



National Institute of Standards and Technology (NIST)

NIST, founded in 1901, is a non-regulatory federal agency within the [Department of Commerce](#). NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Open Data

NIST Public Access Plan

In response to the Memorandum from the Executive Office of the President to the Heads of Executive Departments and Agencies: Increasing Access to the Results of Federally Funded Scientific Research, dated February 22, 2013, NIST developed a Public Access Plan that was approved by the Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) in December 2014. NIST phased in its public access plan, beginning with intramural and moving to extramural research. All public access requirements are now implemented. Within the constraints of its mission and funding, NIST staff are required to provide public access to the results of federally funded research under a set of NIST directives that went into effect in 2015. Language requiring provision of public access to scientific research results is now included in all agreements for research supported by NIST through grants, contracts, cooperative agreements, or other awards, including research conducted at joint institutes and federally funded research and development centers, as they come up for renewal. The plan and public comments are available as [NISTIR 8084](#). NIST's Public Access Policy, which was derived from the plan, is available at <https://www.nist.gov/open>.

Improved Access to Publications and Archival Materials

NIST has partnered with the National Institutes of Health (NIH) to use the [PubMed Central \(PMC\)](#) repository system to provide public access to full-text peer-reviewed scholarly publications authored by NIST staff, leveraging the well-established search, archival, and

dissemination features of PMC. NIST Technical Series publications are available through the Government Publishing Office's (GPO's) [govinfo](#).

NIST, formerly the National Bureau of Standards (NBS), has worked with *The Internet Archive* under an arrangement with the Library of Congress to digitize over 20,000 technical reports the agency has published over the last 100+ years. The digitization of this collection of NBS/NIST technical publications will be completed by the end of fiscal year 2018. As the publications are digitized, they are made accessible to the public through appropriate sources:

- GPO *govinfo*, <https://www.govinfo.gov/collection/nist>
- WorldCat, <https://www.worldcat.org/>
- *The Internet Archive*, <https://archive.org/details/NISTresearchlibrary>
- Internet search engines.

Photographs and other materials portraying NBS/NIST history are made available to the public through the NIST Digital Archives, <https://www.nist.gov/digitalarchives>. Information about and images of the scientific instruments and other artifacts in the NIST Museum collections are also accessible to the public through this site.

Improved Access to Research Data

When the OSTP memo was released in 2013, NIST had an existing infrastructure to support review and release of publications, but did not have an analogous infrastructure for data. To enhance NIST's ability to store, exchange, and disseminate NIST research data with external stakeholders and the public, as well as between NIST technical staff and their immediate collaborators, NIST has made fundamental and foundational improvements to its data management infrastructure. NIST has developed a tool for data management that helps create specific plans for storing, archiving, and accessing research data. NIST's enterprise data inventory, which functions like a card catalog, can link to a data management plan (DMP) and upload datasets to a secure repository in the cloud, assign Digital Object Identifiers (DOIs), and allow review and approval prior to release of information to the public. Information about available data is sent to [data.gov](#). NIST research data is accessible through links on data.gov, the "card catalog" for government data, and through a portal on NIST's website.

Recognizing the importance of collaboration for scientific research efforts, NIST's CIO has authorized the use of several collaboration tools for sharing information with internal and external colleagues. Most recently, the NIST CIO introduced a streamlined authorization process for NIST organizational units seeking to use additional collaboration tools. Staff now have access to lists of tools that are available and those in the assessment and authorization process via an internal website, making the process more transparent.

Configurable Data Curation System

The NIST Configurable Data Curation System (CDCS), a platform developed to support the Materials Genome Initiative discussed below, provides a means for capturing and transforming materials data into a structured format that is XML-based and amenable to transformation to other formats so that the data can be shared across academia, the government, and industry. The platform was developed for materials data (Materials Data Curation System, MDCS), but is now also deployed as the NIST Materials Resource Registry (NMRR) as well as the International Metrology Resource Registry (IMRR), a tool for National Metrology Institutes and the International Bureau of Weights and Measures (BIPM) to provide federated discovery and access to the world's knowledge about the science of making measurements.

Proactive Disclosure

To the extent feasible and consistent with law, agency mission, resource constraints, U.S. national, homeland, and economic security, NIST promotes the availability of results of federally funded research in publicly accessible repositories.

NIST has begun an initiative to make NIST directives of significant public interest available on our website.

Privacy

NIST follows departmental guidance from the Office of Privacy and Open Government. NIST's privacy program is described at <https://www.nist.gov/privacy>, and Privacy Impact Assessments are available through a link on that site and at <http://www.osec.doc.gov/opog/privacy/NIST-pias.html>.

Whistleblower Protection

The NIST follows departmental guidance from the Office of Inspector General.

Websites

Several years ago, as part of an effort to expand dissemination of its research results, NIST implemented a content management system (CMS), which included access to an improved database of research papers authored or co-authored by NIST researchers. Content is "tagged" by topic, enabling the public to subscribe to receive new information posted on the website on specific topics of interest such as nanotechnology or energy-related research. Currently, there are more than 240,000 subscribers who receive information on approximately 108 different topics. The NIST website also includes several blogs that allow members of the public to comment or ask questions about posted articles and the CMS includes icons to easily share content from the NIST site with social media websites.

NIST has migrated its central web pages from a proprietary CMS to Drupal, an open source CMS. The website allows greater flexibility in the functionality of NIST internal and external web pages. It is hosted in the cloud, which allows NIST to meet the public's current and future needs.

In 2016, NIST launched a new blog, [Taking Measure](#). Through this blog, we write about trends in measurement science and technology, and discuss *why* we do the work that we do (and why we like it so much).

NIST has created sites on YouTube (more than 8,500 subscribers, more than 1.8 million video views), Facebook (more than 63,000 “followers”), Twitter (more than 41,000 “followers”), LinkedIn (almost 26,000 followers), and Instagram (more than 450 followers since launching in August 2017). To ensure that as many people as possible benefit from NIST's work, news of major research results posted on the NIST website is routinely announced through these additional social media sites.

Open Innovation Methods

NIST uses prizes and challenges to stimulate engagement to solve ambitious problems in support of the NIST mission. Many long-standing NIST programs have created challenges by leveraging NIST authorities (e.g., the NIST Organic Act and Federal Information Security Management Act) to bring people together to showcase to one another; others have a winner who receives public recognition. Examples of recent and ongoing challenges include:

[Global City Teams Challenge](#)

[NIST Transactive Energy Challenge](#)

[Post-Quantum Cryptography Standardization](#)

[Text Retrieval Conference \(TREC\).](#)

NIST prize competitions, involving the award of cash prizes to winners under Prize Competition Authority (15 U.S.C. 3719, as amended), are managed through NIST's Program Coordination Office. Prize competitions are announced on challenge.gov and program websites. Prize competitions completed or in progress include:

[Agile Robotics for Industrial Automation Competition \(ARIAC\)](#)

[2018 Reusable Abstractions of Manufacturing Processes \(RAMP\) Challenge](#)

[The Unmanned Aerial Systems Flight and Payload Challenge](#)

[Virtual Reality Heads-Up-Display Navigation Challenge](#)

[NIST The Future of Public Safety Technology 100k Video Series](#)

[NIST Virtual Public Safety Test Environment Challenge](#)

[Face Recognition Prize Challenge](#) (IARPA Challenge run by NIST)

[PerfLoc Prize Competition](#)

[2017 Reusable Abstractions of Manufacturing Processes \(RAMP\) Challenge](#)

[Federal Impact Assessment Challenge](#)

[Nutrient Sensor Action Challenge](#) (EPA challenge supported by NIST)

[Reference Data Challenge](#)

Access to Scientific Data and Publications

NIST provides public access to scientific data through *data.gov* as well as a data portal on NIST's website. Publications are available within 12 months of publication through the National Institutes of Health's PubMed Central at <https://www.ncbi.nlm.nih.gov/pmc/funder/nist/> and through the Government Publishing Office's govinfo at <https://www.govinfo.gov/collection/nist>.

Open Source Software

Most programming code written at NIST is developed as part of our research programs and is developed to address specific and unique mission-related research problems. We openly share this software through [public Github repositories](#) for potential re-use by our stakeholders, including other researchers, and so that our research processes are fully open and transparent.

Spending Information

NIST spending information is available at <https://www.nist.gov/about-nist/our-organization/budget-planning> and is embedded in Department of Commerce information on USAspending.gov.

Transparency

NIST strives to be consistently open and transparent in its interactions with the public and news media. Information from and about NIST is available on analytics.usa.gov, cfda.gov, challenge.gov, data.gov, grants.gov, ITdashboard.gov, labs.data.gov/dashboard, usa.gov, USAspending.gov as well as on the NIST website and social media, and in news releases, publications, and reports. In some cases, NIST information is embedded in Department of Commerce information.

NIST implements the [Department of Commerce Public Communications Policy](#), which includes explicit approval for research staff to talk with the news media and the public directly – without prior permission from the Public Affairs Office – about the results of their peer-reviewed research.

NIST Public Affairs Office regularly offers communications training to its research staff, including describing this portion of the policy, to ensure that they are committed to broadly disseminating NIST results to a wide variety of audiences. Plain language training is available online and through mentoring and in-person training of NIST employees.

NIST provides a dedicated referral service for phone and email public inquiries during all business hours to ensure that any member of the public may request assistance in locating specialized technical reports or experts or in resolving customer services concerns they may have. The NIST website “Contact Us” page includes several different ways for the public to obtain help with many different types of inquiries. The Public Inquiries office strives to answer general NIST inquiries within 24 to 48 hours.

Public Notice

The NIST follows departmental guidance from the Office of Public Affairs.

Records Management

NIST manages its records in accordance with the National Archives and Records Administration (NARA) and Department of Commerce regulations, ensuring that records are economically and effectively created to meet business needs, kept long enough to protect rights and assure accountability, and preserved and available for future generations. Records are retained in accordance with NARA-approved records schedules. NIST’s records management directives are clear and concise, conveying records management requirements and responsibilities to all NIST staff. The directives were updated in December 2016.

Freedom of Information Act (FOIA) Requests

NIST responds to Freedom of Information Act requests in accordance with Department of Commerce regulations and Department of Justice guidance. NIST emphasizes the importance of transparency of its operations and regularly performs discretionary releases of documents and information that could qualify for exemption from release, but for which there is no foreseeable harm. The NIST FOIA Office works collaboratively with NIST Operating Units to obtain information in response to requests in a timely manner and to encourage proactive disclosure of information.

Congressional Requests

NIST follows Department of Commerce guidance from the Office of Legislative and Intergovernmental Affairs.

Participation

NIST has a rich history of connecting our technological advances to the American economy through interactions with stakeholders and the public, some of which are described in an [Annual Report on Technology Transfer](#). Technology transfer plays an important role in the Department of Commerce's mission to promote job creation, economic growth, sustainable development, and improved standards of living for all Americans. NIST works in partnership with academia, businesses, state and local governments, other federal agencies, and communities to promote innovation and improve the nation's overall competitiveness in the global economy.

To increase citizen involvement in the development of standards to address new technological challenges, NIST has reached out to stakeholder communities to convene workshops at key locations around the country, organize diverse stakeholder groups, and establish consensus-developing organizations. This strategy has been used successfully for developing standards frameworks for the smart grid sector, critical infrastructure cybersecurity, disaster resilience, and forensic standards.

[Framework for Improving Critical Infrastructure Cybersecurity](#)

Starting in 2013, NIST worked with stakeholders to develop a voluntary framework – based on existing standards, guidelines, and practices – for reducing cyber risks to critical infrastructure. The first version of the [Framework for Improving Critical Infrastructure Cybersecurity](#) was released on February 12, 2014. Since then, NIST has collected user feedback and experience through Requests for Information and public workshops. NIST also facilitated working sessions on specific technical areas that will be used to enhance the Framework in the future. A second draft of the proposed update to the Cybersecurity Framework that discusses further integrates cybersecurity supply chain considerations, identity and access management approaches, and ways for organizations to self-assess cybersecurity risk was released in December 2017.

[Privacy Engineering](#)

The NIST Privacy Engineering Program (PEP) supports the development of trustworthy information systems by applying measurement science and system engineering principles to the creation of frameworks, risk models, guidance, tools, and standards that protect privacy and, by extension, civil liberties. In January 2017, the PEP reached a major milestone in advancing the development of privacy engineering and risk management processes with the finalization of NISTIR 8062, [An Introduction to Privacy Engineering and Risk Management in Federal Systems](#). NISTIR 8062 introduces the concept of applying systems engineering

practices to privacy and provides a new model for conducting privacy risk assessments on federal systems. To develop NISTIR 8062 and understand the activities and concepts required for effective privacy engineering, the PEP sought the perspectives and experiences of privacy experts across a variety of sectors in an open and transparent process, including hosting workshops, soliciting public comments, and engaging stakeholders in outreach activities in a broad range of settings.

Continuing the series of public workshops on privacy engineering and risk management and building off the concepts introduced in NISTIR 8062, the PEP also hosted a June 2017 workshop, [Privacy Risk Assessment: A Prerequisite for Privacy Risk Management](#). Stakeholders communicated a need for the further integration of privacy into risk management and security guidance, a privacy-specific risk assessment model, and a toolset to manage privacy risk. The PEP is collaborating with other programs within NIST to integrate privacy into existing security guidance and other projects.

[Organization for Scientific Area Committees](#)

The Organization of Scientific Committees for Forensic Science (OSAC) is an initiative by the National Institute of Standards and Technology (NIST) and the Department of Justice (DOJ) focused on strengthening forensic science in the United States. OSAC provides technical leadership to facilitate the development and promulgation of consensus-based documentary standards and guidelines for forensic science that are fit-for-purpose and based on sound scientific principles. OSAC is uniquely qualified to undertake this mission because of the deep and varied expertise of its members. OSAC consists of more than 560 members and 260 affiliates representing key stakeholder groups, including practitioners, laboratory managers, academic researchers, metrologists, statisticians, human factors experts, accreditation and standards development experts, attorneys and judges. This diverse group represents federal, state and local agencies, academic institutions, and private sector entities from all 50 states and more than a dozen nations.

OSAC continues to make steady progress toward its goal of achieving technically sound, consensus-based standards and guidelines. OSAC committees are working on hundreds of discipline-specific and interdisciplinary forensic science standards projects, have posted hundreds of discipline-specific baseline documents to the OSAC website, and have recently identified 92 research and development needs.

[Community Resilience Planning Guide](#)

[NIST's Community Resilience Planning Guide for Buildings and Infrastructure Systems](#) provides a practical and flexible approach to help all communities improve their resilience by setting priorities and allocating resources to manage risks for their prevailing hazards. Using the Guide can help communities to integrate consistent resilience goals into their

comprehensive, economic development, zoning, mitigation, and other local planning activities that impact buildings, public utilities, and other infrastructure systems. The Guide was released in late 2015 and is being supplemented by [Guide Briefs](#) with more information on supporting methods and best practices.

[Big Data Public Working Group](#)

Big Data is another important area in which NIST is leading public participation in standards development. Although there is broad agreement about the remarkable potential of "Big Data" to spark innovation, fuel commerce, and drive progress, the rate at which data volumes, speeds, and complexity are growing is outpacing scientific and technological advances in data analytics, management, and transport.

NIST is leading the NIST Big Data Public Working Group (NBD-PWG) to develop consensus definitions, taxonomies, reference architectures, and technology roadmaps to accelerate the deployment of robust Big Data solutions. The NBD-PWG, open to the public with active membership from industry, academia, and government, has five subgroups that have developed the NIST Big Data Interoperability Framework (NBDIF). The goal is to create vendor-neutral, technology- and infrastructure-agnostic systems to enable data scientists to perform analytics processing for their given data sources without worrying about the underlying computing environment. The NBDIF will be released in three versions, which correspond to the three stages of the NBD-PWG work with respect to the NIST Big Data Reference Architecture (NBDRA). In Stage 1, we identified the high-level NBDRA key components (seven volumes were published on September 16, 2015). In Stage 2, we drafted the general interfaces between the NBDRA components and enhanced Version 1 content (two new volumes added, under review for publication). For Stage 3, the aim is to validate the NBDRA by building Big Data general applications through the general interfaces (under development). All NBDIF documents are available at <https://bigdatawg.nist.gov/>.

Education

NIST has several partnerships and programs related to science, technology, engineering and mathematics ([STEM](#)) education and workforce and business development. NIST welcomes postdoctoral associates identified through a competitive program administered by the National Research Council as well as students participating in the Graduate Student Measurement Science and Engineering Fellowship Program, the Summer Undergraduate Research Fellowship (SURF) Program, and the Summer High School Internship Program (SHIP). Additionally, the Professional Research Experience Program (PREP) provides lab experience to undergraduate, graduate, and post-graduate students, and the NIST Summer Institute for Middle School Science Teachers provides instruction in cutting-edge research that is coordinated with a middle school curriculum.

Standards provide industries and innovators with a common language that facilitates trade, simplifies transactions, and enables people to work together toward greater common goals that cut across disciplines and borders. NIST supports the development of standards by identifying areas where they are needed, convening stakeholders, and providing technical and scientific guidance and expertise to help stakeholder groups reach a consensus. Under the [Standards Services Curricula Development Cooperative Agreement Program](#), recipients work with NIST to integrate instruction related to standards and standardization into undergraduate and graduate curriculums at U.S. colleges and universities.

Metrics

Performance related to open government is evaluated through quarterly metrics reported to the Department of Commerce on usage of websites; “posts,” “views,” and “tweets” on social media; and blog posts. FOIAs that have been closed are reported. Metrics are collected for numbers of purchases of calibration services, Standard Reference Data, and Standard Reference Materials, and customer satisfaction is evaluated via surveys and customer contacts. The numbers of research papers, data, and code published by NIST staff are reported, as are the numbers of Cooperative Research and Development Agreements (CRADAs), patents, licenses, and research associates, participants, and postdocs. This information is included in NIST’s annual report to OMB on technology transfer, required by 15 USC 3710(f) and available on line at <https://www.nist.gov/tpo/departement-commerce>.

Collaboration

To meet its mission in the face of rapidly evolving priority areas and a widening stakeholder base, NIST is increasingly partnering with academic, industrial, and governmental institutions. National priorities require the united efforts of diverse participants, and NIST has the unique convening power and technical independence to bring those participants together. Each year, NIST hosts about 2,700 associates and facility users who collaborate with its scientists. NIST works with over 1,300 manufacturing specialists around the country to help small and mid-size manufacturers improve and grow. NIST has two user facilities available for both proprietary and non-proprietary research. Access to these facilities is generally provided on a first-come, first-served cost-reimbursable basis. Through a Partnership Intermediary Agreement, [NIST and the Maryland Technology Development Corporation \(TEDCO\)](#) work with researchers to turn promising NIST technologies and know-how into high-tech businesses.

In addition, NIST jointly operates research organizations explicitly established to promote the kind of cross-disciplinary collaborations that accelerate research results. NIST hosts as many as 100 conferences, workshops, symposia, and other meetings annually. Many are co-sponsored with other federal agencies, academic institutions, professional societies, or industry groups.

[Public Safety Communications Research](#)

NIST's Public Safety Communications Research program (PSCR) has worked to drive innovation and advance public safety communication technologies through cutting-edge research and development. PSCR works directly with first responders and other communities to address public safety's urgent need to access the same broadband communications and state-of-the-art technologies that consumers on commercial networks now expect. In February 2012, the enactment of the Middle Class Tax Relief and Job Creation Act marked an unparalleled push toward next-generation technologies for public safety. The legislation contained landmark provisions for the development and build out of the Nationwide Public Safety Broadband Network (NPSBN), a dedicated, interoperable network for emergency responders. The Public Safety Trust Fund (PSTF) was established to support the design and implementation of the Network. The Act charged NIST with utilizing up to \$300 million of PSTF allocations to establish an R&D program to support the development and deployment of NPSBN. PSCR established the Innovation Accelerator Program to drive R&D and transform public safety communications capabilities. PSCR relies on its collaboration with public safety practitioners — fire, police, and EMS, industry, academia, and local, state, and federal agencies to guide R&D initiatives. PSCR works to continuously engage these communities and regularly communicate R&D progress and results through outreach events, conferences, and reports.

[National Cybersecurity Center of Excellence](#)

NIST's National Cybersecurity Center of Excellence (NCCoE) brings together experts from industry, government, and academia to develop and effectively transfer practical cybersecurity standards, technologies, and best practices to the nation's business sectors. By accelerating dissemination and use of standards, best practices, and integrated tools and technologies for protecting information technology assets and processes, the NCCoE fosters trust in U.S. business sectors and improvements to the overall security of the economy. The NCCoE supports implementation of existing cybersecurity guidelines and frameworks, serves as a technical resource for both public and private sectors, and contributes to the development of cybersecurity practices and practitioners.

Today, the NCCoE has programs working with the health care, energy, financial services, manufacturing, public safety, transportation, and retail sectors. In addition, the center is addressing challenges that cut across sectors, including mobile device security, software asset management, cloud security, identity management, internet of things, data integrity, and secure email.

[National Initiative for Cybersecurity Education](#)

Employers are struggling to find workers who have cybersecurity-related skills. The National Initiative for Cybersecurity Education (NICE) is a partnership between government, academia,

and the private sector focused on cybersecurity education, training, and workforce development.

On Monday, November 13, 2017, the First Annual [National Cybersecurity Career Awareness Week](#) began with a kick-off event at the National Cybersecurity Center of Excellence. The event featured experts who spoke about how the cybersecurity community can effectively reach and encourage more students to consider a future career in cybersecurity, how career development strategies can be utilized for college graduates seeking to land their first cybersecurity positions, and how current workers can transition into this exciting field. The National Cybersecurity Career Awareness Week Cybersecurity Challenge was also launched to ignite interest in cybersecurity careers by enabling participants to test drive cybersecurity careers with a [free online cybersecurity career exploration platform](#).

NICE, Burning Glass Technologies, and the Computing Technology Industry Association have developed an interactive map, CyberSeek. Cybersecurity talent gaps exist across the country. Closing these gaps requires detailed knowledge of the cybersecurity workforce in each region. CyberSeek is an interactive heat map that provides a snapshot of supply and demand data for cybersecurity jobs at the state and metropolitan area levels, and career pathways for cybersecurity positions. CyberSeek can be used by students, educators, career counselors, and employers looking to identify or develop skills needed in cybersecurity careers.

Centers of Excellence

NIST has also created Centers of Excellence to provide an interdisciplinary environment where researchers from NIST, academia, and industry will collaborate on emerging areas of basic and applied research and innovations in measurement science. The first of these centers, the [Center for Hierarchical Materials Design \(CHiMaD\)](#), was established in 2013 to accelerate materials discovery and development; provide opportunities to transition new breakthroughs in advanced materials to industry; convene multidisciplinary and multi-sector communities for in-depth discussions; and provide training opportunities for scientists and engineers in materials metrology.

Two Centers of Excellence were established in 2015 after selection through a merit-based competition. The [Center for Risk-Based Community Resilience Planning](#) focuses on tools to support community disaster resilience. The center works on developing integrated, systems-based computational models to assess community infrastructure resilience and guide community-level resilience investment decisions. The center also provides a scientific basis for developing resilience metrics and decision-making tools and for evaluating cascading effects that arise in interconnected physical and social infrastructures.

The [Center for Statistics and Applications in Forensic Evidence](#) was announced in May of 2015. This center supports NIST's efforts to advance the utility of probabilistic methods to

enhance forensic analysis. Working with NIST researchers and partners from four universities led by Iowa State University, the Forensic Science Center of Excellence evaluates and solidifies the statistical foundation for fingerprint, firearm, toolmark, and other pattern evidence analyses, and for multimedia evidence analyses. The center also develops and implements an education and training program to ensure that judges, lawyers, and forensic science investigators can effectively decipher the results of statistical analysis on pattern and digital evidence.

Materials Genome Initiative

The Materials Genome Initiative (MGI) is a multi-agency initiative designed to create new policy, resources, and infrastructure to support U.S. institutions in the effort to discover, manufacture, and deploy advanced materials twice as fast, at a fraction of the cost. It can take 20 or more years to move a material after initial discovery to the market because the discovery and optimization of new materials for innovative products is a time-consuming and laborious process, but computational design of materials has emerged as a powerful new tool for materials discovery and optimization. Major efforts in both theory and experiment are needed to provide the data that underlies successful modeling. Given its expertise in the integration, curation, and provisioning of critically evaluated data and models, NIST has assumed a leadership role within the MGI, establishing essential data exchange protocols and the means to ensure the quality of materials data and models. These efforts will yield the new methods, metrologies, and capabilities necessary for accelerated materials development.

Partnership Facilities

In addition to the Centers of Excellence above, NIST collaborates in partnership facilities with academic institutions and other federal agencies.

Brookhaven National Laboratory

Brookhaven National Laboratory is a multipurpose research institution located on the center of Long Island, New York. In partnership with Brookhaven, NIST develops and disseminates synchrotron measurement science and technology needed by U.S. industry to measure nanoscale electronic, chemical, and spatial structure of advanced materials.

Hollings Marine Laboratory

The Hollings Marine Laboratory (HML) is a joint research facility among NOAA's National Ocean Service, the South Carolina Department of Natural Resources, the College of Charleston, the Medical University of South Carolina, and NIST, with a mission to provide science and biotechnology applications to sustain, protect, and restore coastal

ecosystems, with emphasis on links between environmental conditions and the health of marine organisms and humans.

[Institute for Bioscience and Biotechnology Research](#)

IBBR exists to foster integrated, cross-disciplinary team approaches to scientific discovery, translational development and education, – and to create commercialization relationships and initiatives that serve the expanding economic base of biosciences and technology in the state of Maryland and across the country.

[Joint Center for Quantum Information and Computer Science](#)

QuICS is a partnership between the University of Maryland and NIST to advance research and education in quantum computer science and quantum information theory.

[Joint Initiative for Metrology in Biology](#)

JIMB is a joint initiative between Stanford and NIST, providing standards-based research and innovation in biometrology. JIMB has established three consortia – Genome in a Bottle, the Synthetic Biology Standards Consortium, and the External RNA Controls Consortium – to bring together partners from government, academia and industry to improve the accuracy, reproducibility, and reliability of

[JILA](#)

JILA is a joint physics institute of the University of Colorado at Boulder and NIST. (The institute was previously known as the Joint Institute for Laboratory Astrophysics, but its current research now spans a wide range of physics topic areas).

[Joint Quantum Institute](#)

JQI is a joint institute of the University of Maryland, NIST, and the Laboratory for Physical Sciences.

[National Advanced Spectrum and Communications Test Network](#)

NASTCN is partnership among National Telecommunications and Information Administration (NTIA), and the Department of Defense, and is organizing a national network of federal, academic, and commercial test facilities that will provide the testing, modeling and analyses needed to develop and deploy spectrum-sharing facilities.

[Advanced Manufacturing National Program Office](#)

NIST provides leadership and coordination across federal agencies with programs in advanced manufacturing – including the Departments of Agriculture, Defense, Commerce, Education, Energy, Health and Human Services, and Labor, NASA, and NSF – by leading the interagency Advanced Manufacturing National Program Office (AMNPO). The AMNPO oversees the planning, management, and coordination of the Manufacturing USA program, which brings together public and private investments to improve the competitiveness and productivity of U.S. manufacturing through a robust network of manufacturing innovation institutes. Each of the fourteen Manufacturing USA institutes is a public-private partnership focusing on a specific, promising advanced manufacturing technology area.

The program advances domestic manufacturing innovation by creating the infrastructure needed to allow domestic industry and academia to work together to solve industry-relevant manufacturing problems in research and development, technology transition, workforce training, and education. Manufacturing USA has garnered significant attention in the manufacturing sector; members include two-thirds of Fortune 50 U.S. manufacturers and eight of the ten top-ranked research and engineering universities.

The AMNPO provides information to the public about the Manufacturing USA program primarily through the website, www.ManufacturingUSA.com. The website includes [news about the program](#), announcements of [upcoming events](#) at the fourteen institutes, information about [program funding opportunities](#), an archive of [reports and policy papers](#), and guidance about how to engage with the program. The AMNPO also releases an [annual report on the program's performance](#) and a [triennial strategic plan](#). The AMNPO maintains Twitter and LinkedIn accounts to communicate status updates about Manufacturing USA to the public. Additionally, the AMNPO maintains the Manufacturing.gov website, which contains links to information about U.S. government programs that support advanced manufacturing.

[NIST Technology Transfer](#)

NIST regularly works with multiple other organizations through Cooperative Research and Development Agreements. These agreements allow NIST to work directly with other parties through a public-private partnership to achieve specific scientific outcomes. In addition, NIST does patent and license new technologies developed in our laboratories. NIST regularly organizes technology showcase events to bring together innovative technologies, licensable inventions, research and engineering facilities, small business support resources at the federal and state levels, and sources of funding, all under one roof. NIST also hosts “listening sessions” to hear from local communities about how federal labs can contribute to economic development. Information on NIST technologies available for licensing is on data.gov in a machine-readable format for other parties to use.

NIST regularly conducts economic assessments on the results of our research programs. NIST economic reports and assessments are available on the NIST website at

<https://www.nist.gov/tpo/reports-and-publications>. [Technology Transfer partnership activities across Commerce](#) are described in an annual report. A selection of NIST activities with impacts in industry is provided at <https://www.nist.gov/industry-impacts>.

Interagency Technology Transfer

NIST has an interagency leadership role in technology transfer as delegated by the Secretary of Commerce. NIST has worked with other agencies to place information on all federal laboratory technologies available for licensing and information on available research facilities and equipment on data.gov in a machine-readable format for other parties to use.

As part of NIST's leadership role, a Return on Investment (ROI) Initiative was begun in FY18. Working with private sector and other partners, we intend to identify critically needed improvements to federal technology transfer efforts. Our goal is to streamline and accelerate the transfer of technology from federal laboratories to promote U.S. economic growth and national security through innovative products and services, and new businesses and industries.

Small Business Innovation Research

Small Business Innovation Research (SBIR) is a highly competitive federal grant program that opens opportunities and encourages U.S. owned and controlled small- and mid-sized businesses to engage in Research and Development (R&D) with commercialization potential.

Manufacturing Extension Partnership (MEP)

The MEP Program is a unique, public-private partnership that delivers comprehensive, proven solutions to U.S. manufacturers, fueling growth and advancing U.S. manufacturing. The MEP Centers in all 50 states and Puerto Rico work with U.S. manufacturers to develop new products and adopt new technologies. MEP services can track with the maturity of a technology as well as help strengthen the business side of a company. MEP can play a pivotal role in helping manufacturers move from concept to market through services in areas such as product design, manufacture engineering, product concept testing, quality control/management, supplier scouting, and certification. The MEP Program serves as a bridge to other organizations and federal research labs that share a passion for enhancing the manufacturing community.

NIST Open Government Initiatives

The table below shows a list of initiatives for NIST.

Table 1 - NIST Initiatives

Operating Unit	Project	Status	Estimated Completion
NIST	Improving NIST's Data Management Infrastructure	Ongoing/Continuous	--
	Challenges	Ongoing/Continuous	--
	Improving Access to Publications by NIST Authors	Live/Operational	--
	Materials Data Curation System	Live/Operational	--
	Return on Investment (ROI) Initiative	In Progress	December 2018
	Improve Website Information Related to Public Access	In Progress	December 2018
	Modernization of Standard Reference Data	In Progress	July 2019
	Make Directives of Public Interest Available on NIST's Website	In Progress	September 2019

Project – Return on Investment (ROI) Initiative

Following a Request for Information (RFI) published in the Federal Register and three public forums, a white paper will be published that summarizes public comments and recommendations.

Project – Improve Website Information Related to Public Access

NIST has a /open page on the NIST website, with content that was initially prescribed by OSTP. The page currently contains documents related to our plans for providing public access to results of our research. We are updating that page to provide visitors with information on how to access the various research products that we provide: narrative publications, public data, and software.

Project – Modernization of Standard Reference Data

For more than 50 years, NIST has been making standard reference databases available for a broad range of chemical and physical properties for use in many scientific disciplines including biology, chemistry, engineering, forensics, materials science, and physics. Customer expectations for a “useable” data product have changed as technology has evolved. Most of the 100 databases are

currently available as searchable tables. We are modernizing the look and feel of these databases and incorporating application programming interfaces (APIs) to make the databases easier to use and to allow access to the data through code rather than requiring users to perform multiple manual searches.

Project – Make Directives of Public Interest Available on NIST’s Website

Directives that may be of public interest must be disclosed proactively under the Freedom of Information Act. Currently, only the NIST policy and order for providing public access to results of federally funded research are publicly available. NIST operations were previously coordinated through an Administrative Manual, and subchapters are currently being migrated to a directives system. As that work progresses, we will begin making directives available to the public on the NIST website as appropriate