

# The Federal Government: Doing Business with University Research Parks



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Office of Science and Technology Policy  
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# The President

Office of Management and Budget



Other Boards, Councils, etc.



# Role of White House Office of Science & Technology Policy



- Advise the President
  - Provides S&T analysis and judgement with respect to major policies, plans, programs, & budgets
- Lead the interagency effort to develop sound S&T policies and budgets
  - Set forth (along with OMB) the R&D priorities to guide the agencies when developing their budget
  - Co-chair National Science & Technology Council (NSTC)
    - Committee on Science
    - Committee on Technology
    - Committee on Environment & Natural Resources
    - Committee on National & Homeland Security

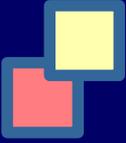
# Role of OSTP cont.

- Build strong partnerships among federal, state and local governments, other countries, industry, academia & scientific associations
  - Presidential Council of Advisors on Science & Technology (PCAST)
  - Association of University Research Parks
- Develop clear, measurable goals and objectives for R&D programs
  - Evaluate the effectiveness of R&D programs
  - Link performance to investment decisions
- Access Federal investments relative to purposes of government
  - Avoid corporate subsidies
  - Avoid competition with industry
  - Avoid funding projects that would be funded anyway via other mechanisms





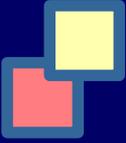
# The Role of the Federal Government in Science & Technology

- Improve Nation's ability to:
    - Innovate
    - Enable Discoveries
    - Sponsor development of critical and enabling technologies
    - Maximize return on investments through cooperation across Federal agencies
  - Ensure National Security
  - Strengthen the Economy
  - Improve Health & Well-being
  - Ensure an Educated Society
- 



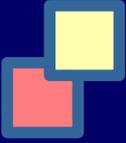
# Why Support Research?

- “Support of basic research offers a double-whammy of a solid payback to the Treasury of between 30% and 60% per year (after a waiting period of 5 and 10 years), as well as an array of new knowledge and technologies that create wealth, add to human health and longevity, and help fulfill human potential”

- Dr. Leon M. Lederman, Director Emeritus of Fermilab and 1998 Nobel Laureate in Physics
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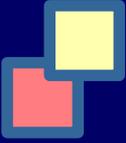


# Why Support University Research?

- Primarily Basic/Fundamental Research
  - Integrates research with education
  - Researchers have flexibility
    - Mobility among states, universities, types of institutions
    - Capitalize on breakthroughs and emerging area
    - Collaborate across disciplines, institutions & countries
    - Collaborate with industry
  - Cultivate interdisciplinary expertise in research and education to develop Centers of Excellence
  - Public service and education to the community
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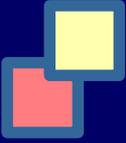


# Changing Role of Universities

- Still regional intellectual centers
    - Education
    - Basic research
  - Centers for innovation and technology transfer
  - Bigger role in regional economic development
  - Bigger role in workforce preparation
    - Partnerships with schools, community colleges
  - *Bridging the university community and the region's industrial community through University Research Parks*
- 



# Role of University Research Parks

- high technology and science based enterprise and support services
  - formal ownership or operational relationship with one or more universities or other educational institutions
  - promote research and development by the university in partnership with industry
  - promote the growth of new ventures, and regional economic development
  - aid the transfer of technology and business skills between the university and industry
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# THE 2005 BUDGET

## Two Broad National Priorities

- \* Making our People Safe
- \* Strengthening our Economy

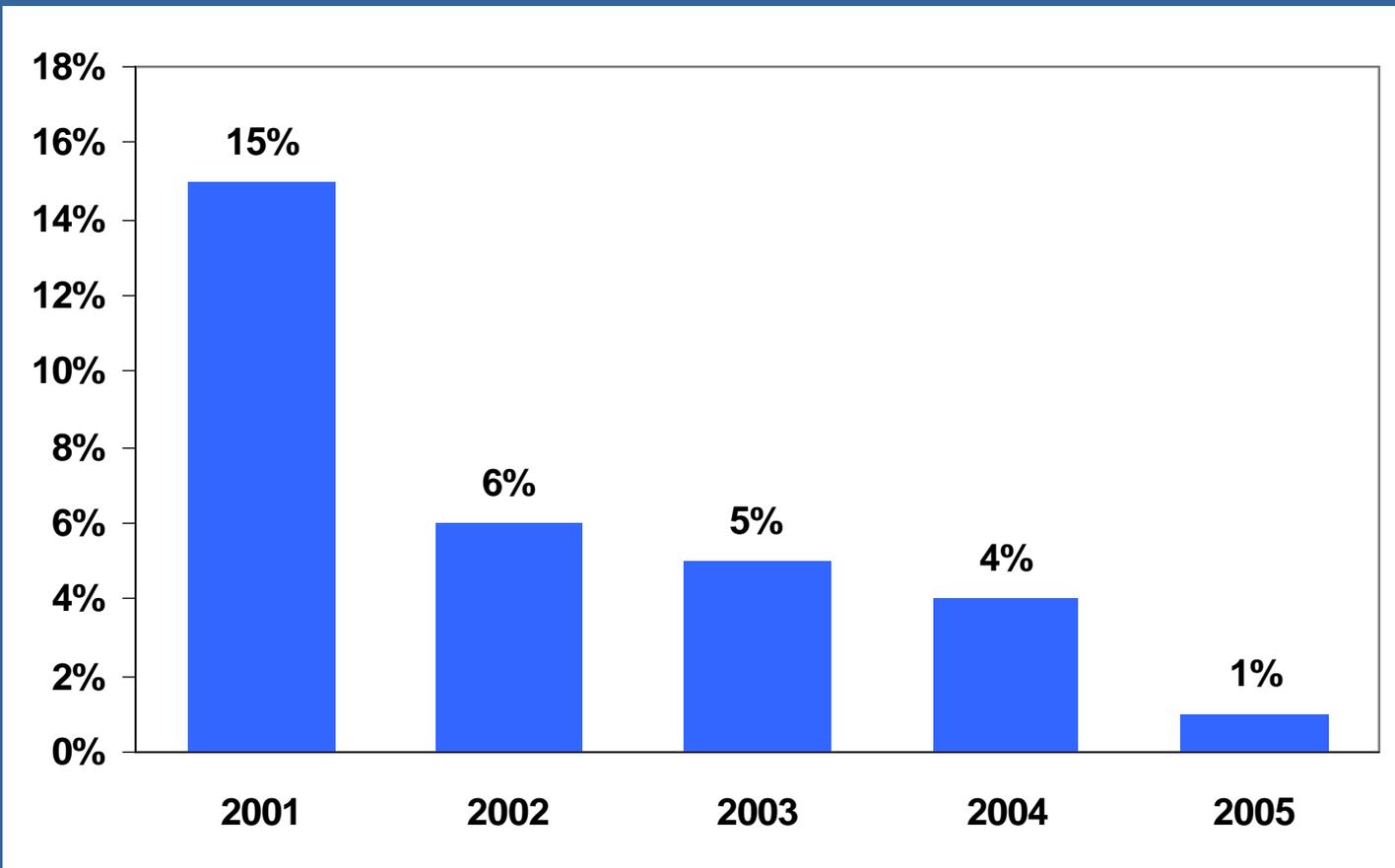
Unprecedented \$132 Billion  
investment in R&D

-up 44% from FY 2001

-equivalent of 10% increase/year

# Growth in Discretionary Spending Declines

Percent Growth in non-defense, non-homeland budget authority excluding supplementals

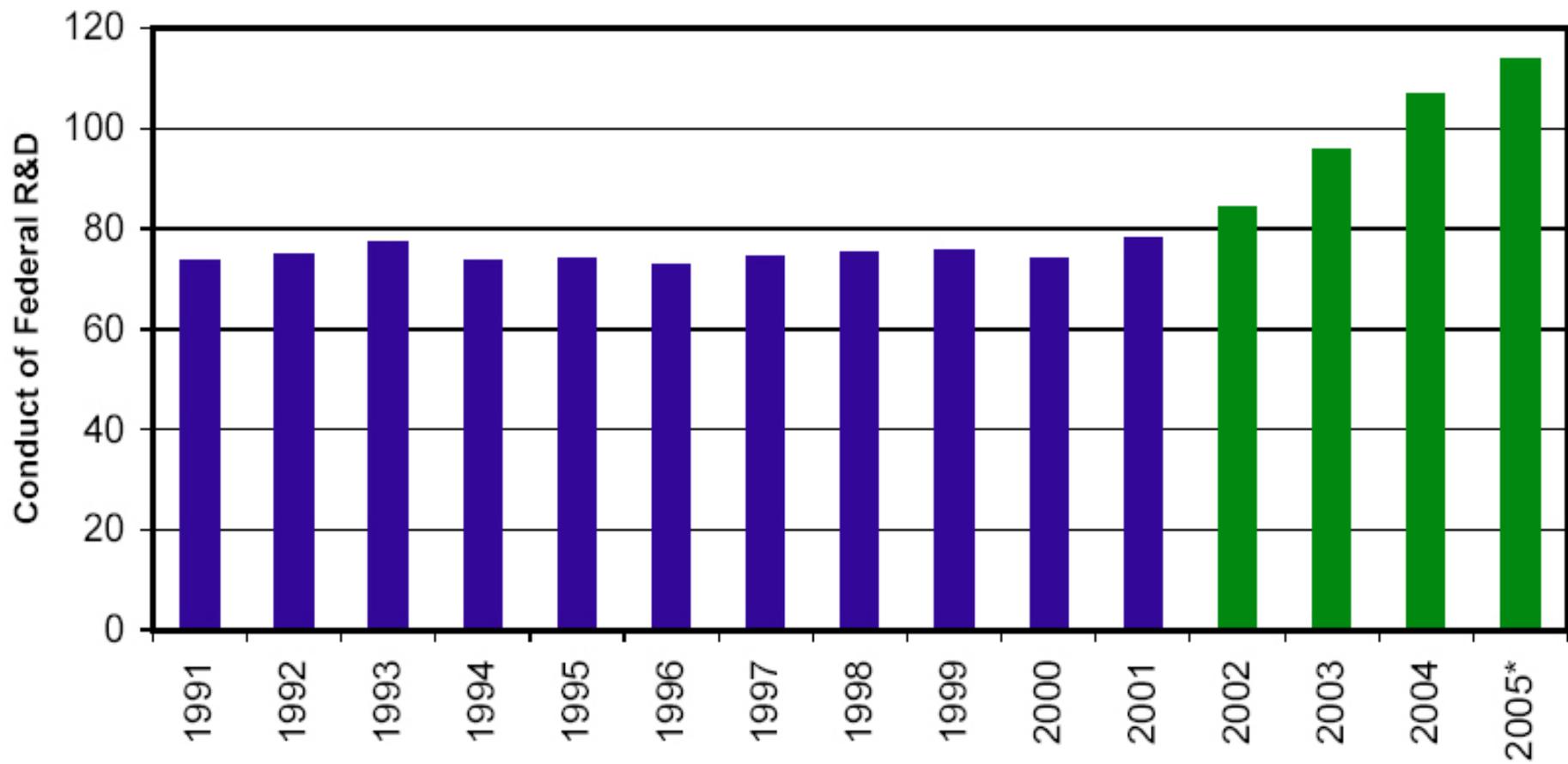


# R&D Budget

<b>Budget Authority (dollar amounts in millions)</b>	<b>2005 Proposed</b>	<b>Percent Change</b>
<b>Defense</b>	<b>69,856</b>	<b>7%</b>
<b>Health and Human Services</b>	<b>29,381</b>	<b>4%</b>
<b>NASA</b>	<b>11,308</b>	<b>4%</b>
<b>Energy</b>	<b>8,893</b>	<b>1%</b>
<b>National Science Foundation</b>	<b>4,252</b>	<b>3%</b>
<b>Agriculture</b>	<b>2,015</b>	<b>-9%</b>
<b>Homeland Security</b>	<b>1,216</b>	<b>15%</b>
<b>Commerce</b>	<b>1,075</b>	<b>-5%</b>
<b>Veterans Affairs</b>	<b>770</b>	<b>-6%</b>
<b>Transportation</b>	<b>749</b>	<b>7%</b>
<b>Interior</b>	<b>648</b>	<b>-4%</b>
<b>Environmental Protection Agency</b>	<b>577</b>	<b>0%</b>
<b>Others</b>	<b>1,034</b>	<b>-5%</b>
<b>TOTAL</b>	<b>131,864</b>	<b>5%</b>

# FEDERAL R&D SPENDING

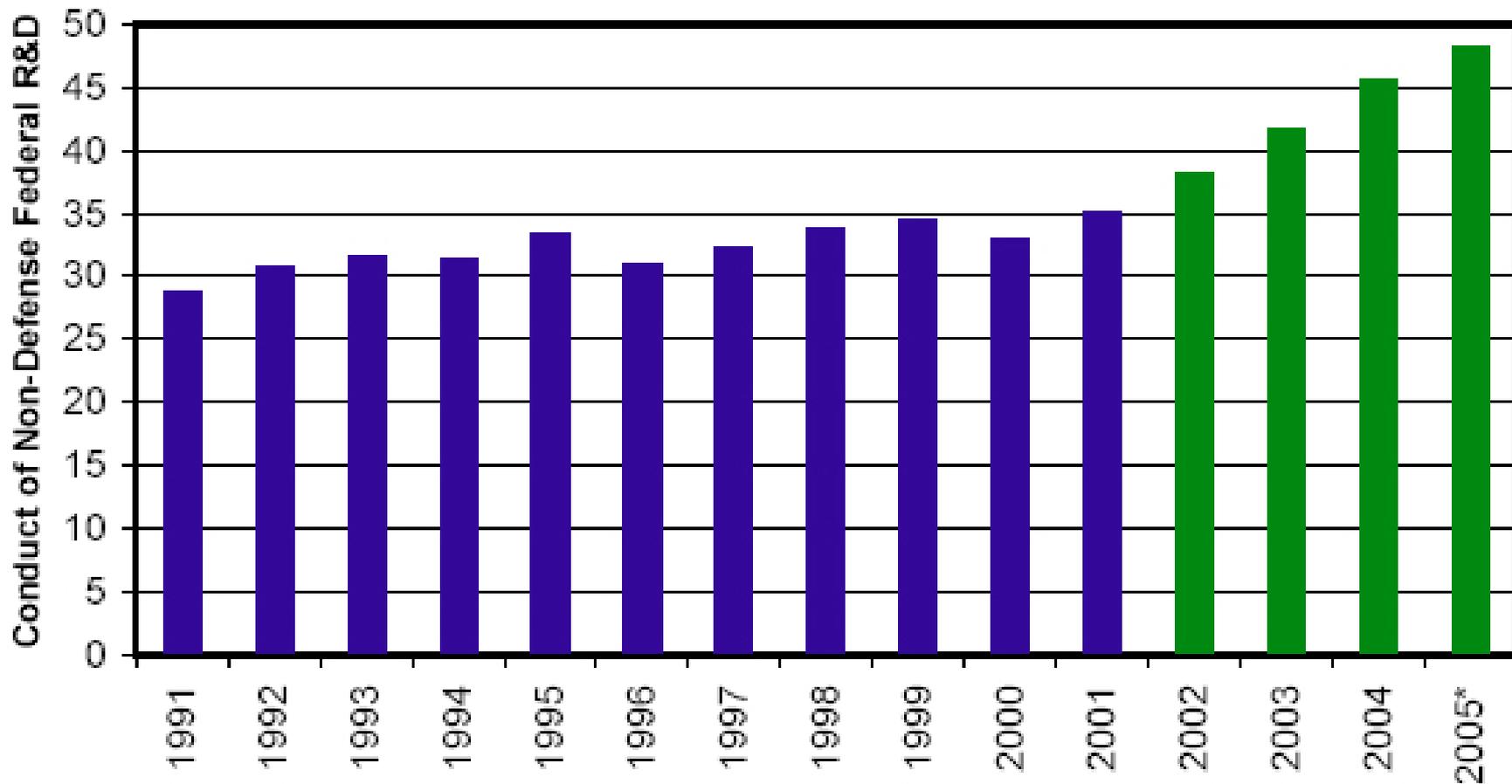
(Outlays in billions, constant 2000 dollars)



\*President's FY 2005 Budget Submission

# FEDERAL NON-DEFENSE R&D SPENDING

(Outlays in billions, constant 2000 dollars)



\*President's FY 2005 Budget Submission



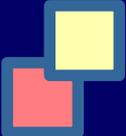
# THE 2005 BUDGET

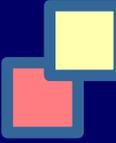
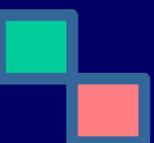
## Research & Experimentation Tax Credit

- Originally enacted in 1981
- 20% tax credit for incremental R&D expenditures
- On-again, off-again nature impedes long-term research
- Make it Permanent
  - Spurs sustained, long-term R&D Investment
  - Results in next generation of critical technologies
  - Strengthens our Economy



# Summary of the 2005 Budget

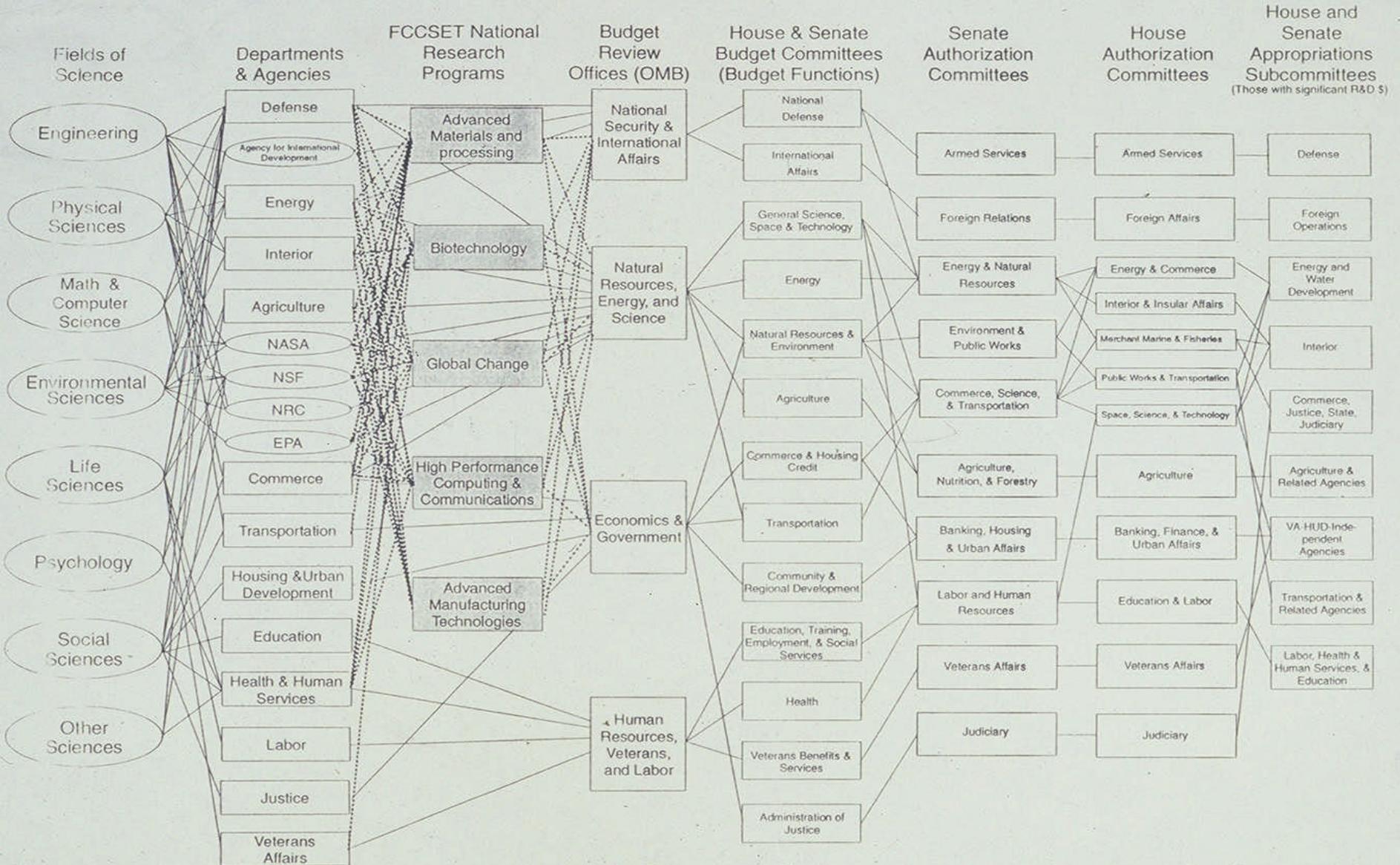
- Sets priority on war against terrorism, overseas and at home
  - Funds high-priority initiatives; restrains spending throughout the rest of government
  - Maintains focus on results instead of dollars
- 



# How Do We Set America's S&T Priorities?

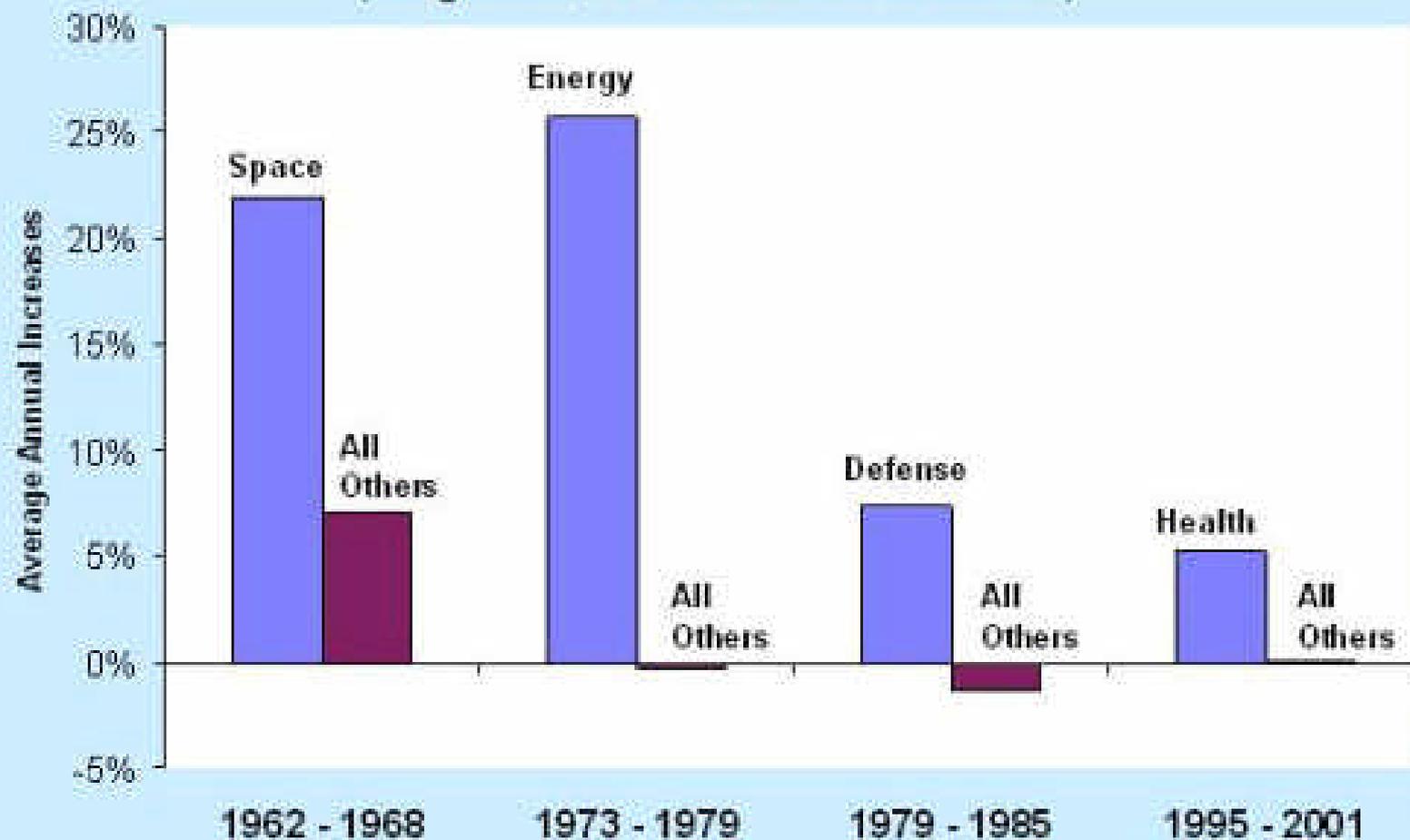
# Development of the Federal R&D Budget

Showing Fields of Science and Executive and Legislative Decision Units  
 Connecting lines indicate location of agency budget decisions, but not decision sequences.



# Historical Perspective

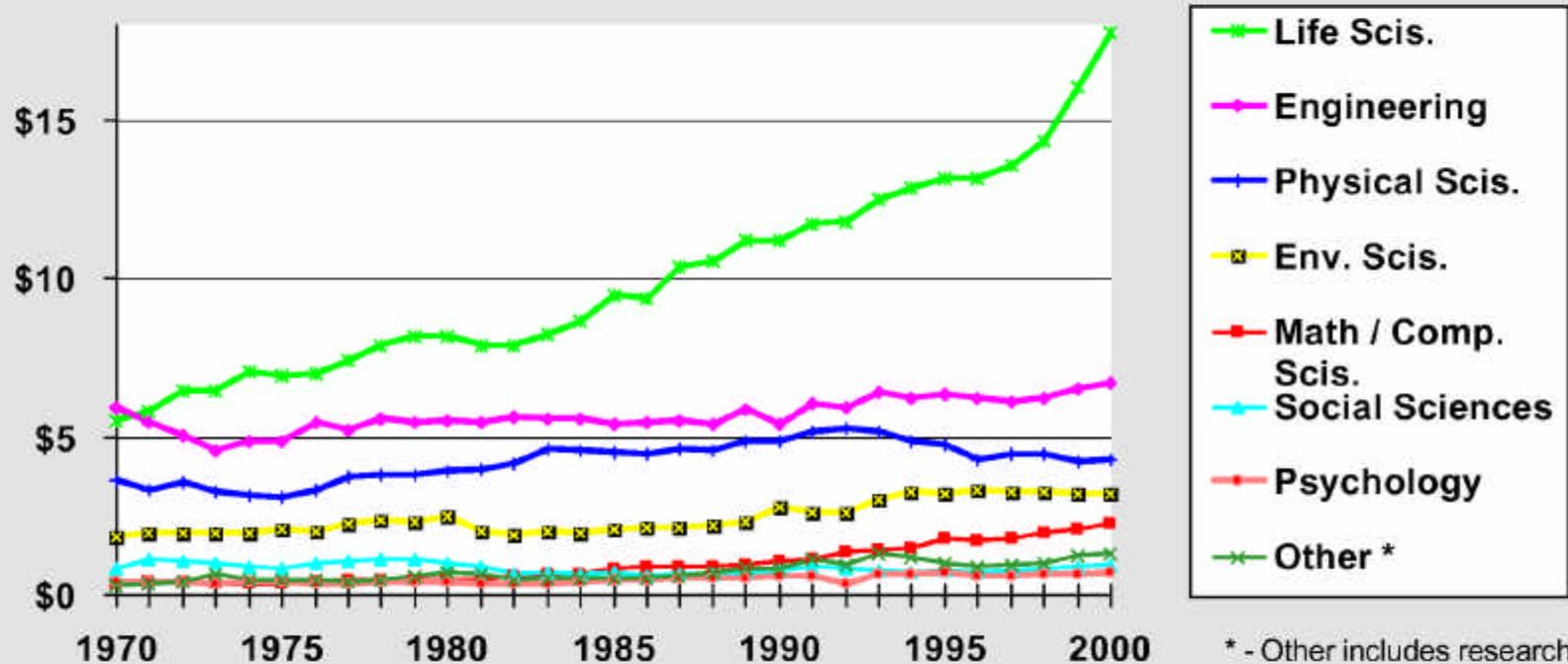
R&D Balance Includes Setting Priorities  
(obligations, in 1996 constant dollars)



Source: National Science Foundation

# Trends in Federal Research by Discipline, FY 1970-2000

obligations in billions of constant FY 2001 dollars



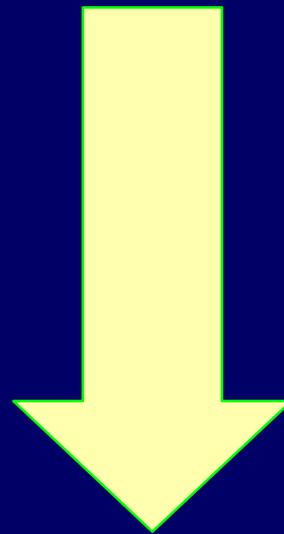
\* - Other includes research not classified (includes basic research and applied research; excludes development and R&D facilities)

Source: National Science Foundation, *Federal Funds for Research and Development FY 1999, 2000, and 2001, 2001*. FY 2000 data are preliminary. Constant-dollar conversions based on OMB's GDP deflators. APRIL '01 © 2001 AAAS



# The Priority Process

Top down  
(OSTP, OMB, Agency management,  
Congress)



- Priorities
- Budget
- Strategic Planning
- DECISIONS

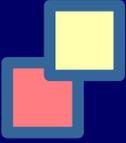
- Ideas
- Concepts
- Planning
- Capability development



Bottom's up  
(academia, industry, Agency S&E personnel)



# PCAST's Role in Priority Setting

- PCAST advises the President on matters involving science and technology policy
  - PCAST assists the National Science and Technology Council (NSTC) in securing private sector involvement in its activities
  - Members are appointed by the President and are drawn from industry, education, and research institutions, and other nongovernmental organizations
  - The Director of OSTP serves as the Council's Co-Chair with Floyd Kvamme
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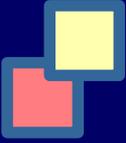


# President's Council of Advisors on Science & Technology

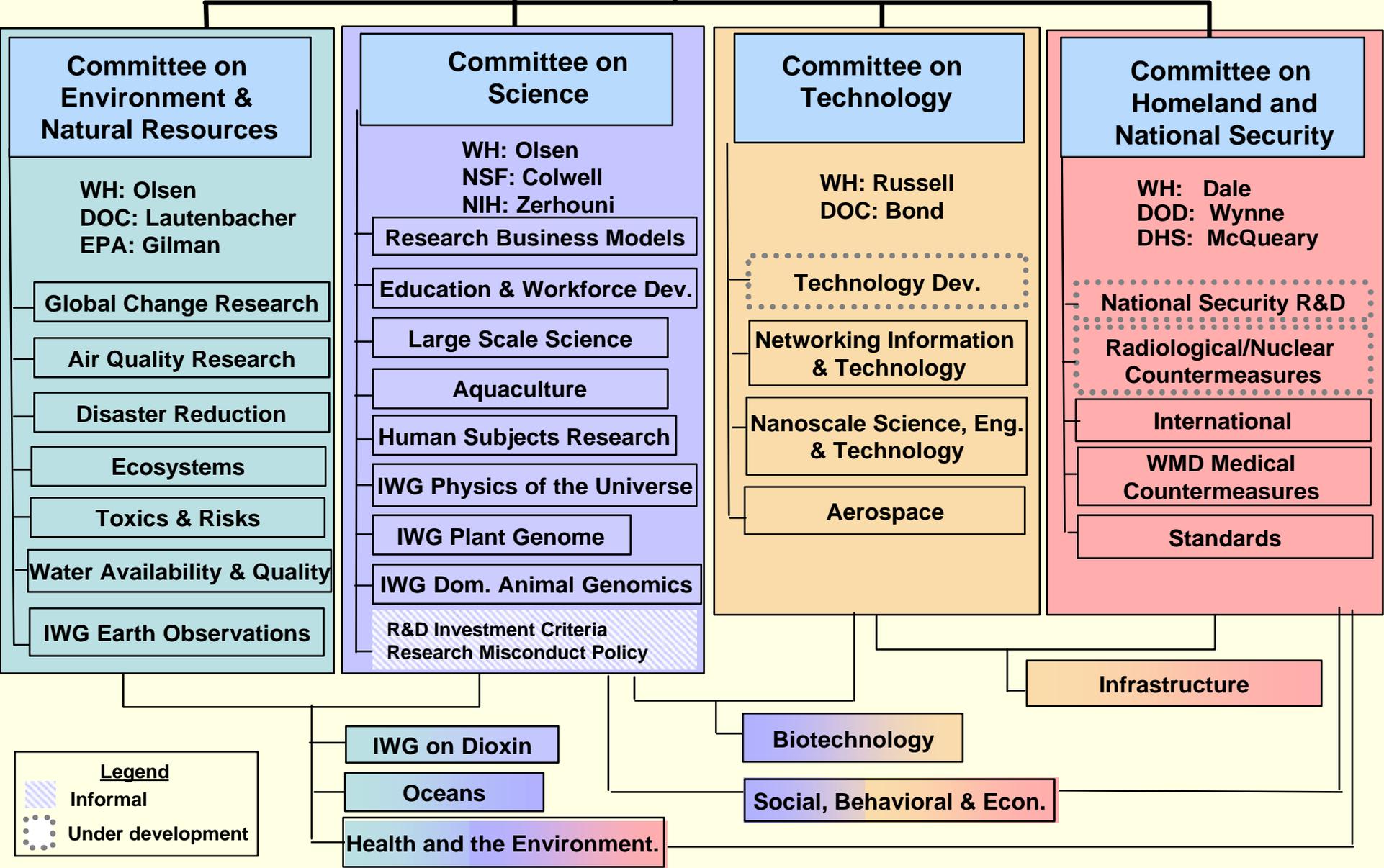
- Co-chairs and Goals:
    - Dr. Jack Marburger, Director-OSTP
    - Floyd Kvamme, Partner-Kleiner, Perkins, Caufield & Byers
    - Address issues of national importance in order to provide advice to President Bush and his OSTP
  - In First Year: Established Four Panels
    - Panel Established on "Federal Investment in R&D and its National Investment" reviewed R&D portfolio & Bayh Dole Act
      - RESULTS:
        - Physical Science Emphasis in FY04/05 Budgets
        - Support of Bayh Dole with some tinkering by Commerce
    - Panel Established on "Homeland Security R&D"
      - RESULT: Strong science presence in new Department
  - In Second Year: Established Three Panels
    - Education & Workforce, Nanotechnology, Semiconductor Manufacturing
- 



# The National Science and Technology Council (NSTC) Role in Priority Setting

- A Cabinet-level council of advisers to the President on Science and Technology
  - Principal means to coordinate science and technology matters within the Federal research and development enterprise
  - Means to establish clear national goals for Federal science and technology investments
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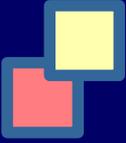
**National Science and Technology Council  
Director, OSTP**



**Legend**  
 Informal (hatched)  
 Under development (dotted)

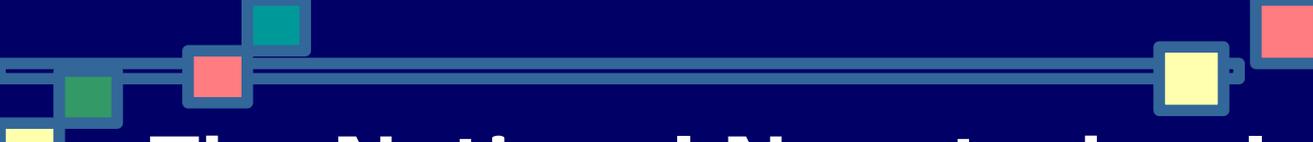


# OSTP/OMB Guidance Memorandum for FY 05

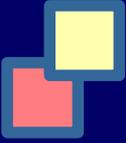
- R&D for Combating Terrorism
  - Nanotechnology
  - Networking & Information Technology R&D
  - Molecular-Level Understanding of Life Processes
  - Environment & Energy
    - Global Change Research
    - Hydrogen Fuel R&D
    - Environmental Observations
- 

# R&D Priorities

Priority Areas	Budget Authority (dollar amounts in millions)
Space Exploration	\$4,798
Combating Terrorism R&D	\$3,600
Networking and Information Technology R&D	\$2,008
Climate Change Science R&D	\$1,958
National Nanotechnology Initiative	\$982
Hydrogen Fuel Initiative	\$228

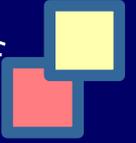


# The National Nanotechnology Initiative

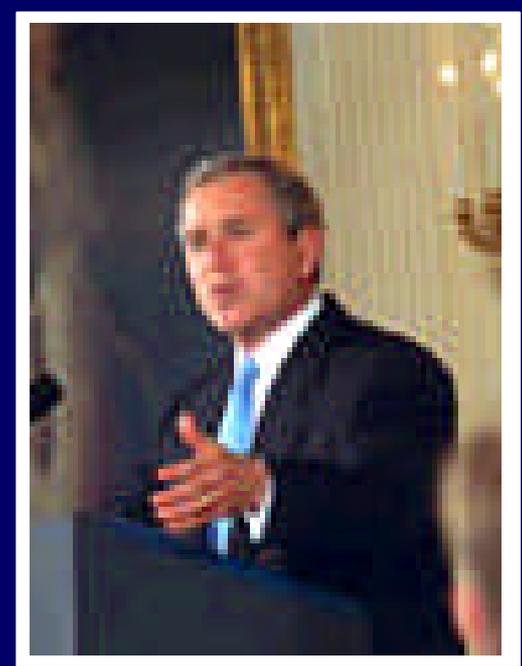
- Nanotech is an Administration Priority
  - Budget is at \$1B Level.
  - Congress Passed and President Signed Nanotechnology Bill
  - The NNI is entering a maturation phase
    - NRC Review
    - Coordination with social/behavioral research
  - OSTP High Priority
    - PCAST
    - NSTC Coordinating Subcommittee
- 



# PCAST Nanotechnology Review

- Developing a compelling set of “Grand Challenges” to focus the research effort on key scientific/technological challenges (including a review of the NNI programs existing grand challenges)
  - Developing crisp, compelling, overarching Strategic Plan to set the general direction of the federal government program and to guide the development of detailed research plans
  - Three Internal task forces formed
    - Materials/Electronics/Photonics- Wayne Clough
    - Energy/Environment- Charles Vest/Steve Papermaster
    - Medical/Bio/Social- Bernadine Healy/Charles Artzen
- 

# The President Proposes

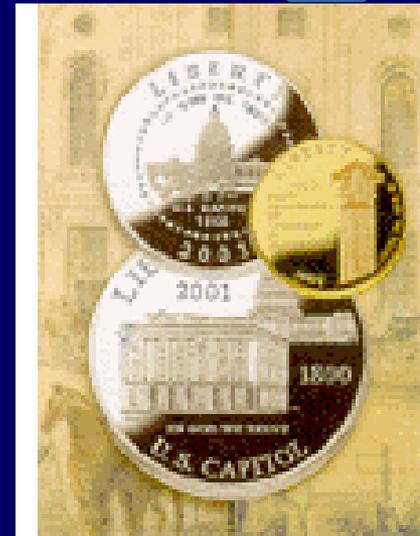


Congress  
Disposes

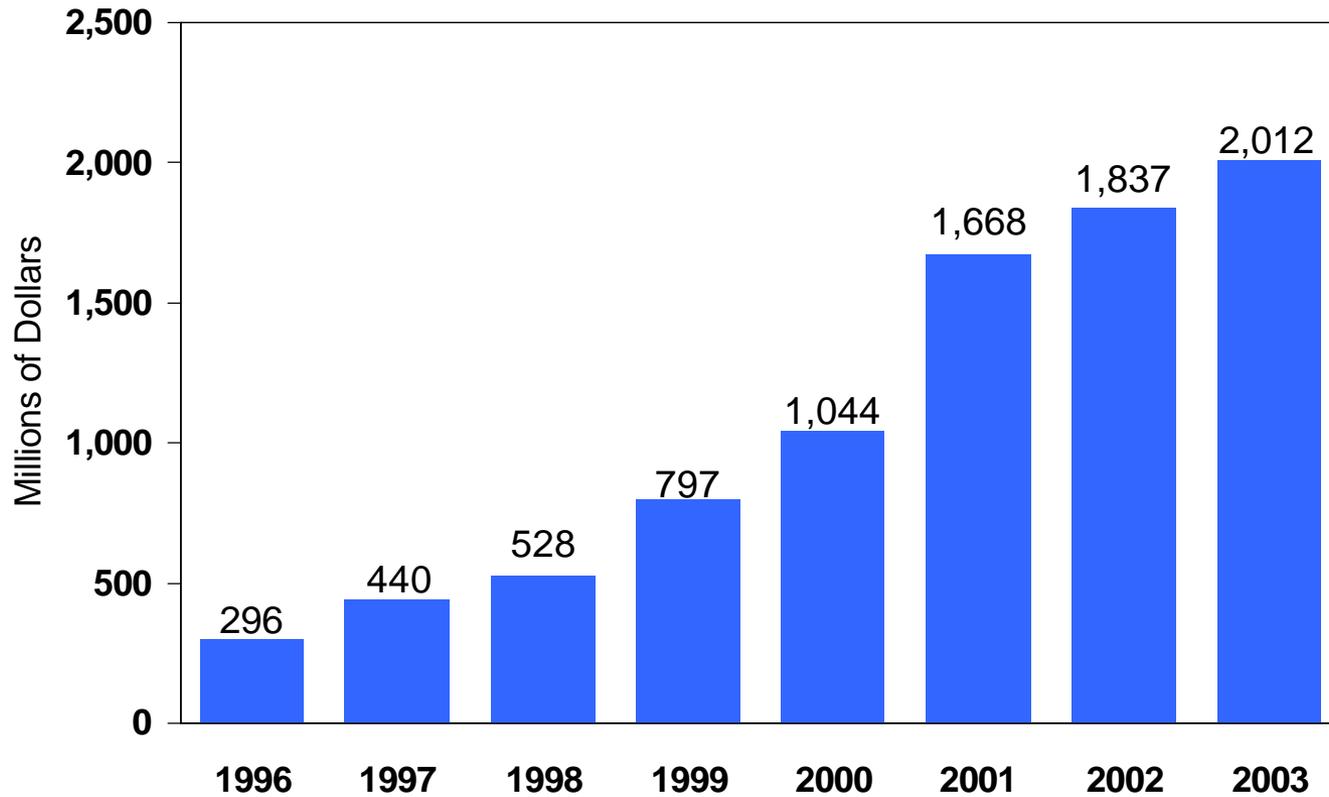


# Agency Competition for Funds

- 13 Separate House and Senate Appropriations Bills -- each assigned spending allocations:
  - NIH, part of HHS, is in the Labor, HHS and Education appropriation bill
  - NSF, NASA are in VA, HUD, Independent Agencies bills
  - DoD is in the Defense bill
  - DoE is in Energy and Water Development



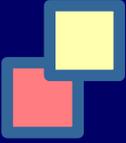
# Academic Earmarks Wow!



Source: *The Chronicle of Higher Education*



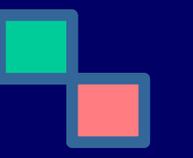
# Challenges & Opportunities

- Earmarks to the President's Budget
  - Strong S&T Portfolio to maximize science return
    - Strong Federal Partnerships
    - Infrastructure & Instrumentation
    - Performance Based Government
  - Educated Society & STEM Workforce
    - \*NSTC: Committee on Science
- 

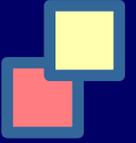


# Technology Commercialization

## Opportunities

- Bayh-Dole: protects commercialization rights of university scientists
  - R&D incubators associated with universities & education
- 

## Challenges

- Not as effective across all disciplines
    - Inconsistent interpretation
    - Still learning
  - Basic research still isn't reaching marketplace
  - Identifying most promising technologies early
- 



# The Final Picture

- Activities emanating R&D investments that produce new economic growth has never been higher
  - 40% of patents cite Federal research as source
  - increasing number of patents and discovery disclosures
  - economists note return on investment for basic research
- National investment in basic science & technology is critical
  - should be prioritized and balanced
  - requirements are every changing and portfolio fits goals of each administration\*
  - requires ongoing re-assessment by all players
- Investment in the next generation of S&T workforce is of the highest priority\*
- Science is global\*
- Opportunities arise from the “Complexity” of the R&D enterprise
- Opportunities arise from the “Flexibility” of the R&D enterprise