



NITRD News Brief

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

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

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

NITRD News

CAREER OPPORTUNITIES: Program Manager, National Strategic Computing Reserve Pilot Program Office: DEADLINE EXTENDED

...The Federal Government is creating a National Strategic Computing Reserve (NSCR) that can be called up in times of urgent national needs to address emergencies from pandemics to earthquakes to other natural or man-made disasters. The NSCR is envisioned as a coalition of resource providers (of compute, software, and data) and technical experts spanning government, academia, industry, nonprofits/foundations, civil society, and communities of practice supported by appropriate coordination structures and mechanisms that can be mobilized quickly to provide critical cyberinfrastructure capabilities and services in times of urgent need. The Networking and Information Technology Research and Development (NITRD) Program is seeking candidates interested in serving as the Program Manager for the NSCR Pilot Program Office. The NSCR Pilot Program

Office will (1) develop a plan, to include the structures, policies, and processes for an NSCR Program Office, and (2) prototype the implementation and operation of these structures, policies, and processes. Submit your resume by January 15, 2023.

The Networking and Information Technology Research and Development (NITRD) Program - Dec 14, 2022

Federal Agency Funding Opportunities

DHS Opens 23.1 Small Business Innovation Research Solicitation

...The Department of Homeland Security (DHS) Small Business Innovation Research (SBIR) 23.1 Solicitation is now open and accepting applications from U.S. small businesses interested in submitting research proposals for seven diverse homeland security technology needs for the following topics: * Accurate and Real-time Hardware-assisted Detection of Cyber Attacks * Machine Learning Based Integration of Alarm Resolution Sensors * Reduced Order Modeling of Critical Infrastructure Protect Surfaces ...and more. DHS will accept proposals for topics until 1 PM ET on January 17, 2023.

Homeland Security - Dec 19, 2022

Artificial Intelligence / Machine Learning

DARPA Announces Winners of AI for Critical Mineral Assessment Competition

...DARPA partnered with the U.S. Geological Survey (USGS) to launch the AI for Critical Mineral Assessment Competition in August 2022. The partnership will help the USGS conduct assessments for more than 50 critical mineral resources to aid in economic planning and land-use decision-making. The goal of the competition was to crowdsource ideas that could drastically reduce the time required to complete parts of the assessment using AI and machine learning to automate key processes. After analyzing the mineral assessment workflow, DARPA and its performers MITRE and NASA Jet Propulsion Laboratory recognized the greatest potential for near-term, high-impact in solving the data needs associated with georeferencing and extraction of individual geologic features found on USGS maps. As such, the competition was divided into two distinct sub-challenges. A total of 18 teams from industry, academia, and even a high school junior, competed for cash prizes of \$10,000 for first place, \$3,000 for second, and \$1,000 for third...

DARPA - Dec 16, 2022

Hot salt, clean energy: How artificial intelligence can enhance advanced nuclear reactors

...Researchers at the U.S. Department of Energy's (DOE) Argonne National Laboratory showed how artificial intelligence could help pinpoint the right types of molten salts, a key component for advanced nuclear reactors. The study set out to determine whether computer simulations driven by machine learning could guide and refine real-world experiments at the Advanced Photon Source (APS), a DOE Office of Science user facility at Argonne. Researchers use the powerful X-rays at the APS to better understand specific salt mixtures by looking closely at their structures. Building on previous modeling that explored heat-resistant materials, researchers used what's known as active learning to create a transferable model to analyze molten salts. Rather than being fitted for one or two specific molten salt mixture compositions, the transferable model can be applied to mixtures across the composition space. The model makes predictions based on principles, in other words, rather than a set of predefined answers. The machine learning simulations were run using high performance computing resources at the Argonne Leadership Computing Facility (ALCF), a DOE Office of Science user facility...

Argonne National Laboratory - Dec 15, 2022

Robotics / Autonomous Vehicles

NASA's Perseverance Rover to Begin Building Martian Sample Depot

...In the coming days, NASA's Perseverance rover is expected to begin building the first sample depot on another world. The rover has been taking a pair of samples from each of its rock targets. Half of every pair will be deposited at Three Forks as a backup set, and the other half will remain inside Perseverance, which will be the primary means to convey the collected samples to the Mars launch vehicle as part of the campaign. The depot's success will depend on accurate placement of the tubes – a process that will take over a month. Before and after Perseverance drops each tube, mission controllers will review a multitude of images from the rover. This assessment will also give the Mars Sample Return team the precise data necessary to locate the tubes in the event of the samples becoming covered by dust or sand before they are collected. Perseverance's prime mission will conclude on Jan. 6, 2023 – one Mars year (about 687 Earth days) after its Feb. 18, 2021, landing. The new science phase will begin when Perseverance

finishes its ascent of the delta's steep embankment and arrives at the expanse that forms the upper surface of the Jezero delta, probably sometime in February. During this approximately eight-month campaign, the science team will be on the lookout for boulders and other materials that were carried from elsewhere on Mars and deposited by the ancient river that formed this delta...

National Aeronautics and Space Administration - Dec 16, 2022

USDA grant funds AI, UAVs, UGVs, and IoT to tackle the scourge of fire ants

...Researchers at The University of Texas at Arlington are taking a different approach: developing a high-tech, insecticide-free solution to eliminate fire ants. Researchers at The University of Texas at Arlington initiated a new project with entomologists from the U.S. Department of Agriculture (USDA). They are using a \$99,453 USDA grant to develop an innovative, artificial intelligence-driven autonomous smart system to automatically deliver fire ant mound treatment using insecticide-free solutions. The will use artificial intelligence, the Internet of Things (IoT), unmanned aerial vehicles (UAVs) and unmanned ground vehicles (UGVs) to find these fire ant mounds and deliver treatment solutions autonomously. The second goal of the project will be to develop a UAV system to monitor a target field or pasture to identify fire ant mounds using deep learning and remote sensing technologies. The UAV would send the detected fire ant mound location to a UGV system, which will be deployed to automatically dispense the water-based solutions. This UGV system will be equipped with a water tank and a robot arm-controlled water injection tube and be run by an integrated artificial intelligence system...

The University of Texas at Arlington - Dec 19, 2022

Quantum

DOE's Q-NEXT quantum center releases roadmap for the development of quantum information technologies

...Quantum technologies are expected to become part of our everyday lives in the coming decades. Researchers in the emerging area of quantum information science (QIS) are rapidly developing many of these technologies, including ultraprecise quantum sensors that could propel fundamental science and medicine forward by leaps and bounds; powerful quantum computers to tackle insoluble problems in finance and logistics; and quantum communications to connect these machines as part of long-distance networks. To guide the development of these devices, the Q-NEXT quantum research center has published a new report, "A Roadmap for Quantum Interconnects," which outlines the research and scientific discoveries needed to develop the technologies for distributing quantum information on a 10- to 15-year timescale. Q-NEXT is a U.S. Department of Energy (DOE) National Quantum Information Science Research Center. The roadmap specifically focuses on quantum interconnects, devices that link and distribute quantum information between systems and across distances to enable quantum computing, communications and sensing...

Argonne National Laboratory - Dec 14, 2022

Cybersecurity / Privacy

NIST Drafts Revised Guidelines for Digital Identification in Federal Systems

...The U.S. Department of Commerce's National Institute of Standards and Technology (NIST) has drafted updated guidelines to help the nation combat fraud and cybercrime while fostering equity and preserving fundamental human rights. The guidelines support risk-informed management of people's personas online — their "digital identities" — often required to engage in everyday digital transactions from banking to ordering groceries. The draft publication, formally titled Digital Identity Guidelines (NIST Special Publication 800-63 Revision 4), covers technical requirements for establishing and authenticating digital representations of real-life people — such as employees of a government contractor or members of the general public. The draft guidelines aim to help organizations manage risks associated with digital interactions while making it easier for individuals to use digital identities successfully, including when applying for government services. They also include privacy requirements and offer considerations for fostering equity and the usability of digital identity solutions. NIST is accepting comments on the multivolume draft until March 24, 2023. NIST will host a virtual workshop on Jan. 12, 2023, to provide details on the major changes to the guidelines and the comment process...

National Institute of Standards and Technology - Dec 16, 2022

NSA Publishes 2022 Cybersecurity Year in Review

...The National Security Agency published its 2022 Cybersecurity Year in Review today to share its mission focuses and demonstrate how it is producing cybersecurity outcomes for the nation. This year's report highlights NSA's ability to scale cybersecurity solutions through strong partnerships, resulting in speed and agility. The Year in Review highlights NSA's efforts, including: * Disclosing dozens of zero-day vulnerabilities to vendors to remediate before nation-state actors exploit them. * Publicly releasing cybersecurity guidance to protect against active adversary and cybercriminal threats and to harden systems. * Researching and delivering tools and technology advancements that protect the nation's cyber ecosystem...

National Security Agency/Central Security Service - Dec 15, 2022

NIST Retires SHA-1 Cryptographic Algorithm

...The SHA-1 algorithm, one of the first widely used methods of protecting electronic information, has reached the end of its useful life, according to security experts at the National Institute of Standards and Technology (NIST). The agency is now recommending that IT professionals replace SHA-1, in the limited situations where it is still used, with newer algorithms that are more secure. Today's more powerful computers can create fraudulent messages that result in the same hash as the original, potentially compromising the authentic message. These "collision" attacks have been used to undermine SHA-1 in recent years. NIST has announced previously that federal agencies should stop using SHA-1 in situations where collision attacks are a critical threat, such as for the creation of digital signatures. NIST will stop using SHA-1 in its last remaining specified protocols by Dec. 31, 2030...

National Institute of Standards and Technology - Dec 15, 2022

5G, Wireless Spectrum, Networking & Communications

NASA Enables Future of Science Observation through Tri-band Antennas

...NASA's Near Space Network enables spacecraft exploring the solar system and Earth to send back essential science data for researchers and scientists to investigate and make profound discoveries. The network has integrated four new global antennas to further support science and exploration missions. In December 2022, antennas in Fairbanks, Alaska; Wallops Island, Virginia; Punta Arenas, Chile; and Svalbard, Norway went online to provide present and future missions with S-, X-, and Ka-band communications capabilities. These new antennas were created to support missions capturing immense amounts of data. Just as scientists increase their instrument capabilities, NASA also advances its communications systems to enable missions near-Earth and in deep space. This upgrade is bringing unprecedented flexibility to the Near Space Network and will enhance direct-to-Earth communications – the process by which a satellite takes a picture and then sends the image over radio waves to an antenna on Earth...

National Aeronautics and Space Administration - Dec 19, 2022

ESF Members NSA and CISA Provide Threat Assessment, Best Practices for 5G Network Slicing

...Enduring Security Framework (ESF) partners, along with experts from the National Security Agency (NSA) and Cybersecurity and Infrastructure Security Agency (CISA), published their assessment of potential threats associated with 5G network slicing and strategies to help keep this emerging tech secure. Network slicing is a 5G network architecture which allows mobile service providers to divide their network up into several independent "slices" in order to create specific virtual networks that cater to different clients and use cases. Today's report specifically identifies management strategies to ensure the confidentiality, integrity, and availability of each network slice. "The Department of Defense is transitioning 5G into its enterprise. Being able to do network slicing across the entire 5G system is a critical new capability that 5G provides over LTE. As important, the ability to use network slicing in a secure way is foundational if the Department is to take advantage of the feature at all," said Andrew Thiessen, Chief Technologist, DOD 5G Cross Functional Team...

National Security Agency/Central Security Service - Dec 13, 2022

Microelectronics

UCF Researchers Create Technology that Harvests Radio Waves for Energy

...To meet the growing energy needs of the internet of things (IoT) and wireless communication systems, University of Central Florida researchers have developed a technology for converting radio frequency signals into direct current electricity. The technology can reduce the electronic industry's reliance on batteries and broaden the expansion of the IoT and its energy needs. UCF researchers developed a technology that integrates power scavenging and spectrum sensing capabilities for ultra-low power applications. The resulting passive module would eliminate the need for power-hungry radio frequency sensing modules. The invention harvests ambient energy, specifically radio frequency electromagnetic waves, the most abundant form of communication among IoT nodes and hubs. The team recently secured the new Allowable Patent Expenses (APEX) award from the U.S. National Science Foundation (NSF)...

UCF Today - Dec 19, 2022

Climate Change / Green Energy & IT

Biden-Harris Administration Releases Inflation Reduction Act Guidebook for Clean Energy and Climate Programs

...The White House released the first edition of a new resource titled Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action, which provides clear descriptions of the law's tax incentives and funding programs to build a clean energy economy, lower energy costs, tackle climate change, and reduce harmful pollution. The Guidebook will help state, local, territorial, and Tribal leaders, the private sector, non-profit organizations, homeowners, and communities better understand how they can benefit from these investments and unlock the full potential of the law. The Guidebook walks through the law program-by-program and provides background on each program's purpose, eligibility requirements, period of availability, and other key details. The Inflation Reduction Act Guidebook follows the successful model of the Bipartisan Infrastructure Law Guidebook and creates a roadmap for the clean energy and climate funding available under the law at the program level...
The White House - Dec 15, 2022

FACT SHEET: Biden-Harris Administration Takes More Than 100 Actions in 2022 to Strengthen Energy Efficiency Standards and Save Families Money

...The White House and the Department of Energy (DOE) announced that the Biden-Harris Administration has surpassed its goal to take 100 actions in 2022 to strengthen energy efficiency standards for a range of appliances and equipment to lower costs for American families. The Biden-Harris Administration has moved quickly to address a vast backlog of outdated energy efficiency standards. DOE took critical steps in 2021 to remedy the rollbacks and procedural roadblocks left by the prior Administration, and throughout 2022 delivered on an ambitious slate of new actions to lower costs, boost American energy security, and reduce greenhouse gas emissions and other harmful air pollution. Along with stronger standards for common household appliances, DOE has also advanced updated standards for commercial and industrial equipment, and for buildings overall (including manufactured home energy efficiency, federal building energy efficiency, and federal building emissions reduction). In addition to proposed and final standards, DOE's 110 actions this year also include test procedures and coverage determinations—rulemakings that lay the groundwork for DOE to issue stronger efficiency standards...

The White House - Dec 19, 2022

University of Hawaii, NOAA to gather climate change data following Mauna Loa eruption

...NOAA will partner with the University of Hawaii (UH) to collect atmospheric measurements at the Maunakea Observatories offsite link on the Big Island of Hawaii. These measurements will provide records of global carbon dioxide (CO₂) similar to those gathered for more than six decades at NOAA's Mauna Loa Observatory (MLO), and will provide key information to track global climate change...

National Oceanic and Atmospheric Administration - Dec 16, 2022

NASA Sensors to Help Detect Methane Emitted by Landfills

...Observations from the Earth Surface Mineral Dust Source Investigation (EMIT) and other NASA science instruments will be part of a global survey of point-source emissions of methane from solid waste sites such as landfills. The aim of the new initiative is to establish a baseline assessment of global waste sites that emit methane at high rates. This information can support decision-makers as they work to reduce the concentration of the gas in the atmosphere and limit climate change. The project will entail conducting an initial remote-sensing survey in 2023 of more than 1,000 managed landfills across the United States and Canada, and in key locations in Latin America, Africa, and Asia. To collect data from these regions, researchers will use aircraft-based sensors, including the Airborne Visible/Infrared Imaging Spectrometer-Next Generation (AVIRIS-NG), which was developed at NASA's Jet Propulsion Laboratory...

National Aeronautics and Space Administration - Dec 14, 2022

Digital Health

AFRL launches wearable biomolecular sensors program for DoD, transfers technology to Sensate Biosystems

...The Air Force Research Laboratory (AFRL) has partnered with the Nano Bio-Materials Consortium (NBMC) and Case Western Reserve University to create wearable sensors that measure biomarkers in Airmen and Guardians. Human performance monitoring wearable sensors optimize capability in capturing and monitoring molecular signatures in body fluids such as saliva, interstitial fluid and perspiration. This technology is key to tracking well-being during critical missions, sensing when Airmen and Guardians become overly fatigued, stressed or hyperstimulated. Wearable sensor technology has the potential to quantitatively measure human stress levels during missions, notify personnel to return to safety zones and monitor biomolecular responses in those who become sick or injured...

Other IT Related

Request for Information; National Biotechnology and Biomanufacturing Initiative

...Biotechnology and Biomanufacturing Initiative (NBBI) to advance biotechnology and biomanufacturing towards innovative solutions in health, climate change, energy, food security, agriculture, and supply chain resilience, and to advance national and economic security. Through Executive Order 14081, the Federal Government will deliver reports to the President on how biotechnology and biomanufacturing can further societal goals related to health, climate change and energy, food and agricultural innovation, resilient supply chains, and cross-cutting scientific advances. The White House Office of Science and Technology Policy (OSTP) is tasked with developing a plan to implement the recommendations in the reports. This RFI seeks public input on how advances in biotechnology and biomanufacturing can help us achieve goals that were previously out of reach and what steps can be taken to ensure we have the right research ecosystem, workforce, data, domestic biomanufacturing capacity, and other components to support a strong bioeconomy. Interested persons and organizations are invited to submit comments on or before 5 p.m. ET on January 20, 2023.

Federal Register - Dec 20, 2022

NIST: The Twelve Days of Metric

...As we approach the end of 2022, we wanted to share with our readers a NISTified version of a classic seasonal song about a topic that is near and dear to NISTers (and many other scientists) year-round: the wonders of the metric system. So without further ado ... The Twelve Days of Metric. On the twelfth day of metric, a NISTer gave to me Eleven physics interns: NIST's Summer Undergraduate Research Fellowship (SURF) provides the next generation of scientists an opportunity to see what it means to practice science. Ten silicon chips: Silicon is a type of material known as a semiconductor and is the most commonly used raw material for semiconductor chips. Nine volts through circuits: The volt is the metric unit for electric potential. Josephson junctions are devices made from two layers of superconducting materials...

National Institute of Standards and Technology - Dec 20, 2022

NSF advances sustainable materials solutions and capabilities

...The U.S. National Science Foundation is accelerating convergence research across materials discovery and development as well as production and manufacturing to address challenges aligned to the manufacturing, reuse and recycling of critical materials and products. With a total investment of \$11.5 million, 16 Phase 1 multidisciplinary teams have been selected for NSF's Convergence Accelerator program's Track I: Sustainable Materials for Global Challenges. "The production and use of materials today is not sustainable for our planet and human health," said Erwin Gianchandani, NSF assistant director for Technology, Innovation and Partnerships. "Creating environmentally – and economically – sustainable materials and products is critical to our future. The use-inspired solutions in which we are investing in today will advance the circular design of materials and manufacturing processes to reduce pollution and waste." The awardees include: * Building a Sustainable, Innovative Ecosystem for Microchip Manufacturing, * Designing for Circular Economies – Creating Impact from Local Plastic Waste Using Off-Grid Containerized 3D Printers & Practice Based Learning, * Energy-efficient MetaConductors for Convergence of Sustainable Electronics, or E-MC2 of Sustainable Electronics...

National Science Foundation - Dec 19, 2022

CSU lasers likely to be key to fusion power future

...The quest for abundant, carbon-free energy will likely get a big boost by Colorado State University, home to advanced laser technology and a key partner in a national research consortium to advance nuclear fusion energy. A scientific breakthrough announced this week by the Department of Energy was met with excitement at CSU. Although commercial use of fusion energy is decades away, the goal seems closer than ever now, and the Advanced Beam Laboratory at CSU's Foothills Research Campus is poised to play an important role. CSU is one of 10 institutions with high-intensity laser facilities called LaserNetUS. It's a consortium of researchers, including the Lawrence Livermore National Laboratory, where the fusion energy breakthrough occurred. In collaboration with the LLNL, CSU is integrating machine learning into its laser experiments, which enable faster data acquisition. Additionally, CSU has expertise for advancing critical optical coatings and target materials affected by lasers. Advanced lasers also contribute to the fabrication of powerful computer chips. The research helps train students and contributes to a proficient workforce that will support fusion energy science far into the future...

Colorado State University - Dec 15, 2022

STEM / Workforce & IT

Biggest-Ever Group of Ventura County Students Graduate from Pre-Engineering Program

...More than 30 high school students from around Ventura County graduated this week from Naval Surface Warfare Center, Port Hueneme Division (NSWC PHD)'s fall 2022 Pre-Engineering Program — the biggest cohort to date for the rigorous after-school program. NSWC PHD facilitates the Pre-Engineering Program twice per year in partnership with the school districts and other naval organizations. During the Pre-Engineering Program, students rotated through engineering instructors to hear their career stories and to design, build and test projects that represent several disciplines, from systems and electrical engineering to environmental and aeronautical engineering. The instructors were professional engineers with NSWC PHD, Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) at Naval Base Ventura County, the Naval Postgraduate School in Monterey, California, and the Engineering Duty Officer School on the NSWC PHD campus...
Navy.mil - Dec 17, 2022

DOE Announces \$32 Million in Research Opportunities for Underrepresented Groups

...The U.S. Department of Energy (DOE) announced 41 awards totaling \$32 million to 37 institutions to support historically underrepresented groups in science, technology, engineering, and mathematics (STEM) and diversify American leadership in the physical sciences, including energy and climate. The funding, through the DOE Office of Science's Reaching a New Energy Sciences Workforce (RENEW) initiative, will support internships, training programs, and mentor opportunities at Historically Black Colleges and Universities (HBCUs), other Minority Serving Institutions (MSIs), and other research institutions. Ensuring America's best and brightest students have pathways to STEM fields will be key to achieving President Biden's energy and climate goals, including achieving a net-zero carbon economy by 2050...
Department of Energy - Dec 14, 2022

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 Program - Nov 22, 2022

Upcoming Conferences / Workshops / Webinars

NIST: Providing Timely and Clear Data to Support Federal Cybersecurity Workforce Needs

...Efforts to grow and sustain the federal cybersecurity workforce should be supported by evidence that informs actions or decisions and the availability of data that allows departments and agencies to evaluate and improve their performance. This webinar will showcase some existing data sources as well as identify opportunities for future improvements that will help the federal government take a data-driven approach to improving the impact of human resources, talent management, and workforce development efforts to recruit, hire, develop, and retain a skilled workforce. January 24, 2023 1:30 - 3:00pm EST
National Institute of Standards and Technology - Dec 19, 2022

NIST: Quantum Matters in Materials Science (QMMS) Workshop

...As part of the JARVIS workshops series, on Jan 31-Feb 1, 2023, NIST is organizing the 2nd QMMS workshop. The workshop will be focused on quantum phenomena in emerging materials for next generation devices. All materials are inherently quantum in nature, but only when quantum phenomena manifest at the classical scale can we hope to leverage their properties for applications. The Materials Genome Initiative represents a compelling approach to investigate quantum materials and accelerate their development for quantum information systems (QIS) or other practical industrial applications. To make the workshop as effective as possible, we plan to mainly focus on 2D and 3D inorganic superconductor, topological, magnetic and electronic materials, but we are not limited to those systems. January 31 - February 1, 2023 Virtual Only EST
National Institute of Standards and Technology - Dec 19, 2022

Innovation Through NITRD Coordination

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

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