Welcome

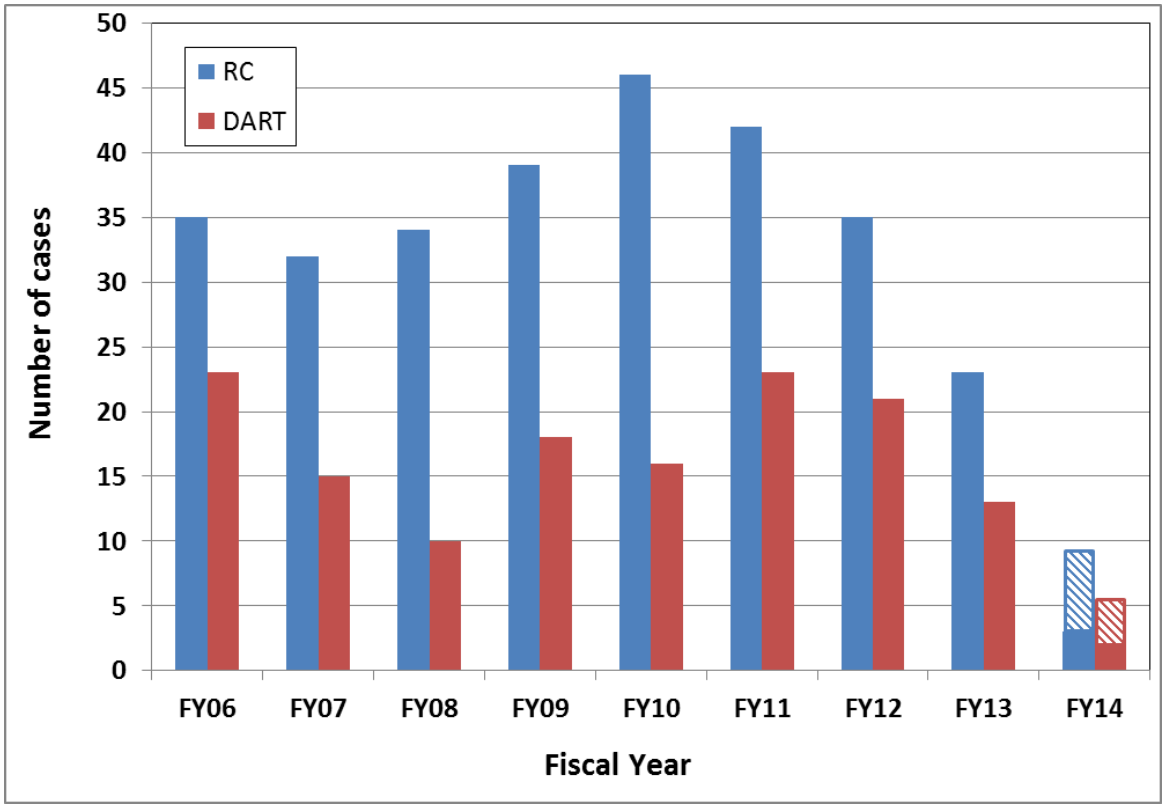
Visiting Committee on Advanced Technology
February 5-6, 2014

Dr. Patrick Gallagher

Under Secretary for Standards and Technology and NIST Director

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

Welcome to New VCAT Member

Rita R. Colwell

Distinguished University Professor, University of Maryland College Park and Johns Hopkins University Bloomberg School of Public Health
Senior Advisor and Chairman Emeritus, Canon U.S. Life Sciences
Chairman and President, CosmosID, Inc.

Credit: University of Maryland

Career Highlights:

- 11th NSF Director, 1990-2004, and Co-chair of the NSTC Committee on Science
- Winner of 2006 National Medal of Science
- Former President of the University of Maryland Biotechnology Institute
- Has held leadership positions at many scientific organizations, including Chairman of the Board of Governors of the American Academy of Microbiology and President of the American Association for the Advancement of Science
- Member of US and International Science Academies
- Authored or co-authored 17 books and more than 800 scientific pubs

THANK YOU to Departing VCAT Members

Credit: NIST

Pradeep Khosla

Term: June 6, 2008–June, 1, 2014

- Member of the VCAT Subcommittee on Cybersecurity, 2013
- Member of the VCAT Subcommittee on Public Safety Networks, 2011

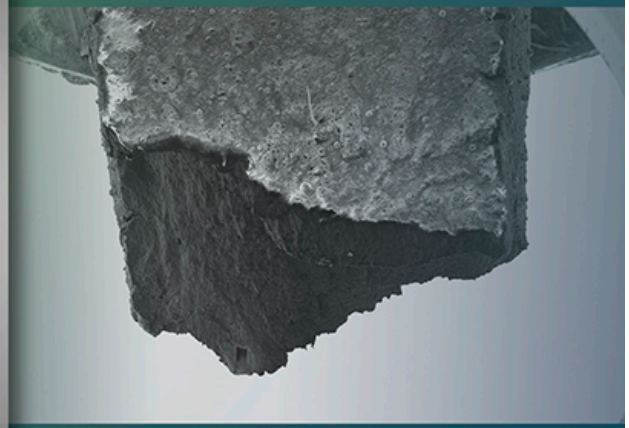
Credit: NIST

Alan Taub

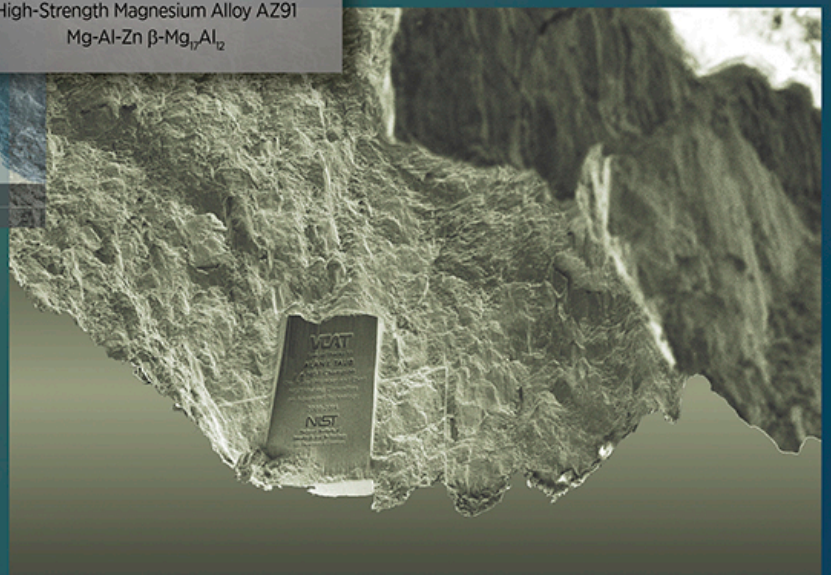
Term: May 9, 2008–May 8, 2014

- VCAT Chair: April 1, 2013–March 31, 2014
- VCAT Vice Chair: March 5, 2010–March 31, 2013
- Member of the VCAT Subcommittee on Manufacturing, 2013-2014
- Member of the VCAT Subcommittee on Safety, 2012–2013
- Chair of the VCAT Subcommittee on Manufacturing, 2011

A SMALL TOKEN OF OUR APPRECIATION



High-Strength Magnesium Alloy AZ91
Mg-Al-Zn β-$Mg_{17}Al_{12}$



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

Congratulations

Courtesy of the John D. & Catherine T. MacArthur Foundation

Ana Maria Rey (NIST/JILA) has been named a 2013 MacArthur Foundation Fellow

"Atomic physicist advancing our ability to simulate, manipulate, and control novel states of matter through fundamental conceptual research on ultra-cold atoms"

Courtesy of theSamuel J. Heyman Service to America Medals

Dan Madrzykowski won the 2013 Service to America Citizen Services Award

"Dramatically improved firefighting practices by conducting and sharing sophisticated research that has saved firefighters' lives and protected property across the nation."

Credit: Glenn Asakawa/University of Colorado

Deborah Jin to receive 2014 Comstock Price in Physics

"Demonstrating quantum degeneracy and the formation of a molecular Bose-Einstein condensate in ultra-cold fermionic atomic gases, and for pioneering work in polar molecular quantum chemistry"

Congratulations

Presidential Early Career Awards for Scientists and Engineers

Gretchen Campbell nominated for

"pioneering research in the new field of atomtronics, proving the feasibility of this technology by demonstrating the first controllable atom circuit, and for mentoring young scientists through coursework, laboratory research, and sponsorship of a women-in-physics group."

R. Joseph Kline, nominated for

"pioneering the use of grazing incidence X-ray diffraction for the characterization of molecular factors critical to the performance of organic electronics, and for building collaborations across NIST and with industry, and mentoring the next generation of scientists in this area."

Ana Maria Rey (NIST/JILA), nominated for

"world-class accomplishments in the theory of complex interactions between atoms and light, guiding and explaining experiments in such areas as ultracold atoms and molecules, quantum information processing, atomic clocks, and quantum magnetism, and for outstanding mentoring of future generations of scientists."

Budget Update

FY 2014 Enacted

- $850 M, increase of $81 M over FY13 enacted
- $651M for STRS, including +$30M for advanced manufacturing, +$5M for cybersecurity research, and +$1 for disaster resilience
- $143M for ITS, including $128M for MEP and $15M for AMTech
- $56M for Construction of Research Facilities

FY 2015 Request

- NIST Request submitted to OMB in September

FY 2016 Request

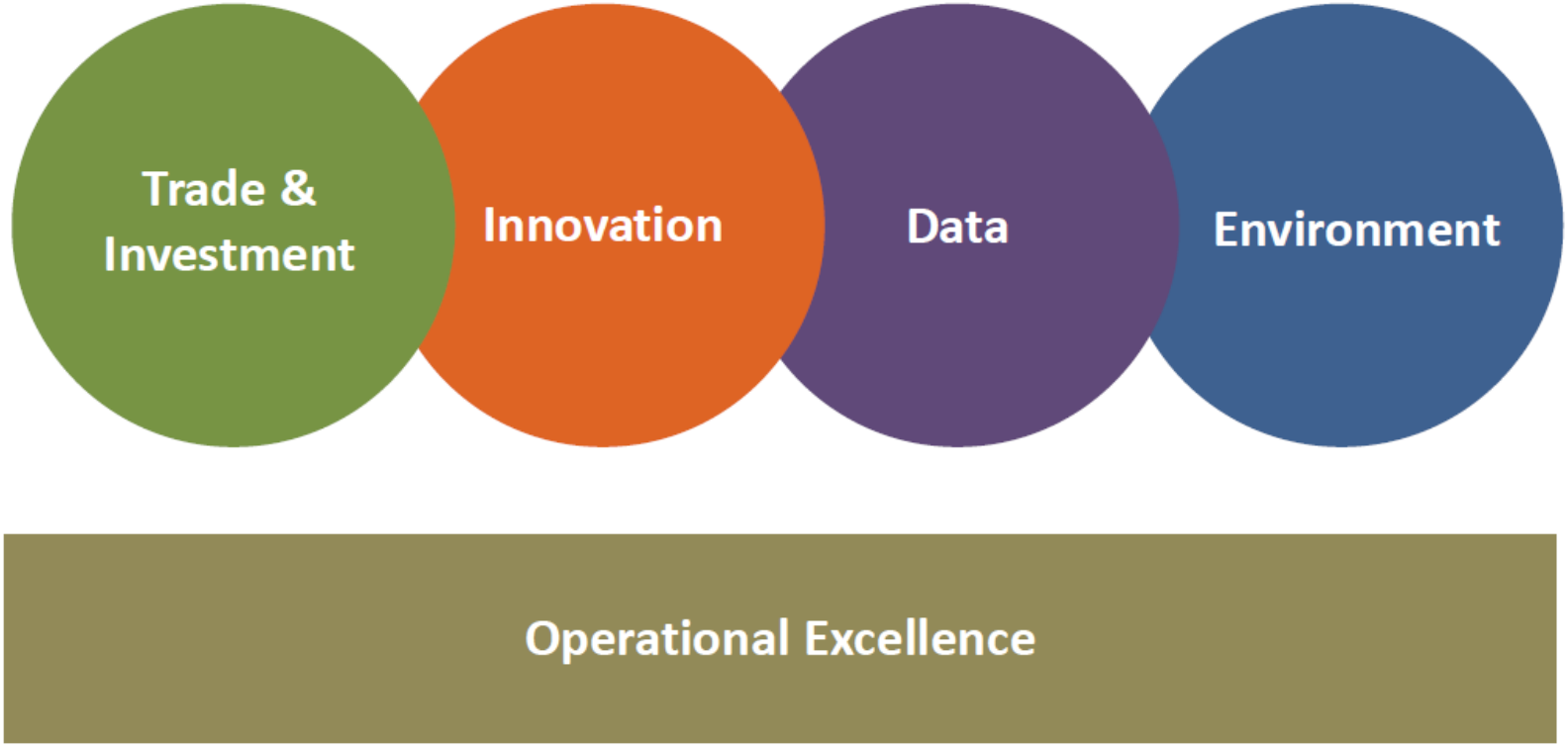
- Planning has started

NIST FY 2014 Omnibus Appropriations Bill
(Dollars in millions)

	FY 2013 Enacted	FY 2014 President's Request	FY 2014 Congressional Budget
STRS	**$579.8**	**$693.7**	**$651.0**
Laboratory Programs	517.1	616.8	TBD
Corporate Services	17.3	18.7	TBD
Stds Coord. and Spec. Prgs.	45.4	58.2	TBD
ITS	**$133.6**	**$174.5**	**$143.0**
Advanced Manu. Tech. Consort.	10.6	21.4	15.0
Hollings Manuf. Ext. Prg.	123.0	153.1	128.0
CRF	**$55.9**	**$60.0**	**$56.0**
Const. & Major Renovations	11.8	11.8	TBD
Saf. Cap., Maint., Maj. Repairs	44.1	48.2	TBD
Total Discretionary	**$769.3**	**$928.2**	**$850.0**
NNMI (Mandatory)	**$0.0**	**$1,000.0**	**$0.0**
WIN (Mandatory) *			
Total NIST	**$769.3**	**$1,928.2**	**$850.0**

* The Middle Class Tax Relief and Job Creation Act of 2012 authorized $300M in funds; the first $100M is provided to NIST after successful spectrum auction of $7.2B or more; an additional $200M is allocated to NIST if spectrum auctions net more than $27.6B; CBO scored the first $100M coming to NIST in FY 2017; these spectrum auctions could take up to 7 years.

DOC Strategic Plan



State of the Union

Themes relevant to NIST:

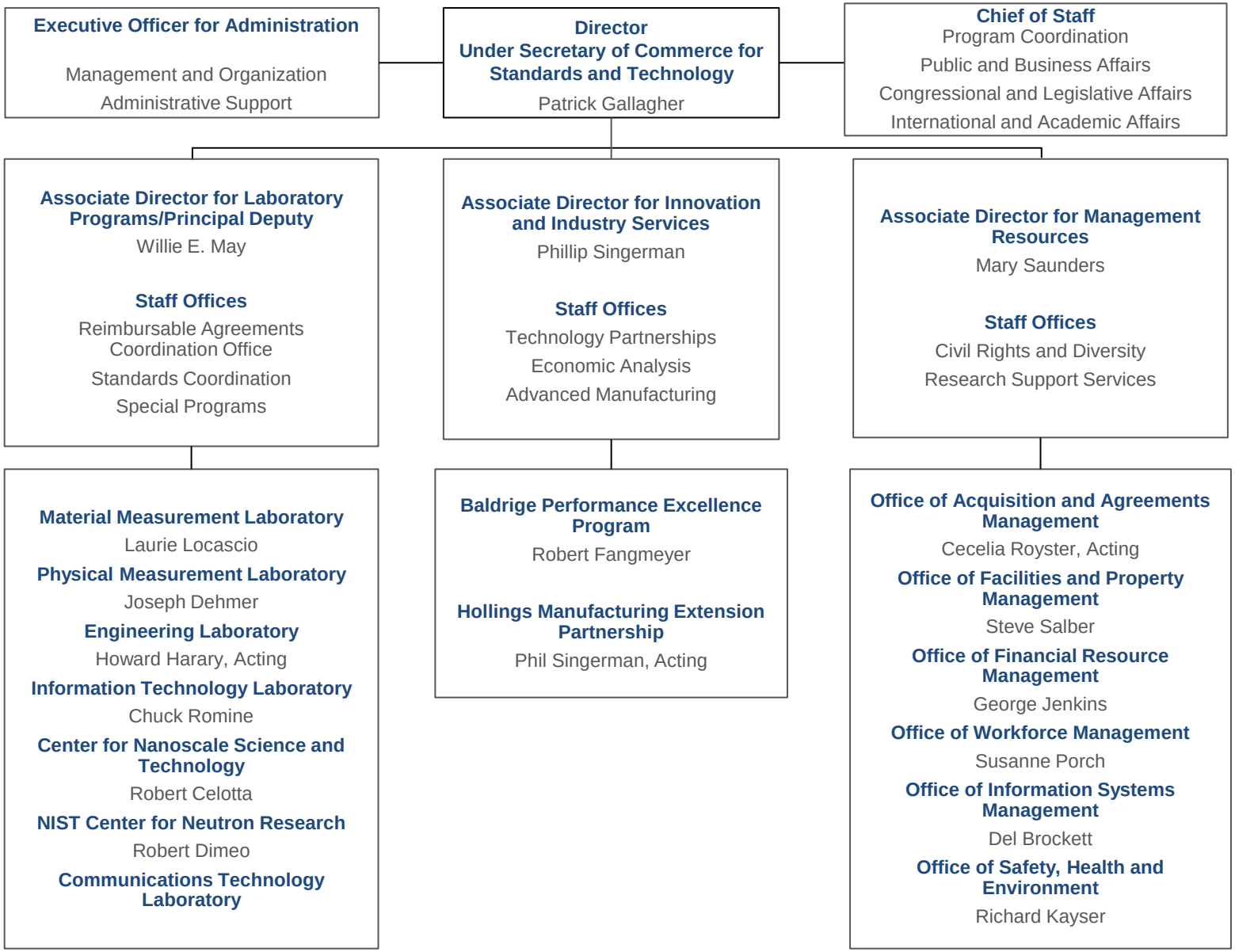
- Manufacturing
- Innovation
- Skills
- Education
- Trade
- Energy & Environment

Official White House Photo by Pete Souza

We know that the nation that goes all-in on innovation today will own the global economy tomorrow. This is an edge America cannot surrender. Federally-funded research helped lead to the ideas and inventions behind Google and smartphones. And that's why Congress should undo the damage done by last year's cuts to basic research so we can unleash the next great American discovery.

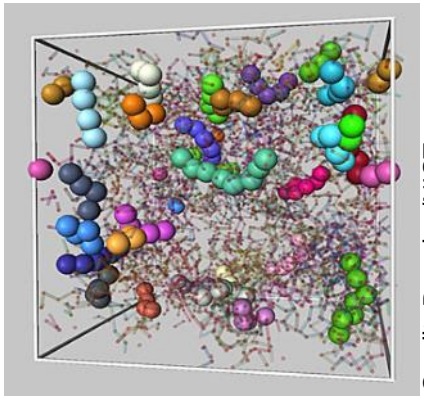
President Obama
2014 State of the Union Address

NIST Organization

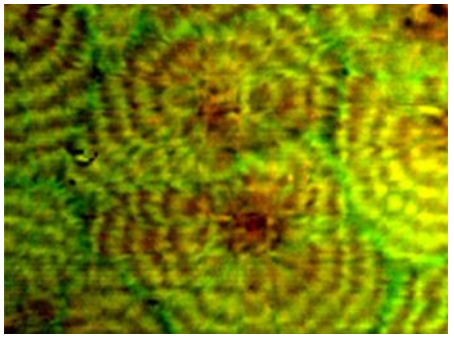


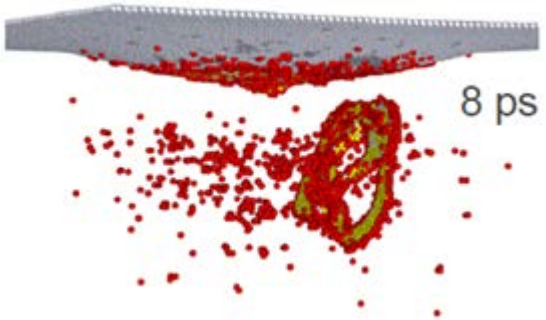
Program Update: Center of Excellence on Advanced Materials

- RFP published June 27th, closed August 12th. NIST received many strong proposals
- Awarded to new Center for Hierarchical Materials Design (CHiMaD) Consortium lead by Northwestern
  - University of Chicago
  - Northwestern-Argonne Institute of Science and Engineering (partnership between Northwestern and DoE's Argonne National Lab)
  - The Computation Institute (partnership between University of Chicago and Argonne National Lab)
- $5 million NIST award with $4.65 million consortium contribution
- CHiMaD will focus on the discovery of novel hierarchical materials. Hierarchical materials exploit distinct structural details at various scales from the atomic on up to achieve special, enhanced properties.



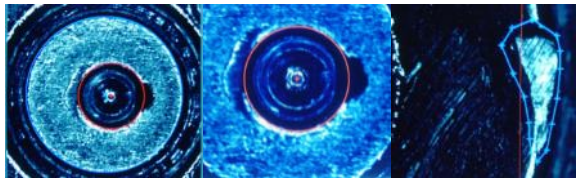
Credit: Douglas/NIST



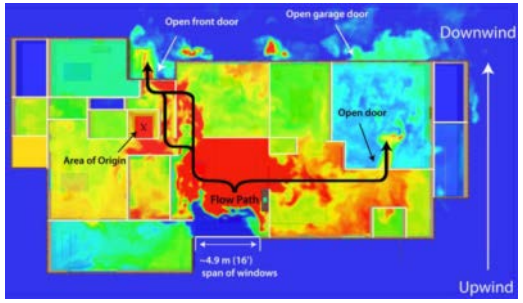


Program Update: Forensic Science

- National Commission on Forensic Science
  - Co-chaired by DOJ Deputy Attorney General and NIST Director
  - Includes forensic science service providers, researchers, law enforcement, prosecutors, defense attorneys, and judges
  - First meeting Feb 3-4, 2014
- Two additional roles for NIST:
  - Validation of forensic measurement;
  - Coordination of guidance to support forensic laboratories
- Guidance Groups
  - NIST has collected public comments and developed a plan for what we term the "Organization of Scientific Area Committees (OSAC)"



Credit: Theodore Vorbuger/NIST



Credit: Adam Barowy/NIST

Credit: Michael Indovina/NIST

Credit: DHS

Program Updates -- National Strategy for Trusted Identities in Cyberspace (NSTIC)

- National Strategy for Trusted Identities in Cyberspace (April 2011)
- National Program Office (interagency)
- Identity Ecosystem Steering Group (private sector)

Second round of pilots awarded on September 17th:
over $7M in awards to 5 organizations

- Exponent (Calif.), $1,589,400;
- Georgia Tech Research Corporation (GTRC) (Ga.), $1,720,723;
- Privacy Vaults Online, Inc. (PRIVO) (Va.), $1,611,349;
- Troop ID (Va.), $1,204,957; and
- Transglobal Secure Collaboration Participation, Inc. (TSCP) (Va.), $1,264,074.

FFO for third round of pilots released January 16, 2014

Program Update: Cybersecurity for Critical Infrastructure Framework

- Draft framework outline published July 1, 2013
- Third Cybersecurity Framework Workshop held July 10-12, 2013 in San Diego, CA
- Preliminary Framework published August 28, 2013
- Fourth Cybersecurity Framework Workshop held September 11-13, 2013 in Dallas, TX
- Preliminary Framework published on October 10, 2013, formal comments requested by December 13, 2013
- Fifth Cybersecurity Framework Workshop held November 14-15, 2013 in Raleigh, NC
- Final Framework to be released February 12, 2014

Erik Jepsen/UC San Diego Publications

Courtesy of UTDallas

Courtesy NCState

Program Update: Advanced Manufacturing Technology Consortia Program

AMTech program funded in 2013 appropriations

Grants will support new or existing industry-driven consortia to develop research plans

Teaming and partnerships strongly encouraged

- With participation by the full value chain, including small-and mid-sized firms.

Planning projects sought that include:

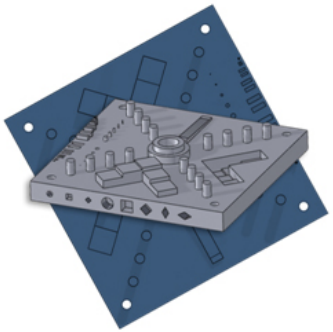
- Facilitating development, diffusion, technology transfer, and knowledge adoption
- Identifying critical gaps in manufacturing common to an industry or sector.
- Creating roadmaps that guide new research and development to address industry problems.

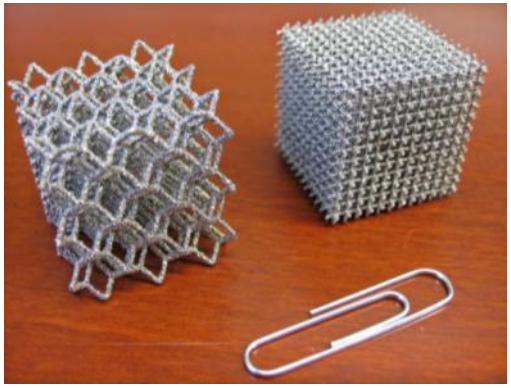
FFO published July 24th; proposals due October 21st. Received a strong response.

Program Update: Measurement Science for Advanced Manufacturing

NIST awarded $7.4 Million in grants for Additive Manufacturing Research

- FFO published March 20
- Awarded September 17





Young/NIST

Grants will go to two awardees

- Northern Illinois University, DeKalb, Ill ($2.4 million)
  Development and validation of physics-based additive manufacturing models for process control and quality assurance
- National Additive Manufacturing Innovation Institute, Youngstown, Ohio ($5 million)
  Holistic approach to solving measurement science challenges in additive manufacturing

NIU

NAMII NATIONAL ADDITIVE MANUFACTURING INNOVATION INSTITUTE

President's Council of Advisors on Science and Technology

Advanced Manufacturing Partnership 2.0

AMP Mission: ***Encourage approaches that sustain and grow U.S. leadership in advanced manufacturing***

19 Senior Leaders
industry, academia & labor

Steering Committee Co-Chairs

Rafael Reif — Massachusetts Institute of Technology

Andrew Liveris — Dow

ALCOA · Applied Materials · Caterpillar · GlobalFoundries · South Central College · MacArthur Corporation · Honeywell · Harper College · Northrop Grumman · United Steelworkers USW Métallos · The University of Akron · Overland Storage · Georgia Tech · Berkeley University of California · Siemens · Rensselaer · Michigan

AMP Coordinating Group
DOW, MIT, WH, AMNPO

AMP 1.0 – 16 Recommendations

Pillar I: Enabling Innovation

Pillar II: Securing the Supply Chain

Pillar III: Improving Business Climate

AMP 2.0 focused on Implementation

kickoff Sept 30, 2013

- Regional engagement and outreach
- Implementation on national initiatives
- Active Working Teams to issue "letter-reports"

AMP 2.0 Working Teams

- Transformative manufacturing technologies
- Demand-driven workforce solutions
- Supporting implementation of NNMI
- Manufacturing policy
- Manufacturing image

NNMI: National Network for Manufacturing Innovation

NNMI Mission: ***Advance U.S. Manufacturing and strengthen workforce skills by "scaling-up" new innovative technologies from labs to production***

NNMI Bipartisan/Bicameral Legislation

- Revitalize American Manufacturing & Innovation ("RAMI") Act, Aug. 1, 2013
- Senate Commerce Committee Hearing, Nov. 13, 2013
- House Science Committee, Subc. on Research & Technology Hearing, Dec. 12, 2013

Official White House Photo by Amanda Lucidon

"Tonight, I'm announcing we'll launch six more this year."

SOTU, January 28, 2014

Administrative Action

- Pilot institute on Additive Manufacturing, Youngstown OH established Oct. 2012
- "Next Generation Power Electronics Innovation Institute," Raleigh, NC, DOE, announced Jan. 15
- DOD Lightweight Metals and Digital Manufacturing Institutes, to be announced shortly.
  - SOTU – announcement of new Institutes (in addition to Youngstown and Raleigh, total of 8)
  - NIST leading effort to coordinate network of Institutes

Manufacturing Subcommittee

Charge

- Assess approach to meeting needs of changing technology landscape in advanced manufacturing
  - Identify emerging trends
  - Mechanisms to develop technical capabilities
- Recommendations on approach to research, collaboration, tech transfer, and outreach across multiple programs

Agenda

State of Advanced Manufacturing Technologies

Stephanie Shipp, Deputy Director and Research Professor, Virginia Bioinformatics Institute at Virginia Tech

Stephen Ezell, Senior Analyst, Information Technology and Innovation Foundation

Rob Gorham, Deputy Director, Technology Development, America Makes

Coordination Among NIST Programs

Roger Kilmer, Chief Manufacturing Officer

Developing the Next Generation of Technical Thought-leaders in Manufacturing

Bob Celotta, Director, CNST

Joe Dehmer, Director, PML

Howard Harary, Acting Director, EL

Laurie Locascio, Director, MML

Cybersecurity Subcommittee

Charge

- Recommendations to position NIST to best respond to cybersecurity needs
  - How to ensure balance between short-term priorities and long-term technical expertise
  - How to confirm that methods of partnership, collaboration, and communication are sufficient?
- Comment on tools organizations need to address cybersecurity risk

NIST Initiating Review of Cryptographic Standards Development Process 11/1/13

"Trust is crucial to the adoption of strong cryptographic algorithms. To ensure that our guidance has been developed according the highest standard of inclusiveness, transparency and security, NIST has initiated a formal review of our standards development efforts. (…) We also will bring in an independent organization to conduct a formal review of our standards development approach and to suggest improvements."

Agenda

Addressing Cybersecurity Risk, a focus of the Cybersecurity Framework for Critical Infrastructure

NIST Cybersecurity Leadership

Optimum Balance – Cultivating Long-Term Expertise to Support Short-Term Priorities

NIST Subject Matter Experts

NIST Response to the Nation's Cybersecurity Needs

Information Security and Privacy Advisory Board (ISPAB) Members

Review of Cryptography Standards Development Processes

Pat Gallagher

VCAT Meeting Agenda Review Day 1

Session I: Overview

Call to Order
Alan Taub, VCAT Chair
Welcome and Agenda Review
Pat Gallagher, Director and Under Secretary for Standards and Technology
NIST Safety Update
Richard Kayser, Chief Safety Officer

Session II: NIST's User Facilities and Other Examples of Ways in Which NIST Partners with Others

Context Setting
Willie May, Associate Director for Laboratory Programs and Principal Deputy
NIST Center for Neutron Research (NCNR)
Rob Dimeo, Director, NCNR
Center for Nanoscale Science and Technology
Bob Celotta, Director, CNST
Other Examples of NIST's Unique Capabilities
Willie May

Break for Parallel Sessions for VCAT Subcommittee Business

Subcommittee on Manufacturing
Sujeet Chand (chair), Uma Chowdhry, Tony Haymet, Karen Kerr, Darlene Solomon, Alan Taub, John Tracy
Subcommittee on Cybersecurity
Roberto Padovani (chair), Rita Colwell, Tony Haymet, Bill Holt, Pradeep Khosla, Al Romig

VCAT Meeting Agenda Review Day 2

Session III: Disaster Resilience

Overview of NIST's Responsibilities in Disaster Resilience

Steve Cauffman, Research Engineer, Materials and Structural Systems Division, Engineering Laboratory

Wrap up VCAT Business and Adjourn

VCAT Subcommittee on Manufacturing Recommendations and Discussion

Sujeet Chand, Chair, VCAT Subcommittee on Manufacturing

VCAT Subcommittee on Cybersecurity Recommendations and Discussion

Roberto Padovani, Chair, VCAT Subcommittee on Cybersecurity

Working Lunch – VCAT Elections and Deliberations and Presentation on Initial Observations, Findings, and Recommendations of 2013 Annual Report

Alan Taub, Chair, VCAT