NIST Update and Agenda Review

VCAT: June 2015

Dr. Willie E. May

NIST Director and Under Secretary of Commerce for Standards and Technology

Official Welcome to New VCAT Member

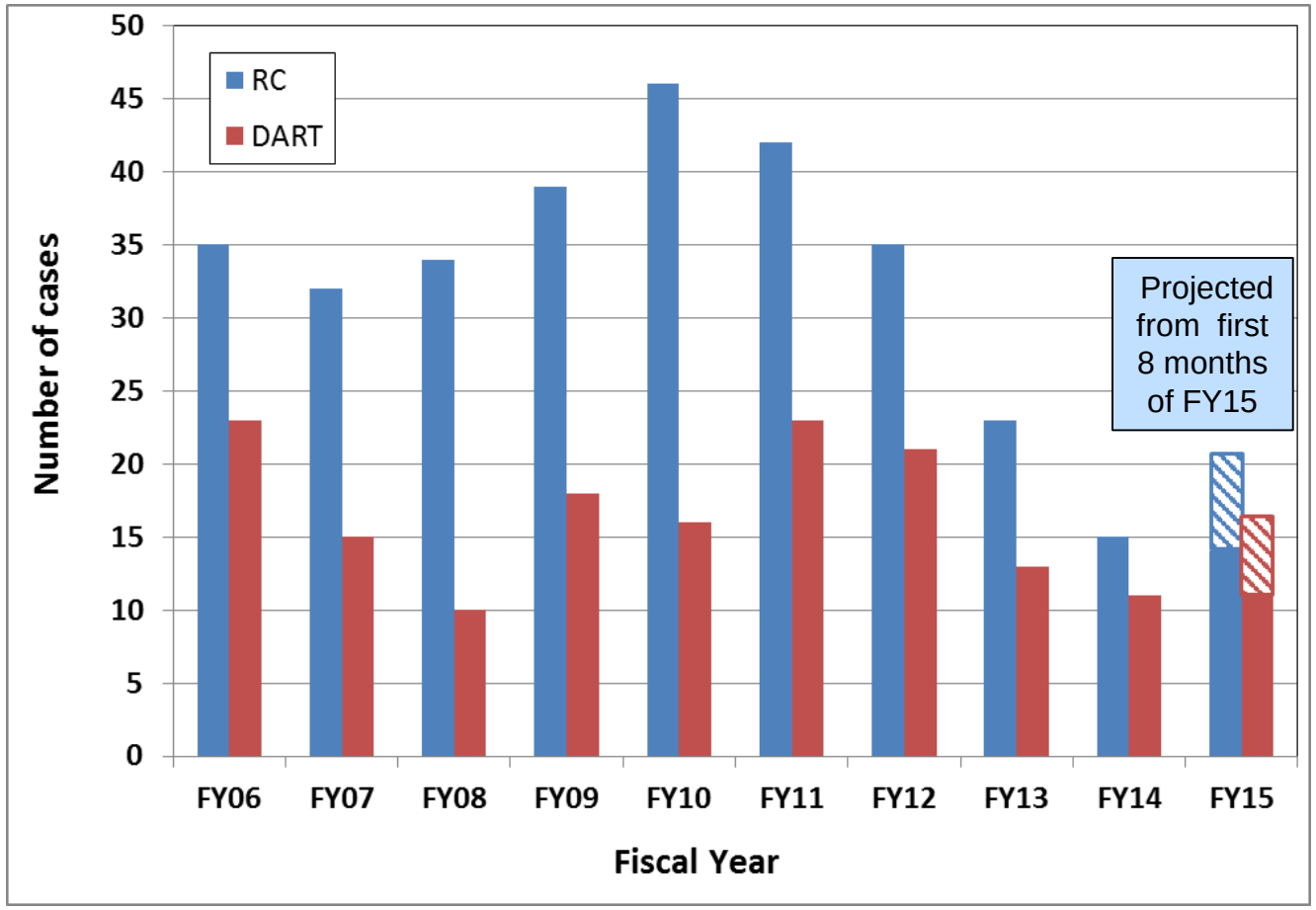
David Wilson

President of Morgan State University

Credit: Morgan State University

- **Former chancellor of both University of Wisconsin Colleges and the University of Wisconsin–Extension**
- **Has held numerous other administrative posts in academia, including: vice president for University Outreach and associate provost at Auburn University, and associate provost of Rutgers, the State University of New Jersey**
- **In February 2010, the President appointed him to the 11-member Board of Advisors on Historically Black Colleges and Universities**

Safety Update



Goal = Zero

Recordable case (RC)

To a first approximation, an injury that required medical treatment beyond first aid

DART case

An OSHA recordable that resulted in employee Days Away, Restricted duty, or job Transfer

Update on Safety Incident: Legacy Radioactive Material Discovery

- As reported in February, during 100% chemical inventory, an MML scientist discovered several uranium-containing reference materials -- in violation of policy for control of radioactive materials

NRC regulations were violated because materials were not:

- appropriately labeled
- in approved facility
- in inventory

Incident response:

- NRC notified
- NIST Leadership informed
- Search for additional radioactive material
- MML had Safety Stand Down Day
- Other OU Directors took actions
- NIST Director sent email to all staff

Causal Factors

- Failure to recognize hazardous condition.
- Inadequate safety inspection procedures.
- Location of the materials in the laboratory.
- Lack of written procedures for material inventory.
- Failure by management to anticipate the hazardous condition.
- Lack of full understanding of supervisor responsibilities due to lack of supervisor training.

Corrective Actions

- NIST has secured reported sources and surveyed their areas for contamination.
- GRSD is working with Source Custodians to completely characterize their inventories.
- NIST has formalized the chain–of-custody process for Source Custodians who leave NIST.
- NIST is re-assessing its current source tracking practices for inventory and waste disposal activities to further ensure adequate control and accountability.
- NIST is developing a detailed inventory guidance procedure that includes line-management roles and responsibilities.

NRC Responses to Radioactive Material Discovery Incident

The NRC conducted a routine unannounced inspection on August 26-28, 2014 and issued security and safety inspection reports – May 2015, June 2015

- **Findings:**
  - Four Severity Level IV violations (lowest level, no civil penalties; 1 cited & 3 non-cited)
    - **Cited violation:** Each licensee shall keep records showing the receipt, inventory, acquisition, transfer, and disposal of all special nuclear material in its possession regardless of its origin or method of acquisition.
      - Although self-identified, NIST should have recognized this earlier.
- **Additional Comments/Feedback from the NRC**
  - NIST's response to the legacy-source incident was outstanding after the first legacy sources were discovered
  - MML, PML, and OSHE worked together to find, characterize, and safely dispose of legacy materials
  - Strong NIST radiation safety program
    - NRC's positive view of NIST's radiation safety program played a major role in the final inspection results
    - Proactive approach to identifying and addressing radiation safety issues
    - Engaged Ionizing Radiation Safety Committee
    - Strong management support
  - Excellent transparency with the NRC on issues affecting radiation safety

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NIST Director Update:
Presidential Re-Nomination and Senate Confirmation Required

Presidential Nomination

- ~~July 24, 2014: Dr. Willie E. May nominated to be NIST Director and Commerce Undersecretary for Standards and Technology~~
- February 25, 2015: Dr. Willie E. May re-nominated to be NIST Director and Commerce Undersecretary for Standards and Technology

Senate Commerce, Science and Transportation Committee

Ordered nomination to be reported favorably to Full Senate on 25 March

Full Senate Vote

Confirmed by the Full Senate on 05 May by Vote of 93 – 0.

https://www.congress.gov/nomination/114th-congress/209

My Priorities

- **Fill key leadership vacancies (e.g., Directors of PML, EL, MEP, SCO and my replacement as ADLP)**

- **Work with the Senior Leadership Team in:**
  - Continuing to strengthen the NIST Safety Culture
  - Completing the successful implementation of programs that NIST has initiated in response to pressing national needs
  - Enhancing current and developing new capabilities needed to enhance mission delivery
  - Addressing long-term sustainability of the Baldrige Program
  - Strengthening the MEP Program
  - Supporting the Secretary in the execution of the Department's Strategic Plan
  - **Improving the efficiency and effectiveness of our internal operations**
    - **becoming an organization known and looked up to for our "Operational Excellence"**
  - **Increasing staff engagement in the direction and implementation of NIST programs and priorities**

Priorities: Filling key leadership vacancies

- Previously filled: PML Director, James Olthoff & EL Director, Howard Harary

- Filled since Feb Meeting:

Director, MEP
Carroll A. Thomas
Appointment date: April 19, 2015

- Selected, Pending DoC and OPM Approval:

Director, Standards Coordination Office
Gordon Gillerman

Director, Advanced Manufacturing National Program Office
Mike Molnar

- Yet to be filled:
  - Associate Director for Laboratory Programs
    - **Vacancy Announcement Posted April 27, 2015 and closes June 26, 2015**

Priority: Improving operational efficiency and effectiveness

- **Effective NIST Mission Delivery requires operational excellence in**
  - Acquisitions
  - Agreements
  - Human Resources
  - Legal Services

  as well as in our Program Areas

- **A task force was established for each of these four areas to:**
  - Address/ Answer:
    - What does success look like?
    - What currently works well?
    - What currently hinders success?
    - How can we fix barriers to success?
  - Challenge status quo
  - Recommend process improvement solutions
  - Report back every 30 days

Each Task Force included a facilitator, an OU Director, NIST customers, and MR process owners.

- **Each Task Force completed its report and presented its recommendations at NIST Town Meeting in March 2015**

Task Group Recommendation Themes

There were a number of common themes across the groups for the need to:

- clarify and document roles and responsibilities of all parties.
- differentiate the amount of time, and level of review, provided for high-risk vs. lower-risk activities.
- increase transparency of processes through:
  - better tracking of the delivery of services via online tools
  - increased consistency in implementing policies.
- improve communications, by:
  - providing clearer directions, checklists, and templates
  - annotating reviews of documents to show which changes are suggestions and which are required.

Action plans are being formed to address these common themes that include:

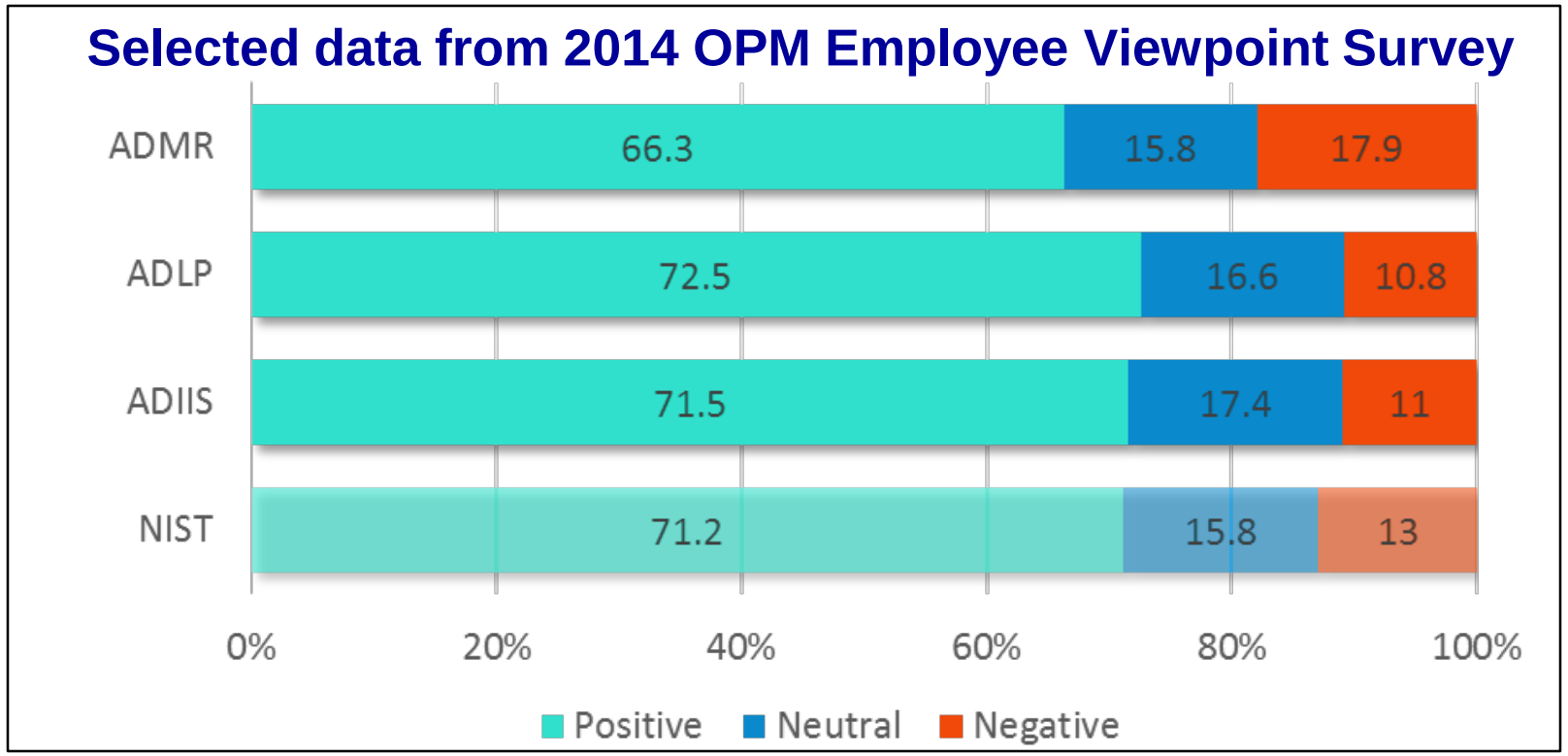
- securing a contractor to introduce Service Management[1] concepts and best practices to three key Offices through a series of workshops and the evaluation of current processes, and then identifying and piloting the automation and tracking of 3-5 key services using our existing online Service Management system.
- clearly documenting and disseminating the roles, responsibilities, and expectations of all parties involved in review processes, while simultaneously identifying gaps and streamlining review processes where possible.
- developing new training offerings, guidance, checklists, dos and don'ts, and FAQs.

Work is also underway on recommendations specific to each service area – progress will be documented on the NIST Internal Website

[1]Service Management is a customer-focused approach to delivering services. Service Management focuses on providing value to the customer and also on the customer relationship.

Priority: Employee Engagement and Satisfaction

Administrative Support Staff



- **HR selected 11 questions from the survey related to employment engagement and job satisfaction.**

Director's Recognition for Excellence in Mission Support

- **Was established to recognize staff within the Management Resources Directorate whose commitment to and excellence in service delivery has stood out among customers and significantly contributed to NIST mission delivery.**

- Bi-monthly recognition to an individual or group of employees from the MR Directorate for:
  - Quality of activity and service
  - Initiative and creativity
  - Degree of difficulty overcome
  - Breadth and scope of impact provided

- **Nominations by OU Directors within Lab and IIS Directorates**
  - will be due by the second Tuesday of February, April, June, August, October, and December of each year

- **First selection for Recognition announced May 20, 2015:**
  - "for his work as the Contract Specialist whose work helped establish a Federally Funded Research and Development Center (FFRDC) to support NIST's "National Cybersecurity Center of Excellence (NCCoE)."

Keith Bubar
Acquis. Mgmt. Div.

Every other month, an email sent to AllStaff will describe how that Bimonthly Awardee's contribution has been critical to NIST Mission Delivery.

Innovations in Measurement Science (IMS) Program
Currently: ~$22M

IMS Program Overview:

- provides funds to explore high-risk, leading-edge research concepts that anticipate future measurement and standards needs of industry and science
- Is a principal mechanism for initiating the new programs and research directions necessary for NIST to keep pace with and respond quickly to the increasingly complex nature, and the shorter time frame, of technology development and build new competences and capabilities to address our Mission.
- Helped support research that led to the four NIST Nobel Prizes in Physics

- **Input: Bottom-up** from NIST scientists and engineers

- **Decision: ADLP --** based on recommendations/input from Lab Directors

- **Since its inception in 1979, the IMS Program has**:
  - funded over 100 research projects that have formed the cutting edge of research programs and/or evolved into core activities within the NIST Labs
    - Led to development of a cold-neutron small-angle scattering facility that led to the NIST Center for Neutron Research (NCNR)
    - Supported growth of our NIST program in biology
    - addressed fundamental problems in metrology, such as the links between electrical and mechanical SI units

New - Colleague's Choice Innovations in Measurement Science Program

- C2IMS is an open competition to encourage and reward staff creativity by putting them in charge of identifying, selecting, and solving significant challenges in measurement science and is part of a more general effort to broaden staff engagement

- **In the first stage**, **NIST's staff** are to:
  - Propose new measurement, standards and technology challenges that NIST should undertake, discuss and rate the challenges via a program specific website transparent to all staff
    - **Choose the winner**
- **Likewise, in the second stage**, NIST's staff are to:
  - Propose solutions to the chosen challenge, discuss and rate the solutions via the website
    - **Choose the winner**

- The Peer-Selected Topic and Team will be provided with IMS-level funding for 3 years (up to $1 M/yr), based on required resources

NIST's First C2IMS Competition was launched May 4

Staff have submitted over 50 pressing measurement and standards challenges, and are now commenting and rating the problems submitted

Director's NIST Fellows Postdoc Program

NIST Fellows are senior researchers who:

- operate at the highest level of achievement and impact in contributing to the NIST mission;
- are visionary scientific/technical leaders;
- provide high-quality programmatic input/advice to NIST management; and mentor, motivate, and
- inspire other NIST technical staff. NIST Fellows are employees whose jobs primarily involve research, not administration.

A New Benefit for NIST Fellows was launched in 2014:

- Where each Fellow is now endowed with a postdoctoral researcher of their choice to help them take on a new research challenge of the Fellow's choice
  - different from selection process used for NRC Postdocs, who are vetted and ranked by NRC
- Benefits and funding are comparable to that of NRC Postdocs

Examples of Comments by NIST Fellows re Postdoc Program

"The new Director's postdoc program for NIST Fellows has already had an important impact on my own work and that of my NIST-Fellow colleagues, allowing us to rapidly explore new research directions. Giving NIST's research leaders the flexibility and resources to pursue new ideas with a top-notch young person of their choice is a big plus for NIST, providing an important way for us to stay in the vanguard of scientific opportunity. It is also a big plus for the young postdocs, who profit from the mentorship of some of the country's best researchers in an atmosphere that encourages scientific creativity in support of US technology, industry, and science." ***William Phillips***

"The program is great. It amplifies the influence of NIST Fellows without giving heartburn to NIST's line managers. With a minimum of paperwork, I was able to place a Grant with a university that will bring a postdoc to NIST on August 1. With my guidance, the postdoc will test the feasibility of using very-low-frequency sound waves to accurately measure the CO2 emitted by stacks at coal-burning power plants. Accurate, internationally-recognized, emission measurements will form the technical basis for pricing CO2, either by a carbon tax, or by cap-and-trade." ***Mike Moldover***

The Fellows Postdoc Program has been a tremendous benefit to our work; in addition to the increase in support, it has given us the ability to act quickly when we identify a good candidate for a key problem.

Dave Wineland

"Empowering the Fellows with funds for a postdoc not only makes everyone feel like they are needed, it also distributes funds rather than concentrating them into a few ideas. . **.If the Fellows have demonstrated success in getting to where they are now, giving them more resources provides more than a perk—it speaks of trust in their abilities and commitment to doing good science at NIST."** ***John Butler***

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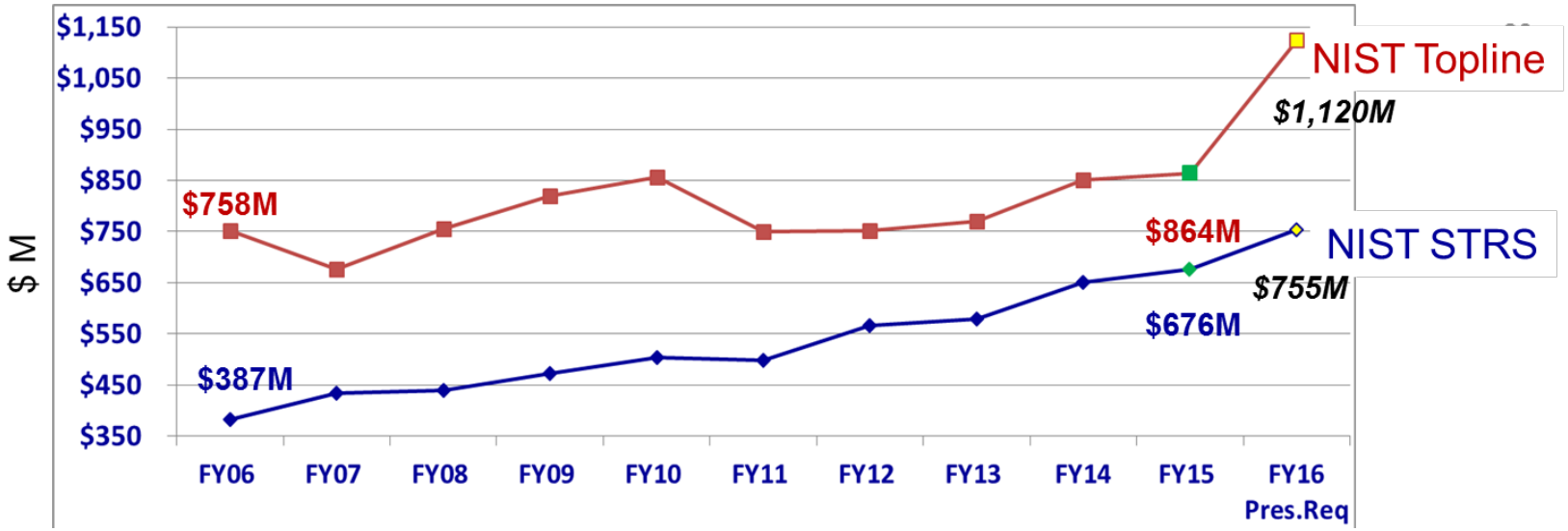
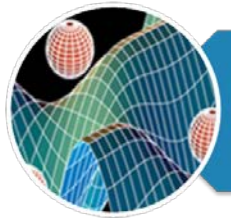
President's FY 2016 Budget Request





Scientific and Technical Research and Services $754.7 M (+$79.2 M)

Strengthens efforts in many areas of national importance

Industrial Technology Services $306.0 M (+$167.9 M)

Requests funds to establish NNMI and continues support for MEP and AMTech

Construction of Research Facilities $59.0 M (+$8.7 M)

Sustains funding for facilities and provides an increase for safety, capacity, maintenance, and major repair

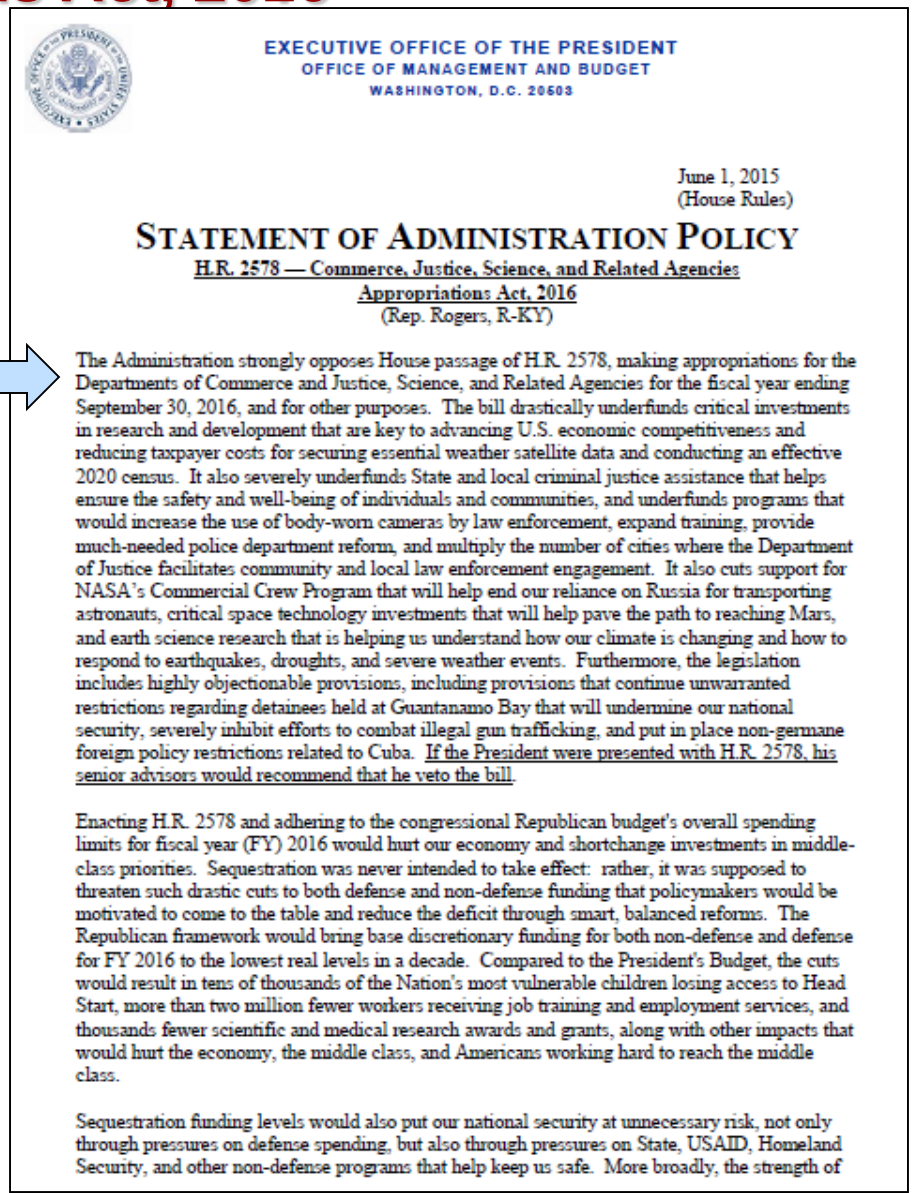
Status of NIST FY16 Budget Request (Dollars in millions)

	FY 2015 Enacted	FY 2016 President's Request	FY 2016 House CJS Mark	+/(-) Over FY 2016 Request
STRS	**$675.5**	**$754.7**	**$675.0**	**($79.7)**
Laboratory Programs	591.3	661.6	TBD	N/A
Corporate Services	17.3	16.9	TBD	N/A
Stds Coord & Special Pgms	66.9	76.2	TBD	N/A
ITS	**$138.1**	**$306.0**	**$130.0**	**($176.0)**
Advanced Mfg Tech Consortia	8.1	15.0	0.0	(15.0)
Hollings Mfg Ext Partnership	130.0	141.0	130.0	(11.0)
National Network for Mfg Innov.	0.0	150.0	0.0	(150.0)
CRF	**$50.3**	**$59.0**	**$50.0**	**($9.0)**
Total, NIST Discretionary	**863.9**	**1,119.7**	**855.0**	**(264.7)**

Senate Mark-up expected later this week.

Administration Response to House Passage of H.R. 2578 – Commerce, Justice, Science, and Related Agencies Appropriations Act, 2016

"The Administration strongly opposes House passage of H.R. 2578, … The bill drastically underfunds critical investments in research and development that are key to advancing . . ."



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

June 1, 2015
(House Rules)

STATEMENT OF ADMINISTRATION POLICY

H.R. 2578 — Commerce, Justice, Science, and Related Agencies Appropriations Act, 2016
(Rep. Rogers, R-KY)

The Administration strongly opposes House passage of H.R. 2578, making appropriations for the Departments of Commerce and Justice, Science, and Related Agencies for the fiscal year ending September 30, 2016, and for other purposes. The bill drastically underfunds critical investments in research and development that are key to advancing U.S. economic competitiveness and reducing taxpayer costs for securing essential weather satellite data and conducting an effective 2020 census. It also severely underfunds State and local criminal justice assistance that helps ensure the safety and well-being of individuals and communities, and underfunds programs that would increase the use of body-worn cameras by law enforcement, expand training, provide much-needed police department reform, and multiply the number of cities where the Department of Justice facilitates community and local law enforcement engagement. It also cuts support for NASA's Commercial Crew Program that will help end our reliance on Russia for transporting astronauts, critical space technology investments that will help pave the path to reaching Mars, and earth science research that is helping us understand how our climate is changing and how to respond to earthquakes, droughts, and severe weather events. Furthermore, the legislation includes highly objectionable provisions, including provisions that continue unwarranted restrictions regarding detainees held at Guantanamo Bay that will undermine our national security, severely inhibit efforts to combat illegal gun trafficking, and put in place non-germane foreign policy restrictions related to Cuba. If the President were presented with H.R. 2578, his senior advisors would recommend that he veto the bill.

Enacting H.R. 2578 and adhering to the congressional Republican budget's overall spending limits for fiscal year (FY) 2016 would hurt our economy and shortchange investments in middle-class priorities. Sequestration was never intended to take effect: rather, it was supposed to threaten such drastic cuts to both defense and non-defense funding that policymakers would be motivated to come to the table and reduce the deficit through smart, balanced reforms. The Republican framework would bring base discretionary funding for both non-defense and defense for FY 2016 to the lowest real levels in a decade. Compared to the President's Budget, the cuts would result in tens of thousands of the Nation's most vulnerable children losing access to Head Start, more than two million fewer workers receiving job training and employment services, and thousands fewer scientific and medical research awards and grants, along with other impacts that would hurt the economy, the middle class, and Americans working hard to reach the middle class.

Sequestration funding levels would also put our national security at unnecessary risk, not only through pressures on defense spending, but also through pressures on State, USAID, Homeland Security, and other non-defense programs that help keep us safe. More broadly, the strength of

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SAMUEL J. HEYMAN
SERVICE to AMERICA MEDALS

Two NIST staffers among 30 finalists chosen from >500 nominations across the federal government.

In the Call to Service category:

- **Gretchen K. Campbell**, Research Physicist
  - for advancing the emerging field of physics known as atomtronics. Her work is helping to pave the way for a new generation of technologies much like electronics has transformed our society today.

In the Homeland Security and Law Enforcement category:

- **Ron Ross**, Computer Security Researcher and NIST Fellow
  - for instituting a "state-of-the-art" risk assessment system that has protected federal computer networks from cyberattacks and helped secure information critical to our national and economic security.

Other Noteworthy Awards

Dereck Orr, CTL – National Public Safety Telecommunications Council (NPSTC) Leadership Award

"Dereck Orr's achievements and advocacy on behalf of public safety communications professionals across the nation … have helped change the face of public safety communication. …. . .[through] his leadership, understanding of technical systems, and people management skills"

Ari Schwartz, ITL – Federal 100 Award

For his deep knowledge and voice of reason as an inside advocate for a wide range of cybersecurity activities while on detail to the Executive Office of the President

Donna Dodson, ITL – one of FedScoop's "DC's Top 50 Women in Tech for 2015"

(second consecutive year on the list)

For her work with industry, academia, and other government agencies to forge a consensus on how best to secure the nation's information and communications infrastructure

Robert Cook, MML – The Robert B. Sosman Award

For his pioneering work on Multi-Scale Effects in the Strength of Ceramics.

Michael Boss, PML - 2015 Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer

For outstanding work in the process of transferring federally developed technology to the commercial market - MRI Calibration Standard

Other Noteworthy Awards - continued

Paul Witherell, EL – ASME/CIE Young Engineer

For making outstanding contributions to the application of computers in engineering; being recognized by his peers for his professional ability and potential to make significant contributions to the discipline of computers and information in engineering in the future.

Jason Averill EL – 2014 International Assoc. of Fire Chiefs (IACF) President's Award

For Leadership and Contributions to Scientific-Based Firefighting Tactics and Strategy.

Dan Madrzykowski, EL – 2014 International Assoc. of Fire Chiefs (IACF) President's Award

For Leadership and Contributions to Scientific-Based Firefighting Tactics and Strategy.

Keith Stouffer, EL – Gov30 Security award

In recognition of his contribution to the government security community.

Dale Bentz, EL – 2014 American Concrete Institute (ACI) Cedric Wilson Lightweight Aggregate Concrete Award

In recognition of "clearly articulated scholarly research that pointed the way to significant advances in both industry and research."

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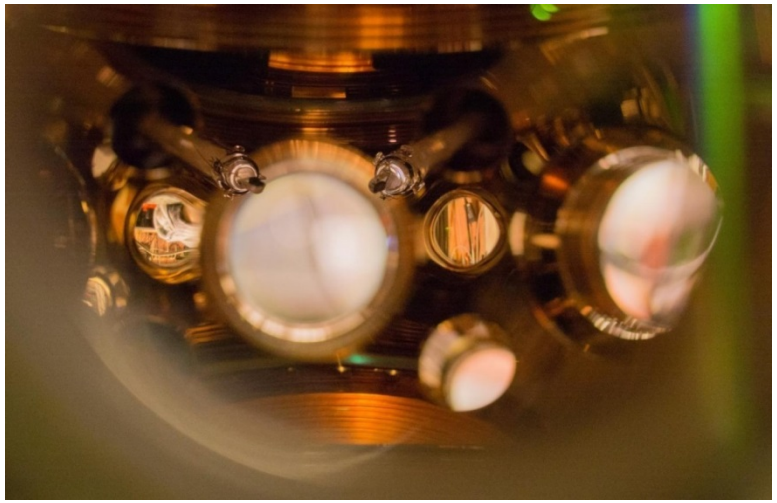
Update: Strontium Lattice Atomic Clock

- Lead researcher **Jun Ye** reports that thanks to new modifications, the record-setting strontium atomic clock is now so stable that it could theoretically "tick" for **15 billion years** -- the age of our entire universe -- without gaining or losing a second
- Ultracold strontium atoms confined in “crystal” of laser light (optical lattice).
- This development was widely publicized in both scientific and lay publications.



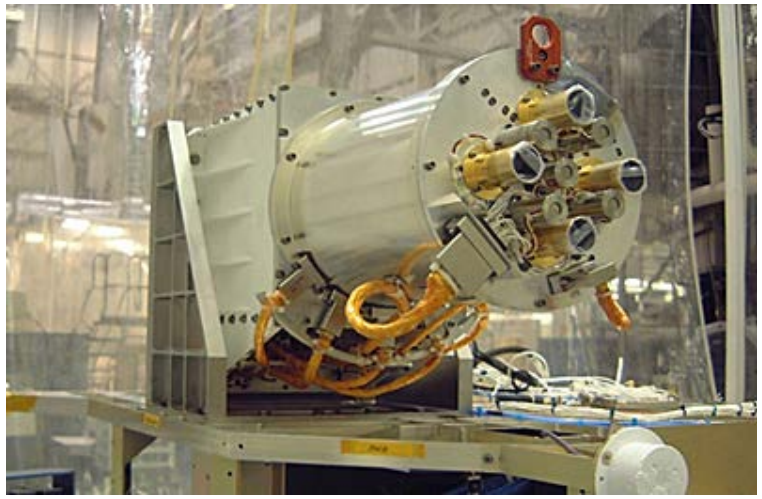
(Marti/JILA)

Key improvements:

- New ultra-stable laser developed by Ye improves clock performance.
- Special NIST-calibrated thermometers (visible near center of photo) provide better measurement of tiny temperature-induced changes in frequency (“ticking rate”).

NIST Instrument – "NISTAR" Launched into Space

- For the past 24 years, a sizable portion of our nation's space effort has involved missions to observe—and measure—phenomena on Earth.
- **NIST has been instrumental in critical calibration of sensors for many of these missions dating back to the 1960's** and numerous others are in the planning stages (see lists of these at the website shown below).
- An example, the **D**eep **S**pace **C**limate **O**bserver mission -- a partnership between NOAA, NASA and the U.S. Air Force.
  - DSCOVR contains NASA-funded instruments that require NIST traceable calibrations
  - One of these instruments, NISTAR, was conceived at NIST



Credit: NASA/DSCOVR

The DSCOVR Mission's **NISTAR**—the **NIST** **A**dvanced **R**adiometer -- will measure *whether our planet's atmosphere is retaining more or less solar energy than it radiates back to space* -- the Earth's radiation budget

DSCOVR is expected to arrive at L1 point (the neutral gravity point between the Earth and sun approximately one million miles from Earth where it will have a continuous view of Earth's sunlit side) around time of VCAT meeting

http://www.nist.gov/earth-from-distance-nist-role-observing-planet-from-space.cfm

NIST Issues 1st RM for Whole-genome Measurement Assurance

- **NIST-convened Genome in a Bottle Consortium for developing standards to support clinical adoption of DNA sequencing technology**
  - public-private-academic partnership
    - ~100 member organizations
    - technology developers, clinical labs, major sequencing centers
  - "pilot" genome sample now available from NIST
  - genomes from 2 family "trios" (Mother, Father, Son) in development at NIST
    - commercial products already on market, based on these samples
- **Standards resulting from this effort will**
  - support WH Precision Medicine Initiative
  - enable FDA regulatory oversight

SECTIONS

The New York Times

HEALTH

U.S. Introduces New DNA Standard for Ensuring Accuracy of Genetic Tests

By ROBERT PEAR MAY 14, 2015

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WASHINGTON — The federal government opened the door to a new era of genetic medicine on Thursday by introducing a standard way to ensure the accuracy of DNA tests used to tailor treatments for individual patients.

Scientists have identified hundreds of genetic mutations that appear to increase the risk of diseases, including cancer, Alzheimer's and cystic fibrosis. But laboratories often report different results when they analyze genes obtained from samples of the same blood or tissue, because of variations in their testing equipment and methods.

The National Institute of Standards and Technology said Thursday that it had developed "reference materials" that could be used by laboratories to determine whether their machines and software were properly analyzing a person's genetic blueprint, or genome.

The institute disseminates such reference materials for thousands of products including steel, concrete and peanut butter. These materials are used for myriad purposes — to calibrate instruments, to make sure buildings are safe, to ensure that nutritional labels are accurate.

RELATED COVERAGE

Sidestepping the Biopsy With New Tools to Spot Cancer APRIL 7, 2014

New Blood Test Shows Promise in Cancer Fight APRIL 19, 2015

Laboratories can use the new DNA standard to make sure their genetic testing is accurate. If labs get the right answers for the reference material

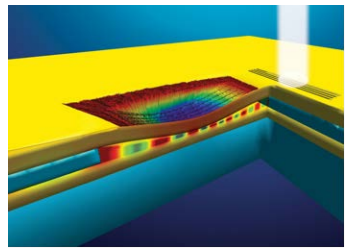
The end result of a DNA sequencing process. Each color represents one of the four base chemicals that make up DNA (adenine, guanine, cytosine and thymine).

Photonics: NIST Researchers have created a nanoscale "speedbump" that can be used to regulate the flow of high-speed data

- **Computers currently process information using electricity traveling in nanoscale metal wires.**
  - Metal wires are inexpensive and easy to miniaturize but limited in terms of speed due to the resistance in the metal itself
  - Fiber optics use light to move information about 10,000 times faster, but these and other nonmetallic waveguides are constrained by pesky physical laws that require critical dimensions to be at least half the wavelength of the light in size; still small, but many times larger than the dimensions of current commercial nanoscale electronics.

- **Plasmonics combines the small size and manufacturability of electronics with the high speeds of optics.**
  - When light waves interact with electrons on a metal's surface, strong fields with dimensions far smaller than the wavelength of the original light can be created—plasmons. Unlike light, these tiny plasmons are free to travel down nanoscale wires or gaps in metals.
  - By using an electric field to bend a nanoscale membrane, the speed of propagating plasmons can be slowed. **This allows optical signals to be delayed or even switched off.**

- **This innovation is a step towards enabling computers to process information hundreds of times faster than today's machines.**



- Nature Photonics: B.S. Dennis, M.I. Haftel, D.A. Czaplewski, D. Lopez, G. Blumberg and V.A. Aksyuk. Compact nano-mechanical plasmonic phase modulators. Nature Photonics.
- The CNST led team included participants from Rutgers University, the University of Colorado at Colorado Springs, and Argonne National Laboratory
- http://www.nist.gov/cnst/nanoscale-speed-bump040115.cfm

Global Cities Expo Showcases IoT Apps

Sponsored by NIST and US Ignite

Keynote Speakers

Anthony Foxx, Transportation Secretary

Tom Kalil, Dep. Director for Policy, OSTP

Willie E. May, NIST Director

- ~ 800 participated in a June 1 Expo showcasing 61 “smart cities” projects from 51 different cities from around the world. Each is a collaborative effort between businesses, university researchers and communities to harness Internet of Things technologies in ways that address needs of the world’s rapidly urbanizing population.
- The projects demonstrated how connecting smart devices and systems -- in sectors such as energy, health care, education, disaster response and transportation -- will enable communities to improve services, promote economic growth and enhance their citizens’ quality of life.
  - Presentations included smart water-leak detection and public lighting control systems in Los Angeles, Calif.; driverless campus shuttles for Greenville, S.C.; and a gunshot-sensing safety network for a middle school in Ammon, Idaho.

Meeting with Mayors and City Planners

NIST Co-Organizers of Expo

WEM Hosting King and Queen of The Netherlands at Expo

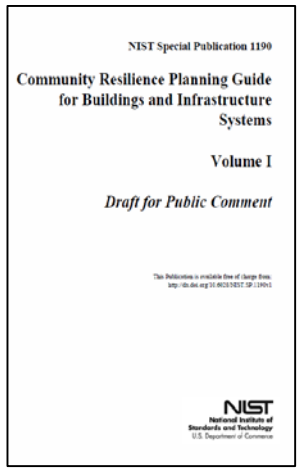
NIST issues its "Community Resilience Planning Guide for public comment

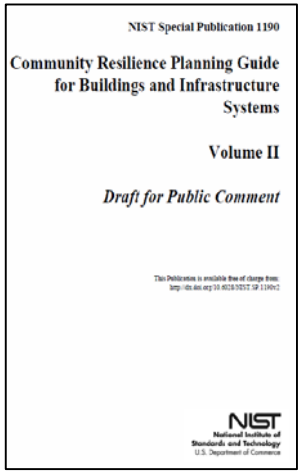
On April 27, at a Workshop held at Texas Southern University, NIST issued its "Community Resilience Planning Guide for Buildings and Infrastructure Systems" for public comment

- a Component of the President's Climate Action Plan, the Planning Guide takes a proactive approach. It leads communities through a step-by-step process that helps them make informed long-term decisions about priorities, costs and ways to better manage disaster risks
- based on input gathered during four regional meetings with stakeholder community and from nine outside experts in disciplines ranging from buildings to public utilities and from earthquake engineering to sociology to assist in drafting the guide.

The Guide consists of 2 volumes:

- **Volume I** describes the methodology and has an appendix that illustrates the planning process for a fictional town, Riverbend, USA;
- **Volume II** has informational chapters as a reference for Volume I





Program Update: Head Health Challenge III: Advanced Materials for Impact Mitigation

- A Public-Private Challenge Prize to stimulate the development of advanced materials that exhibit excellent energy absorbing /dissipating properties
- Employs NIST expertise in materials testing and assessment
- Inspired by the National Materials Genome Initiative (MGI)

NIST is leveraging Challenge III to expand MGI-related activities in advanced protection materials

- **January 29, 2015:** NFL SuperBowl Press Conference
- **February 2, 2015:** Challenge III Opens
- **March 2015:** 125 Abstracts Received
- **April 2015:** 75 Winning Abstracts invited to submit full proposal and a material sample
  - Summer 2015: NIST tests materials samples
  - September 2015: 6 First Round awardees up to $250,000 each
- **October 2015:** 6 First Round Awardees begin work to refine materials
- **September 2016:** **Grand Prize Winner awarded $500,000**

Program Update: Forensics

Since our last meeting, NIST and DoJ have addressed a number of critical issues regarding our partnership through increased understanding and documentation of the roles and responsibilities of each.

1. **National Commission on Forensic Science** (NCFS - DoJ FACA)
   - Updated Commission Charter Clarifies that Standards issues are in the NIST domain – not shared with DoJ
     - The Attorney General will refer recommendations regarding measurement standards and priorities for standards development to the Director of NIST, as he deems appropriate.
   - New MOU between DOJ and NIST (in signature phase)
     - Clarifies that the MOU address the NCFS and OSAC as distinct but related activities
     - The NIST Director will consult with the Attorney General (rather than get approval) to ensure that balance of perspectives is maintained in OSAC.

2. **Organization of Scientific Area Committees** (OSAC)

   First public meetings of the five Scientific Area Committees held in late February with announcement of priorities for standards and guidelines covering 24 forensic science disciplines.

3. Forensics Science Research

- **NIST Forensic Science Research Foci Identified**

DNA	Increased reliability of analysis of DNA samples.
Ballistics	An objective, numerical and statistically valid criteria for identification of firearm and tool mark evidence
Digital	Reference data for personal computer software through the National Software Reference Library (NSRL) and the Computer Forensic Tool Testing (CFTT) program. Support for the FBI fingerprint database,
Statistics	A long term program to build new methods suited to forensic problems in the specific use cases such as illicit drug analysis, pattern recognition, and trace evidence analysis
Toxins	Designer drugs, synthetic marijuana, and ricin are a few of the compounds requiring measurement research to establish validated analytical procedures.
Trace	Development of objective measures for interpretation of evidence to promote standardization of trace evidence work across laboratories.

- **New Forensic Science Center of Excellence**

Re-Competition for MEP State Programs

DRIVERS:

- **The Administration's FY2015 Budget** proposed a 10% increase ($13 M) for MEP and noted
  - MEP's strategic planning process and operational reform agenda, and
  - NIST Management's direction in FY2014 to initiate a carefully planned, systematic, multi-year recompetition of the national system of Centers.

- **The Government Accountability Office** (March 2014 report) "MEP: Most Federal Spending Directly Supports Work with Manufacturers, but Distribution Could Be Improved" recommended that "Commerce's spending on cooperative agreement awards be revised to account for variations across service areas in demand for program services and in MEP centers' cost of providing services."

- **NIST Reauthorization Act of 2014** – which provided **that if a recipient has received a Center award for 10 consecutive years, then the NIST Director shall conduct a competition to select a Center operator**.

Overview:

- **Primary objective:** Optimize the impact of the Federal investment on U.S. manufacturing and to allocate additional funds to areas with higher concentrations of manufacturers.
- **Goal**: Complete competition of the entire 50 State (plus Puerto Rico) national network over three years

MEP State Competitions

Round 1 competition in 10 states:

- Competition announced Aug 1, 2014 with proposals due Oct 15, 2014
- Awards announced Feb 23, 2015; Start date July 1, 2015
  - Colorado, Connecticut, Indiana, Michigan, North Carolina, New Hampshire, Oregon, Tennessee, Texas, Virginia

Round 2 competition in 12 states:

- Competition announced Mar 2, 2015 with proposals due Jun 1, 2015
- Award date: Sep 30, 2015; Start date Jan 1, 2016
  - Alaska, Idaho, Illinois, Minnesota, New Jersey, New York, Ohio, Oklahoma, Utah, Washington, West Virginia, Wisconsin

Round 3 competition in 10 States and Puerto Rico:

- Announcement anticipated in Jan 2016.
- New MEP Center cooperative agreements anticipated to start in Oct 2016
  - Alabama, Arkansas, California, Georgia, Louisiana, Massachusetts, Missouri, Montana, Pennsylvania, Puerto Rico, Vermont

Round 4 competition for 11 States:

- Announcement anticipated in July 2016.
- New MEP Center cooperative agreements anticipated to start in Apr 2017
  - Delaware, Hawaii, Iowa, Kansas, Maine, Mississippi, Nevada, New Mexico, North Dakota, South Carolina, Wyoming

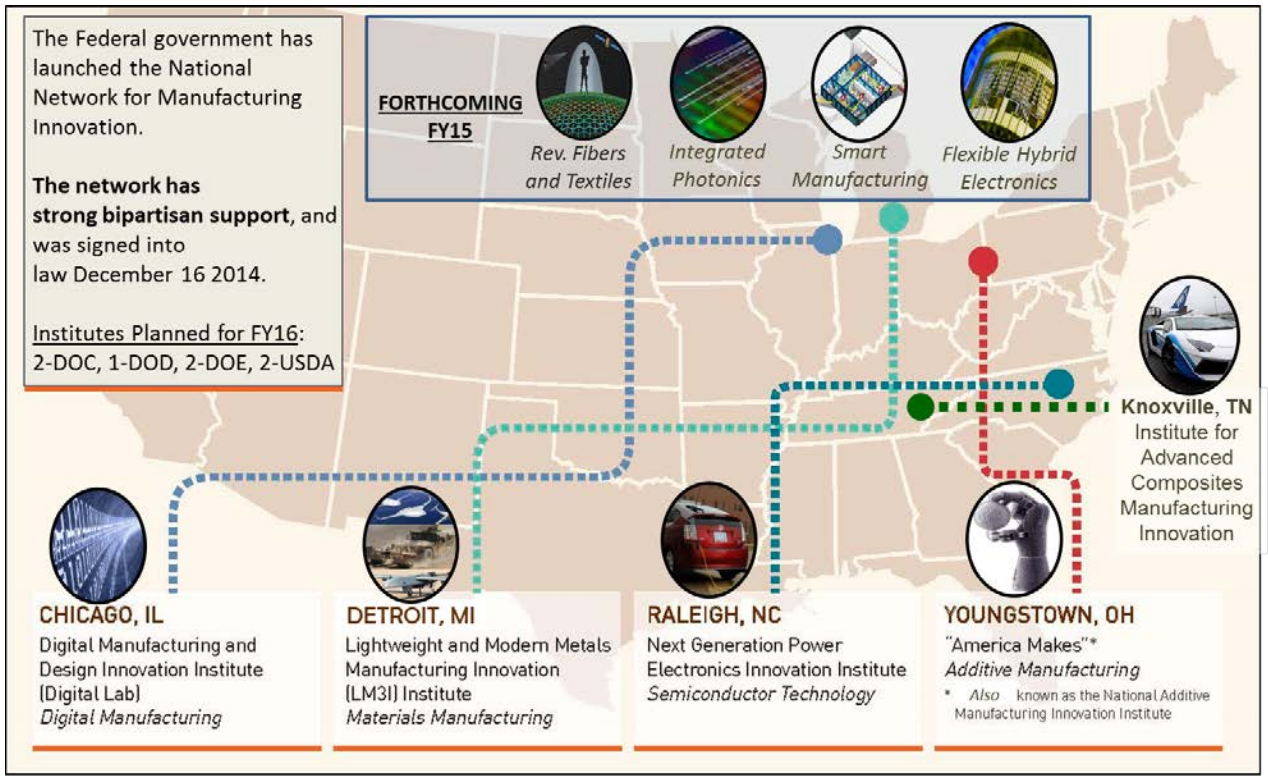
The National Network on Manufacturing Innovation

President Obama

"In my State of the Union Address, I asked Congress to build on a successful pilot program and create 15 manufacturing innovation institutes that connect businesses, universities, and federal agencies to turn communities left behind by global competition into global centers of high-tech jobs.

"Today, I'm asking Congress to build on the bipartisan support for this idea and triple that number to 45 – creating a network of these hubs and guaranteeing that the next revolution in manufacturing is 'Made in America.'"

- July 30, 2013



NNMI Authorized: Revitalize American Manufacturing & Innovation Act

118 bipartisan RAMI Bill Sponsors

Rep. Tom Reed
R NY-23

Rep. Joe Kennedy
D MA-4

Sen. Sherrod Brown
D Ohio

Sen. Roy Blunt
R Missouri

RAMI and NIST

RAMI calls upon the U.S. Secretary of Commerce through the NIST to:

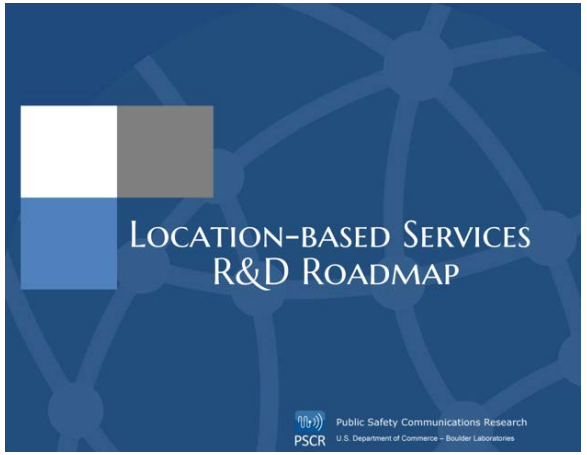
1. **Establish the "Network for Manufacturing Innovation Program"** to convene and support existing and future manufacturing innovation Institutes.
2. **Establish new "Institutes for Manufacturing Innovation"** that address private sector needs using an open topic, open competition process
3. **But… no new funds allocated to implement… and forbids use of existing funds**

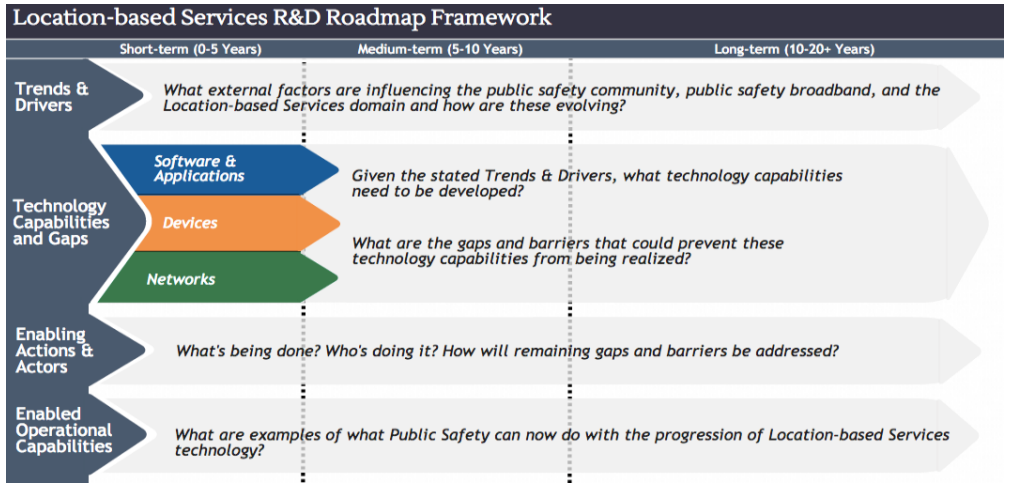
The Advanced Manufacturing National Program Office housed at NIST has the responsibility to oversee the program coordination, network support, and reporting.

First Public Safety Communications Research Stakeholder-driven R&D plan released

- **PSCR recently unveiled its first R&D roadmap**
  - Location-based Services R&D issued as NIST Technical Note 1883
  - Addresses trends, drivers, software, applications, devices & networks

- **Data analytics roadmap in process**

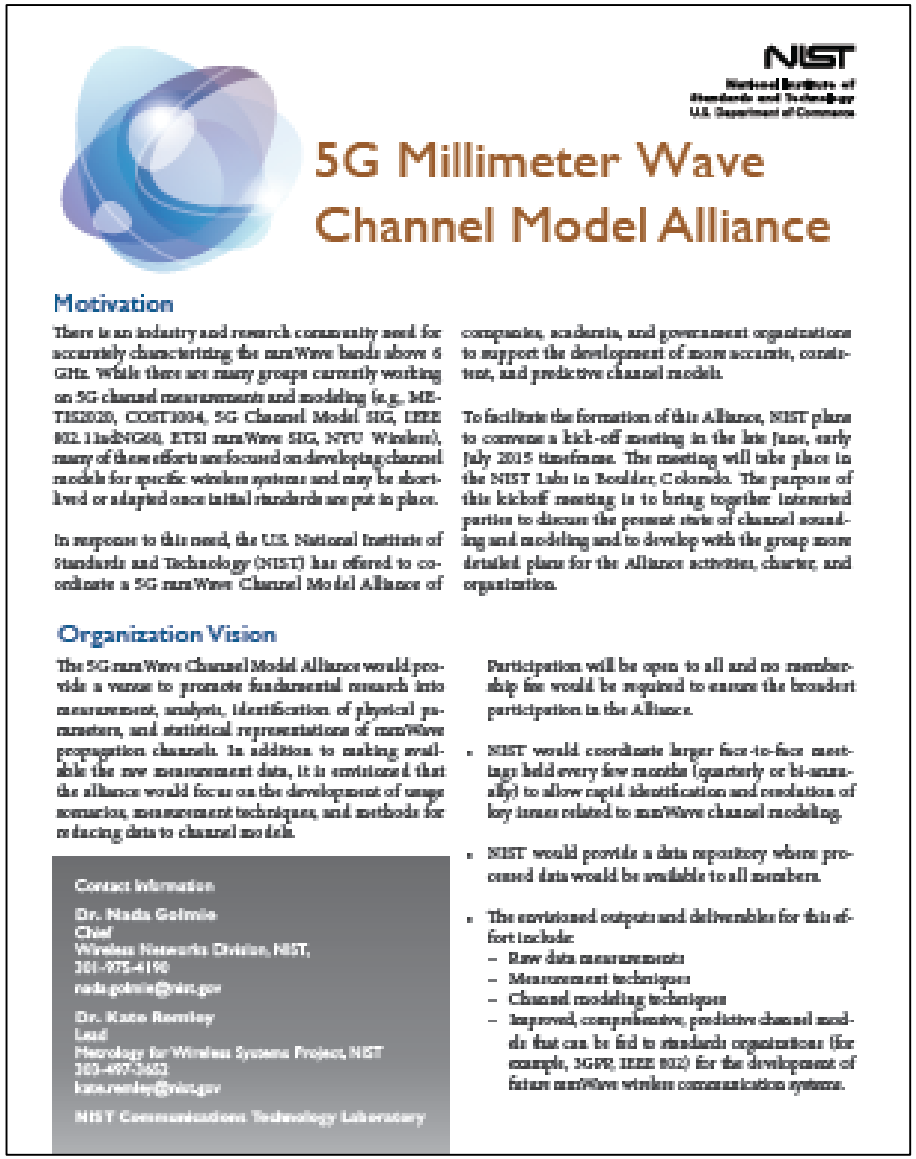




5G mmWave channel model alliance

Purpose: Assemble worldwide expertise to tackle fundamental challenges in channel measurement and modeling.

- NIST to convene a kickoff meeting on July 8-9, 2015 in Boulder, CO with 15+ corporate & academic participants
- Goal is improved channel measurement techniques, channel sounding techniques, and library of channel models



NIST
National Institute of Standards and Technology
U.S. Department of Commerce

5G Millimeter Wave Channel Model Alliance

Motivation

There is an industry and research community need for accurately characterizing the mmWave bands above 6 GHz. While there are many groups currently working on 5G channel measurements and modeling (e.g. METIS2020, COST1004, 5G Channel Model SIG, IEEE 802.11ad/NG60, ETSI mmWave SIG, NYU Wireless), many of these efforts are focused on developing channel models for specific wireless systems and may be short-lived or adapted once initial standards are put in place.

In response to this need, the U.S. National Institute of Standards and Technology (NIST) has offered to coordinate a 5G mmWave Channel Model Alliance of companies, academia, and government organizations to support the development of more accurate, consistent, and predictive channel models.

To facilitate the formation of this Alliance, NIST plans to convene a kick-off meeting in the late June, early July 2015 timeframe. The meeting will take place in the NIST Labs in Boulder, Colorado. The purpose of this kickoff meeting is to bring together interested parties to discuss the present state of channel sounding and modeling and to develop with the group more detailed plans for the Alliance activities, charter, and organization.

Organization Vision

The 5G mmWave Channel Model Alliance would provide a venue to promote fundamental research into measurement, analysis, identification of physical parameters, and statistical representations of mmWave propagation channels. In addition to making available the new measurement data, it is envisioned that the alliance would focus on the development of usage scenarios, measurement techniques, and methods for reducing data to channel models.

Participation will be open to all and no membership fee would be required to ensure the broadest participation in the Alliance.

- NIST would coordinate larger face-to-face meetings held every few months (quarterly or bi-annually) to allow rapid identification and resolution of key issues related to mmWave channel modeling.
- NIST would provide a data repository where processed data would be available to all members.
- The envisioned outputs and deliverables for this effort include:
  - Raw data measurements
  - Measurement techniques
  - Channel modeling techniques
  - Improved, comprehensive, predictive channel models that can be fed to standards organizations (for example, 3GPP, IEEE 802) for the development of future mmWave wireless communication systems.

Contact Information

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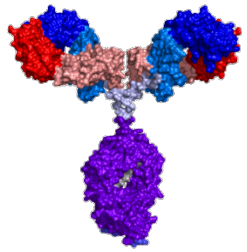
NIST Communications Technology Laboratory

NIST Update

- NIST Organizational Update
  - Update on Director's Priorities
  - NIST Budget Status
- Selected Staff Achievements
- Selected Research Updates
- Selected Program Updates
- Selected New Programmatic Partnerships
- Agenda Review

NIST- MedImmune Establish 5-year Cooperative Research & Development Agreement

"MedImmune is committed to partnering with premier institutions that can translate strong science into patient benefit," Bahija Jallal, executive vice president, MedImmune from joint NIST-MedI press release Feb, 2015.



NISTmAb: MedI donated monoclonal antibody for reference material to be issued end of 2015

7 MedImmune funded Projects Under CRADA

- Develop a fluorescence-based optical method to select the optimal formulation for keeping protein medicines stable and safe.
- Develop a new form of Raman Spectroscopy to determine rapidly that protein medicines are properly folded.
- Develop a mass spectral library to help detect and identify contaminant proteins from the host cells used to manufacture protein medicines.
- Develop a mass spectral library of cell surface proteins that are important in the biological pathways of disease and potential targets of therapeutics.
- Determine the genetic stability of cell lines used to manufacture protein therapeutics.
- Develop high resolution NMR and isotopic labeling methods to produce atomic resolution, 3-D structural maps of monoclonal antibodies, the largest class of protein therapeutics.
- Use neutron scattering methods to understand at a molecular level why protein therapeutics can unfold and form particles during manufacturing and during administration to patients.

NIST Centers of Excellence Program -- Update

- **First of these new "Centers of Excellence" on Advanced Materials was announced last year**
  - **Center for Hierarchical Materials Design (CHiMaD)**
    - **NIST, Northwestern Univ., Univ. of Chicago, Argonne Natl. Lab**
- **The Second, to support NIST efforts in Disaster Resilience was announced in February 2015**
  - **Center of Excellence for Community Resilience Research** – focused on the development of tools that individual communities can use to assess and improve their disaster resilience.
    - **NIST, Colorado State University**, University of Oklahoma, Rice University, Texas A&M University, University of Washington, University of South Alabama, California Polytechnic University in Pomona and Texas A&M-Kingsville.
- **The Third, to support NIST efforts in Forensic Science was announced May 25, 2015**
  - **The research in the Center will focus on improving the statistical foundation for:**
    - **fingerprint, firearm, toolmark, dental, and other pattern evidence analyses, and**
    - **for computer, video, audio and other digital evidence analyses.**
  - The Center will also be responsible for developing training tools for practitioners and non-practitioners
    - **NIST, Iowa State University, Carnegie Mellon University, the University of Virginia and the University of California, Irvine**

NIST Update

- NIST Organizational Update
  - Update on Director's Priorities
  - NIST Budget Status
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My Ask from VCAT

In general:

- Assistance in determining, establishing, and sustaining strategies for a "Healthy NIST"
- Helping us to determine "what we should", rather than "what we could" be doing to address pressing national needs

more specifically:

- In the near-term
  - Help NIST ensure it can meet its responsibilities and expectations in **Disaster Resilience, Cybersecurity, and Advanced Manufacturing**
  - Assess NIST's growing programs in **Advanced Communications** to ensure maximum relevance and effectiveness
- In the longer-term
  - Continue examination of NIST's **measurement service programs**
  - Advise NIST on the effectiveness of its portfolio of **international engagements and programs beyond its "Treaty-of-the-meter" related responsibilities**

and:

- Identification of other areas where you -- VCAT-- think I should focus

Charge to the VCAT for this meeting

With a focus on NIST's programs and projects in the areas of information technology and bioscience, the VCAT is asked to review NIST's current portfolio of activities and provide feedback and recommendations in the following areas:

- **Current research portfolio vs. future needs:**
  - How can NIST best be positioned to respond to the emerging measurement and standards needs in these technology areas?
- **Diversity and depth of partnership arrangements:**
  - In each area, what technical capabilities should be internal to NIST's core programs and where are partnerships potentially advantageous? How can NIST ensure it has the right partners to support these activities?
- **Current and future technical staff:**
  - Considering NIST's current staff and partnership arrangements, how can NIST ensure access to the technical expertise to address these technology areas in the future? What considerations will be needed to allow NIST to compete in the future for the needed technical experts/expertise in these areas?

VCAT Meeting Agenda

Tues. 8:30 - Session I: Overview and Safety

- **Call to Order**, Tony Haymet, VCAT Chair
- **NIST Update and Agenda Review**, Willie E. May, Under Secretary of Commerce for Standards and Technology and NIST Director
- **Safety Update**, Richard Kayser, Chief Safety Officer

Tues. 10:30 -Session II: NIST Planning Activities and Studies

- **NIST Wide Planning Activities and Workforce Study Needs and Trends**, Jason Boehm, Director, Program Coordination Office
- **Panel Discussion with NIST Post-Docs**

Tues. 10:30 Session III: Bioscience Review

- **Context Setting**, Willie E. May
- **Review of NIST Bioscience Research Programs and Activities**, Laurie Locascio, Director, Material Measurement Laboratory (MML)
- **Panel of Internal NIST speakers**
  - **Protein Therapeutics**– Mike Tarlov, Chief, Biomolecular Measurement Division, MML
  - **Cell measurements** – Anne Plant, Program Director, Biosciences, MML
  - **Synthetic biology** – Marc Salit, Leader, Genome-Scale Measurements Group, MML
- **Bioscience Industry: Future Direction & Trends in Therapeutic**
  - Christine Colvis, Director for Drug Development Partnership Programs, National Center for Advancing Translational Sciences, NIH
  - Robert Deans, Executive Vice President for Regenerative Medicine, Athersys
  - Scott Koenig, President & CEO, MacroGenics

VCAT Meeting Agenda

Tues. 3:15 - Session IV: Institute for Bioscience and Biotechnology Research (IBBR) & National Cybersecurity Center of Excellence (NCCoE)

- **Context Setting,** Willie E. May, Under Secretary of Commerce for Standards and Technology and NIST Director
- **Tours of IBBR & NCCoE**

Wed. 8:30 - Session V: Information Technology/Cybersecurity Review

- **Context Setting**, Willie E. May
- **Review of NIST Research Programs and Activities**, Chuck Romine, Director, ITL
- **Panel of Internal NIST speakers**
  - **Metrology for Scientific Computing** - Andrew Dienstfrey, Manager, Virtual Measurement Systems Program, ITL
  - **Big Data** – Mark Przybocki, Leader, Multimodal Information Group, ITL
  - **Software Quality -** Paul Black, Acting Leader, Software Quality Group, ITL
- **Future Direction & Trends in Information Technology**,
  - Daniel A. Reed, Vice President for Research and Economic Development and the Professor of Computer Science, Electrical and Computer Engineering, and Medicine at the University of Iowa
  - Paul Ammann, Associate Professor, Software Engineering, George Mason University

Further Questions/Discussion??