

OSTP Perspective
or
The View From 30,000 Feet

Patrick Looney

Assistant Director
Physical Science and Engineering
Office of Science and Technology Policy
Executive Office of the President

OSTP Mission:

1. **Advise the President** (and by implication, EOP.)
2. **Lead interagency effort** to develop sound S&T policies & budgets.
3. **Work with the private sector** to match S&T investments to needs.
4. **Build strong partnerships** among Federal, State, and local governments, other countries, and the scientific community.
5. **Evaluate** the scale, quality, and effectiveness of the Federal effort in science and technology.

External Policy Advisors:

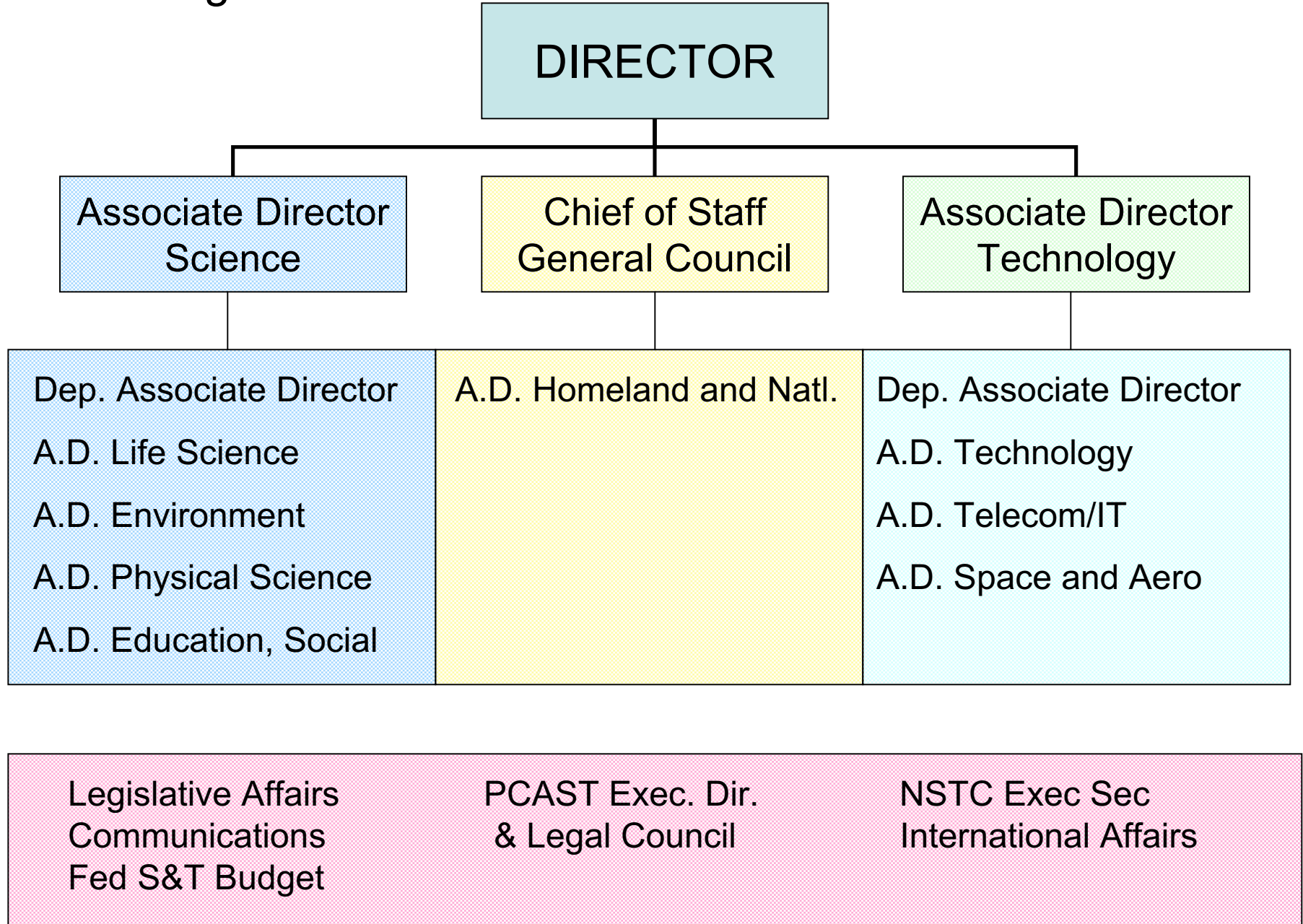
President's Council of Advisors on Science and Technology (PCAST)

President's Information Technology Advisory Committee (PITAC)

Intergovernmental Policy Council:

National Science and Technology Council (NSTC)

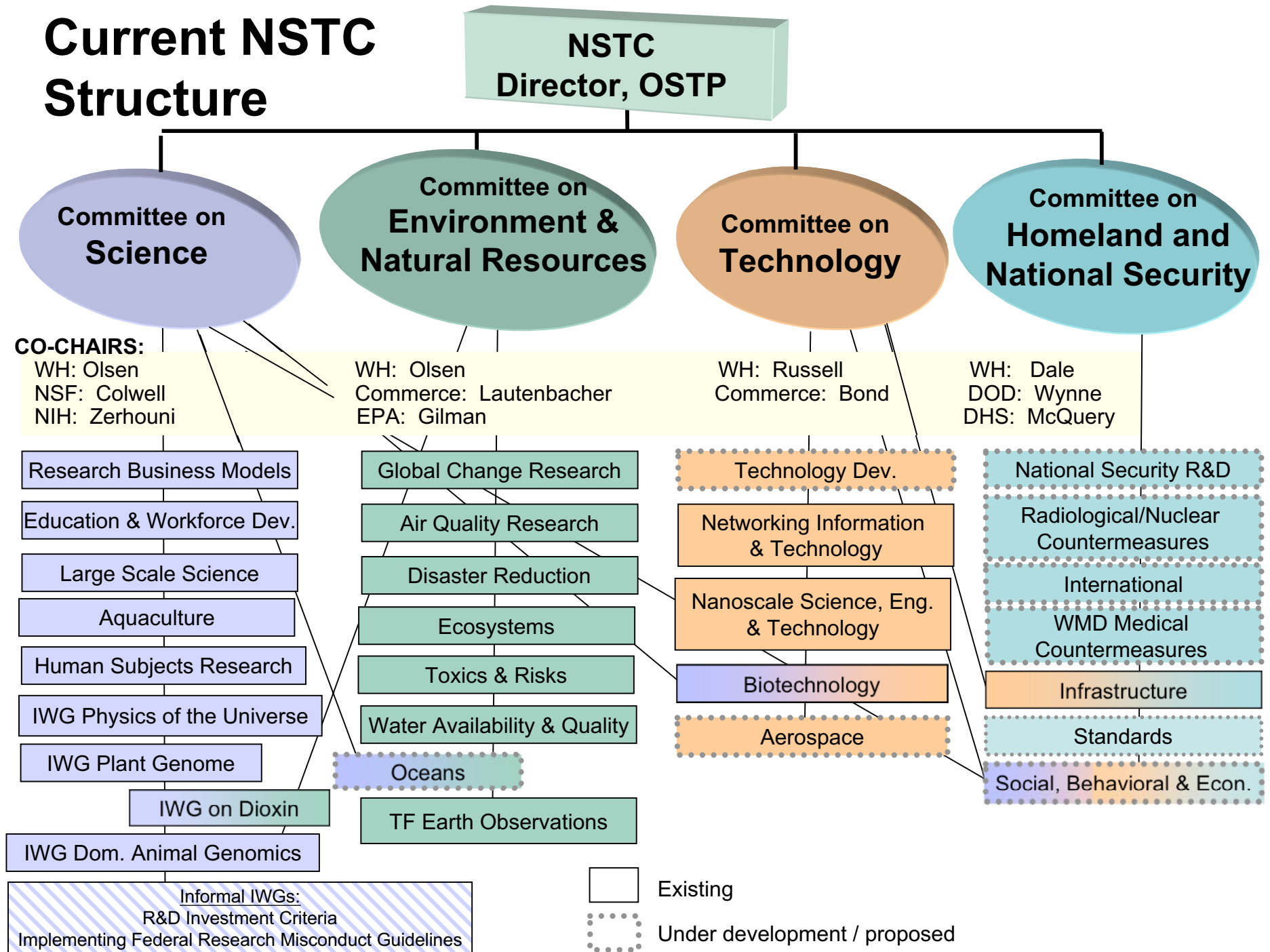
OSTP Organization



Ongoing OSTP Activities

- **Homeland and National Security**
 - Department of Homeland Security
 - Sensitive Homeland Security Information
- **Technology**
 - Nanotechnology*
 - Information Technology*
 - Tech Policy
- **Space/Aero**
 - Columbia tragedy & Implications
 - Aeronautics
- **Telecom/IT**
 - Media Ownership, Spectrum Allocation*
- **Life Sciences**
 - Bioterrorism & Select Agents
 - Human Subjects
- **Education/Social Science**
 - Scientific visas*
- **Agriculture**
 - GMOs, Plant/Food Safety, etc.
- **Environment**
 - Climate Change Research
 - Mercury, Dioxin, etc.
- **Physical Sciences**
 - Energy
 - Nuclear
 - Hydrogen fuel cells
 - Fusion

Current NSTC Structure



FY 2005 OSTP/OMB Priorities Memo

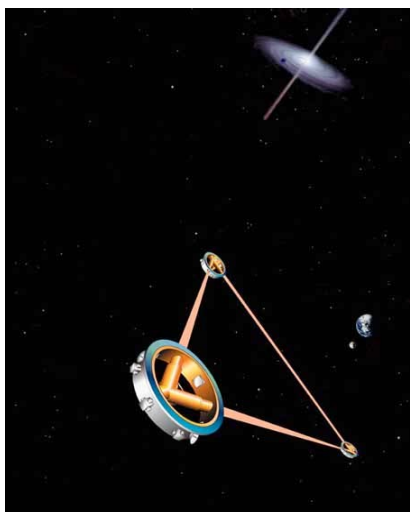
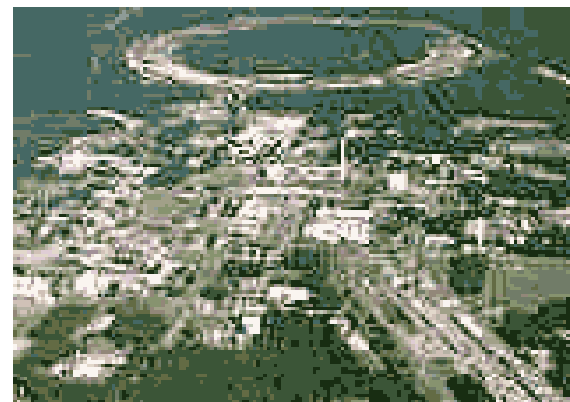
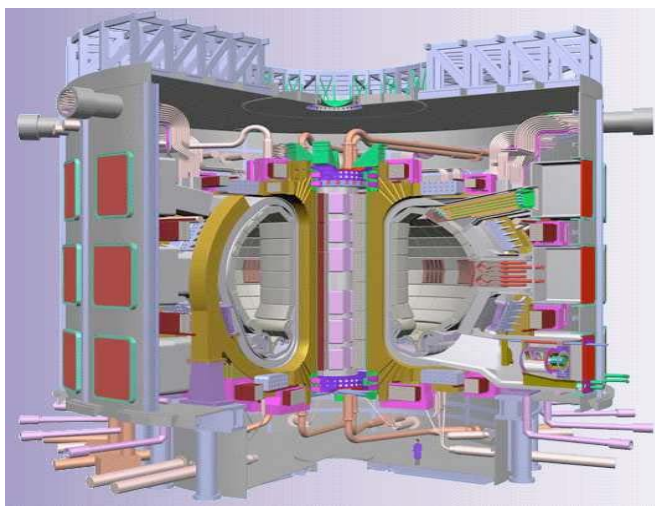
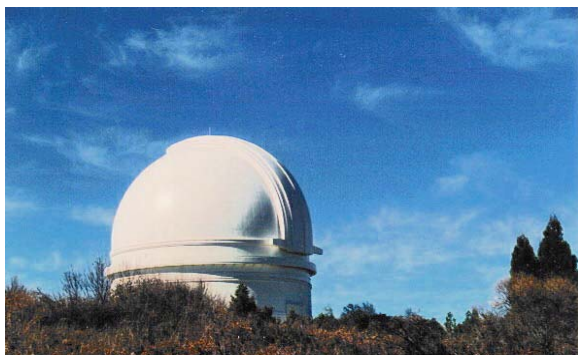
- 1.) R&D for Homeland and National Security
- 2.) Nanotechnology
- 3.) Networking and Information Technology R&D
(includes scientific computing)
- 4.) Molecular-level understanding of life processes
 - non-biomedical biology: plant genomics, animal genomics
- 5.) Environment and Energy
 - climate change
 - environmental observations
 - hydrogen R&D

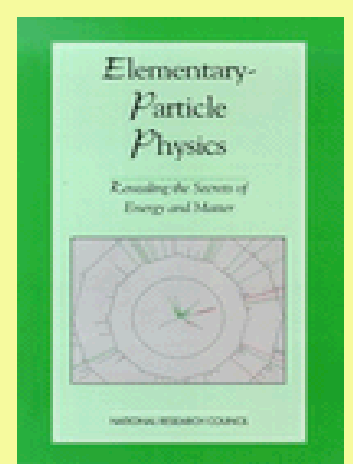
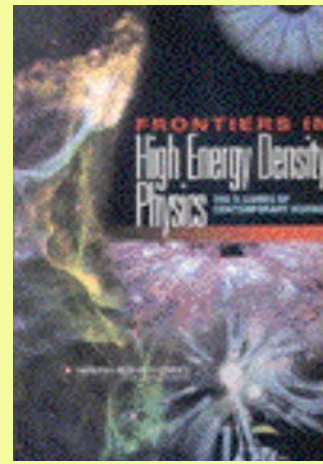
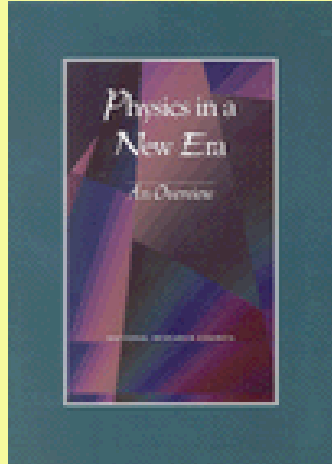
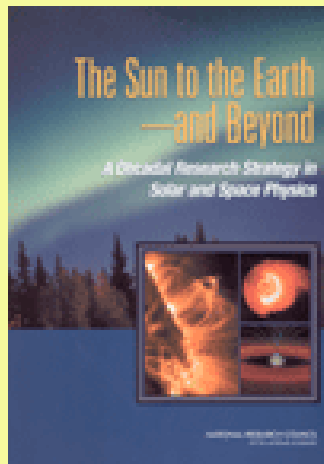
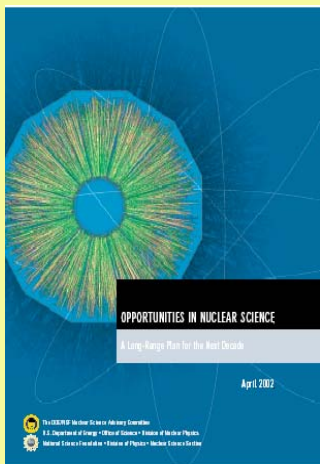
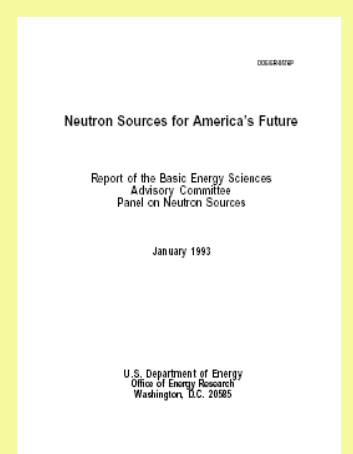
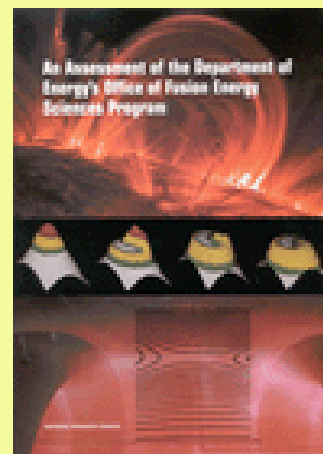
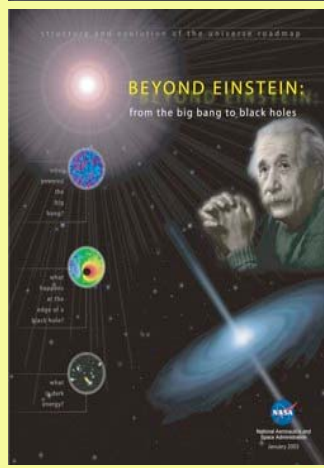
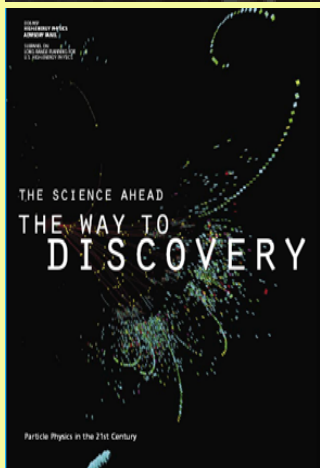
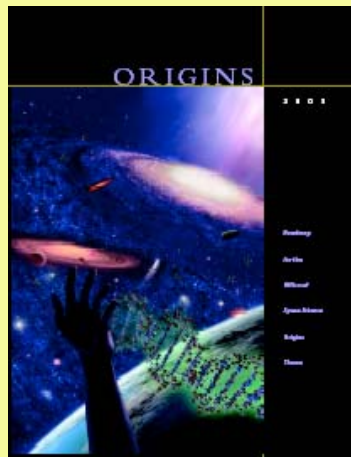
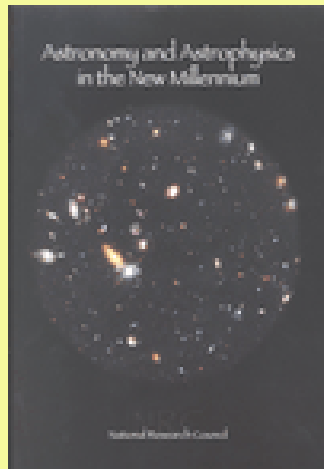
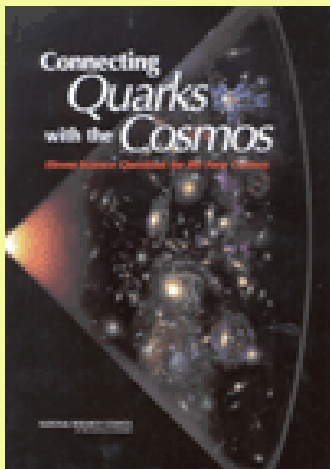
OSTP Physical Sciences Group Coverage

Department/Agency	Department of Energy			NASA	National Science Foundation			Commerce	Smithsonian
	Office of Science	Nuclear Programs	NNSA	Office of Space Science	Engineering	Mathematical and Physical Science	Polar Research	NIST	
Physical Science Discipline									
Astronomy				X		X	X		X
Astrophysics	X			X		X			X
Biophysics						X		X	
Chemistry	X			X		X		X	X
Materials Science	X			X	X	X		X	
Mathematics						X			
Physics									
Atomic and Molecular				X		X		X	
Fusion, High Energy Density and Plasma Physics	X		X	X		X		X	
High Energy and Elementary Physics	X			X		X	X		
Relativity				X		X			X
Condensed Matter (Solid State, etc.)	X					X		X	
Polymer Science	X				X	X		X	
Nuclear Engineering		X		X					
BUDGET	\$3B			\$4B		\$1 B		\$0.5B	

Physical Science Issues: Facilities, Facilities, Facilities

- Existing Facilities (too many to count)
 - Access
 - Operations
 - Upgrades
 - Shutdowns/Transfer of Stewardship
- Facilities Under Development
 - SNS
 - LHC
 - GLAST
- Recent Facilities Decisions
 - ITER
 - LISA/Con-X
 - Nanoscience Centers
- Proposed Facilities
 - Underground Laboratory
 - RIA
 - SNAP
 - Linear Collider
 - LCLS
 - GSMT
 - Ad Infinitum





Changing environment for “large scale science” program investments:

- Traditional fields are proposing a significant number of new facilities and asking for significant new \$.
- There is a wide disparity in the quality and quantity of the information used to justify facility investment requests – many requests are “not ready for prime time.”
- There is increased competition from emerging fields. Some will most certainly be deserving of funding.
- Significant increase in earmarking and lobbying activity in R&D funding. Re-adjudication of decisions and straight-up earmarking of facilities.

Trends indicate need for policy actions

- Today there are more facilities recommended than could be funded under the most optimistic budget scenarios (by factors of 2-4).
- We have a large installed base of existing facilities - some may be under utilized, some may be redundant, some maybe a low priority for continuation, many need upgrades.
- There is a greater emphasis by the administration on understanding what we are getting for our investment, minimize redundancy, maximize return on large existing investment base.
- Although the scientific community is best qualified to set the priorities for scientific activities but has been unable to do so.
- Agency budget submissions tend not to consider the impact of their activities & facilities on related related programs and activities of other agencies.

We are in danger of saturating our available budget with low priority, redundant, and/or uncoordinated activities.

- Machines and Instrumentation must be subordinated to a broader view of science.
- We introduce inefficiency, imbalance, and waste by not looking at related programs *across the Government* as one program. (“A Federal Program”)
- We need to get better, more critical, and more broadly coordinated advice (not advocacy) on priorities *across the government*.
- R&D Programs must begin to use the advice from FACA Committees as input to fashion programs business plans. These plans must be realistic.
- Policy is needed for “making the case” for facility investments. (Beyond R&D Investment Criteria)

Current/ Recent OSTP Activities addressing these issues:

1. OSTP/OMB Priorities Memo.
2. NSTC Committee on Large Scale Science.
3. NSTC IWG on Physics of the Universe.
4. Policy Speeches by OSTP Director.

FY 2005 OSTP/OMB Priorities Memo

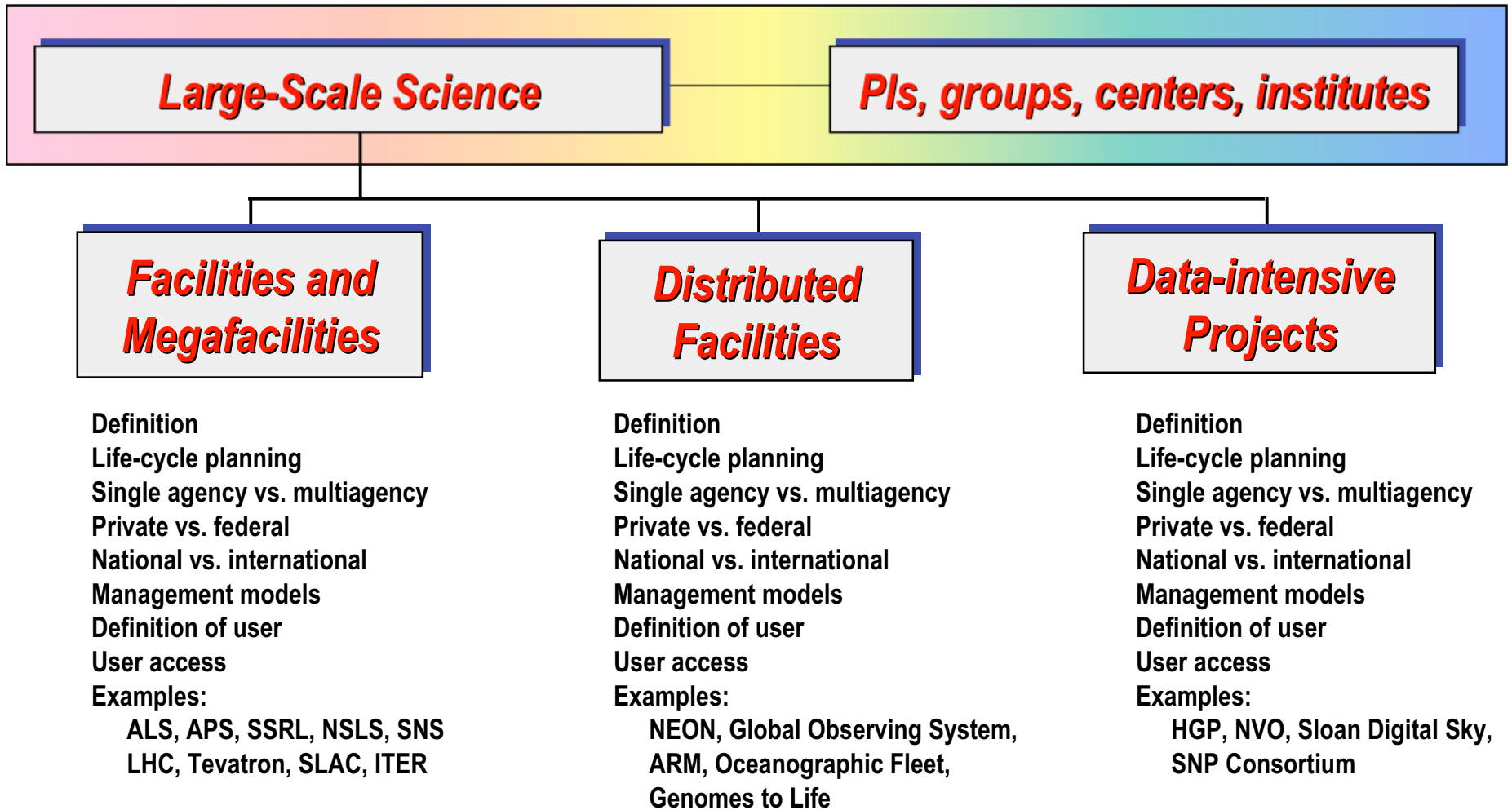
Some agencies operate *programs or facilities whose capabilities are important to the missions of other agencies*. Such programs and facilities will be given special consideration in budget preparations. Consistent with the President's Management Agenda, *it is imperative that, where appropriate, federal R&D investments be managed as a portfolio of potentially interconnected activities to optimize scientific discovery through interagency coordination of related research areas*. OSTP informs the budget process regarding the availability of instrumentation and facilities for S&T priorities and the need for coordination of related research programs based on information generated through the National Science and Technology Council (NSTC) and other interagency mechanisms.

<http://www.ostp.gov/html/new.html>

FY 2005 OSTP/OMB Priorities Memo

The President's Council of Advisors on Science and Technology has urged increased investment in certain areas of physical science, citing opportunities for continued scientific discovery and the fact that such discoveries often drive advances in other areas of science. **Budgetary proposals for these or any other area must be specific regarding how the programs will expand scientific frontiers in a manner consistent with stated agency missions and national goals and demonstrate coordination with similar programs in other agencies.** The desire to achieve parity in funding levels among disciplines does not by itself suffice to justify funding increases.

NSTC Sub-Committee on LSS



Making the Case: A Strawman Set of Criteria

- What are the driving scientific questions for the field?
- How do these questions fit into the larger picture of science?
- How will this investment address the driving questions?
- Is this a priority? (If so, what do you NOT want?)
- Do you have consensus within the field?
- How will this impact the rest of the field? (+ and –) (including \$\$)
- Is the planning realistic (\$, time, available technology, management, etc)
- What is the international context? Is it redundant? Do you have international participation?
- Is anyone outside of the field waiting for the results? (Will they voice their opinion and support?)
- Will this impact or strengthen other programs or related activities?
- Can you demonstrate coordination with these other programs?
- How has is the program managing and performing with the current funds?

NSTC IWG on The Physics of the Universe

Co-chairs: Anne Kinney, Joe Dehmer, Peter Rosen (Robin Staffin)

Participation:

NASA OSS

NSF (Astronomy, Physics, Office of Polar Programs),

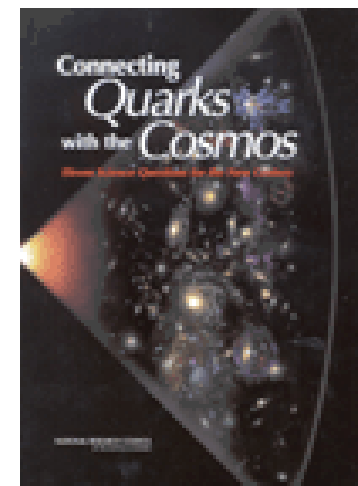
DOE

High Energy and Nuclear Physics

Fusion Energy Science

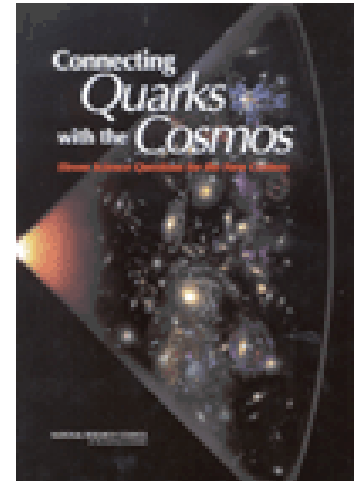
NNSA

OSTP, OMB



Quarks to the Cosmos Report

1. What is the Dark Matter?
2. What is Dark Energy?
3. How did the Universe Begin?
4. Did Einstein have the last word on gravity?
5. What are the masses of the neutrinos and how have they shaped our universe?
6. How do cosmic accelerators work and what are they accelerating?
7. Are protons unstable?
8. What are new states of matter at exceedingly high density and temperature? (HED)
9. Are there additional space-time dimensions?
10. How were elements from iron to uranium made?
11. Is a new theory of matter and light needed at the highest energies?



Response to Quarks to the Cosmos

- What are the approaches to answers?
 - What suite of tools are needed?
 - What are the highest priorities?
 - What are the “tall pole” policy issues?
-
- Define steward agencies for fields and tools.
 - Define who will do what and when (as best we can).
 - Bring items up for a decision in a timely manner.

POU: Prioritization of Recommendations

Step 1

- Inventoried current investments.
- Ranked the 11 scientific questions using:
 - potential for scientific advancement
 - timeliness for the investment
 - technical readiness of projects
 - existence of gaps in current investments

POU: Prioritization of Recommendations

Step 2

- Start with questions prioritized in terms of investment priority.
- Sort or group questions into themes that are programmatically linked across agencies (e.g. dark matter, neutrinos, proton decay).
- Develop recommended actions for each theme area (across agencies)
- Assess programmatic readiness to proceed.
- Grouped into:
 - o Programmatic Directions known (THE PRIORITIES NOW)
 - o Programmatic Directions not certain: Roadmap/flesh out areas in more detail. (NEXT STEPS)

ITER is the highest priority activity for the FES Program right now.

- Need to come to agreement on a business plan for FES Program as we move into the ITER construction phase.
- The program should also consider broadening the view of FES Program in HED Physics:
 - connect to and coordinate with other related programs at NSF, NIST, NASA and DOE/NNSA.
 - UULs are the tool – HED Physics is the science

to be continued....