VISITING COMMITTEE ON ADVANCED TECHNOLOGY (VCAT)
MINUTES OF THE JUNE 7-8, 2016 MEETING
GAITHERSBURG, MD

ATTENDANCE:

Visiting Committee Members Attending
Adler, Allen
Brooks, Rodney
Colwell, Rita
Garvey, Michael
Holt, William
Ishak, Waguih
Kerr, Karen*
Padovani, Roberto
Prafullchandra, Hemma
Sizer, Theodore

Designated Federal Officer
Stephanie Shaw

NIST Leadership Board
Boehm, Jason
Celotta, Bob
Dimeo, Rob
Fangmeyer, Robert
Harary, Howard
Jenkins, George
Kayser, Rich
Kimball, Kevin
Locascio, Laurie
May, Willie
Messerly, Clyde
Molnar, Michael
Olthoff, James
Porch, Susanne
Rochford, Kent
Romine, Charles (Chuck)
Royster, Cecilia
Saunders, Mary
Thomas, Carroll
Wixon, Henry

NIST Staff and Associates
Acierto, Linda
Bald, Kevin
Banovic, Stephen
Beers, Kathryn
Brunner, Zahraha
Cavanagh, Richard
Coraggio, Mary-Deirdre
Cranmer, David
Currens, Christopher
Evans, Heather
Fitzgerald, Ryan
FitzPatrick, Gerald
Fraser, Gerald
Fronczek, Lisa
Gayle, Frank
Gebbie, Katharine
Gendron, Cheryl
Golmie, Nada
Gonzalez, Carlos
Greer, Chris
Gundlach, David
Hacker, Christina
Hight-Walker, Angela
Hudson, Steven
Hughes, Colleen
Jillavenkatesa, Ajit
Kalonia, Cavan
Lin, Eric
Liu, Rosa
Martinez, Serena
Melkote, Shreyes
Migler, Kalman
Miner, Laurel
Newton, Tom
Orellana, Cindy
Parris, Reenie
Pfefferkorn, Frank
Pillitteri, Vicky
Plant, Anne
Porter, Gail
Reidy, Kari
Richter, Curt
Roberts, Kamie
Robinson, Crissy
Rudnitsky, Robert
Satterfield, Mary
Schiller, Susannah
Schneider, Barry
Seiler, David
Silcox, Barbara
Simpson, Michael
Small, John
Spurrier, Mark
St. Pierre, Jim
Stine, Kevin
Strouse, Gregory
Tarlov, Michael
Thorne, Roger
Trumpet, Craig
Williams, Carl
Wollman, David
Yashar, David
Zielinski, Paul

Others

Doering, Bob - Texas Instruments
McMillan, Andy - BACnet International
Peniche, Roger - Fluke Calibration
Wasserman, Gail - MedImmune
Predmore, Tom - Department of Commerce
Preis, Benjamin – Lewis-Burke Associates LLC

*Participated Remotely

Tuesday, June 7, 2016

Call to Order - *Dr. Rita Colwell, VCAT Chair*

Dr. Colwell called the meeting to order at 8:30 a.m. and went over logistics for the meeting.

OVERVIEW AND SAFETY UPDATE

NIST Update and Agenda Review – *Dr. Willie E. May, Under Secretary of Commerce for Standards and Technology and NIST Director*

Dr. May began with a brief overview of the NIST safety metrics, an update on several major NIST efforts and reviewed the agenda. He noted that DART (Days Away, Restricted or Transferred) is projected to increase from last year and approximately 1/3 of the cases occurred during the major snowstorm in January 2016.

Dr. May updated the VCAT on the verdict of the July 2015 security incident that involved an explosion in Building 236, and informed them of the critical steps that have been taken to enhance security. For access control, NIST has installed a security portal that connects the open Administration Building to the labs, requiring a NIST Personal Identity Verification (PIV) badge to get through. There are additional plans to have other security portals installed at additional strategic campus locations as well. Dr. May also reviewed options that are being explored to improve perimeter security at the Boulder campus after the unauthorized intrusion earlier this year.

Dr. May then provided the VCAT with an update to the progress against his high-level priorities. He reminded the VCAT that one of his first priorities was to fill key senior leadership vacancies. One of those vacancies to be filled is the Chief Facilities Management Office.

Dr. May reminded the VCAT that the MEP program is undergoing a system wide re-competition of all the Centers in order to right-size the funding to various states to be congruent with the manufacturing enterprise that it serves, as well as strengthen the partnerships with the MEP centers.

Dr. May then addressed his priority of addressing the long-term sustainability of the Baldrige Program. The Baldrige Performance Excellence Program is working with the NIST Applied Cybersecurity Division, OMB, and industry to explore the development of a Baldrige-based cyber assessment.

Dr. May next described the NIST budget status. The budget resolution for FY2016 this year was different than previous years, as NIST did not receive the requested increases in the President's budget yet, was still directed by Congress to support that work at the requested funding levels which required significant reprograming of NIST resources. For FY2017 the President's budget request puts total NIST funding at $1.01B a $50.5M increase over FY2016 levels. The House marks for FY2017 would cut the NIST budget by $99M compared to FY2016 enacted levels, while the Senate marks would increase NIST's budget by $10M over FY2016 levels. Funding at the House levels would have significant negative impacts including elimination of funding for our GHG measurements work, lab to market activities, and support for the Forensic Science Advisory Committees. In addition, NIST would not be able to fund additional NNMI institutes or continue much needed renovations in Boulder and Gaithersburg.

Dr. May then provided updates about some of NIST's strategic partnerships. First, the National Cybersecurity Center of Excellence (NCCoE) – the Department of Commerce's first federally funded Research & Development (R&D) center, and the first dedicated to cybersecurity – had its ribbon-cutting ceremony for its new facility on February 8, 2016. The NCCoE has six current areas of R&D: health care, energy, transportation, financial services, attribute based access controls, and trusted email. Next, Dr. May highlighted the technical progress being made in each of NIST's three Centers of Excellence.

Dr. May next asked some of the NIST Laboratory Directors to describe a few recent technical highlights and recent awards received by NIST staff.

Discussion:

The group discussed the following topic:

- The wide gap of requested funding levels between the President's request and the House marks for FY2017.

For more information, see Dr. May's presentation.

Safety Update – *Richard Kayser, Chief Safety Officer*

Dr. Kayser reviewed the latest safety metrics at NIST and provided an update on a number of key activities including:

- An overview of a program targeting the causes of slips, trips, and falls which are a major category of NIST injuries.

- An overview of the results of the 2014 NIST safety climate survey. Workplace inspections will be implemented in phases one to be completed and in effect by October 2016 and the remaining requirements to be in completed and in effect by October 2017.

- Efforts to increase near-miss reporting at NIST as a possible tool to identify unsafe practices earlier in order to prevent actual injuries.

- Efforts to improve safety education through the use of "microlearning" -based-training tools that to divide information into smaller segments or focused building blocks. They will be spaced out over time and delivered via e-mail. Smaller microbursts of information will be less time-disruptive and easier to understand. Part of the strategy is to have engaging content, critical thinking exercises, short videos in the form of safety bursts, and peer-to-peer conversations. Targeted communications, such as NIST safety minutes, will address each block of data.

Discussion:

The group discussed the following topic:

- Roles and responsibilities of reporting of safety hazards
- Cost increases and potential problems if there is a lack of funding.

For more information, see Dr. Kayser's presentation.

Updates on Major Programs: Commission on Enhancing National Cybersecurity – *Kiersten Todt, Executive Director, Commission on Enhancing National Cybersecurity*

Ms. Todt gave an overview on the role of NIST to the Commission, how the Commission has been progressing, and what the goals are for the next 4 to 6 months.

The Commission on Enhancing National Cybersecurity was established through a presidential executive order http://www.nist.gov/cybercommission/ in February 2016. It is hoped that this report will be a roadmap for the next administration on cybersecurity.

The report is due to the President on December 1, 2016 and will cover eleven key issues. The President provided eight issues, and the Commission added three more. The eleven key issues are:

- Federal Agency Roles and Responsibilities
- Critical Infrastructure Protection and Resilience
- Cybersecurity Workforce Development
- Security for the Internet of Things
- Research and Development
- Public Awareness and Education
- State and Local Government
- Data and Identity Theft Protection
- International Norms
- Cyber Insurance
- Metrics

Support teams have been created for each issue, led by an NIST SME. One of the efforts is a research and development agenda that NIST is leading in partnership with some researchers at MIT, looking at where the gaps are in the current government R&D agenda for the digital economy.

Five public meetings will focus on key issues, for more information see: http://www.nist.gov/cybercommission/commission-meetings.cfm .

Discussion:

The group discussed the following topic:

- A question was asked who were the Commission members. The list can be found here: http://www.nist.gov/cybercommission/commissioner-list.cfm .

For more information, see Ms. Todt's presentation.

Updates on Major Programs: Forensic Science – *Dr. Richard Cavanagh, Director, Special Programs Office*

Dr. Cavanagh provided an update on NIST's work in forensic science. Following a 2009 report from the National Academy of Science on the state of forensic science, the President's Commission of Advisors on Science and Technology held a workshop and a series of subcommittees on forensic science with the Office of Science and Technology Policy. As a result, NIST partnered with Department of Justice to improve the state of forensic science. That partnership focuses on three topics: standards of practice for forensic professionals, federal policy to meet societal expectations, and research for new or improved methods and data analysis.

The Organization of Scientific Area Committees (OSAC) was set up to provide technical leadership to help develop and promulgate consensus-based documentary standards and guidelines for forensic science, to have standards in place that were based on sound science, to promote the use of OSAC documents through accreditation and certification bodies, and to share best practices with other organizations around the world and maintain working relationships with similar organizations, which will prevent reinventing the wheel. The end goal is to move OSAC outside of NIST while retaining NIST involvement. One model being looked at is the National Conference on Weights and Measures.

The National Committee on Forensic Science advises the Attorney General and makes recommendations. Some of the recommendations are universal accreditation for all practitioners in the forensics field, interim solutions such as transparency of a quality management system and Automated Fingerprint Identification System (AFIS) interoperability, scientific inquiry and research, medicolegal death investigation, reporting and

testimony using the term "reasonable scientific certainty" to not be used in courtrooms anymore, and training on science and law.

On the policy realm and documentary standards space, NIST is working with Department of Justice to ensure the sustainability of support for OSAC efforts. Those efforts require about $3 million in support, which is currently appropriated to the Department of Justice and then transferred to NIST.

Discussion:

The group discussed the following topic:

- The potential for damage to NIST's international reputation if prosecutors are involved in adversarial relationships.
- Whether the standards being set up would be complied with by other federal laboratories

For more information, see Dr. Cavanagh's presentation.

Update on Major Programs: National Network for Manufacturing Innovation (NNMI) – *Mr. Mike Molnar, Director, Advanced Manufacturing Program Office*

Dr. Mike Molnar provided the VCAT with an update on the NNMI program, and NIST's roles under the Revitalize American Manufacturing and Innovation Act (RAMI).

1. The "Network for Manufacturing Innovation Program" - to convene and support a network of Institutes *(network function)*

    a. The Manufacturing Extension Partnership (MEP) has a memorandum of understanding with the Department of Defense (DOD) and the Department of Energy (DOE) to increase small manufacturer awareness of Institute focus areas and resources, to facilitate small manufacturer informing Institute research, to facilitate small manufacturer participation in Institute research, and to help deploy results of Institute research to small manufacturers.
    b. MEP Centers are being embedded in the NNMI Institutes to enhance the scale of Institute impacts on small US manufacturers by conducting new pilot projects and to broaden and deepen engagements.

2. The National Program Office (NPO) at NIST – to oversee and carry out the Program *(coordination, network support, and reporting function)*

    a. The NPO launched a trial shared services site, implemented a shared calendar, and are in the process of setting up a shared practices library.
    b. The first Annual Report and Strategic Plan were released.

3. New "Centers for Manufacturing Innovation" – using an open topic competition process *(establish new Institutes)*

    a. Dr. Molnar provided the NNMI Network status and 2016 plans. The open topic competition is an 18 month process, which is completed in two stages – stage one - the competition outreach, the private sector provided 135 discrete topics and the after the request for information process, workshops (The NIST Proposers' Day), webinars (to address resources, frequently asked questions and assembling a budget), and public comments, and stage two is the competition, the pre and full applications are due, recommendations are sent to the

selecting official, final decision is made, and the packages are sent to Grants and Negotiations. Then the cooperative agreement will be signed and an Institute award will be announced.

Dr. Molnar concluded his presentation by informing the VCAT that along with DOD and DOE, the Department of Education, National Science Foundation, and NASA have been extraordinary partners in this endeavor.

Discussion:

The group discussed the following topics:

- Challenges in the coordination efforts between the NPO and other Federal Agencies,
- Challenges in getting new institutes up to speed quickly

For more information, see Mr. Molnar's presentation.

Setting the Context – *Dr. Kent Rochford, Associate Director of Laboratory Programs*

Dr. Rochford introduced the primary topic of the VCAT meeting: achieving balance in NIST Laboratory Programs. He pointed out that at previous meetings, the VCAT had expressed concern that NIST was a "victim of our own success" and was being stretched too thin. To address this, Dr. Rochford told the VCAT that he wanted their perspectives about how to ensure NIST maintains balance between various aspects of its core mission in its activities.

Dr. Rochford began by describing how NIST views its core as three responsibilities: measurement science, standards, and technology transfer. He outlined how NIST cultivates those strengths through its planning and budget structure. Specifically, he highlighted the necessity of intramural research, self-determination, and long-term budget stability as critical to maintaining strength in the core.

Dr. Rochford then noted that an increasingly important aspect of NIST's activities is convening, ie, hosting stakeholders collaboratively to solve a problem or address an opportunity. NIST is a very attractive host for these activities and has had success in those areas. However, as these activities become more external facing, they can draw staff and other resources away from other core NIST efforts. NIST is actively trying to achieve balance between these convening efforts – whether self-motivated or required by Congress or the Administration – and NIST research activities.

Dr. Rochford last detailed the request of VCAT: to help NIST consider this problem. What is the right balance? How can we evaluate it? When should we demur and where are we at risk? He then outlined the structure of the session. First, the VCAT would hear from a panel of external stakeholders. Second, program managers for some of the more notable extramural convening programs would describe the costs and benefits of those efforts. Last, the VCAT could discuss these issues with a panel of NIST's Laboratory Directors about the challenges they face in their own Labs.

Discussion:

The group discussed the following topic:

- How and when can NIST say no to Congress and the Administration on externally-directed convening activities.
- What the direct costs of some of these activities have been.

For more information, see Dr. Rochford's presentation.

Panel of Stakeholder Perspectives – *Dr. Bob Doering, Research Manager, Technology and Manufacturing Group, Texas Instruments; Mr. Andy McMillan, President and Managing Director, BACnet International; Mr. Roger Peniche, Director of Worldwide Engineering and Product Innovation, Fluke Calibration; Dr. Gail Folena-Wasserman, Senior Vice President, Biopharmaceutical Development, MedImmune*

Each stakeholder provided brief remarks about how they've interacted with NIST.

Dr. Doering with Texas Instruments (TI) stated his first real connection with NIST began in the early '90s when TI won the Malcolm Baldrige Award. TI's interest in quality in manufacturing continues today. The new metrology techniques and standard reference materials NIST develops are of great value. NIST's technical literature on specific materials is of great interest to TI. Further, TI looks forward to the benefits of the data standards NIST created through the Materials Genome Initiative, which will allow a wider community to exchange information. TI is also very interested in the advanced instrumentation and devices NIST develops through its fundamental metrology research. Quantum computing is another area of interest for the future, but Dr. Doering is not sure how TI will use those technologies in any of their products. Last, Dr. Doering highlighted conferences as valuable to enhancing communication and interdisciplinary collaboration.

Mr. McMillan introduced himself as a leader with BACnet International, an organization that represents over 100 corporate members and over 10,000 individual members with a focus on the idea that intelligent equipment should be able to integrate systems by communicating through a common protocol. Mr. McMillan began by telling the VCAT that his exposure to NIST activities have spanned over three decades and a half a dozen companies. NIST played a valuable role in recent fundamental changes to factory automation and commercial building automation, by helping the industry go from a traditional supplier-specific communications infrastructure to a standards-based open system. NIST's role was to create a collaboration environment where users and suppliers of technology could test out ideas together. NIST's position as a technically competent neutral body helped manage all of the natural tensions and conflicts. NIST also provided guidance on navigating the international standards process, adding credibility to standards. Mr. McMillan continued by briefly explaining how NIST supported the first attempt to put together a standards-based profile around factory equipment communications by building prototype tools.

Mr. Peniche, the Director of Worldwide Engineering and Product Innovation with Fluke Calibration, spoke next. He stated that a partnership between Fluke and NIST would help Fluke fulfill its obligations to customers who want a calibration certification traceable to NIST. Any potential partnership with NIST would be very valuable in this regard.

Dr. Gail Folena-Wasserman, the Senior Vice President of Biopharmaceutical Development with MedImmume, began by telling the VCAT how MedImmune recently expanded collaborations with NIST through a Cooperative Research and Development Agreement (CRADA). They have six to eight ongoing projects working through one principal investigator at NIST and one at MedImmune. Dr. Wasserman continued by emphasizing MedImmune's interest in NIST developing a reference standard for monoclonal antibodies. Dr. Wasserman concluded by stating that quality is important to industry because their goal is to bring new medicines to patients. NIST can support this desire for quality by developing new measurement tools. For example, NIST has new nuclear magnetic resonance technology that can be used to identify the amino acids that cause proteins to aggregate – knowledge that can help improve drug formation stability. One of the projects based on the Raman spectroscopy is being able to put it in a high throughput format, screen hundreds of formulations, and find just the right one.

The VCAT then asked the panel a number of questions.

First, the VCAT asked the panelists what new things NIST could do to help their industries. Mr. McMillan said that it might be useful to structure projects recognizing that, after some initial burst of effort, it often takes a small amount of continued NIST involvement to maximize impact. Dr. Doering suggested that NIST should consider characterizing the changes in standard reference materials over time to allow customers to confidently use the materials for longer. Dr. Wasserman emphasized the importance of having NIST actively engage with the scientific community to share knowledge and at the same time build connections with companies to find out some of ongoing hurdles.

The VCAT also asked what could NIST do to support smaller enterprises and startups. Mr. McMillan said that a primary benefit NIST provides is a collaborative environment for smaller companies to build capabilities on a common platform without having to build it themselves.

Panel for CASE STUDIES

In this session VCAT members received briefings on past or ongoing activities that impacted NIST's core R&D mission.

Smart Grid – *Dr. Dave Wollman, Smart Grid and Cyber-Physical Systems Program Office, Engineering Laboratory*

In 2007, by congressional mandate, NIST was given the primary responsibility to coordinate development of a framework that includes standards to achieve interoperability of smart grid devices and systems. NIST convened a Smart Grid Interoperability Panel (SGIP) consisting of stakeholders. There was no funding for the convening role, therefore it was started on a volunteer-level effort by small teams from several different laboratories. After the 2008 recession, the administration put an emphasis on smart grid with stimulus funds and $4.5 billion went towards smart grid deployments through the Department of Energy. There were concerns that standards in place were not sufficient to support public expenditures. NIST responded by reassigning numerous staff to address smart grid. Since most of the one-time ARRA stimulus funding and budget increases were used to pay for the Smart Grid Office and Smart Grid Framework infrastructure, NIST's work in electrical metrology was put on hold to support NIST staff in SGIP coordination activities.

George Arnold, now retired, launched a very high-visibility interaction with leaders in the community. The White House had a kickoff meeting, including the Secretaries of Commerce and Energy and industry CEOs to get their buy-in, participate, and support the NIST Smart Grid Interoperability Program, followed up by workshops and other activities.

Today, the Smart Grid Interoperability Panel has transitioned to a nonprofit organization, hoping that industry will evolve this effort to be a membership dues-based organization. NIST still has a cooperative agreement, and the NIST funds will be tapering down, from a million-dollar-a-year level in 2013-15, $900,000 in 2016, and then $500,000 in 2018. By rebalancing funds, NIST will increase funding to the research component. Going forward, more stakeholder engagement will be implement, such as the Grid 3.0 multi-organization collaboration.

For more information, see Dr. Wollman's presentation.

Cybersecurity Framework (CSF) – *Mr. Kevin Stine, Applied Cybersecurity Division, Information Technology Laboratory*

In 2013, the President issued Executive Order 13636, Improving Critical Infrastructure Cybersecurity. NIST was directed to work with stakeholders to develop a voluntary framework for reducing cybersecurity risks to critical infrastructure.

NIST hosted seven public workshops around the country. Mr. Stine highlighted some of the benefits and opportunities, such as strengthening long-standing collaborative relationships with industry; establishing new relationships, partnerships, and collaborations with new sectors and organizations; providing an opportunity to highlight our technical depth/breadth, and dedicated staff; amplifying awareness of and interest in other NIST cybersecurity programs; and increasing our interactions with non-technical audiences. He also highlighted some of the challenges, such as the need to divert staffing and other resources from other important work, as well as the continued need to meet increasing interest in how to implement and deploy the framework.

The value of the framework has been widely recognized. The role and approach was reaffirmed in the Cybersecurity Enhancement Act of 2014. The administration continues to turn to NIST on issues of national importance in cybersecurity. For example, under Executive Order 13718, the Commission on Enhancing National Cybersecurity was established. The interest in and use of the Cybersecurity Framework continues to grow.

For more information, see Mr. Stine's presentation.

5G Wireless – *Dr. Nada Golmie, Communications Technology Laboratory*

The Communications Technology Laboratory, established in 2014 supports interoperable public safety communications, enables spectrum sharing and efficient use of the spectrum, and supports research in advanced communications technologies including millimeter wave metrology, ultra-dense networks, and massive multiple input/multiple output (MIMO) technology.

Dr. Golmie described NIST's research efforts to develop measurement solutions for these advanced communications techologies through the formation of the 5G Wave Model Chanel Alliance. Less than a year after its founding, the 5G Alliance has tripled in participation and has plans for workshops co-located with relevant stakeholder industry meetings.

Dr. Golmie discussed some of the short-term milestones and what NIST's contributions are. She also highlighted the cost of NIST's support role, including a burden on NIST technical staff and the costs of a contract to support the working group and online data repository.

For more information, see Dr. Golmie's presentation.

PANEL OF NIST LAB DIRECTORS – *Dr. Charles Romine, Director, Information Technology Laboratory (ITL), Dr. Laurie Locascio, Director, Material Measurement Laboratory (MML), Dr. James Olthoff, Director, Physical Measurement Laboratory (PML), Dr. Howard Harary, Director, Engineering Laboratory (EL)*

In this session VCAT members were able to get the perspectives of various NIST Laboratory directors on the challenges of balancing investment in NIST's R&D programs while meeting external demands and mandates.

Dr. Romine highlighted the value of the Cybersecurity Framework activity has forged new relationships with different parts of the industry that is going to pay dividends for decades to come. NIST must manage a balance between the high-profile delivery mechanisms and the investment in basic research. Dr. Romine gave the example of the health information technology and the Office of National Coordinator for Health Information Technology (ONC) partnering with NIST to provide the tools and testing infrastructure for ONC to accelerate the adoption of electronic health care records. Almost all research has been cut off due to lack of resources or pressure on NIST discretionary funding.

Dr. Locascio shared her thoughts on the differences between MML and ITL, her researchers are being pulled to leadership roles leaving a gap in the research itself. Her example is that MML developed a Genome in a Bottle Consortium about microarray standards a decade ago, which grew into standards for the whole genome. Because of the success of those efforts, her researchers have been asked to create other groups and panels, pulling them away from research. Without new funding in these newly created groups, MML has to reprogram staff, which means added responsibility that also depletes the technical expertise.

Dr. Olthoff stated that even though PML has a very different role than other laboratories, as their work validates the importance of how to do measurement and improve accuracy, they too have to spread their staff thin when they are required to as address specific measurement challenges for external partners such as the Centers for Disease Control (CDC).

Dr. Harary shared his perspective that EL is one of the two laboratories that are the principal recipients and beneficiaries of legislative mandates, executive orders, and presidential action plans. For example, EL has two federal advisory committees that they have the administrative responsibility to run: the National Construction Safety Team and the Advisory Committee on Earthquake Hazards Reduction. NIST also received responsibility to develop a Community Resilience Planning Guide through the President's Climate Action Plan. To provide greater research capabilities in these areas with significant extramural responsibilities, NIST has invested in disaster resilience fellows and a Center of Excellence on resilience centered at Colorado State University focused on the modeling area, which will be beneficial to NIST in many ways, one of which may be new hires.

The VCAT asked for the panelists' perspectives on the impact of politically charged topics such as voting standards. The Lab Directors said that NIST tries to stray away from things that are partisan but, in cases of statutory requirements, we really have no choice so we do the very best technical work possible without putting NIST in a partisan position.

The VCAT then asked the panelists how many staff are dedicated to externally-driven activities beyond fundamental research. The laboratories with the most extramural demands – ITL and EL – each have several dozen staff out of several hundred that can be dedicated to these activities. Similarly, bench scientists in MML and PML may be pulled away from research to participate in and lead standards development activities or measurement science outside of their other duties.

Wednesday, June 8, 2016

Review of National Strategic Computing Initiative – *Dr. Carl Williams, Deputy Director, Physical Measurement Laboratory*

Dr. Williams presentation summarized the National Strategic Community Initiative (NSCI), and NIST's role in it. To support NIST's efforts in the NSCI NIST requested a $13.75M increase in the FY2017 budget. To jump start NIST's work in this space the ADLP has invested $3M of discretionary funding.

The NSCI principles are to deploy and apply new high-performance computing (HPC) technologies, foster public-private collaboration, adopt a whole-of-government approach, and develop a comprehensive technical and scientific approach to transition HPC research. Their strategic objectives are to accelerate delivery of a capable exascale computer system, increase coherence between the technology base used for modeling and simulation, establishing over the next 15 years a viable path forward for future HPC systems even after limits of current semiconductor technology is reached, increasing capacity and capability of an enduring national HPC ecosystem, and developing an enduring public-private collaboration ensuring research and development benefits shared between the Federal Government, industry, and academia.

The NSCI scope is very large and includes hardware, software, architecture, data analytics, software validation, data verification, cybersecurity, and alternative computational paradigms. It requires integration of the program, identifying strengths and current investments, assessing gaps, evaluating where NIST should be in a decade, and creating a path forward.

Dr. William's has formed a multi-laboratory coordination group consisting of researchers from PML, ITL, MML, and CNST to roadmap NIST's approach to providing the measurement research necessary to support the development and implementation of future computing technologies.

NIST's strengths/expertise are in the areas of research and measurement science but, we lack in the area of co-design but, will engage with Department of Defense and DoE who have the expertise.

Discussion:

The group discussed the following topics:

- Difficulty of keeping up with the speed of change in super computing technology
- Timeline and staying globally competitive
- NIST's position to help industry with limited resources and capabilities
- NIST's challenge of enhancing reliability, reproducibility, and error quantification in new computing paradigms while achieving new modeling capabilities

For more information, see Dr. Williams' presentation.

Administrative Business

Dr. Colwell reminded VCAT that they need to produce a report by the end of February, and that a main focus of the report should be on recommendations for balancing core research and efforts of NIST to ensure that other forms of service to the nation are not overwhelming one or the other. Dr. Colwell also enquired how the VCAT could help with educating the new administration on the important role of NIST. Because of the traditional timing of the VCAT report, the VCAT members discussed whether shorter topic specific papers might be a more-timely approach for informing incoming policy makers.

There were no public comments offered.

In closing, Dr. May believes NIST is moving in the right direction, and that NIST needs input from external sources to assist in offering maximum benefit to our country.

Adjournment

The meeting was adjourned at 11:53 AM.

I hereby certify that to the best of my knowledge, the forgoing minutes are accurate and complete.

Stephanie Shaw, Designated Federal Officer, NIST Visiting Committee on Advanced Technology

Dr. Rita Colwell, Chair, NIST Visiting Committee on Advanced Technology