The Power to Transform U.S. Manufacturing
Dr. Phillip Singerman
Associate Director for Innovation and Industry Services, NIST
2016 NIST NNMI Institute Competition

Proposers’ Day, March 8, 2016

**Website and Resources**
- Resources to assist Applicants, include:
  - Documents, FAQs, Suggested Templates and Guidance, and How-To’s
  - Cooperative Agreements & Award Requirements, and Publications
- Send questions to NIST hotline at nnmifund@nist.gov or (301) 975-0404

**Competition Timeline**
- **February 19, 2016**
  - Announced on [Grants.gov](https://grants.gov/) (2016-NIST-NNMI-01)
- **April 20, 2016, 11:59 p.m. ET**
  - Pre-Applications due through Grants.gov
- **May 23, 2016 (on or about)**
  - Pre-Application review and selection notification
- **July 22, 2016, 11:59 p.m. ET (on or about)**
  - Full Applications due through Grants.gov
- **Q1, CY 2017**
  - Anticipated start date for awards
2016 NIST NNMI Institute Competition

NNMI: The Power to Innovate

Welcome

Dr. Willie E. May
Under Secretary of Commerce for Standards and Technology
& NIST Director
NIST is part of the Department of Commerce

Penny Pritzker
Secretary of Commerce

NIST’s Mission is to:

promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.
NIST At-a-Glance

Major Assets, Partnerships, People, Budget

2 Large Research Campuses

Gaithersburg, MD—62 bldgs., 578 acres
Boulder, CO—26 bldgs., 208 acres

Partnerships In Every State

60 Manufacturing Extension Centers
10 joint institutes/Centers of Excellence

FY 2016 Appropriations.
$964 Million

NIST labs, $690 M
Industrial Technology Services, $155 M
Construction of Research Facilities, $119 M

People: Employees & Associates

~3,400 Federal Employees
~3,700 Guest Researchers & other NIST Associates
~400 NIST Staff on ~1,000 standards committees

Addition Resources
~$120 M from other government agencies
~$50 M from reimbursable services
“It is therefore the unanimous opinion of your committee that no more essential aid could be given to
• manufacturing
• commerce
• the makers of scientific apparatus
• the scientific work of Government
• schools, colleges, and universities
than by the establishment of the institution proposed in this bill.”
NIST is a world-class scientific and technical agency uniquely focused on driving innovation and economic competitiveness through:

- **a world-leading scientific research program** – measurement, technology, and standards solutions to our stakeholders
- **a Manufacturing Extension Partnership** – focused on strengthening our nation’s small and medium manufacturers
- **an Advanced Manufacturing National Program Office** – facilitating expansion of a nationwide network of Institutes for innovation in Manufacturing
- **a Baldrige Performance Excellence Program** – used to assess the nation’s companies and organizations which is recognized, utilized, and emulated around the world

We have a great and unique Mission and are:

- a key player on the Administration’s Innovation Team
- the nation’s go-to agency for measurements, standards, and technology
- receiving bipartisan and bicameral support
NIST (NBS) established in 1901
Organic Act of 1901; Updated in 2008

Functions and activities of the Institute include:

- custody and dissemination of national standards
  - comparison of U.S. national standards with those of other nations
- determination of physical constants and the properties of materials,
- solutions to measurement and standards problems of other government agencies
- providing “Innovation” assistance to industry

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NMI’s Around the World are Working together
to link our global measurement system to the fundamental constants of nature

<table>
<thead>
<tr>
<th>Unit</th>
<th>Reference value used to define the unit in current SI</th>
<th>Reference value used to define the unit in the new SI</th>
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<tbody>
<tr>
<td>second, s</td>
<td>$\Delta v^{(133}\text{Cs})_{\text{hfs}}$</td>
<td>$\Delta v^{(133}\text{Cs})_{\text{hfs}}$</td>
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<td>metre, m</td>
<td>$c$</td>
<td>$c$</td>
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<tr>
<td>kilogram, kg</td>
<td>$m(\kappa)$</td>
<td>$h$</td>
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<tr>
<td>ampere, A</td>
<td>$\mu_0$</td>
<td>$e$</td>
</tr>
<tr>
<td>kelvin, K</td>
<td>$T_{\text{TPW}}$</td>
<td>$k$</td>
</tr>
<tr>
<td>mole, mol</td>
<td>$M(\text{^{12}\text{C}})$</td>
<td>$N_A$</td>
</tr>
<tr>
<td>candela, cd</td>
<td>$K_{\text{cd}}$</td>
<td>$K_{\text{cd}}$</td>
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</tbody>
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Rigorous realization of these units has provided undeniable impact on trade, commerce, and quality of life.
Lead the world in defining the International System of Units

**Record-setting Atomic Clock**
NIST/JILA’s strontium lattice atomic clock, accurate to:
1 second in 15 billion years

**Why this level of Precision Matters:**

**Electric power grid** requires:
synchronization to about 1 millionth of a second per day

**Modern telecommunications and computer network systems** require:
synchronization to about 1 millionth of a second per day

**GPS system** requires:
synchronization to about 1 billionth of a second per day.

NIST official time is used to time-stamp hundreds of billions of dollars in U.S. financial transactions each working day.
But since our inception as the National Bureau of Standards in 1901, in addition to maintaining the more traditional National Physical Measurement Standards, we have also focused a significant portion of our research and measurement services activities on addressing contemporary societal needs.

NIST has become:
- a key player on the Administration’s Innovation Team
- the nation’s go-to agency for measurements, standards, and technology

**Supporting the Industrial Revolution**
- Interoperability of fire hose screw threads
- Light bulb standards
- Standards for irons and steels
- Working with ICC to reduce railway accidents

**2016**
- Advanced manufacturing
- Advanced communications
- Advanced materials
- Bioscience and Health
- Cyber-physical systems
- Cybersecurity
- Disaster resilience
- Forensic science
- Quantum science
Current Institutes (Sponsored by DoD and DoE)

- **America Makes** (additive manufacturing) Youngstown, OH
- **Digital Manufacturing and Design Innovation Institute**, Chicago, IL
- **Lightweight Innovations for Tomorrow**, Detroit, MI
- **Power America** (Wide Band Gap Semiconductors) Raleigh, N.C.
- **Institute for Advanced Composites Mfg. Innovation**, Knoxville, TN
- **Integrated Photonics**, New York
- **Flexible Hybrid Electronics Manufacturing Innovation Institute**, San Jose, CA

Coming this year!
- DoC – 1-2, open topic
- DoD – 2, topics TBD
- DoE – 2, topics TBD

Today, I’m asking Congress to build on the bipartisan support for this idea . . . creating a network of these hubs and guaranteeing that the next revolution in manufacturing is “Made in America.” -- July 30, 2013

**NIST Role in NNMI**

- **NIST MEP Network linked to NNMI Network** via MOUs, to ensure institute work with small and medium entities
- **NIST lab experts are heavily involved in advisory roles and collaborations with Institute researchers**
- **And now, establish open-topic DoC-led Institute(s)**
Again, Welcome to NIST!
We hope your time here is informative and productive.

2016 NIST NNMI Institute Competition Proposers’ Day

Session I: The 2016 NIST Funding Opportunity
• NNMI and NIST Competition Overview
• The Elements of a Complete and Competitive Application
• How Applications Will Be Evaluated

Session II: MEP and Administrative Requirements
• Leveraging the Network of NIST MEP Centers
• Administrative and Award Requirements

Session II: Participant Questions and Next Steps
• Questions and Answers
• Wrap-Up and Next Steps