## **Quantum**

### **How the Quantum World Can Help Scientists Engineer Biology**

...A novel method improves the accuracy of the CRISPR Cas9 gene editing tool scientists use to modify microbes for renewable fuels and chemicals production. It draws on quantum chemistry, artificial intelligence, and synthetic biology. CRISPR-Cas is a tool that allows scientists to make targeted changes to an organism's DNA. By studying the biology and chemistry of how CRISPR-Cas functions, scientists can predict and design where DNA modifications will occur. However, these predictions often fail because there is large variation in genome structure. Researchers used artificial intelligence to better predict the tool's behavior. The approach used a novel set of quantum chemical properties. These properties apply the rules of quantum mechanics to molecules to better understand how molecules interact. This improved the accuracy of predicting where CRISPR-Cas genome engineering might occur...

Department of Energy - Feb 9, 2024

### **Magnesium Protects Tantalum, a Promising Material for Making Qubits**

...Scientists at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory have discovered that adding a layer of magnesium improves the properties of tantalum, a superconducting material that shows great promise for building qubits, the basis of quantum computers. Collaborators at PNNL used computational modeling at the atomic scale to identify the most likely arrangements and interactions of the atoms based on their binding energies and other characteristics. These simulations helped the team develop a mechanistic understanding of why magnesium works so well. The magnesium had an unexpected beneficial effect: It "sponged out" inadvertent impurities in the tantalum and, as a result, raised the temperature at which it operates as a superconductor. But when the scientists added the magnesium coating, they discovered that its strong affinity for the impurities pulled them out. The resulting purer tantalum had a higher superconducting transition temperature. All this work is being carried out as part of the Co-design Center for Quantum Advantage (C2QA), a Brookhaven-led national quantum information science research center. This research was funded by the DOE Office of Science...

Brookhaven Lab - Feb 5, 2024

### **NSF-funded technique could improve the sensitivity of quantum sensing devices**

...As many real-world quantum sensing devices are emerging, one promising direction is the use of microscopic defects inside diamonds to create "qubits" that can be used for quantum sensing. MIT researchers have developed a technique that enables them to identify and control a greater number of these microscopic defects. This could help them build a larger system of qubits that can perform quantum sensing with greater sensitivity. Their method builds off a central defect inside a diamond, known as a nitrogen-vacancy (NV) center, which scientists can detect and excite using laser light and then control with microwave pulses. To create NV centers, scientists implant nitrogen into a sample of diamond. Some of these defects, including the NV center, can host what are known as electronic spins, which originate from the valence electrons around the site of the defect. This new approach uses a specific protocol of microwave pulses to identify and extend that control to additional defects that can't be seen with a laser, which are called dark spins. The researchers use a technique known as spin echo double resonance (SEDOR), which involves a series of microwave pulses that decouple an NV center from all electronic spins that are interacting with it. Then, they selectively apply another microwave pulse to pair the NV center with one nearby spin. ... his research is supported, in part,

MIT News - Feb 8, 2024



### **DOE-funded researchers measure and control interactions between magnetic ripples using lasers**

...One vision for the future of computing involves using ripples in magnetic fields — called magnons — as a basic mechanism. In conventional digital technologies, such magnonic systems are expected to be far faster than today’s technologies. In quantum computing, the advantages of magnonics could include not only quicker speeds but also more stable devices. Research showed an early-stage discovery along the path to developing magnonic computers. The researchers caused two distinct types of ripples in the magnetic field of a thin plate of alloy, measured the results and showed that the magnons interacted in a nonlinear manner. “Nonlinear” refers to output that is not directly proportional to input — a necessity for any sort of computing application. The researchers applied laser pulses to a 2-millimeter-thick plate made from a carefully chosen alloy containing yttrium, a metal found in LEDs and radar technology. This research was supported by the Quantum Science Center, a Department of Energy National Quantum Information Science Research Center headquartered at Oak Ridge National Laboratory. The study was primarily supported by the Department of Energy...  
UCLA Newsroom - Feb 7, 2024

## **Cybersecurity / Privacy**

### **Readout of White House Roundtable on Protecting Our Nation’s Data and Networks from Future Cybersecurity Threats**

...The Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP) convened leaders from government, industry, and academia at a roundtable to discuss plans for addressing the requirements of National Security Memorandum 10 (NSM-10) on Promoting United States Leadership in Quantum Computing While Mitigating Risks to Vulnerable Cryptographic Systems and the Quantum Computing Cybersecurity Preparedness Act of 2022. While quantum computing technology brings opportunity, the United States must ensure it is ready to mitigate the risk that quantum computers present to protect our nation’s most sensitive information. At the roundtable, several senior officials underscored the need for implementation of zero trust cybersecurity defenses on Federal and critical infrastructure networks. OMB, OSTP, and members of the interagency post-quantum cryptography (PQC) migration working group will continue to engage with experts both inside and outside government...  
The White House - Feb 12, 2024

### **DOE Announces New Partnership with Westinghouse to Enhance Energy Supply Chain Security and Resilience**

...The U.S. Department of Energy (DOE)’s Office of Cybersecurity, Energy Security, and Emergency Response (CESER) today announced a collaboration with Westinghouse Electric Company to test for potential cyber vulnerabilities in one of the company’s Instrumentation and Controls (I&C) systems used for nuclear applications. Westinghouse joins four other private sector companies, and is the first nuclear energy company, actively participating in the DOE’s Cyber Testing for Resilient Industrial Control Systems (CyTRICS™) program. The security of industrial control systems and software supply chains ensure the continued operation and functionality of a broad range of U.S. critical infrastructure activities that support critical functions within our communities. If vulnerabilities in these systems are exploited, the consequences can have cascading impacts across all sectors. The CyTRICS program tests critical system components to identify cyber vulnerabilities before they are exploited, improving the integrity and reliability of the energy system. As testing expands, CyTRICS is looking to identify systemic supply chain vulnerabilities...  
Department of Energy - Feb 1, 2024

### **NIST’s International Cybersecurity and Privacy Engagement Update – International Dialogues, Workshops, and Translations**

...NIST is continuing to engage with our international partners to enhance cybersecurity. NIST international engagement continues through our support to the Department of State and the International Trade Administration (ITA) during numerous international dialogues. NIST shared remarks virtually on the Cybersecurity Framework 2.0 update in January 2024 at a training course on the Framework hosted by the U.S. Agency for International Development (USAID). NIST also continues to add to the growing list of translations of resources on the International Cybersecurity and Privacy Resources page. Most recently, translations of the Cybersecurity Framework Version 1.1 in Korean and the NIST Privacy Framework Version 1.0 in Malay have been released...  
National Institute of Standards and Technology - Feb 8, 2024

### **International Cybercrime Malware Service Dismantled by Federal Authorities**

...The U.S. Attorney’s Office announced today that, as part of an international law enforcement effort, federal authorities in Boston seized internet domains that were used to sell computer malware used by cybercriminals to secretly access and steal data from victims’ computers. Federal authorities in Boston seized [www.warzone.ws](http://www.warzone.ws) and three related domains, which together offered for sale the Warzone RAT malware – a sophisticated remote access trojan (RAT) capable of enabling cybercriminals to surreptitiously connect to victims’ computers for malicious purposes...  
The United States Department of Justice - Feb 9, 2024

# 5G, Wireless Spectrum, Networking & Communications

## **FACT SHEET: As Affordable Connectivity Program Hits Milestone of Providing Affordable High-Speed Internet To 23 Million Households Nationwide, Biden-Harris Administration Calls on Congress to Extend Its Funding**

...The Affordable Connectivity Program, enacted under President Biden's Bipartisan Infrastructure Law as the largest internet affordability program in our nation's history, is now helping 23 million households – 1 in 6 households across America – save \$30-\$75 each on their monthly internet bills. However, without action from Congress, this program will sunset this spring and millions of Americans may no longer be able to afford high-speed internet service. On October 25, 2023, the Biden-Harris Administration sent Congress a supplemental request for \$6 billion to extend funding for the Affordable Connectivity Program. Key stats on enrollment include the following: \* Nearly half of the households benefitting from ACP are military families. \* Four million seniors and 10 million Americans over the age of 50 benefit from this program every month. \* 1-in-4 households participating in the Affordable Connectivity Program are African American and 1-in-4 households are Latino...

The White House - Feb 6, 2024

## **NASA's New Experimental Antenna Tracks Deep Space Laser**

...An experimental antenna has received both radio frequency and near-infrared laser signals from NASA's Psyche spacecraft as it travels through deep space. This shows it's possible for the giant dish antennas of NASA's Deep Space Network (DSN), which communicate with spacecraft via radio waves, to be retrofitted for optical, or laser, communications. By packing more data into transmissions, optical communication will enable new space exploration capabilities. The 34-meter radio-frequency-optical-hybrid antenna, called Deep Space Station 13, has tracked the downlink laser from NASA's Deep Space Optical Communications (DSOC) technology demonstration since November 2023. In order to detect the laser's photons, seven ultra-precise segmented mirrors were attached to the inside of the hybrid antenna's curved surface. As the laser photons arrive at the antenna, each mirror reflects the photons and precisely redirects them into a high-exposure camera attached to the antenna's subreflector suspended above the center of the dish. The laser signal collected by the camera is then transmitted through optical fiber that feeds into a cryogenically cooled semiconducting nanowire single photon detector. DSOC is paving the way for higher-data-rate communications capable of transmitting complex scientific information, video, and high-definition imagery in support of humanity's next giant leap: sending humans to Mars...

National Aeronautics and Space Administration - Feb 8, 2024

## **NOAA researchers leverage smart buoys to help brace Great Lakes for environmental challenges**

...Lake Erie is the first of the Great Lakes getting connected to the internet with a series of offshore "smart" buoys. And it's not just for sending texts on the water. The buoy project, called the Smart Lake Erie Watershed Initiative, is providing invaluable data to researchers and anglers. The network makes water conditions, contaminants and nutrients easily accessible. Smart Lake Erie is an infrastructure investment that will better prepare the region for harmful algal blooms, oil spills and consequences of climate change. National Oceanic and Atmospheric Administration researchers at Michigan Technological University and Lake Superior State University have been collaborating with Cleveland-based Freeboard Technology on water studies leveraging the expansive network. Other methods of connecting to the internet on the water — cell modems and satellite telemetry — are expensive and inconvenient, but Smart Lake Erie allows users to directly connect their devices through short-wave radio. One proposed study would deploy small "drifters" that float through the water to map the path of algal blooms. The buoy network would relay their location and local algae concentration in real-time...

Spartan Newsroom - Feb 9, 2024

# Advanced Manufacturing

## **Integrating Sustainability: Insights from the Wisconsin Sustainable Business Council**

...The Wisconsin Manufacturing Extension Partnership (part of the MEP National Network™) works with strategic partners, such as the Wisconsin Sustainable Business Council (WSBC), to provide additional services and information to Wisconsin manufacturers. Together with the WSBC, the MEP Center's suite of sustainability services supports manufacturers to advance sustainability programs, increase efficiency, and get the credentials needed to integrate and operate sustainably. One standout feature of the WSBC's initiatives is the Green Masters Program®, a comprehensive sustainability assessment and recognition platform. The Green Masters Program® is a tool to prioritize, measure, and manage a company's sustainability performance. The virtual platform was purpose-built as a scalable standard for measuring and improving ESG impacts material to each organization and their stakeholders. By evaluating and improving sustainability practices, businesses can streamline their supply chains, reduce costs, and appeal to an ever-growing mindful workforce and customer base....

National Institute of Standards and Technology - Feb 1, 2024

## Microelectronics

### **FACT SHEET: Biden-Harris Administration Announces Over \$5 Billion from the CHIPS and Science Act for Research, Development, and Workforce**

...The Biden-Harris Administration announced it expects to invest over \$5 billion in semiconductor-related research, development, and workforce needs, including in the National Semiconductor Technology Center (NSTC), to advance President Biden's goals of driving R&D in the United States. Semiconductors were invented in America and serve as the backbone of the modern economy. But today, the United States produces less than 10 percent of global supply and none of the most advanced chips. The White House hosted research and development and workforce convenings with senior Administration leadership, industry, academia, think tanks, state and local government, and labor, where the Biden-Harris Administration announced several milestones that will drive U.S. leadership in cutting-edge semiconductor research and development...

The White House - Feb 9, 2024

### **DOE/AFOSR/NSF-funded researchers find 'flawed' material that resolves superconductor conundrum**

...Christopher Parzyck, a postdoctoral researcher, had brought his nickelate samples – a newly discovered family of superconductors – to a synchrotron beamline for x-ray scattering experiments. He was measuring his samples, which he'd synthesized with a new method, in the hope of detecting the suspected presence of "charge ordering" – a phenomenon in which electrons self-organize into periodic patterns. The phenomenon has been linked to high-temperature superconductivity. Parzyck's new synthesis method produced nickelates that were so pure, they were free of the flaws that had tainted previous studies of nickelates. The charge order had never existed. Parzyck and Shen devised an alternative technique in which the oxygen is removed by a beam of atomic hydrogen, a process that is commonly used for cleaning semiconductor surfaces, but had never been used for materials synthesis. Atomic hydrogen reduction gives the researchers greater independent control of the amount of hydrogen being applied. After their synchrotron experiments failed to show the "resonant scattering peak" that should have signaled the presence of charge ordering, the researchers began varying the amount of oxygen they were stripping out. The research was primarily supported by the U.S. Department of Energy's Office of Basic Energy Sciences, with additional support from the Air Force Office of Scientific Research and the National Science Foundation...

Cornell University - Feb 1, 2024

### **DoD officials convene at ASU to learn about university-led microelectronics hub**

...Some of the top defense technology officials in the U.S. came to Arizona State University recently to hear about the progress of the new Southwest Accelerated Prototyping Hub. The hub's goal is to speed the time it takes to transform lab ideas into practical solutions for the Department of Defense. In September, the U.S. Department of Defense announced that the SWAP Hub would receive nearly \$40 million in funding this year as one of eight "Microelectronics Commons" regional innovation hubs. The SWAP Hub is part of the Microelectronics Commons, a \$1.63 billion Department of Defense network of eight regional hubs funded by the 2022 CHIPS and Science Act. The hub provides access to its "clean room" technology and state-of-the-art tools to its partners as well as to ASU students. Last year, the SWAP Hub put out a call for project ideas and is putting forward more than a dozen that were determined to be a good fit to DoD for potential funding...

Arizona State University - Feb 2, 2024

## Climate Change / Green Energy & IT

### **USDA Celebrates 10 Years of Climate Hubs as Biden-Harris Administration Leads Historic Climate Agenda**

...It has been 10 years since the U.S. Department of Agriculture (USDA) created regional Climate Hubs, which were established to help support the agricultural producers and rural communities make climate-informed decisions. The Climate Hubs are an important piece of USDA's bold agenda to address climate change, complementing investments of \$19.5 billion through President Biden's Inflation Reduction Act, the largest-ever climate investment, to help agricultural producers adopt climate-smart practices, \$1 billion to the Urban and Community Forestry Program to combat extreme heat and climate change, and \$3.1 billion to expand markets for climate-smart commodities through the Partnerships for Climate-Smart Commodities. The Climate Hubs form a network of more than 120 climate researchers and communicators who work across the USDA and with partners to support climate-informed decisions. The Hubs are a collaboration of several USDA agencies, including the Agricultural Research Service, Forest Service, and Natural Resources Conservation Service, and act as force multipliers for USDA's climate science and services extending the Department's reach. The Hubs also coordinate with the U.S. Geological Survey and National Oceanic and Atmospheric Administration...

USDA APHIS - Feb 5, 2024



### **WVU leading regional effort with \$1M NSF award to accelerate energy technology, infrastructure**

... West Virginia University will lead a \$1 million National Science Foundation funded effort to drive energy technology and infrastructure, as well as address issues involving decarbonization and grid resiliency. The Resilient Energy Technology and Infrastructure team spearheaded the initiative that aims to identify pathways for workforce development. It align with energy technologies and policy development that accelerates the adoption of those technologies. The program is designed to support the development of diverse regional coalitions to create innovation-driven solutions with economic and societal impact. By the end of the 18-month project phase, the team will develop lists of technologies ready for translation, interested commercial partners and policy statements to inform regional governments on effective activities to support a regional innovation engine...

WVU - Feb 1, 2024

### **NASA's space lasers have unearthed plethora of climate data over the years**

...A team of scientists has sifted through two decades' worth of climate data collected by NASA laser pulses that it says both paints a sobering picture and underscores the need for such missions to continue. Satellite laser altimeters accurately measure how the Earth's surface evolves on a global scale. A satellite laser altimeter sends a laser beam pulse from space that illuminates a specific area on Earth and then bounces back. The topography — the height and shape — of an area can be determined by how far the laser travels and how long it takes to bounce back. For the past few decades, these lasers have radically improved understanding of critical climate issues, such as melting ice, sea level changes, carbon levels in forests and the amount of aerosols in the sky. Collectively, the data from the three missions demonstrates the rapid changes that Earth has experienced in a relatively short amount of time...

University at Buffalo - Feb 1, 2024

## **Digital Health**

### **Readout of Kids Online Health and Safety Task Force Principal Listening Session**

...White House leaders and the co-chairs of the Biden-Harris Administration's Task Force on Kids Online Health and Safety (KOHS Task Force) hosted a listening session with academic experts, youth advocates, civil society leaders, and practitioners on advancing the health, safety, and privacy of kids online. Officials from the White House Office of Science and Technology Policy, the Domestic Policy Council, the Gender Policy Council and the National Economic Council joined officials from the National Telecommunications and Information Administration to welcome guests and to detail the Administration's ongoing work to advance the health and safety of youth online. Participants discussed a range of topics, including: digital technologies for engaging in every-day life; strategies that could center children's well-being in companies' product development processes; importance of designing digital environments that help kids thrive; and risks to kids of large-scale personal data collection and advertising models of technology companies. Protecting youth mental health, safety, and privacy online is a key component to delivering on President Biden's Unity Agenda. This listening session will inform the Biden-Harris Administration's ongoing efforts to address the harms America's children and youth face online...

The White House - Feb 2, 2024

### **SAMHSA and ONC Launch the Behavioral Health Information Technology Initiative**

...The Substance Abuse and Mental Health Services Administration (SAMHSA) and the Office of the National Coordinator for Health Information Technology (ONC) will work together to invest more than \$20 million of SAMHSA funds over the next three years in an initiative to advance health information technology (IT) in behavioral health care and practice settings. The project supports the HHS Roadmap for Behavioral Health Integration and is consistent with the President's call to action to prevent, treat, and provide long-term recovery supports for mental illness and substance use disorders. ONC will develop a behavioral health information resource to support behavioral health care and integrated practice settings for HHS grantees and the public, similar to past ONC resources focused on pediatric health IT and Neonatal Abstinence Syndrome. ONC will provide technical assistance to pilot participants from the SUPTRS BG and MHGB programs to inform implementation of health IT in support of improved capacity at the state and local level for substance use and mental health treatment as well as recovery support services...

Health IT - Feb 5, 2024

### **NIH-Funded Research Found Artificial Intelligence May Benefit Heart Patients**

...University of Virginia scientists combining artificial intelligence and decades of human research are identifying drugs that could help minimize harmful scarring after a heart attack and improve patient outcomes. The new machine-learning tool has found a promising candidate to help prevent harmful heart scarring, something previous drugs did not. UVA researchers say the cutting-edge computer model also has the potential to predict and explain the effects of drugs for other diseases. The team combined a computer model based on decades of human knowledge with machine learning to better understand how drugs affect cells called fibroblasts. These cells produce collagen to help repair the heart after injury. But they can also cause harmful scarring as part of the repair process. They wanted to see if a selection of promising drugs would give doctors more ability

to prevent scarring and improve patient outcomes. The researchers developed a new approach called “logic-based mechanistic machine learning” that not only predicts which drugs may help, but predicts how they affect fibroblast behaviors. The research was supported by the National Institutes of Health...  
UVA Today - Feb 2, 2024

### **DARPA/NSF fund AI model that flags high-risk pancreatic cancer patients 18 months before diagnosis**

...Pancreatic cancer has the lowest five-year relative survival rate of any cancer diagnosis, but if caught in its earliest stages, five-year survival rates can reach as high as 80 percent. Investigators at Harvard-affiliated Beth Israel Deaconess Medical Center (BIDMC), in collaboration with colleagues at Massachusetts Institute of Technology, built and validated a risk prediction model to help physicians identify patients who are at high risk for developing pancreatic cancer. The team’s model, a neural network trained on de-identified data from electronic health records. It flagged patients as at risk of developing pancreatic cancer up to 18 months before diagnosis in patients 40 years or older and caught 3.5 times as many cases than current screening guidelines. Named PrismNN, the team’s machine learning model was trained on data from more than 1.5 million EHR provided by industry partner TriNetX. To further validate the model, the researchers assessed its real-time accuracy by allowing PrismNN to sort patients into low-, intermediate- and high-risk groups, as well as follow their outcomes. This work was funded by DARPA and NSF...  
Harvard Gazette - Feb 1, 2024

## **Other IT Related**

### **NSF invests nearly \$10M to develop transformative bio-inspired solutions**

...The U.S. National Science Foundation is investing \$9.75 million to advance novel solutions for complex societal and economic challenges inspired by biological systems. NSF’s investment awards 15 multidisciplinary teams to Phase 1 of the NSF Convergence Accelerator’s Track M: Bio-Inspired Design Innovations. The track leverages the understanding of living systems and utilizes expertise spanning scientists, engineers and practitioners to inspire novel approaches and technologies. "Research in bio-inspired design has the potential to yield transformative solutions to complex challenges," said Erwin Gianchandani, NSF assistant director for Technology, Innovation and Partnerships (TIP). ... Launched in 2019, the NSF Convergence Accelerator — a TIP program — builds upon NSF’s investment in basic research and discovery to accelerate solutions toward societal and economic impact. The program’s multidisciplinary teams use convergence research fundamentals and innovation processes to stimulate innovative idea sharing and development of sustainable solutions...  
National Science Foundation - Feb 8, 2024

### **NSF launched initiative for new water-focused innovation engine that aims to turn waste into wealth for Great Lakes region**

...Argonne will contribute proven expertise in water research and development, technology commercialization and workforce development to spur economic growth thanks to a new regional innovation and economic development initiative launched by the U.S. National Science Foundation (NSF). The initiative will fund efforts to find new ways to recover clean water, nutrients and materials for clean energy technologies from wastewater — all while removing dangerous chemicals. Recovering substances from wastewater for commercial reuse is easier said than done. Existing processes for doing so can be technically complicated. Argonne is already pioneering innovative methods for separating contaminants and other substances from water. These have been especially effective in green energy and manufacturing applications. Argonne researchers also work across disciplines to confront challenges and find solutions, including manufacturing, materials, modeling and artificial intelligence/machine learning, sensors and control and sustainability. Argonne’s expertise in all of these areas will help ensure that ReNEW can unlock all \$160 million of NSF’s grant over the next 10 years...  
Argonne National Laboratory - Feb 6, 2024

## **STEM / Workforce & IT**

### **Readout of White House Convening with Community College Presidents and Provosts**

...The Biden-Harris Administration convened community college presidents and provosts at the White House to discuss the ways they are strengthening talent pipelines into growing sectors fueled by President Biden’s historic Investing in America agenda. To support community colleges’ critical efforts to prepare a diverse, skilled workforce for these good jobs, the Administration has made robust investments in these institutions, including through the National Science Foundation’s Advanced Technical Education program, the Department of Labor’s Strengthening Community Colleges Training Grants, the Department of Commerce’s Tech Hubs program, and more...  
The White House - Feb 6, 2024

### **DHS Launches First-of-its-Kind Initiative to Hire 50 Artificial Intelligence Experts in 2024**

...DHS announced the Department's first-ever hiring sprint to recruit 50 Artificial Intelligence (AI) technology experts in 2024. The new DHS "AI Corps" is modeled after the U.S. Digital Service, building teams that will help better leverage this new technology responsibly across strategic areas of the homeland security enterprise. The AI Corps will bolster the DHS workforce with experts in AI and Machine Learning (ML) technologies, models, and applications who will support policy initiatives to ensure the safe and secure use of AI, while protecting privacy and civil rights and civil liberties. Using the Office of Personnel Management's new flexible hiring authorities for AI-related jobs, DHS has worked to streamline and expedite the federal hiring process to ensure qualified candidates receive offers as quickly as possible. The DHS AI Corps AI Technology experts will be part of the DHS Office of the Chief Information Officer and will work on a variety of projects across the Department advancing AI innovation and use. They will provide expertise in AI/ML, data science, data engineering, program management, product management, software engineering, cybersecurity, and safe, secure, and responsible use of these technologies. DHS's work on AI is part of a whole-of-government effort to address this emerging technology...

Homeland Security - Feb 6, 2024

### **NPS students accelerate innovative over-the-horizon technology solution**

...Since Secretary of the Navy Carlos Del Toro announced the establishment of the Naval Innovation Center at the Naval Postgraduate School (NPS) in 2022, the institution has worked to establish the processes needed to support and empower student ideas and align them to defense critical technological areas. In one of the first research projects under the NIX Intelligent Autonomous Systems (IAS) team, U.S. Navy Lt. Austin Dumas and Lt. Cmdr. Hans Lauzen and U.S. Marine Corps Capt. Daniel Lim conceived an autonomous over-the-horizon (OTH) maritime solution – a capability that has the potential to be in the hands of warfighters as early as next year. The students and their advisors all bring a diverse set of skills and experiences to bear on this problem. The core of NIX lies in its dedication to accelerating project development for students, from mere ideation to prototype deployment and completion...

Department of the Navy Chief Information Officer - Feb 7, 2024

### **NSF CyberCorps Scholarship Program Renews Grant for Tuskegee University's Cybersecurity Program - No. 2 Ranking in Cybersecurity Guide's 2024 List**

...Tuskegee University has achieved a No. 2 ranking in the Cybersecurity Guide's 2024 list for its exceptional Computer Science Cybersecurity Program. This recognition underscores Tuskegee University's commitment to providing cutting-edge education and research in the field of cybersecurity. The Master of Science in Information Systems and Computer Security (MS-ISCS) program combines business and computer science disciplines to prepare graduates for critical roles in information assurance. Tuskegee's commitment to cybersecurity education is further exemplified by its Center of Information Assurance Education, endorsed by the National Security Agency (NSA) and Department of Homeland Security (DHS), and its renewed NSF grant of \$2.86 million for the CyberCorps® Scholarship for Service and Cyber Bridge programs, integrating AI competencies into cybersecurity training for a strong federal workforce...

Tuskegee University - Feb 12, 2024

## **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 - Jan 1, 2024

### **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!

Networking and Information Technology Research and Development - Dec 19, 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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