One Perspective on Science Policy

Carl Picconatto, Ph.D.
The MITRE Corporation
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All materials contain herein represent the opinions of the author. They are neither approved nor endorsed by the MITRE Corporation.
Objectives of this Presentation

- Briefly discuss my view of the world of science policy
- Describe my role within that worldview, esp., working at MITRE in particular & FFRDC's in general

While this talk is intended to provide information, it should be viewed more as a dialogue than a presentation

Please interrupt if you have questions or comments

FFRDC's = Federally Funded Research and Development Centers

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How Does The Government Get Scientific Information?

- Disciplinary Societies
- Non-Profit Organizations
- Industry and Lobbying Groups
- Research and Development Corporations
- Government Agencies
- MITRE
- Library of Congress Cong. Research Service

There is no shortage of policy advice available to Government.
The Science/Policy World as I See it

Science

- Academia
- Government Labs
- Industry

Policy

- Congress
- Think-Tanks
- Government Agencies
- National Academies
- FFRDC’s

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Three Types of Jobs in Science Policy

- Working to make policy
  - Executive Branch
  - Congress
  - Regulatory Agencies
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- **Working to influence policy**
  - The National Academies
  - Disciplinary Societies, e.g., ACS, AAAS
  - Lobbyists/Commercial Interests
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- **Working to implement policy**
  - Executive Agencies
  - *FFRDC's*
  - Consulting Firms, aka, "Beltway Bandits"
  - Commercial Interests
What is an FFRDC?

- FFRDC = *Federally Funded Research and Development Center*
  Created following World War II, there are 36 FFRDC’s e.g., MITRE, RAND, Aerospace, DOE labs (Brookhaven, Sandia, etc.)

- Three basic types
  - System Engineering
  - Policy and Analysis
  - R&D

- Organized as independent entities with *restrictions* on activities

- Greater flexibility than Government agencies, while retaining unique access to sensitive industrial and government information

- Works in the public interest to assist the Government with scientific research and analysis, systems development, and systems acquisition in order to solve complex technical problems that cannot be solved by a single group
What is The MITRE Corporation?

- A not-for-profit corporation chartered by the Congress to perform systems engineering and information technology R&D in the public interest

- Unbiased, “friend of the Government” in high technology planning, prototyping, and acquisition
  - No manufacturing or for-profit activities
  - Constrained to ensure impartiality

- Operates several Federally Funded Research & Development Centers (FFRDC’s) under sole-source contracts with
  - Military Services and DOD
  - Federal Aviation Administration
  - Internal Revenue Service
  - Treasury
  - Dept. of Homeland Security
Working at MITRE: What do I do?
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- Science Benchwork
Working at MITRE: What do I do?

- Science Benchwork
  - Direct a laboratory

2700 sq. ft physical lab that supports both nanotech & biotech expts.

Two dedicated portions of lab for nanotech-related expt’s

Four expt’l thrust areas focusing on critical areas for Gov’t

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Working at MITRE: What do I do?

- Science Benchwork
  - Direct a laboratory
  - Write papers, patents, books, book chapters, etc.
Working at MITRE: What do I do?

- **Science Benchwork**
  - Direct a laboratory
  - Write papers, patents, books, book chapters, etc.
  - Manage a reasonably large, broadly based R&D effort
    - Nano & molecular electronics
    - Nose-like nanosensing systems
    - Nano-enable power and energy
    - Nanomaterials

Nanoelectronic Memories and Processors

Nose-like Nanosensing Systems

Hybrid Nano-enabled Power Systems

High-Energy Storage

High-Power Delivery

Control Circuit

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Working at MITRE: What do I do?

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  Nano & molecular electronics
  - Nose-like nanosensing systems
  - Nano-enable power and energy
  - Nanomaterials
  - Nanoelectronic Memories and Processors

While fundamental R&D is very important to my group and to MITRE, it is not the bulk of what I do

My main focus is to provide world-class, technical support to the U.S. Government

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Wide-Ranging, Technical Assistance to the U.S. Military & Intelligence Communities

- Plan, mount, and help administer major R&D programs, e.g., National Nanotechnology Initiative, DARPA's ULTRA, Moletronics, and MoleApps programs, U.S. NETI
  - Working with Program Managers (PM's) to develop R&D program proposals
  - Providing subject matter expertise to source selection committees
  - Assisting PM's with the oversight and review of academic and industrial performers under contract

- Collaborate, at the Gov't's instruction, with program PI's to conduct fundamental R&D not covered by submitted proposals

- Provide system engineering assistance to the government to integrate technology from the lab, through prototyping, to programs of record, e.g., ARMY ATOs, and JCTDs

DARPA = Defense Advanced Research Projects Agency; NETI = Nanoenabled Technology Initiative
ATO = Army Technology Objective; JCTD = Joint Capability Technology Demonstration

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Wide-Ranging, Technical Assistance to the U.S. Military & Intelligence Communities

- Organize major national meetings to inform and educate Gov't on specific topics of national security interest
Summary of how MITRE Intersects with Science Policy

Working at MITRE in particular, & FFRDC's in general provides:

- Access to the most cutting edge research in development, often well in advance of publication
- Collaborations with world-class, best-in-breed researchers in both academia and industry
- The opportunity to impact directly the decisions affecting both fundamental and applied R&D throughout the entire U.S. science and engineering portfolio
- True "insider" dealing with critical issues regarding the direction of science and engineering R&D

A strong connection to fundamental R&D, but focus on much broader support to S&E efforts throughout the Government

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Conclusions

- Many view science policy through the narrow prism of regulations/laws/money
  - Critical area that needs scientists to become directly involved, either at the "making" or "influencing" level
  - General scientific training/processes are highly valuable, but will not leverage your specific education/skills
  - Fellowships are an excellent (necessary?) way to find opportunities in these areas

- There are broader ways to think about science policy, however
  - Opportunities to work at the application level, where things get built and fielded
  - Such positions do not require a "change in career"

Ultimately, to impact science policy at the most fundamental level, you have to do science
~ Supplementary Vugraphs ~
Background in Science and Technology Policy

- Came to Washington in 2002 as a Christine Mirzayan Fellow of the National Academy of Sciences
  - Worked for the Committee on Science, Engineering, and Public Policy
  - Examined post-doctoral education issues, government reporting requirements, human cloning technologies, & K-12 math and science ed.

- Later, served as a Congressional Fellow for both the National Academies and the ACS
  - Worked in the personal office of the Honorable Constance A. Morella
  - Senior member of the House Committee on Science
  - Very scientifically astute district (home of NIST, NOAA, NIH, FDA), and strong focus on a technical and scientific legislative agenda
Still, Scientists are Needed in the Policy Community

- **Key Need:** People who can translate science for government
  - Address specific issues, at the appropriate level of detail e.g., stem cells, nanotechnology
  - Provide context to the broader issues impacted by S&T

- **"Trusted Advisors"** with strong science backgrounds
  - Members of Congress listen to people they trust
  - Expert ≠ Trustworthy (in fact, frequently the opposite)

- People who are willing to be science advisors, not become policy makers
  - Policy is about advocacy, science is about the truth
  - Science can inform policy, but policy decisions are about things well outside of science’s purview

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We need to expand the number scientists *in* government

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How Does Government Evaluate Science?

The Government filters information through TRUSTED advisors

- Government personnel listen to people they trust -- just like everybody else

- Expert ≠ Trustworthy
  The Government is used to dealing with “soft” issues, it does not deal in the truth the way science does

- To be effective, people/organizations must have the expertise and must become trusted

- This can be extremely difficult to achieve…

- …but the NAS is an effective place to start
How to get the most from your Fellowship

- Start by challenging your own assumptions
  Insights into your own motivations can be achieved with great practice

- Listen more than you speak:
  The problem with politics and policy is that everyone is an expert (or thinks they are)

- Keep a sense of perspective:
  The technical information you have is not really useful, but your training is invaluable, if you use it

- Get out of the office:
  There is a great diversity of experiences and perspectives, and your office will give you only one
What to Expect as a Science Advisor

- Always dealing with “soft” issues, policy does not deal in the truth the way science does
- Detailed expertise, while occasionally helpful, is not often needed (always have access to the expert)
- Almost everyone you meet is an advocate with an "axe"
  - Advancing a specific agenda they believe in passionately
  - Not trying to provide an unbiased point of view
- Your work will focus on filtering this information to achieve the goals of the office you work for
- With time (and trust), you may even become the "decider"
Policy/Science Advising is Hard to Break Into, But the ACS Provides Unique Opportunities

- Offices usually look for experienced people, they are not sure how your backgrounds help.

- Trust, not expertise, is the coin of the realm.

- However, fellowships offer convenient entrees
  - ACS Congressional and Science Policy
  - National Academy of Sciences
  - AAAS, White House, etc.,

- ACS Committee on Chemistry and Public Policy, and Office of Public Affairs (formerly OLGA) administers these ACS fellowships and has much additional information.
Some Random Thoughts on How to Get a Job After Your Fellowship

- Do the legwork
  - Job hunting can be time consuming
  - The shotgun approach is almost always more effective

- Network, network, network
  - Jobs are handed out by *people*, go meet them
  - Your specific skills, while highly respected, may not qualify you for a job, esp. in policy

- Figure out what you want to do and why
  - Could be tricky, many of you probably are here because you are not sure
  - Platitudes and generalities only sound good the first couple of times you hear them