

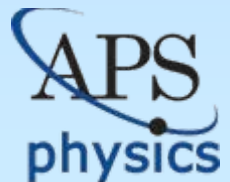
APS EXECUTIVE BOARD

February 10, 2007

New Congress, New Control What Does It Mean for Science?

Michael S. Lubell

APS Director of Public Affairs



R&D Benchmarks II Report

The Task force on the Future of American Innovation

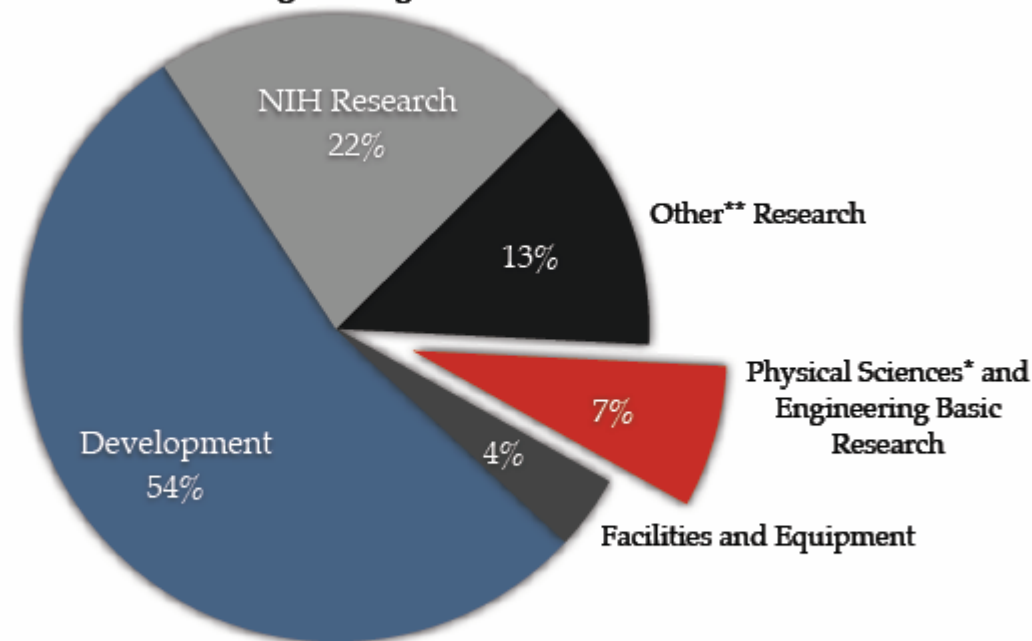


The Federal R&D Portfolio

Funding for Physical Sciences and Engineering Basic Research a Small Part of Federal R&D Portfolio

Total Federal R&D Portfolio in FY 2005 = \$130 billion

Total Physical Sciences* and Engineering Basic Research in FY 2005 = \$9.5 billion



* Physical Sciences includes Physics, Chemistry, Astronomy and the NSF definitions of Environmental Science, Mathematics and Computer Science.

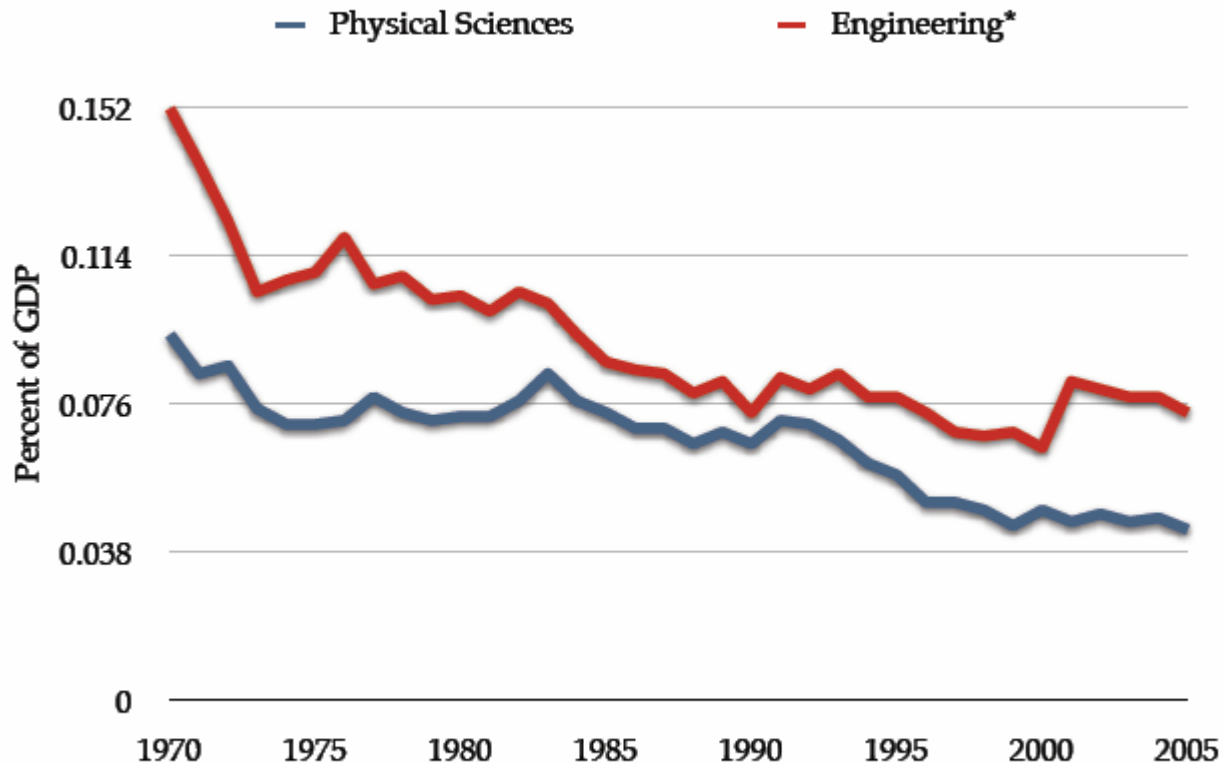
** Other research is comprised mainly on non-NIH research.

Source: Fiscal Year 2007 Analytical Perspectives. Budget of the U.S. Government.

Compiled by the APS Physics Washington Office.

Decades of Neglect

Federal Investment in Physical Sciences and Engineering
as Share of GDP in Significant Decline



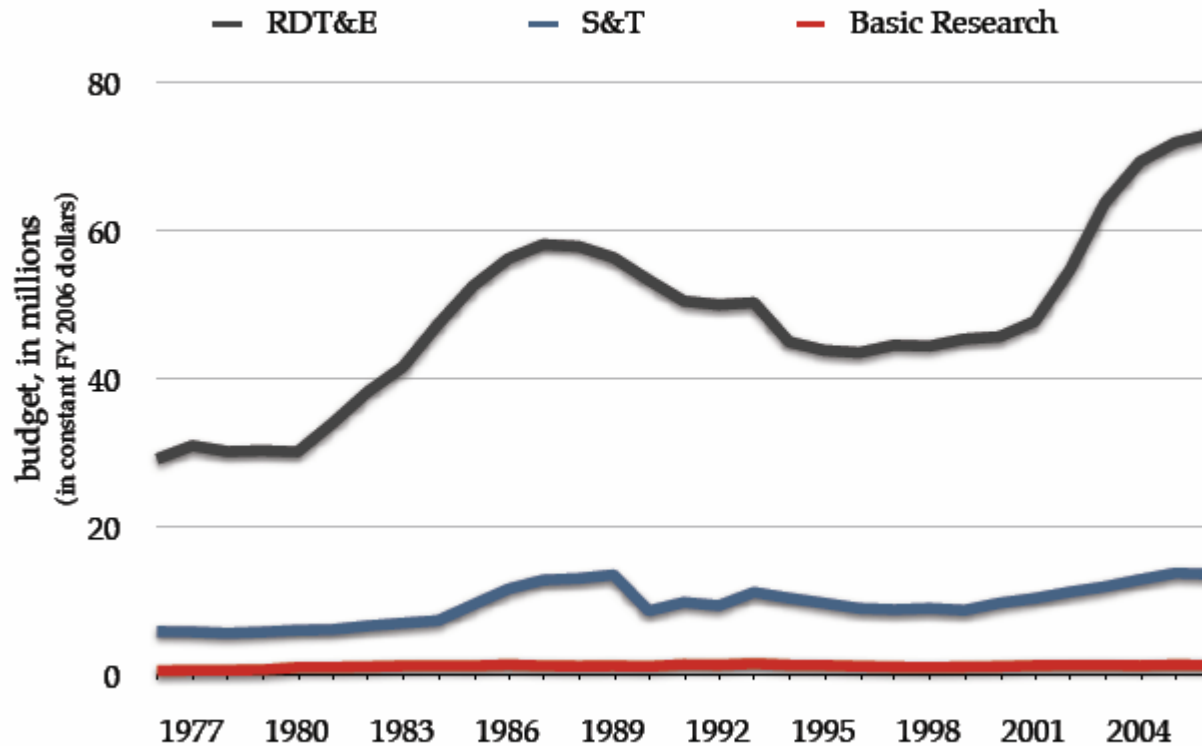
*The 2001 jump in engineering is due to reclassification of funding and is therefore artificial.

Source: American Association for the Advancement of Science. <http://www.aaas.org/spp/rd/guidisc.htm>.

Compiled by the APS Washington Office.

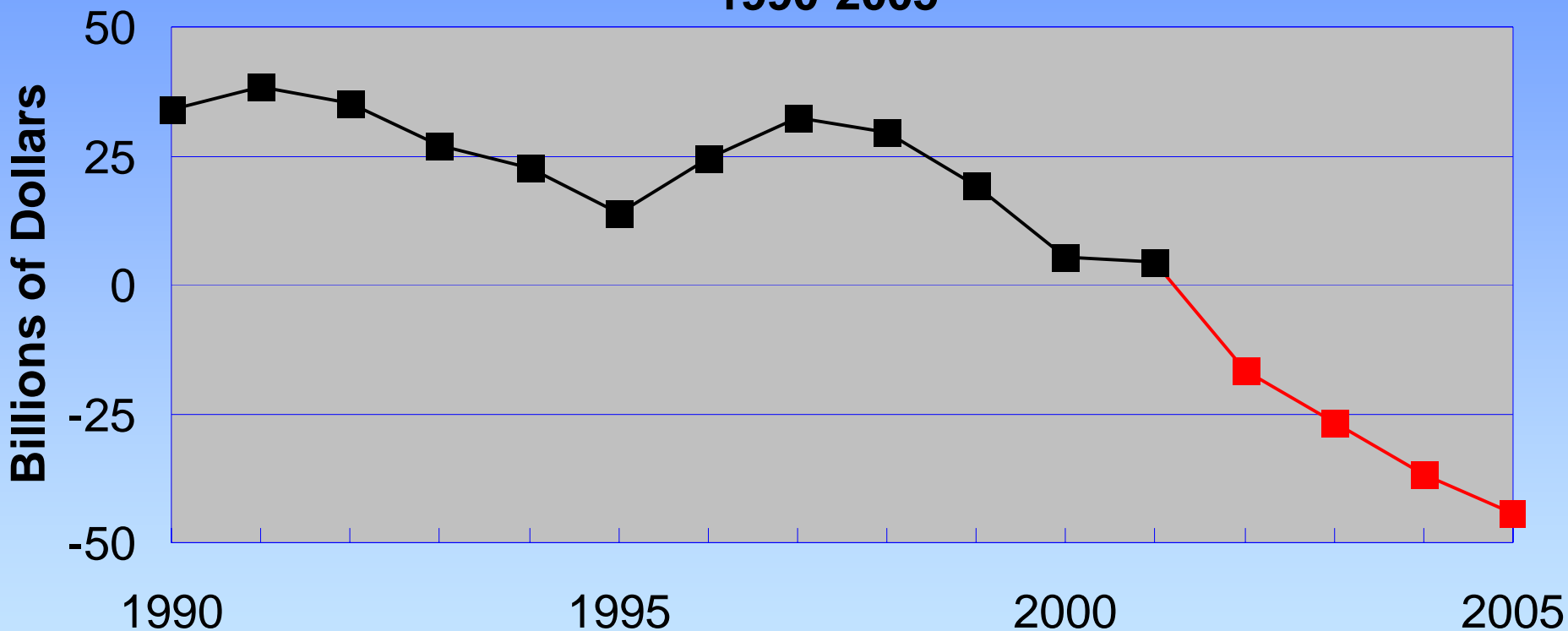
Defense R&D

Defense Basic Research Has Remained Flat Despite Overall Growth in Defense Research, Development, Test and Evaluation



Source: American Association for the Advancement of Science, 2006

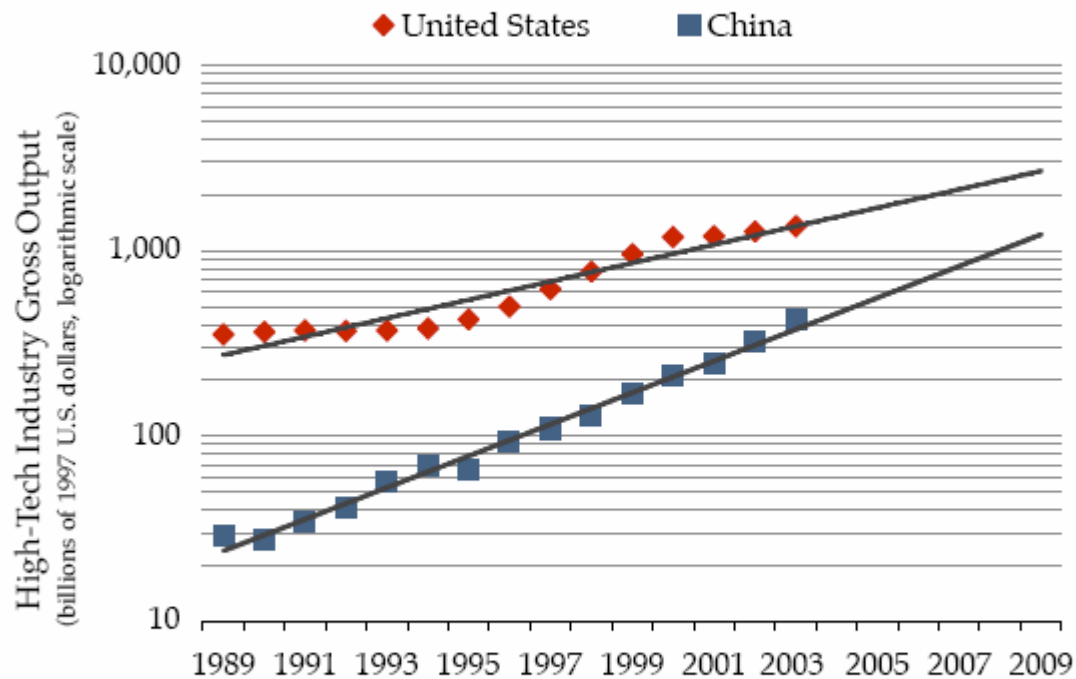
U.S. Trade Balance for Advanced Technology Products 1990-2005



Source: U.S. Census Bureau Foreign Trade Statistics, *U.S. International Trade in Goods and Services*
Compiled by the APS Office of Public Affairs.

High-Tech Economy

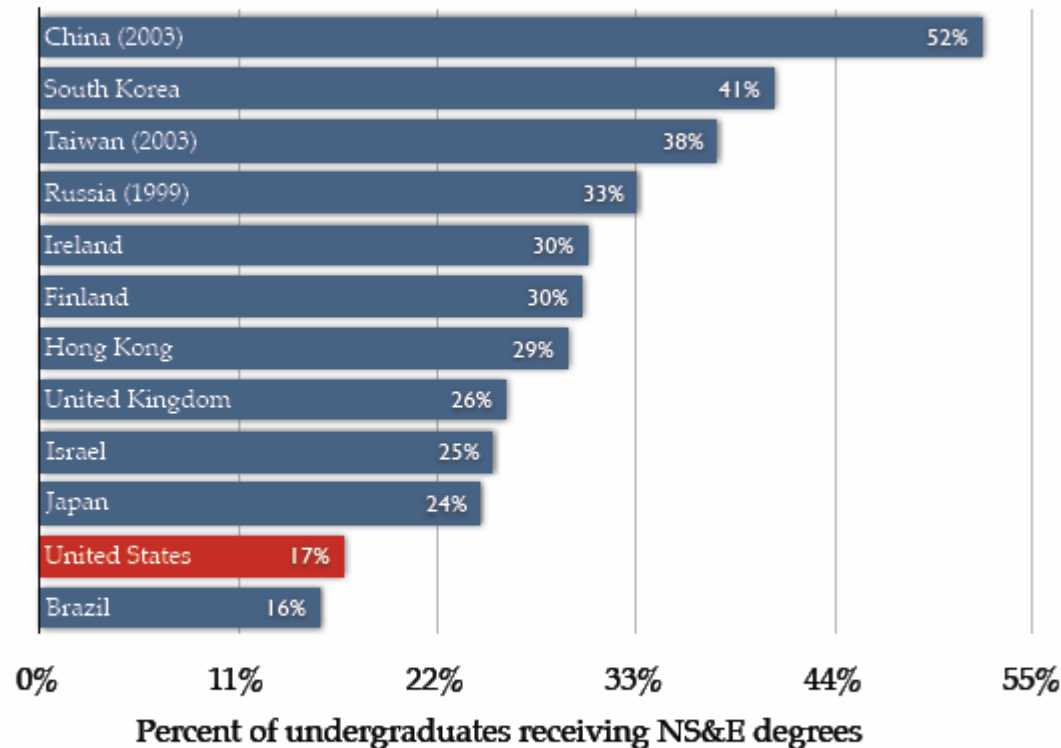
China Gaining Rapidly on U.S. in High-Tech Industry Output



Source: National Science Foundation, Science and Engineering Indicators 2006. Appendix Table 6-2. Compiled by the APS Washington Office.

Education

U.S. Undergraduate Emphasis on Science and Engineering Small



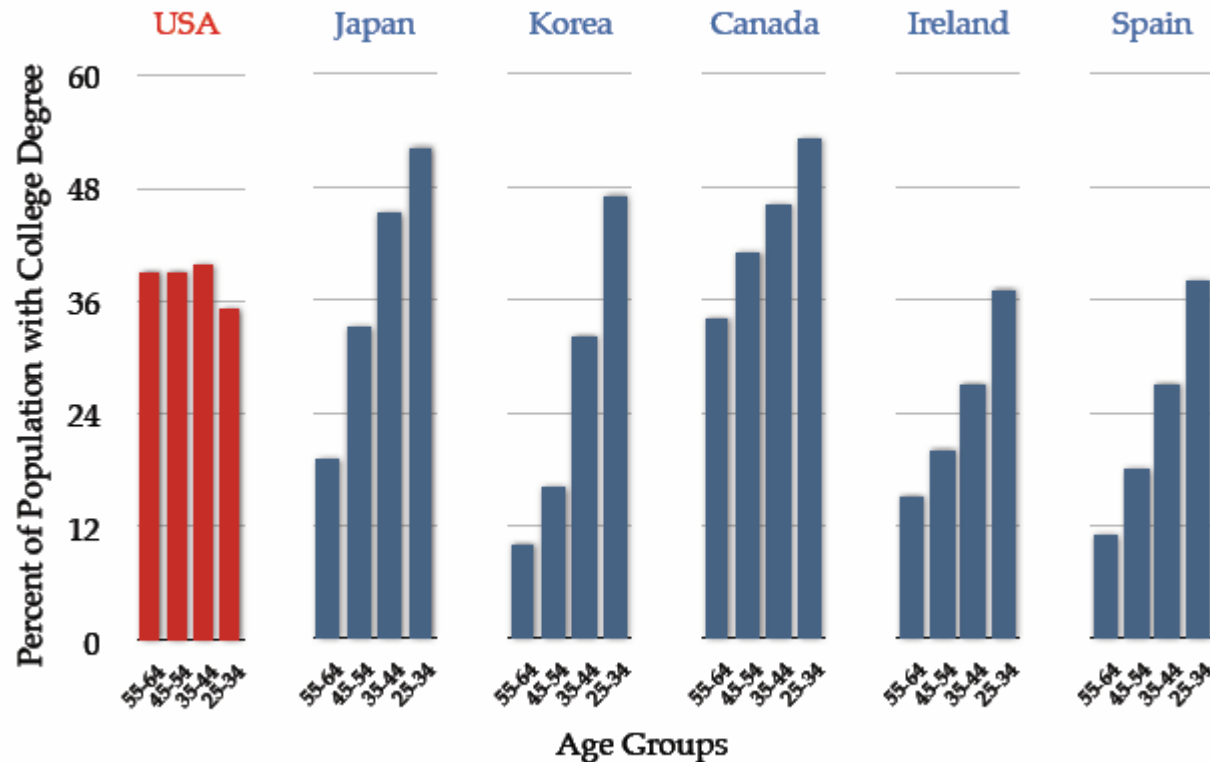
*NS&E degrees include natural (physical, biological, earth, atmospheric, and ocean sciences), agricultural, and computer sciences, mathematics, and engineering. Data are for 2002 (or most recent year).

Source: *NSF Science and Engineering Indicators 2006*.

Compiled by the APS Washington Office.

Education

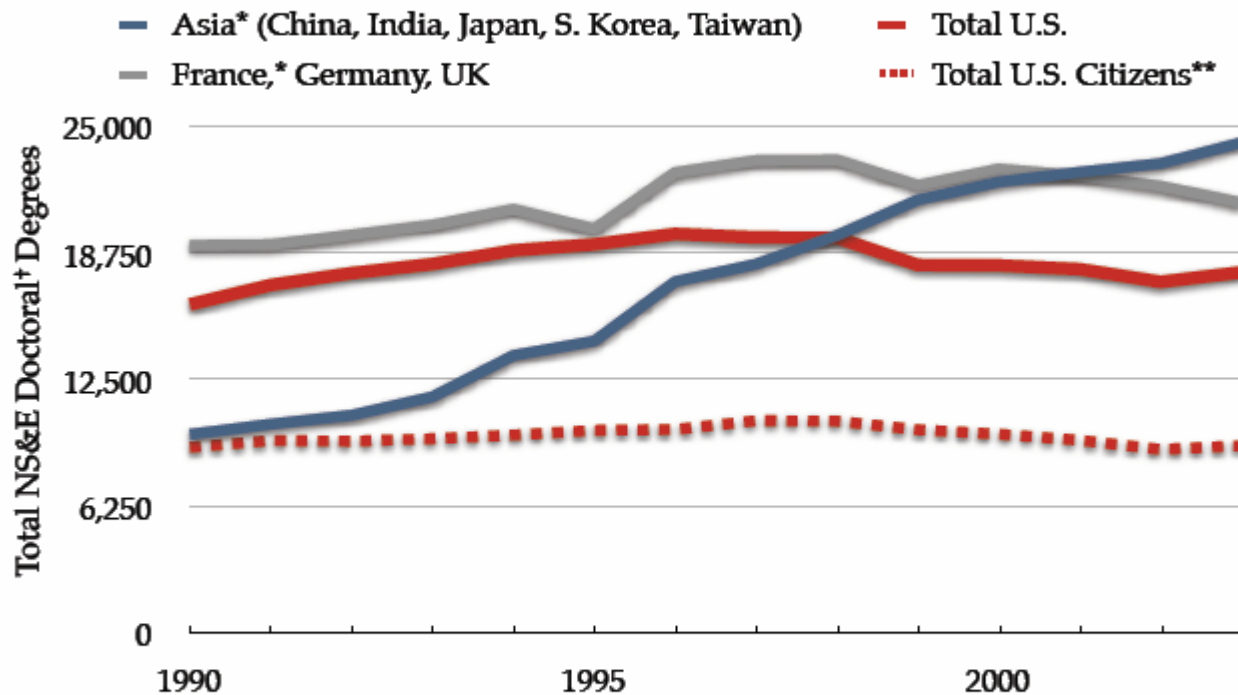
Other Countries Educating Higher Proportion of Younger Generation



Source: Education at a Glance, 2005, OECD.
Compiled by the APS Physics Washington Office

Education

Asian Output of Ph.D.s on Rapid Rise, U.S. Number Flat, with Half Going to Foreigners

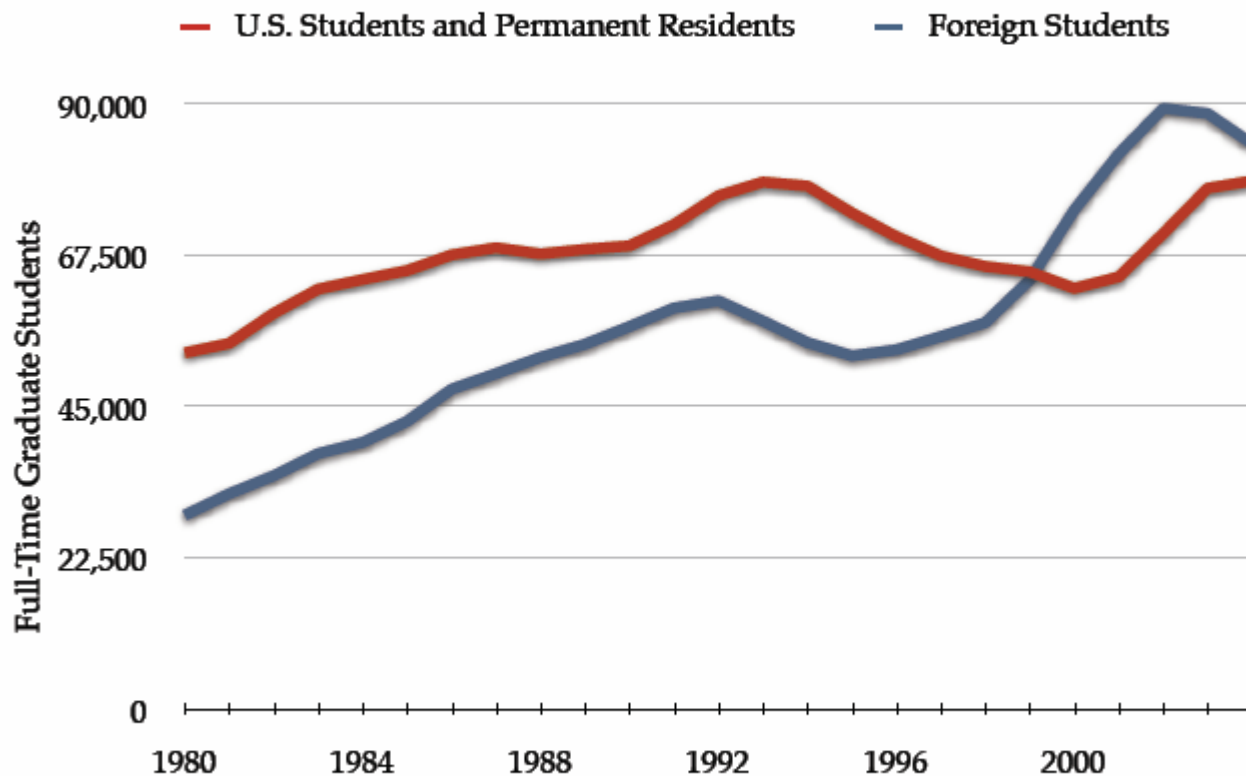


*Some data were not available. As a conservative estimate, most recent value was carried over. 2001 China data used for 2002 and 2003 values; 2001 Taiwan value for 2002 value; 2000 and 2002 South Korea data for 2001 and 2003, respectively; 1999 France value for 2000-20003.
**U.S. Institutions only. *NS&E degrees include natural (physical, biological, earth, atmospheric, and ocean sciences), agricultural, and computer sciences, mathematics, and engineering.

Source: 2006 Science and Engineering Indicators, National Science Foundation.
Compiled by the APS Washington Office.

Education

U.S. Graduate Institutions: Foreign Students Outnumber U.S. Students in Physical Science* and Engineering



* Mathematical and Computer Science included.

Source: National Science Foundation Division of Science Resources Statistics: Graduate Students and Postdoctorates in Science and Engineering, Fall 2002, Fall 2003, and Fall 2004. Compiled by the APS Physics Washington Office.

Time for Action

106TH CONGRESS
1ST SESSION

S. 296

To provide for continuation of the Federal research investment in a fiscally sustainable way, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JANUARY 22, 1999

Mr. FRIST (for himself, Mr. ROCKEFELLER, Mr. DOMENICI, Mr. LIEBERMAN, Mr. GRAMM, Mr. BINGAMAN, Mr. BURNS, Mr. BREAUX, Mrs. HUTCHISON, Mr. CLELAND, Mr. THOMPSON, Mr. KERRY, Mr. DEWINE, Mr. KERREY, Mr. ABRAHAM, Mr. AKAKA, Mr. ALLARD, Mrs. BOXER, Mr. ROBERTS, and Mr. ROBB) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To provide for continuation of the Federal research investment in a fiscally sustainable way, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 SECTION 1. SHORT TITLE.

4 This Act may be cited as the “Federal Research In-
5 vestment Act”.

1 SEC. 2. GENERAL FINDINGS REGARDING FEDERAL INVEST-

2 MENT IN RESEARCH.

22 (6) Studies show that about half of all United
23 States post-World War II economic growth is a di-
24 rect result of technical innovation; and science, engi-
25 neering, and technology contribute to the creation of
26 new goods and services, new jobs and new capital.

1 (7) Technical innovation is the principal driving
2 force behind the long-term economic growth and in-
3 creased standards of living of the world’s modern in-
4 dustrial societies. Other nations are well aware of
5 the pivotal role of science, engineering, and tech-
6 nology, and they are seeking to exploit it wherever
7 possible to advance their own global competitiveness.

Task Force on the Future of American Innovation

National Press Club Rollout February 16, 2005

THE KNOWLEDGE ECONOMY: IS THE UNITED STATES LOSING IT'S COMPETITIVE EDGE?



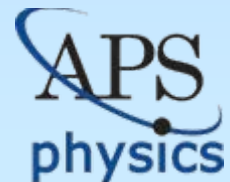
BENCHMARKS OF OUR INNOVATION FUTURE

February 16, 2005

THE REPORT OF THE TASK FORCE
ON THE FUTURE OF AMERICAN INNOVATION

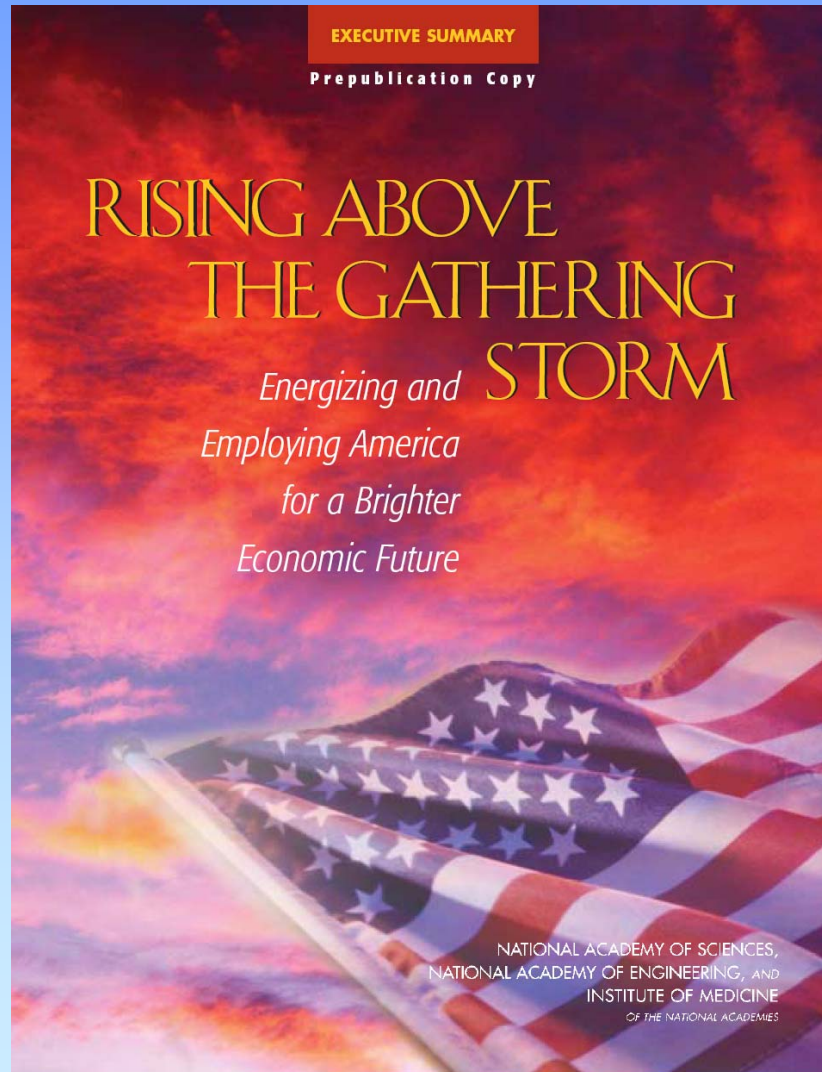
www.futureofinnovation.org

Agilent Technologies, ASTRA, American Chemical Society, American Electronics Association,
American Mathematical Society, American Physical Society, Association of American Universities,
Computing Research Association, Computing Technology Industry Association,
Computing Systems Policy Project, Council on Competitiveness, Hewlett-Packard, Intel, Lucent,
Materials Research Society, Microsoft, National Association of Manufacturers, NASULGC,
The Science Coalition, Semiconductor Industry Association,
Southeastern Universities Research Association, Texas Instruments



National Academies Report

Rollout October 12, 2005



2006 House Democrats Campaign

National Press Club Rollout November 15, 2005





AMERICAN COMPETITIVENESS INITIATIVE

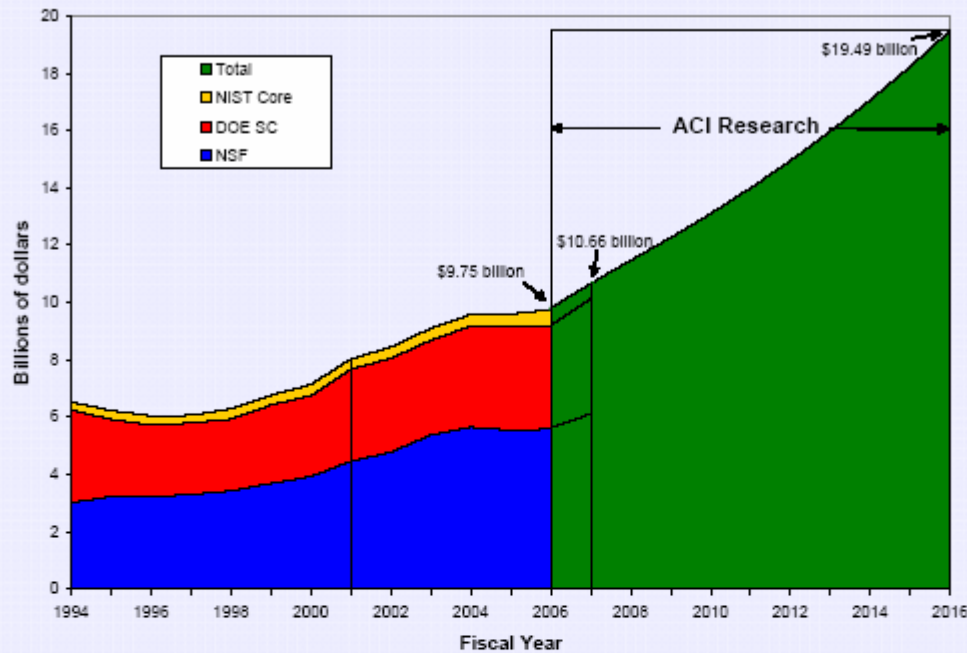
LEADING THE WORLD IN INNOVATION

**DOMESTIC POLICY COUNCIL
OFFICE OF SCIENCE AND TECHNOLOGY POLICY**

FEBRUARY 2000

Figure 1: ACI Research Funding, 2007-2016.

American Competitiveness Initiative Research: FY 2007- FY 2016



	FY 2006 Funding	ACI Research FY 2007		ACI Research FY 2016	
	(billions of dollars)	(billions of dollars)	% increase	(billions of dollars)	% increase over FY06
NSF	\$5.58	\$6.02	7.8	\$11.16 ¹	100.0
DoE SC	\$3.60	\$4.10	14.0	\$7.19 ¹	100.0
NIST Core²	\$0.57 ³	\$0.54	-5.8 ⁴	\$1.14 ¹	100.0
TOTAL	\$9.75	\$10.66	9.3	\$19.49	100.0

¹ ACI doubles total research fund; individual agency allocations remain to be determined.

² NIST core consists of NIST lab research and construction accounts.

³ The 2006 enacted level for NIST core includes \$137 million in earmarks.

⁴ Represents a 24 percent increase after accounting for earmarks.

September 2006

FY 2007 Appropriations

Committee Passage
Floor Passage

ACI Basic Research Investment	FY 2006 Funding	Administration's FY 2007 ACI Research Requests		House FY 2007 Appropriations		Senate FY 2007 Appropriations ⁶	
	\$ in millions	\$ in millions	% increase	\$ in millions	% increase	\$ in millions	% increase
National Science Foundation	5,581	6,020	7.9	6,020	7.9	5,992	7.3
Dept. of Energy – Office of Science	3,596	4,102	14.1	4,132	14.9	4,241	17.9
National Institute of Standards & Technology ¹	431 ²	535	24.1 ³	535	24.1	658 ⁴	52.7
TOTAL	\$9,608	\$10,657	10.9	\$10,687	11.2	\$10,891⁵	13.4

Refers to NIST core accounts, consisting of the Scientific & Technical Research and Services (STRS) budget, plus the Construction of Research Facilities (CRF) budget

Total FY 2006 funding for NIST core accounts was \$568 million; the figure in the chart reflects a subtraction of \$137 million in earmarks

If earmarks are factored back into the FY 2006 funding, the Administration's FY 2007 proposal represents a 5.8% decrease

The Senate might earmark \$137 million of this figure. If so, the non-earmarked portion would be \$521 million, or a 20.9% increase

If \$137 million in NIST funding is earmarked, this total would fall to \$10,754, or an 11.9% increase

The Senate numbers for NSF & NIST have been approved by the Appropriations Committee, but not the full Senate; all other House & Senate numbers passed by full body

October 2006

- Election recess: CR through Nov. 17
- Election outcomes: forecasts
 - Rasmussen
 - ? Senate: **R 48**, **D 47**, Toss-up 5
 - C-SPAN/CQ
 - ? Senate: **R 48**, **D 49**, Toss-up 3
 - ? House: **D 210**, **R 207**, Toss-up 18
 - Cook
 - ? Senate: **D 49**, **R 48**, Toss-up 3
 - ✓ House: **D by 1 to 20**
 - Thomas Mann
 - ✓ Senate: **D 51**, **R 49**
 - ✓ House: **D by 5 to 15**
 - Lubell's Picks
 - ✓ Senate: **R 50**, **D 50**
 - ✓ House: **D by 15**

October 2006

- Election outcomes
 - **Scenario 1. Neither chamber changes hands**
 - **Scenario 2 Both chambers change hands**
 - **Scenario 3 Dems take over House only**
 - **Scenario 4 Dems take over Senate only**
- Possible appropriations scenarios
 - **Omnibus appropriations**
 - **Minibus appropriations**
 - **CR until February 2007 or longer**
 - **Year-long CR**

The FY 2007 Mess and How It Got Cleaned Up

The Chronology

- ❖ Feb 06 White House submits FY 07 ACI budget request
- ❖ Jul 06 House passes ACI budgets
- ❖ Sep 06 Senate Appropriations Committee passes ACI budgets
- ❖ Oct 06 Congress recesses for election with CR to Nov.
- ❖ Nov 06 Dems win 110th Congress & 109th Congress votes CR to Dec.
- ❖ Dec 06 109th Congress adjourns, passing CR through Feb. 15
- ❖ Dec 06 Obey and Byrd plan year-long CR with no exceptions
- ❖ Jan 07 Obey and Byrd agree to limited adjustments
- ❖ Jan 07 Science put on priority list with vets and highways
- ❖ Feb 07 House passes CR with science adjustments
- ❖ Feb 07 White House criticizes 110th Congress's CR
- ❖ Feb 07 White House submits FY 08 ACI budget request
- ❖ Feb 07 Democrats criticize White House S&T budget request
- ❖ Feb 07 Senate “contemplates”– outcome still to be determined

The FY 2007 Mess and How It Got Cleaned Up

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- ❖ **Feb 06** White House submits FY 07 ACI budget request
- ❖ **Jul 06** House passes ACI budgets
- ❖ **Sep 06** Senate Appropriations Committee passes ACI budgets
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- ❖ **Nov 06** Dems win 110th Congress & 109th Congress votes CR to Dec.
- ❖ **Dec 06** 109th Congress adjourns, passing CR through Feb. 15
- ❖ *Dec 06* *Obey and Byrd plan year-long CR with no exceptions*
- ❖ *Jan 07* *Obey and Byrd agree to limited adjustments*
- ❖ *Jan 07* *Science put on priority list with vets and highways*
- ❖ *Feb 07* *House passes CR with science adjustments*
- ❖ **Feb 07** White House criticizes 110th Congress's CR
- ❖ **Feb 07** White House submits FY 08 ACI budget request
- ❖ **Feb 07** Democrats criticize White House S&T budget request
- ❖ **Feb 07** Senate “contemplates”– outcome still to be determined

The FY 2007 Mess and How It Got Cleaned Up

The Chronology

- ❖ *Dec 06 Obey and Byrd plan year-long CR with no exceptions*
- ❖ *Jan 07 Obey and Byrd agree to limited adjustments*
- ❖ *Jan 07 Science put on priority list with vets and highways*
- ❖ *Feb 07 House passes CR with science adjustments*

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

- ❖ *Dec 06 Obey and Byrd plan year-long CR with no exceptions*
- ❖ *Jan 07 Obey and Byrd agree to limited adjustments*
- ❖ *Jan 07 Science put on priority list with vets and highways*
- ❖ *Feb 07 House passes CR with science adjustments*

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

❖ *Dec 06 Obey and Byrd plan year-long CR with no exceptions*

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

- ❖ **Dec 06 Obey and Byrd plan year-long CR with no exceptions**
 - **Intelligence and Advocacy**
 - **Holt**
 - **DeLauro**
 - **Which agencies? DOE, NIST, NSF**
 - **Media: Bill Broad (NYT), NPR “Science Friday”**
 - **APS Alert**

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

- ❖ **Dec 06 Obey and Byrd plan year-long CR with no exceptions**
 - **The Schumer Strategy**
 - **BNL Management**
 - **Jim Simons**
 - **The Pelosi Strategy**
 - **Eshoo**
 - **AeA, SIA, TI, Task Force on Future of American Innovation**
 - **California Research Universities, Northrup Grumman**
 - **Lofgren**
 - **Miller**
 - **DeLauro**
 - **Emanuel**

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

- ❖ **Dec 06** Obey and Byrd plan year-long CR with no exceptions
- ❖ **Jan 07** Obey and Byrd agree to limited adjustments
 - **Targeting the appropriations subcommittees**
 - **Senate CJS (Mikulski and Shelby)**
 - AAU, NASULGC
 - 200 APS letters to Mikulski
 - Lieberman “Dear Colleague” (23 total but only 3 R)
 - **Senate Energy & Water (Dorgan & Domenici)**
 - Alexander-Bingaman “Dear Colleague” (45 total: 27 D 18 R)
 - Domenici
 - Schumer

The FY 2007 Mess and How It Got Cleaned Up

The Inside Story

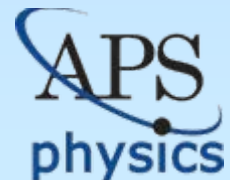
- ❖ **Dec 06** Obey and Byrd plan year-long CR with no exceptions
- ❖ **Jan 07** Obey and Byrd agree to limited adjustments
 - **Targeting the appropriations subcommittees**
 - **House CJS (Mollohan and Frelinghuysen)**
 - **MSL**
 - **AAU and NASULGC**
 - **Princeton**
 - **Holt, Ehlers, Gordon**
 - **House Energy & Water (Visclosky and Hobson)**
 - **Holt, Tauscher, Biggert**
 - **Indiana University Presidents**
 - **DeLauro**

FY 2007 Appropriations

Account	FY05 (\$B)	FY06 (\$B)	FY07 (\$B)	FY07 Request		Congress			
				(\$B)	% Change	House (\$B)	Senate (\$B)	FY07 CR (\$B)	% Change
DOE Science DOE Renewables	3.57	3.47 1.16		4.10 1.17	+18 +0.8	4.10 1.17	<u>4.17</u> <u>1.17</u>	3.80 1.46	9.4 25.9
NSF	5.48	5.58		6.02	+7.8	6.02	<u>5.99</u>	5.91	5.9
NIST STRS NIST ATP	0.38	0.40 0.06		0.47 0.00	+18	0.47 0.00	<u>0.47</u> <u>0.00</u>	0.45 0.06	12.5
DOD 6.1	1.49	1.47	1.54	1.42	-3	1.56	1.48		4.5
DOD 6.2	4.79	5.17	5.21	4.48	-13	5.25	4.81		0.7
NASA Science	5.50	5.25		5.33	+1	5.41	<u>5.4</u>	???	???

Adjusted for earmarks

Action by Appropriations Committee only



FY 2008 Appropriations

Account	FY05 (\$B)	FY06 (\$B)	FY07 (\$B)	FY08 Request		Congress			
				(\$B)	% Change				
DOE Science	3.57	3.47	3.80	4.40	+15.8				
DOE Renewables		1.16	1.46	1.23	-15.8				
NSF	5.48	5.58	5.91	6.43	+8.8				
NIST STRS	0.38	0.40	0.45	0.59	+31				
NIST ATP		0.06	0.06	0.00					
DOD 6.1	1.49	1.47	1.54	1.42	-7.8				
DOD 6.2	4.79	5.17	5.21	4.36	-16.3				
NASA Science	5.50	5.25	???	???	???				

Adjusted for earmarks

House CR appropriations

