Science, Technology, and Innovation for America’s National Security

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Associate Director

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Two major responsibilities for OSTP

1. Policy for Science and Technology
   - Analysis, recommendations, and coordination with other White House offices on R&D budgets and related policies
   - S&T education and workforce issues
   - interagency S&T initiatives: spectrum, cyber, global health security, open government, ...

2. Science and Technology for Policy
   Independent advice for the President about S&T germane to all policy issues with which he is concerned
## A Track Record of Critical Contributions

<table>
<thead>
<tr>
<th>20th Century</th>
<th>21st</th>
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<tr>
<td>Nuclear weapons</td>
<td>Nerve &amp; Muscle interfaced artificial limbs</td>
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<td>Radar</td>
<td>Armed UAVs</td>
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<td>Proximity fuse</td>
<td>Optical SATCOM</td>
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<td>Sonar</td>
<td>Data mining</td>
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<td>Sonar</td>
<td>Advanced seekers</td>
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<td>Jet engine</td>
<td>Decision support</td>
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Innovation for national security

- Open government, open data, open access, open innovation
  - Presidential Innovation Fellows
  - Challenge.gov
- Presidential initiatives
  - Big Data
  - Manufacturing
  - BRAIN
- President’s management agenda
  - Acquisition reform
National Network Manufacturing Institutes

White House Report
NNMI Framework Design
January 2013

March 2012
Additive Mfg Pilot

January 2013
Digital Mfg
Power Electronics
Lght-weight Metals

Next Steps: #’s 5-9 in 2014/15
Photonics, ....
Derived from President’s National Security Strategy, OSTP is developing the **National Security Science and Technology Strategy**

- Provide an updated, unified national approach to ensure appropriate resource allocation, technological priorities and S&T policies to continue national security S&T superiority

- Will convene interagency groups with key stakeholders to guide development of strategy informed by:
  - An assessment of past and current S&T strategies
  - Scenario planning
Active national security policy issues

- Cybersecurity / big data / privacy
- Disaster response, resilience, crisis communications
- Biodefense and global health security
- Nuclear weapons, nuclear defense, nuclear energy, and nuclear waste
- National security space
- Defense technologies
- Arctic
- Energy and climate I Climate Action Plan
National Strategic Computing Initiative

Challenge: Creating actions for the federal government to sustain U.S. lead for High Performance Computing

Developing government & private sector initiatives that create strategic advantages for national security, economic competitiveness and scientific discovery
**Challenge:** Information owners lack the tools & workforce to implement a resilience strategy that favors the defender.

- Deterrence efforts are hampered by limitations in speed, scale, and attribution.

Leading the interagency to develop tools, techniques, national workforce & facilities to support a balanced strategy of resilience and deterrence enabling the U.S. to stop or deter adversaries much sooner.
• Supporting ODNI and DOJ’s efforts to define and implement reforms under PPD-28 *Signals Intelligence Activities*.

• Supporting 78 reform actions & initiatives from the *Report and Recommendations of The President’s Review Group on Intelligence and Communications Technologies* – Includes review of big data and privacy led by Counselor Podesta

• Supporting current PCAST study to – Clarify current and future big-data technological capabilities – The associated challenges and opportunities relating to privacy and civil liberties.

• Co-lead with ODNI an Information Sharing and Access (ISA) Interagency Policy Committee on large-scale data processing challenges associated with intelligence & information that straddles the foreign and domestic divide.
Countering Biological and Chemical Threats

• Biological threats span a wide security spectrum
  – Natural outbreaks of infectious disease
  – Accidents involving dangerous pathogens
  – Deliberate acts of bioterrorism

• S&T Priorities
  – Combatting the rise in antibiotic-resistant bacteria
  – Strengthening infectious disease prediction and forecasting capabilities
  – Ensuring effective oversight of life sciences dual use research of concern
  – Highlighting the important role of S&T in advancing global health security
“...we must ensure that terrorists never acquire a nuclear weapon. This is the most immediate and extreme threat to global security.  

Prague, April 2009

“Peace with justice means pursuing the security of a world without nuclear weapons -- no matter how distant that dream may be. “  

Berlin, June 2013

- Lead whole-of-government efforts in non-proliferation, detection, forensics, response and recovery
- Convene Stakeholders meeting to Encourage Reliable Supplies of Molybdenum-99 Produced without Highly Enriched Uranium
- Support Treaty regimes by offering technologic verification means, including the discovery class science required to advance monitoring capabilities
Current trends are adversely affecting the national security S&T enterprise

- Globalization of science and technology
- Mobility of workforce
- Funding constraints
- Growth in private sector research and innovation

- National security inherently “national”
- Security missions benefit from commitment
- Challenges for R&D and the enterprise as a whole
- Updated partnership models needed for public & private sector institutions
Initiatives for the national security S&T enterprise

• People
  – Next generation IPA
  – Career paths for military scientists
  – New PMF-STEM

• Places
  – Capability assessments and trade-offs
  – Third party financing
  – Multi-agency facility sharing

• Roles and Rules
  – FFRDC governance best practices
  – Pilot lab conversion study
FY14 NDAA Legislation – Management Innovation

§1107(a) – **Direct Hire** for all S&E candidates, by the Lab Director, with annual appointment limits

§1107(f) – Lab Director **appoint** & manage Senior Scientific Technical Managers to engage in S&E related research and management

§1107(h) – Exclusion from Personnel Limitations - Lab Director shall **manage** the lab workforce strength, structure, positions, & compensation with available budget
Partnerships: Federal Security Labs, Academic, & Industry Partners

Gates & high walls provide 20th century security, but are barriers to 21st century innovation.
Create “skunk works” in the industrial base, universities and the DOD labs to undertake targeted, unconventional, potentially disruptive programs through prototyping.

- Provide rotational assignments for individuals from government, the industrial base and the private sector.

- Create a culture to nurture critical STEM skills within the DOD workforce as well as provide exciting, challenging and highly attractive opportunities for the STEM workforce.

Lab to Market

FY 2015 President’s Management Agenda – Lab-to-Market Cross-Agency Priority Goal established to improve & accelerate technology transfer

GOAL ACTIONS
(1) Optimize the management, discoverability, and ease-of-license of 100,000+ Federally-funded patents
(2) Increase the utilization of Federally-funded research facilities by entrepreneurs and innovators
(3) Ensure that relevant Federal institutions and employees are appropriately incentivized to prioritize R&D commercialization
(4) Identify steps to develop human capital with technology transfer experience
(5) Maximize the economic impact of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs
STEM Education for Army Children – Partnerships Between the Army, DODEA, Public Schools, Teachers and Students

Priority #2: Ensure excellence in military children’s education and their development. – Presidential Study Directive-9

POSSIBLE ACTIONS

• National Math & Science Initiative AP Program
• Internships at DOD Labs and Centers
• Fellowships for Army Children
• Mentorship Opportunities for Army Civilians
• …

Program Expansion Possibilities:
Ft. Rucker (AL), Ft. Polk (LA), Ft. Bragg (NC), Ft. Drum (NY), others, …
Strong support for innovation and the U.S. science and technology enterprise

- Science and technology will drive America’s future: jobs, our economy, health, energy security, and national & homeland security

- The DoD S&T enterprise is a critical element of U.S. capabilities and strengths