Science in its Rightful Place: Science, Technology, & Innovation Policy in the Obama Administration

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The new President’s pledge in 2009

“We will restore science to its rightful place…”
Barack Obama, January 20, 2009

(Here “science” was short for “science, technology, & innovation—ST&I”)
What he’s done to keep the pledge

• Placed early priority on...
  – scientific integrity
  – STEM education & inclusion
  – open data & public access
  – tech innovation for economic recovery & growth
  – energy & climate change
  – advancing biomedicine & public health
  – strengthening international cooperation in S&T
  – rebalancing NASA to boost science, advanced tech
  – exploiting modern IT and private-sector innovation talent to improve the responsiveness & effectiveness of gov’t

Keeping the pledge (continued)

• Put a huge boost for ST&I in the Recovery Act, then fought for ST&I budgets despite tight constraints

• To help implement it all, rebuilt White House leadership in ST&I
  – Created new WH positions: CTO, CIO, CDS, CDO
  – Created a WH Office of Energy and Climate
  – Restored OSTP Director’s dual hat as AP for S&T
  – Restored Environment and National Security & International Affairs to status as full OSTP divisions
  – Revitalized President’s Council of Advisors on S&T (PCAST) and National S&T Council (NSTC)
  – Built up the OSTP staff to match
**OSTP today**

- **Staff**: ~130, of which 100 are technical (mostly detailers, IPAs)
- **Director**: John Holdren*
- **CTO**: Megan Smith*
- **FY2016 budget**: ~$5.6 million/yr

**Director’s Office**

- NSTC Executive Director
- NSTC National Coordination Offices
- Science Division Associate Director
- Technology & Innovation Division Deputy Director
- Environment & Energy Division Division Leader
- National Security & International Affairs Division Division Leader

**Chief of Staff**

- PCAST Executive Dir.
- Office of the CTO

*Both Director Holdren and CTO Smith have the rank of Assistant to the President

**OSTP interacts closely with other White House components with ST&I interests**

The Executive Office of the President (EOP)

- Office of Management & Budget (OMB)
- Council on Environmental Quality (CEQ)
- Council of Economic Advisors (CEA)
- Domestic Policy Council (DPC)
- National Security Council (NSC)
- National Economic Council (NEC)

EOP also includes Offices of: Vice President, Chief of Staff, Cabinet Affairs, Communications, Intergovernmental Relations, Public Engagement, Social Secretary, US Trade Representative, Energy & Climate Change, and more.
OSTP: two major responsibilities

1. Policy for ST&I

Analysis, recommendations, and coordination with OMB and other White House offices on R&D budgets & related policies, S&T education and workforce issues, interagency ST&I initiatives, broadband, open government, scientific integrity ...

2. ST&I for policy

Independent advice for the President about ST&I germane to all policy issues with which he is concerned

OSTP’s specific responsibilities also include...

- providing White House oversight for NSF and NASA;
- chairing and managing the interagency National Science & Technology Council (NSTC);
- providing administrative and analytical support for the President’s Council of Advisors on Science & Technology (PCAST);
- carrying out a range of functions in support of National Security and Emergency Preparedness Communications; and
- coordinating & overseeing US cooperation in S&T with other countries.
OSTP-managed entities (continued)

- National Ocean Council (NOC, jointly with CEQ)
  - Implements the National Policy on Oceans, Coasts, Great Lakes
- Interagency Task Force on Climate Preparedness & Resilience (jointly with NSC, CEQ, OMB)
  - Implements P&R aspects of the President’s Climate Action Plan
- Arctic Executive Steering Committee
  - Executes the 2015 Arctic-activities-coordination strategy
- Six ministerial-level Joint Commissions on S&T Cooperation (with support from State Department)
  - Brazil, China, India, Japan, Korea, Russia
- US-China Dialogue on Innovation Policy
  - Addresses challenges in IP, discrimination v. foreign firms

OSTP-managed entities (continued)

- President’s Council of Advisors on Science and Technology (PCAST)
  - A PCAST or its equivalent has existed under every U.S. President since Eisenhower.
  - The current PCAST has 19 members, of whom 18, including one Co-Chair, are part-time, uncompensated Special Government Employees, appointed by the President.
  - The 19th member and other Co-Chair is the Assistant to the President for S&T / OSTP Director.
  - PCAST’s function is to provide an additional high-caliber source of S&T advice for the President and to help connect him with the outside S&T community.
  - Administrative support for PCAST is provided by an Executive Director and two deputies housed in OSTP.
The members of the 2nd-term Obama PCAST

- J. Holdren
- E. Lander
- W. Press
- M. Savitz
- W. Austin
- R. Bierbaum
- C. Cassel
- C. Chyba
- S. J. Gates
- M. Gorenberg
- S. Graham
- M. Halpern
- C. Minkin
- M. Molina
- C. Mundie
- E. Penhoet
- B. Schaal
- E. Schmidt
- D. Schrag

PCAST studies in the Obama Administration, 2009-2016

**Biomedicine & Public Health**
- The science and technology of 2009-H1N1 influenza
- Reengineering the influenza vaccine production enterprise
- Realizing the full potential of health IT to improve healthcare
- Accelerating drug development and approval
- Combating antibiotic resistance
- Technologies to assist with hearing
- Technologies for graceful aging
- S&T for safe drinking water [Fall 2016]

**Energy, Resources, & Environment**
- Accelerating the pace of change in energy technologies
- Sustaining biodiversity and other environmental capital
- Agricultural preparedness and related R&D
- Options for climate-change mitigation & resilience (2 reports)
President Obama has embraced a large fraction of PCAST’s recommendations.
Implementation of PCAST studies

PCAST recommendations embodied in the 2010-2016 budgets:

• Prepare an additional 100,000 K-12 STEM teachers by the end of the decade; launch a STEM Master Teacher Corps
• Launch a new Advanced Research Projects Agency – Education
• Initiate improvements to influenza-vaccine manufacturing to shorten production timeframe
• Conduct DOE Quadrennial Technology Reviews to assess energy options; conduct interagency Quadrennial Energy Reviews
• Accelerate adoption of Electronic Health Records; develop standards for health-information exchange over the internet
• Expand research to foster the next revolution in IT, to help transform healthcare, energy efficiency, education, and transportation
• Launch a network of advanced-manufacturing centers
• Require increased clearing and sharing of electromagnetic spectrum held by Federal agencies to create more commercial opportunity
• Launch 3 new multidisciplinary research institutes for agriculture
• Increase collaboration with the private sector on climate resilience

Keeping the pledge (continued)

• Recruited top ST&I talent to POTUS-appointed posts
  – 5 Nobel Laureates in science; another 25+ members of National Academies; VP’s of NAS & NAE to PCAST, plus Schmidt, Mundie
  – scientists & engineers heading Dept’s of Energy & Interior, as well as EPA and NIH, NSF, NOAA, NIST, USGS
• Used bully pulpit & WH venue to promote ST&I
  – Both inaugural addresses & every State of the Union, two addresses to NAS annual meetings; multiple major speeches on ST&I around the country (on space, energy, manufacturing…)
  – 6 White House Science Fairs, 2 WH Astronomy Nights for Kids, East Wing ceremonies & Oval Office welcomes for Medalists of Science and Technology & Innovation, US Nobelists & Kavli Prize winners, Intel finalists, middle-school mathletes, outstanding teachers...
• Launched unprecedented number of ST&I initiatives focused on national & global challenges
POTUS events around STEM-ed and ST&I

1st WH Astronomy Night for Kids
Mathletes in the Oval Office
1st WH Science Fair
Honoring outstanding K-12 science teachers
Visiting MIT’s Energy Lab

Initiatives on nat’l & global challenges

STEM EDUCATION
• Educate to Innovate
• STEM Master Teacher Corps
• 100kin10
• STEM Inclusion Initiative
• Computer Science for All

INFOTECH / COMPUTING
• ConnectED
• Big Data Initiative
• Nat’l Strategic Computing Initiative

INNOVATION FOR THE ECONOMY
• American Innovation Strategy
• Startup America
• Data.gov
• Challenge.gov
• Advanced Mfg Partnership / Nat’l Network for Mfg Innovation

BIOMEDICINE & HEALTH
• Neuroscience / BRAIN Initiative
• Combating Antimicrobial Resistance
• Precision Medicine Initiative (PMI)
• Cancer Moonshot

ENERGY & ENVIRONMENT
• New fuel-economy/CO₂ standards
• ARPA-E, Energy Innovation Hubs
• National Ocean Policy
• Arctic Initiative / AESC
• Pollinator Initiative
• Climate Action Plan & COP21

NAT’L SECURITY / INTERNAT’L S&T
• Cybersecurity Initiative
• Space Weather Strategy
• Science Envoys
• Mission Innovation
The unfinished ST&I agenda: a partial list

- Ensuring sufficient, safe, secure, sustainable, affordable food, water, & energy for all, while reducing GHGs
- Minimizing harm from changes in climate that are no longer avoidable
- Fashioning materials from abundant elements to substitute for current uses of scarce ones
- Understanding the brain & curing its ailments
- Controlling infectious & vector-borne diseases
- Defeating cancer
- Facilitating graceful aging
- Defending the planet from killer asteroids
- Sending humans into space not just to visit but to stay

Some persistent obstacles

- Inadequate funding for R&D (public & private)
- Slow translation of R&D advances into practical applications
- Under-representation of females & ethnic minorities in STEM fields
- Under-representation of ST&I talent in many Federal departments, agencies, and offices
- Poor public & policy-maker understanding of ST&I
  - the role of ST&I in meet societal challenges
  - the importance of basic research
  - the value of international cooperation
Some big opportunities on the path ahead

- Harness the full potential of partnerships (local/state/federal, public/private/academic/civil-society, international) to overcome many of the obstacles.
- Continue the “infiltration” across the gov’t of ST&I talent by aggressive recruiting, PIFs, AAAS fellows, etc.
- Apply research on “what works” in STEM inspiration, teaching, mentoring, training to increase participation in STEM careers and create a science-savvy citizenry.
- Exploit recent advances in biomedical sciences & “big data” to drastically improve healthcare.
- Build on the momentum of COP21 and the recent rapid growth of renewable-energy deployments worldwide to fashion a global revolution in clean energy.

http://www.ostp.gov