



Who are we?

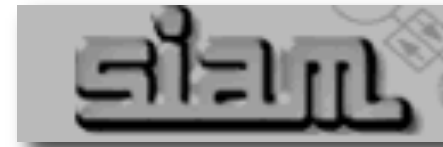
- CS	Michigan State University - CSE	University of Alabama, Tuscaloosa - CS	University of North Carolina at Chapel Hill - CS
iversity - CS	Michigan Technological University - CS	University of Alberta - CS	University of North Carolina at Chapel Hill - SILS
CS	Mississippi State University - CS	University of Arizona - CS	University of North Carolina, Charlotte - IT
- MCS	Montana State University - CS	University of Arkansas - CSCE	University of North Dakota - CS
- CS	Montclair State University - CS	University of Arkansas at Little Rock - I	University of North Texas - CS
of Technology - CS	National University of Singapore - CS/IS	University of Calgary - CS	University of Notre Dame - CSE
nic State University - CS	Naval Postgraduate School - CS	University of California, Berkeley - EECS	University of Oklahoma - CS
iversity, Chico - CS	New Jersey Institute of Technology - CCS	University of California, Berkeley - IMS	University of Oregon - CIS
iversity - CS	New Mexico State University - CS	University of California, Davis - CS	University of Pennsylvania - CIS
erve University - EECS	New York University - CS	University of California, Irvine - ICS	University of Pittsburgh - CS
New York, Graduate Center - CS	North Carolina State University - CS	University of California, Los Angeles - CS	University of Pittsburgh - IS
y - CS	Northeastern University - CIS	University of California, Riverside - CSE	University of Puget Sound - MCS
- CS	Northern University - ECE	University of California, San Diego - CSE	University of Rochester - CS
& Mary - CS	Northwestern University - ECE	University of California, Santa Barbara - CS	University of Rochester - CS
f Mines - MCS	Nova Southeastern University - CS	University of California, Santa Cruz - CE	University of South Alabama - CIS
iversity - CS	Oakland University - CSE	University of California, Santa Cruz - CS	University of South Carolina - CSE
y - CS	Ohio State University - CSE	University of Central Florida - CS	University of South Florida - CSE
- CS	Ohio University - EECS	University of Chicago - CS	University of Southern California - CS
- ECE	Oklahoma State University - CS	University of Cincinnati - ECECS	University of Southern California - EES
ty - CS	Old Dominion University - CS	University of Colorado, Boulder - CS	University of Tennessee, Knoxville - CS
e - CS	Oregon Health & Science University - CSE	University of Colorado, Boulder - CS	University of Tennessee, Knoxville - CS
- CS	Oregon State University - EECS	University of Delaware - CIS	University of Texas, Arlington - CSE
CS	Pace University - CSIS	University of Denver - CS	University of Texas, Austin - CS
CS	Pennsylvania State University - CSE	University of Denver - CS	University of Texas, Dallas - CS
IST	Pennsylvania State University - IST	University of Florida - CISE	University of Texas, El Paso - CS
CS	Polytechnic University - CIS	University of Georgia - CS	University of Toronto - CS
MCS	Pomona College - MCS	University of Hawaii - ICS	University of Tulsa - MCS
iversity - CSE	Portland State University - CS	University of Houston - CS	University of Utah - CS
Technology - CS	Princeton University - CS	University of Houston - ECE	University of Virginia - CS
al University - CS	Purdue University - CS	University of Idaho - CS	University of Washington - CSE
rsity - CS	Purdue University - ECE	University of Illinois, Chicago - CS	University of Washington - I
rsity - IS	Rensselaer Polytechnic Institute - CS	University of Illinois, Urbana Champaign - CS	University of Washington, Bothell - CS
iversity - CS	Rice University - CS	University of Illinois, Urbana Champaign - ECE	University of Washington, Tacoma - CSS
n University - CS	Rochester Institute of Technology - CS	University of Iowa - CS	University of Waterloo - CS
f Technology - CSE	Roosevelt University - CS&T	University of Kansas - EECS	University of Wisconsin, Madison - CS
University - IT	Rutgers University, Busch Campus - CS	University of Kentucky - CS	University of Wisconsin, Milwaukee - EECS
ersity - CIS	Saint Louis University - MCS	University of Louisiana at Lafayette - CACS	University of Wyoming - CS
ersity - CS	Santa Clara University - CE	University of Louisville - CECS	Utah State University - CS
MCS	Simon Fraser University - CS	University of Maine - CS	Vanderbilt University - EECS
- CS	Singapore Management University - IS	University of Maryland - CS	Virginia Commonwealth University - CS
ge - CS	Southern Illinois University, Carbondale - CS	University of Maryland, Baltimore Co - CSEE	Virginia Tech - CS
CS	Southern Methodist University - CSE	University of Maryland, Baltimore Co - IS	Wake Forest University - CS
Technology - CS	Southern Polytechnic State University - CSE	University of Massachusetts, Amherst - CS	Washington State University - EECS
rsity - ACS	Stanford University - CS	University of Massachusetts, Boston - CS	Washington University in St. Louis - CS
CS	State University of New York, Albany - CS	University of Michigan - EECS	Wayne State University - CS
	State University of New York, Binghamton - CS	University of Michigan - I	West Virginia University - CSEE
		University of Michigan, Dearborn - CIS	Western Michigan University - CS
		University of Minnesota - CSE	



Intel Corporation (Sponsoring Member)
Sun Microsystems (Sponsoring Member)
Microsoft Corporation (Sustaining Member)
IBM Research (Supporting Member)



Argonne National Laboratory
Avaya
CA Labs
Computer Science Research Institute at Sandia National Labs
Fujitsu Laboratories of America
FX Palo Alto Laboratory
Google
Hewlett-Packard Company
IDA Center for Computing Sciences
Lawrence Berkeley National Laboratory
Los Alamos National Laboratory
Mitsubishi Electric Research Labs
National Center for Atmospheric Research
NCSA
NEC Laboratories America
Ricoh Innovations
San Diego Supercomputer Center
SAP Labs
SRI International
Telcordia Technologies



History

1972: Computer Science Board formed

- Periodic discussions among the chairs of the major computer science departments

1986: => Computing Research Board

- Embraced computer engineering and computational science

1990: => Computing Research Association

- Washington DC office with professional staff

2007-08 CRA Board of Directors

Antón, North Carolina State University
m Aspray, Indiana University
ernstein, Microsoft Research
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- David Gries, Cornell Univ., 1987-89
- Paul Young, Univ. of Washington, 1989-91
- John Rice, Purdue Univ., 1991-93
- Dave Patterson, UC Berkeley, 1993-97
- Ed Lazowska, Univ. of Washington, 1997-2001
- Jim Foley, Georgia Tech, 2001-05
- Dan Reed, Univ. of North Carolina, 2005-09

MISSION

strengthen research and education in the computing
fields

working to influence **policy** that impacts computing
research

encouraging the development of **human
resources**

contributing to the cohesiveness of the professional
community

and collecting and disseminating **information** about
the importance and the state of computing research

: Collect and disseminate to the research and y-making communities information about the importance and state of computing research and ed policy.

COMPUTING RESEARCH NEWS
 A Publication of the Computing Research Association
 September 2005 Vol. 17/No. 4

Computing Research Gains Congressional Focus

By Peter Harsha

The concerns of computing researchers about the overall underinvestment in the federal IT research portfolio—and specific concerns about DARPA's steady withdrawal from long-term IT research, especially in unclassified areas—have gained new prominence in Congress thanks to a series of recent news reports, studies and congressional actions. That attention has so far culminated in a hearing of the full House Science Committee on the future of computer science research in the United States and questions about the implications of the shift in the overall landscape for federal support of computing research. As Congress works to set the funding levels for federal science agencies in fiscal year 2006, it remains to be seen whether the increased focus will result in increases in funding for IT research, but the increased attention has spurred some federal agencies and the

over the past several years to focus attention on what it sees as a significant shift in the federal IT research portfolio away from fundamental, long-term research toward shorter-term, development-related research, getting traction for those concerns on the Hill and in the Administration has been slow going until recently. In March, the Senate Armed Services Committee (SASC)—a committee sympathetic to the community's concerns, especially as they related to DARPA, an agency under the committee's jurisdiction—passed a question to DARPA Director Anthony Tether aimed at getting data on DARPA's current and historical support for IT research at universities. The committee was responding to a request from the community to get actual data—the anecdotal evidence for DARPA's withdrawal from support for unclassified IT research was strong

DARPA responded by noting that its support for IT research overall, for both universities and in industry, had been fairly consistent, averaging about \$80 million in constant dollars over the past five years. DARPA support for university IT research, however, had fallen considerably over the same period—from \$14 million in FY 2001 to \$123 million in FY 2004. DARPA cited five "factors for the decline":

1. A change in emphasis in the high-performance computing program from pure research to supercomputer construction;
2. A significant drop in unclassified information security research;
3. The end of TIA-related programs in FY 2004 due to congressional decree, a move that cost universities \$6 million per year in research funding;
4. Research into intelligent software had matured beyond the research stage into integration; and
5. Classified funding for computer science-related programs increased markedly between FY 2001 and FY 2004, but universities received none of this funding.

To the computing community, DARPA's response was a concession that the agency's focus in IT research is increasingly short term (at least in the unclassified realm) and that universities are no longer significant performers of DARPA IT research (classified or unclassified). In essence, DARPA's response validated the arguments the community had been making since 2001, but had only anecdotal evidence to prove. DARPA's answers to the question posed by SASC found their way to New York Times reporter John Markoff, who had been interested in

news

Computing Research Policy Blog

As more details are revealed, I'm thinking the positives outweigh the negatives...

Posted by Peter Harsha at 05:22 PM | [TrackBack](#)
 Posted to [Policy](#)

SEPTEMBER 26, 2005

FY 06 APPROPRIATIONS UPDATE: A BIGGIE

On September 15th, the Senate approved the **FY 2006 Commerce, Science, Justice** appropriations bill (the version of the House's **Science, State, Justice, Commerce** bill, which the House approved **back in June**), approving funding for a number of science agencies for the coming year. As we noted **back in June**, the Senate indicated it was going to be less generous than the House for some key science agencies, and that indication held true. With the Senate's action, we now have a substantial piece of the puzzle that is the annual appropriations process for science, so it seems like an appropriate time to summarize where we stand. After the agency-by-agency summaries, see the "outlook" section for the reasons why things will probably get even worse.

Latest Agency Funding Levels
 (in millions of dollars)

	National Science Foundation		House		Senate	
	FY05	FY06 Budget Request	FY06 House	FY06 Senate	House vs. FY05 (%)	Senate vs. FY05 (%)
Research and Related Activities	4,200.6	4,323.5	4,310	4,345.2	2.1%	3.0%
NSF/IBRC		278.7	266	283.4	-11.3%	-11.3%
Education and Human Resources	843.4	737	807	747	-4.1%	-11.2%
Salaries and Expenses	223.2	269	250	229.9	-12.0%	3.0%
National Science Board	4	4	4	4	0%	0%
Office of the Inspector General	10	11.5	11.5	11.5	15%	15%
Total NSF	5,472.9	5,605	5,643.3	5,531	3.1%	1.1%

While the Senate increase of 1.1 percent for FY 2006 would be well below the expected rate of inflation over the next year (meaning its increase is actually a small cut in real-dollar terms), even the slightly-more-reasonable increase approved by the House would still be a decline in real dollars of \$14 million over the FY 2004 level, marking the second straight year of real-dollar budget cuts to the only federal agency focused exclusively on basic research.

	National Institute of Standards and Technology		House		Senate	
	FY05	FY06 Budget Request	FY06 House	FY06 Senate	House vs. FY05 (%)	Senate vs. FY05 (%)
STRS (NIST Labs)	376.7	426.5	397.7	399.6	5.0%	5.4%
Computer Science and Applied Mathematics				65.4		

policy

COMPUTING RESEARCH NEWS
 SEPTEMBER 2005

Professional Opportunities

CRN Advertising Policy
 See <http://www.cra.org/main/cra/jobshow.html>

Clemson University
 Departments of Mathematical Sciences and Computer Science
 Tenure-Track Positions

Clemson University invites applications for two tenure-track leadership faculty positions starting with the Spring 2006 semester. These positions exist in the Department of Mathematical Sciences and one in the Department of Computer Science as part of the University's commitment to build a high-quality research and education program in geospatial science. These new faculty members (tenure-track, position-specific and functional geospatial) will be added to 10

Grinnell College
 Department of Mathematics and Computer Science
 Tenure-Track Faculty Position

Grinnell College seeks an Assistant or Associate Professor of Computer Science in the Department of Mathematics and Computer Science starting August 2006. Ph.D. in computer science, excellent academic record, and strong research and teaching skills are required. The position also includes a teaching assistantship and a research assistantship. Applications from scientists must be postmarked by December 1, 2005. www.grinnell.edu

North Carolina State University
 Department of Computer Science

The College of Engineering at North Carolina State University (NCSU) invites nominations and applications for the position of Assistant Professor of Computer Science. The successful candidate is expected to be recognized by the rank of Professor, and to assume the departmental Head position in the near future. The position is located in Raleigh within the Research Triangle, which has a high concentration of corporate and public organizations that require computer science graduates and provide partnering opportunities for the faculty. The area offers outstanding opportunities for professional growth and an exceptional quality of life. Qualifications for the position include an earned doctorate degree in Computer Science or a relevant discipline; an excellent record of scholarly and educational accomplishments; a demonstrated ability to attract and manage external research funding and strong leadership skills. The successful candidate is expected to be recognized by the rank of Professor, and to assume the departmental Head position in the near future. The position is located in Raleigh within the Research Triangle, which has a high concentration of corporate and public organizations that require computer science graduates and provide partnering opportunities for the faculty. The area offers outstanding opportunities for professional growth and an exceptional quality of life. Qualifications for the position include an earned doctorate degree in Computer Science or a relevant discipline; an excellent record of scholarly and educational accomplishments; a demonstrated ability to attract and manage external research funding and strong leadership skills.

jobs

CRA Bulletin - High-Technology Employment

9/26/2005

IT Sector Employment
 Filed under: High-Technology Employment — Jay Vegso @ 1:54 pm

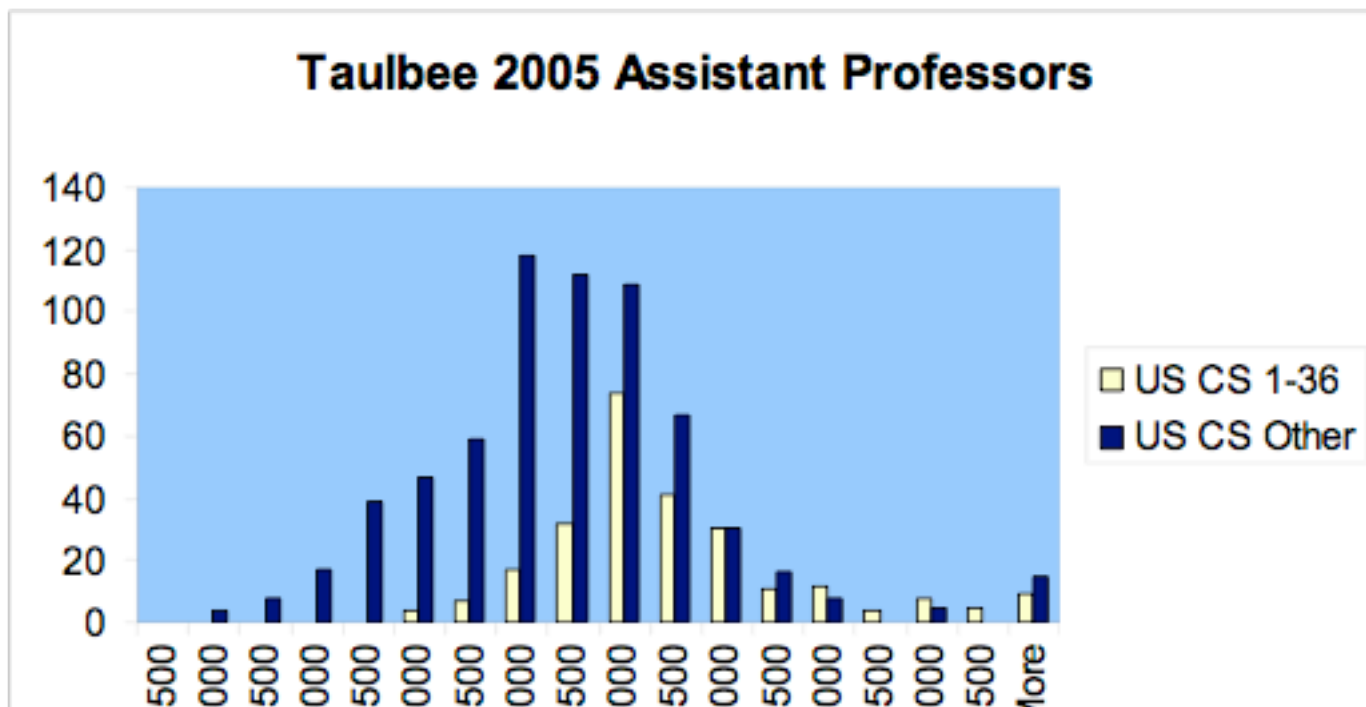
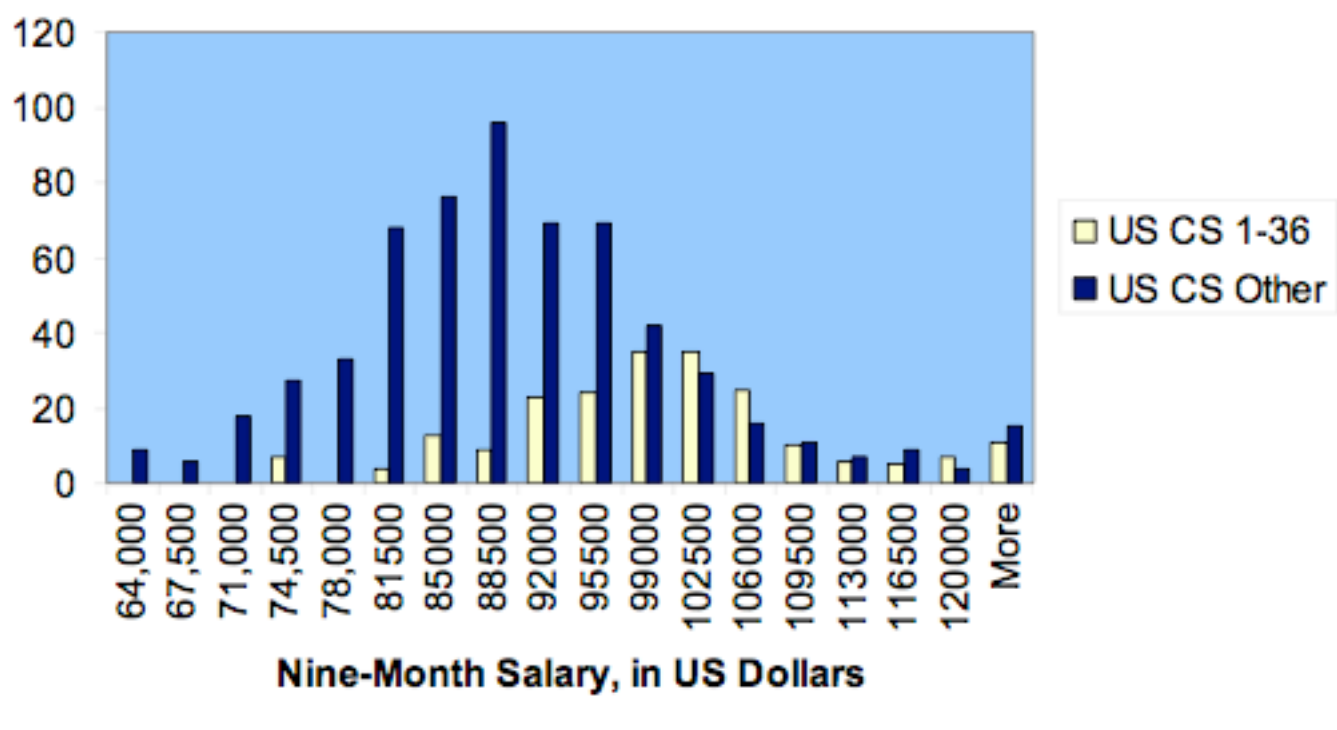
Below are two helpful tables from the *Monthly Labor Review* article that I discussed in an earlier post. They detail the size of the labor force and unemployment rates among IT-sector SOC codes. As with employment projections, these tables show how diverse the "IT workforce" is.

Occupation	Employment in the IT sector, by occupation, 2000-04 (Numbers in thousands)			
	2000	2001	2002	2003
Total IT sector	4,718	4,795	4,510	4,494
Computer and information system managers	228	216	221	247
Computer programmers	745	689	630	563
Computer and information scientist and systems analysts	835	734	682	722
Computer hardware engineers	83	100	76	99
Computer software engineers	739	745	715	758
Computer support specialists	350	355	353	320
Database administrators	54	66	84	72
Network and computer systems administrators	154	185	179	176
Network systems and data communication analysts	305	353	328	359
Computer operators	113	124	126	131

Categories:

- Academic Research and Development Expenditures (4)
- BLS Workforce Projections (3)
- CSA (Twelve Survey (1))
- Events (3)
- FY03 Academic R&D Expenditures (4)
- General (5)
- Graduate Enrollment (1)
- High-Technology Employment (3)
- IT Workforce Debate (5)
- IT Technology Review Scorecard (2)
- Migration Patterns of Degree Recipients (2)
- NACE Salary Survey (1)
- NASIS Enrollment Survey (1)
- NSF InfoBrief (10)

info b



Community

Promote a cohesive and effective sense of community among individuals and groups involved in computing research.

Leadership Summit

Policy workshops

and Research Challenges conferences

Workshops

Computing Community Consortium



Human Resources

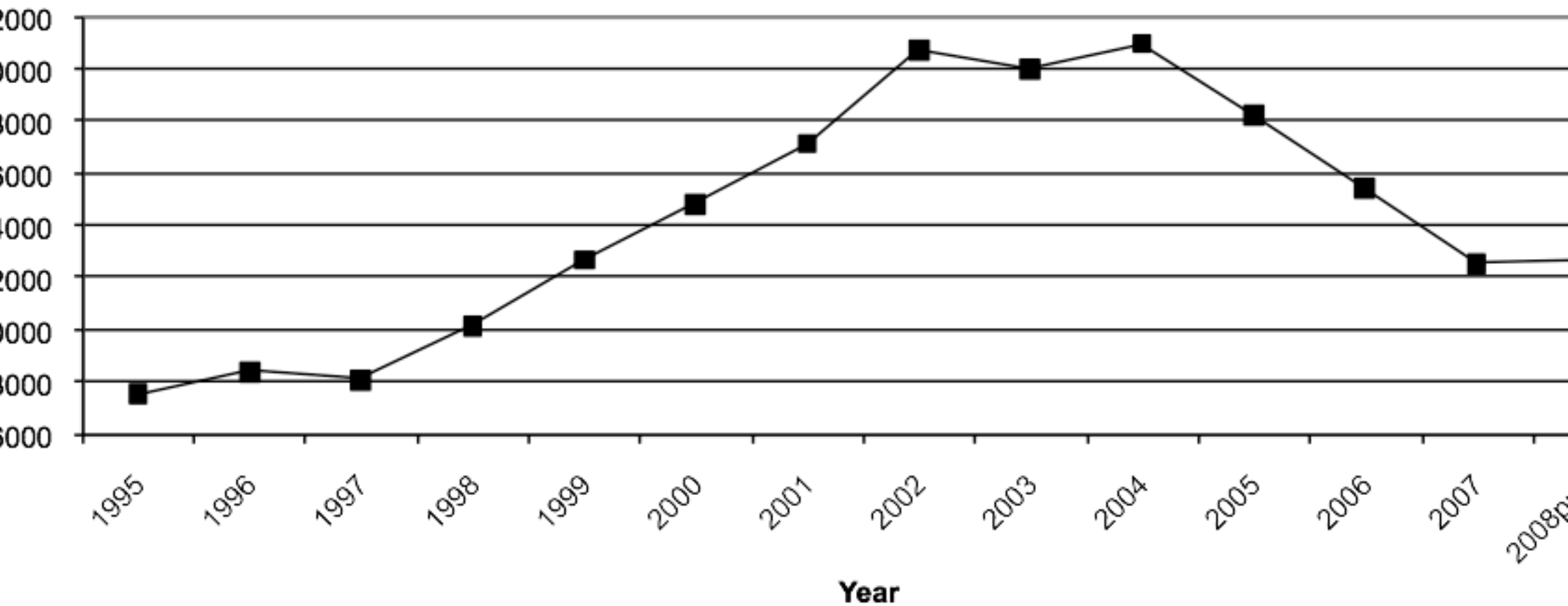
Ensure that society's need for a continuous supply of talented educated computing researchers and advanced practitioners is

Career Mentoring Workshops

Awards

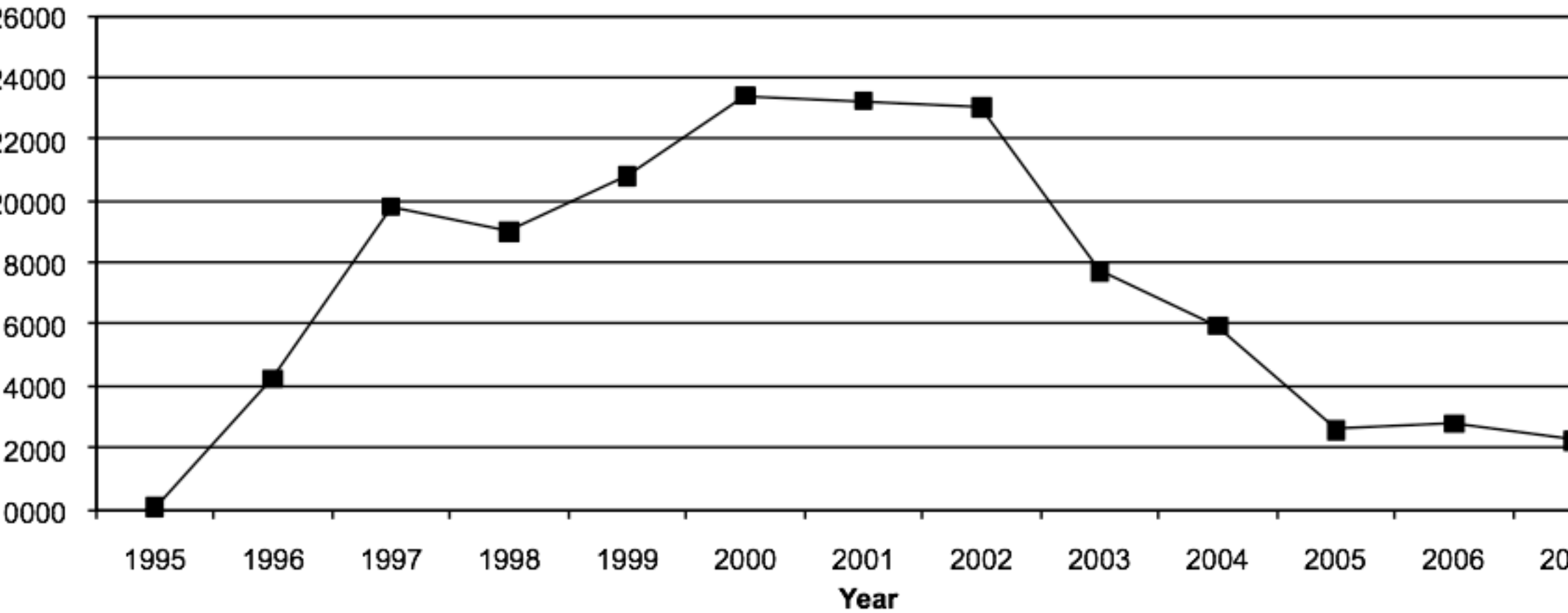
Job listings

Figure 6. BS Production



Bachelors data for Ph.D.-granting department

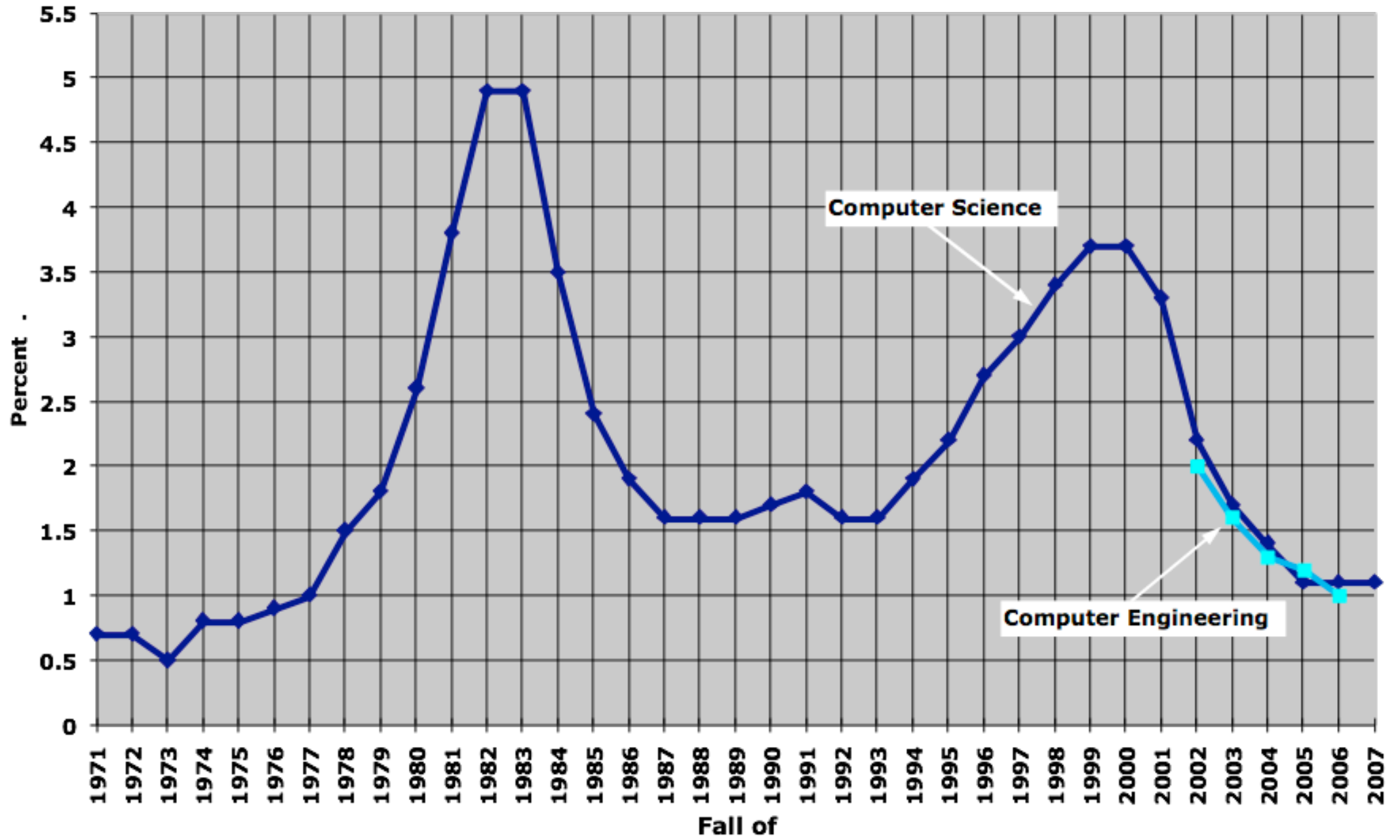
Figure 7. Newly Declared CS/CE Undergraduate Majors



Undergraduate data for Ph.D.-granting departments

CS and CE listed as probable major among incoming freshmen

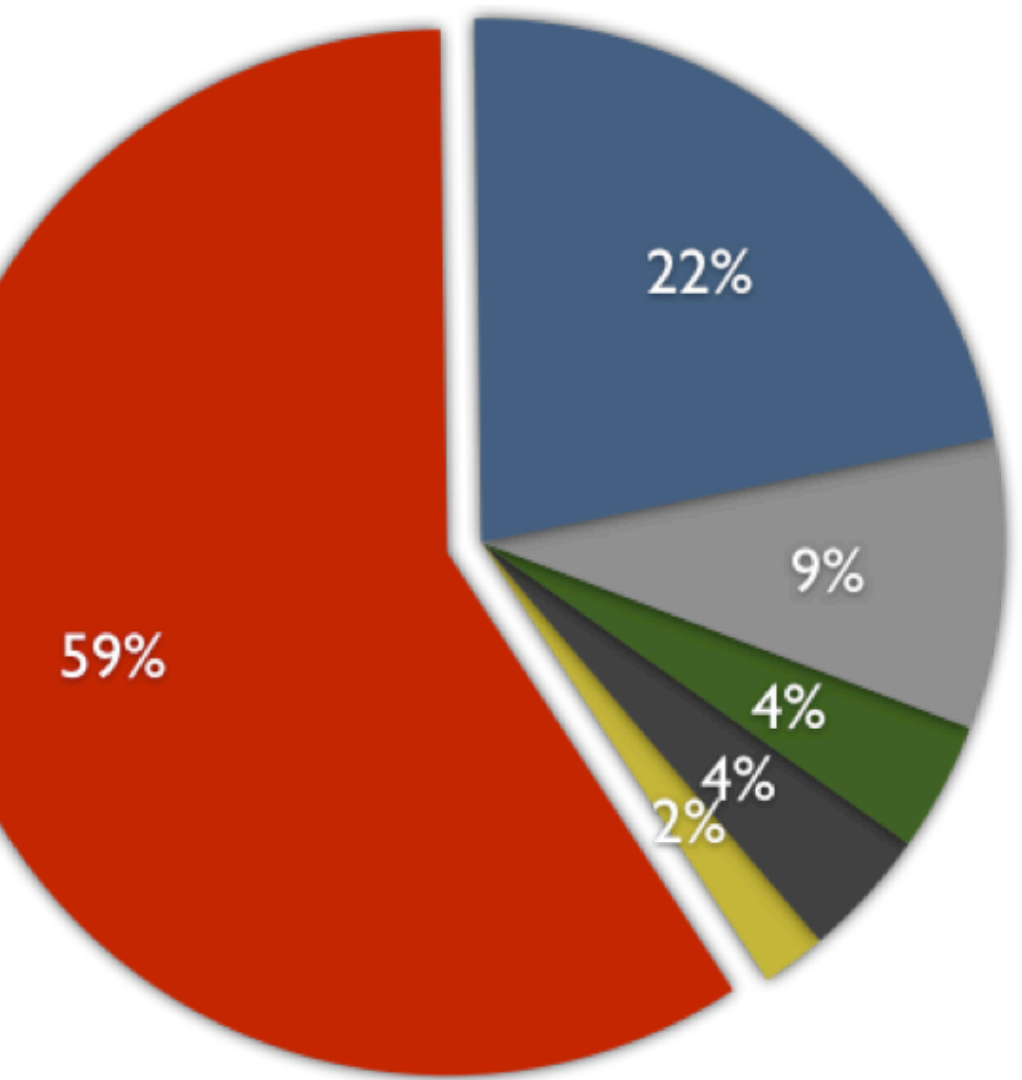
Source: HERI at UCLA



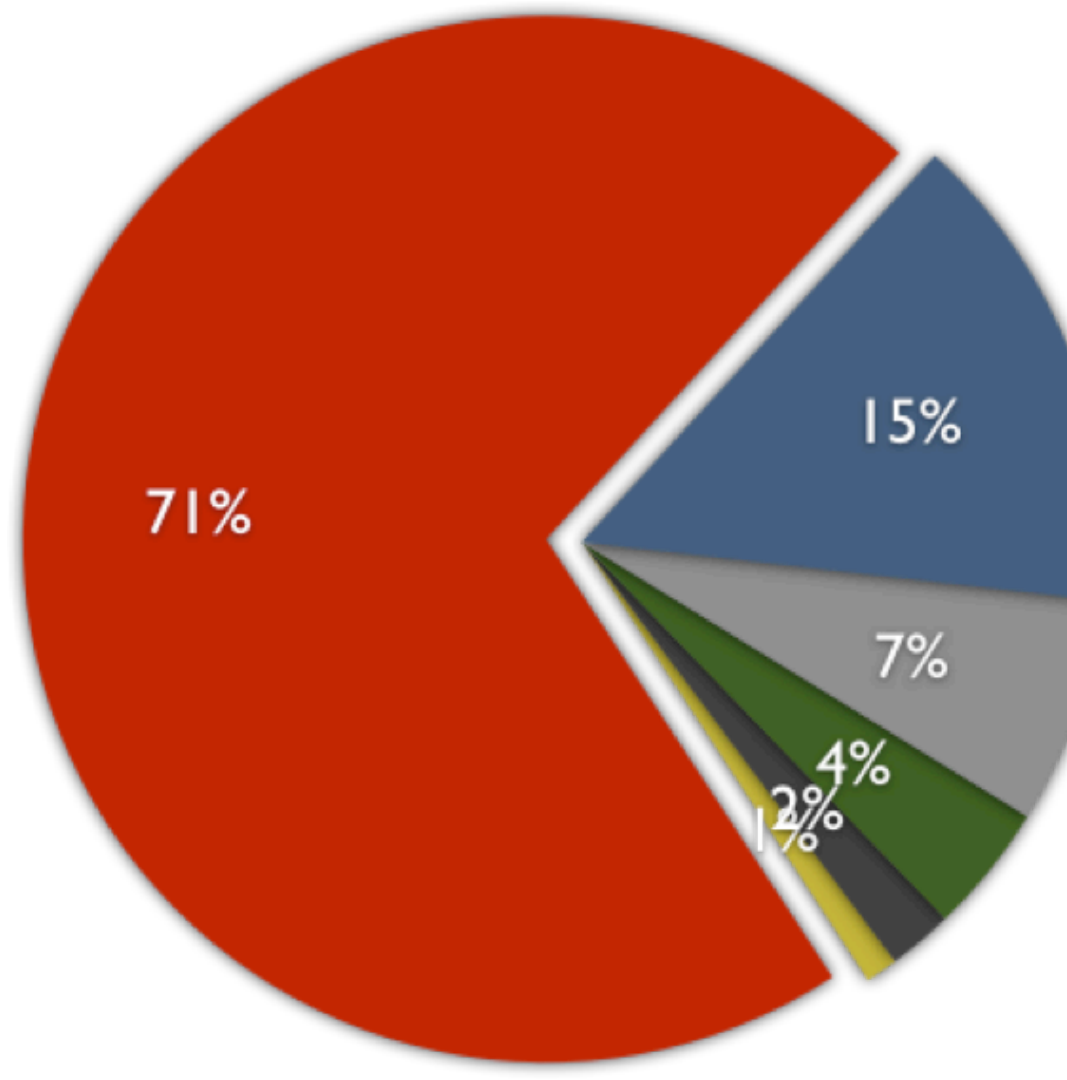


Computing is where the jobs are...

Projected S&E Job Openings
(new jobs + net replacements, 2004-2014)



Projected S&E Job Creation
(new jobs, 2004-2014)

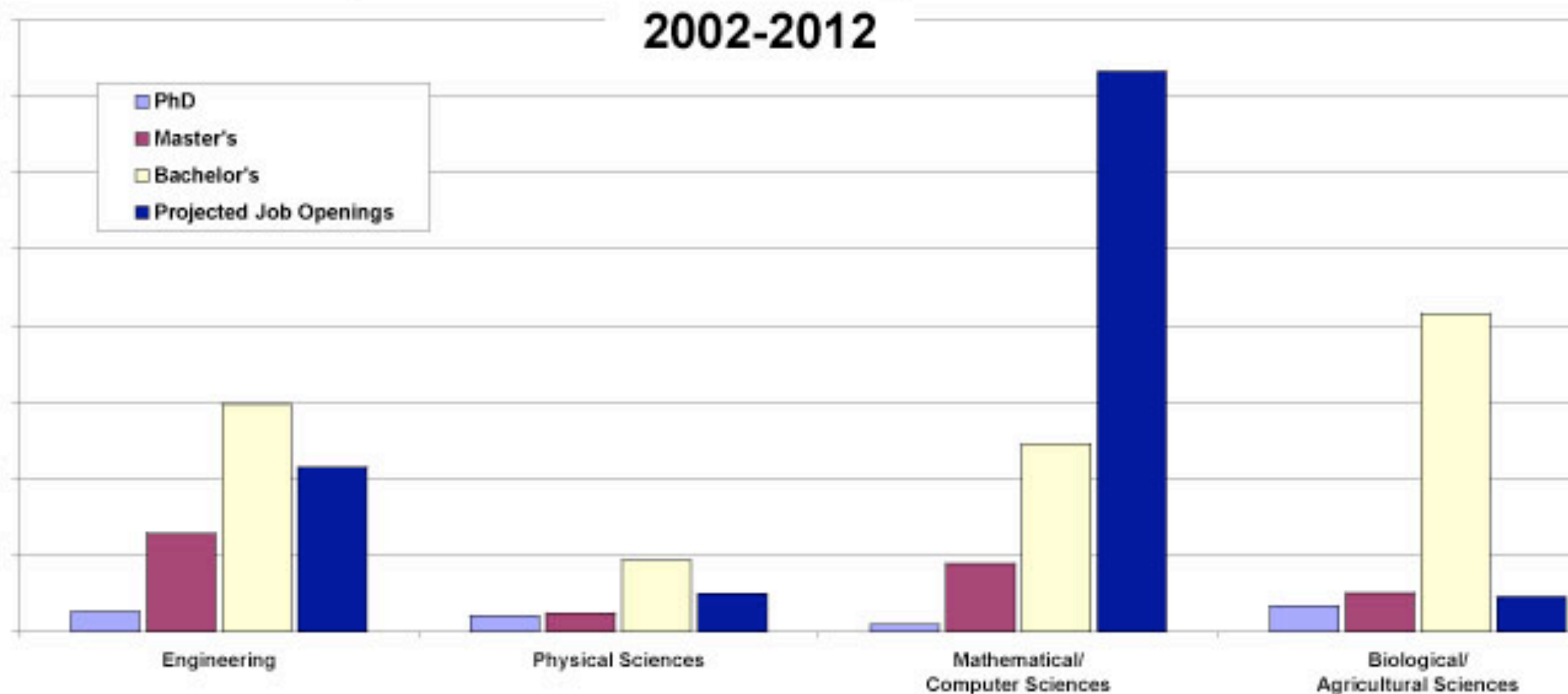


- Computer Specialists
- Engineers
- Social Scientists
- Life Scientists
- Physical Scientists
- Mathematical Scientists



Annual Degrees and Job Openings in Broad S&E Fields

2002-2012



NSF: Tabulated by National Science Foundation/Division of Science Resources Statistics; degree data from Department of Education/National Center for Education Statistics; Integrated Postsecondary Education Data System Completions Survey; and NSF/SRS; Doctorates; Projected Annual Average Job Openings derived from Department of Commerce (Office of Technology Policy) analysis of Bureau of Labor Statistics 2003-2012 projections

Something unfortunate is going on here

The Myths

You need to have programmed in high school to pursue computer science in college

computer science degree leads only to a career as a programmer

programming is a solitary activity

employment continues to be in a trough

eventually, all the programming jobs will be overseas

student interest in computer science is lower than in most other STEM

fields

computer science lacks opportunities for making a positive impact on

society

there's nothing intellectually challenging in computer science

there have been no recent breakthroughs in computer science

Resources

The Promise of IT Research (Lazowska)

Theoretical Computer Science Matters (Karp)

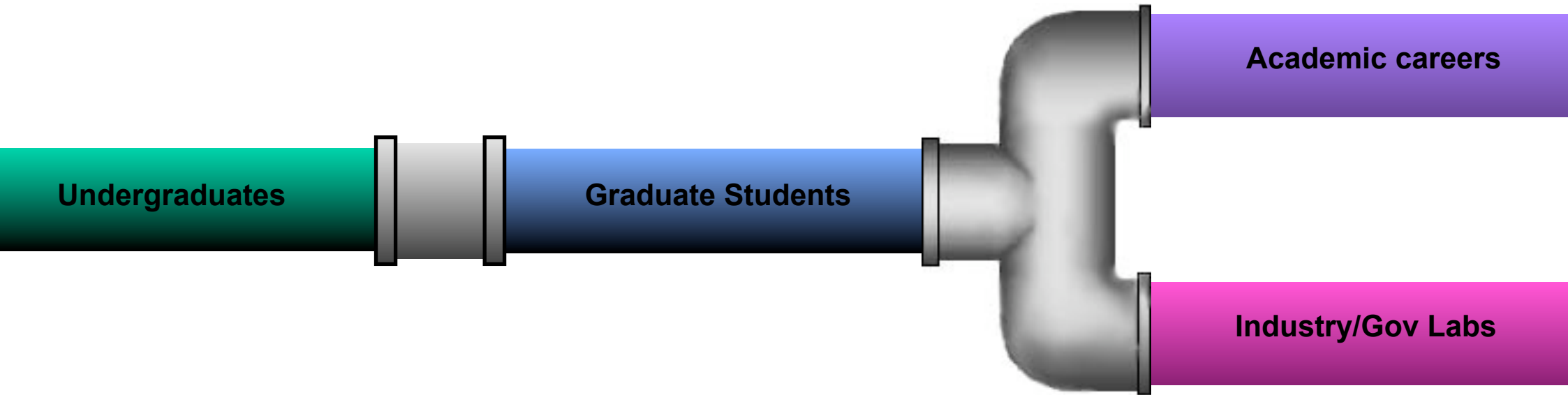
Myth-busters (Harsha)

Image Task Force (Ross)

CRA-Education (van Dam)

The Computing Community Consortium (Lazowska)

CRA-W's Mission



To increase the participation and success of women at every stage of the computing research pipeline.

CDC Mission

increase the diversity of people in computing

Policy

: Develop a deeper understanding of policy issues, their impact, and work for informed policies governing computing research and computing technology in general.

influence policy related to computing research by improving public and policy maker understanding of the nature and role of such research.

increase the computing community's awareness of and participation in policy issues.

Why is computing research important?

Global economy now doubles every two decades (vs. every three decades)

IT is only 3% of global economy

Yet 25% of global economic growth is attributable to IT

and there is still only 50% penetration of IT into productivity

Advances in IT are changing our lives, driving our economy and transforming the conduct of science

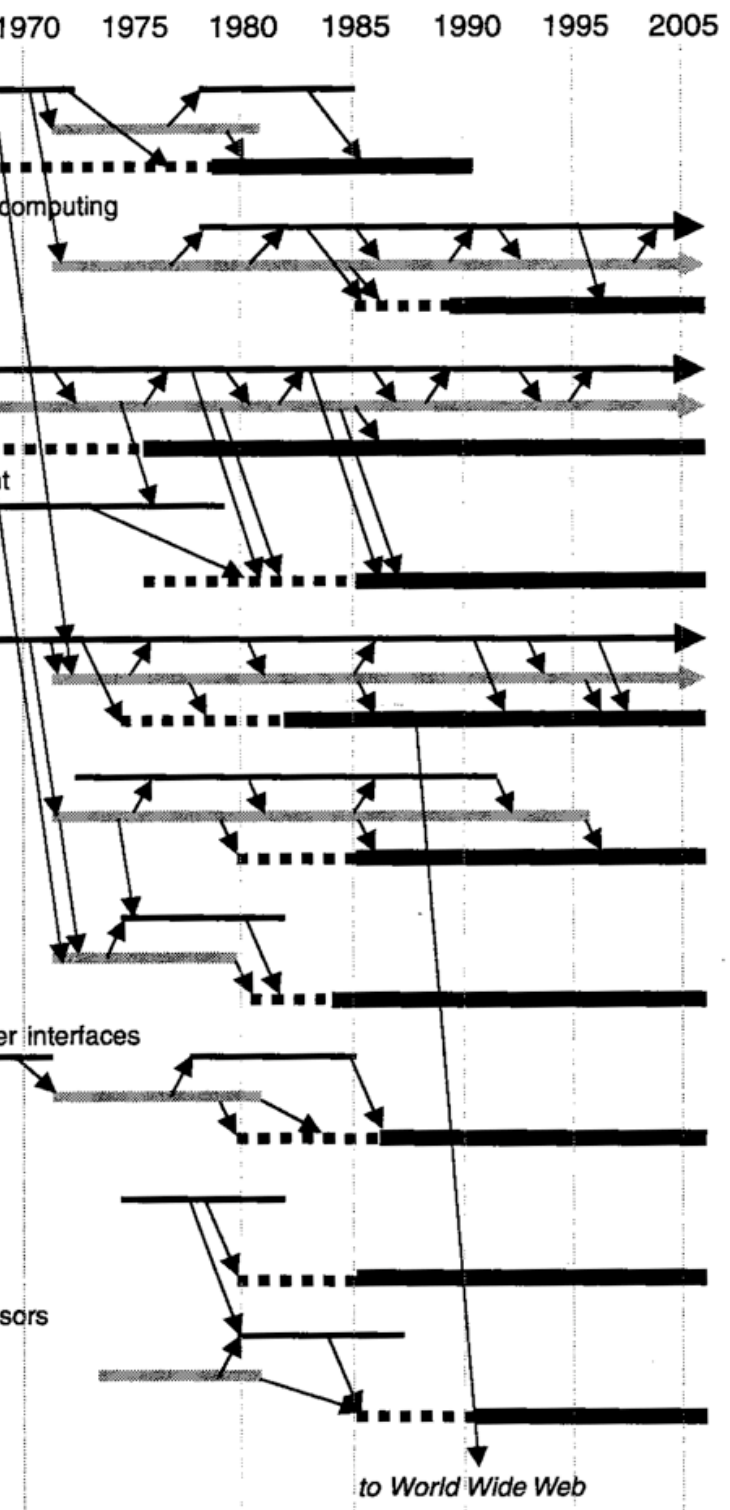
Why is federal support for computing research
important?

IT is key to national security

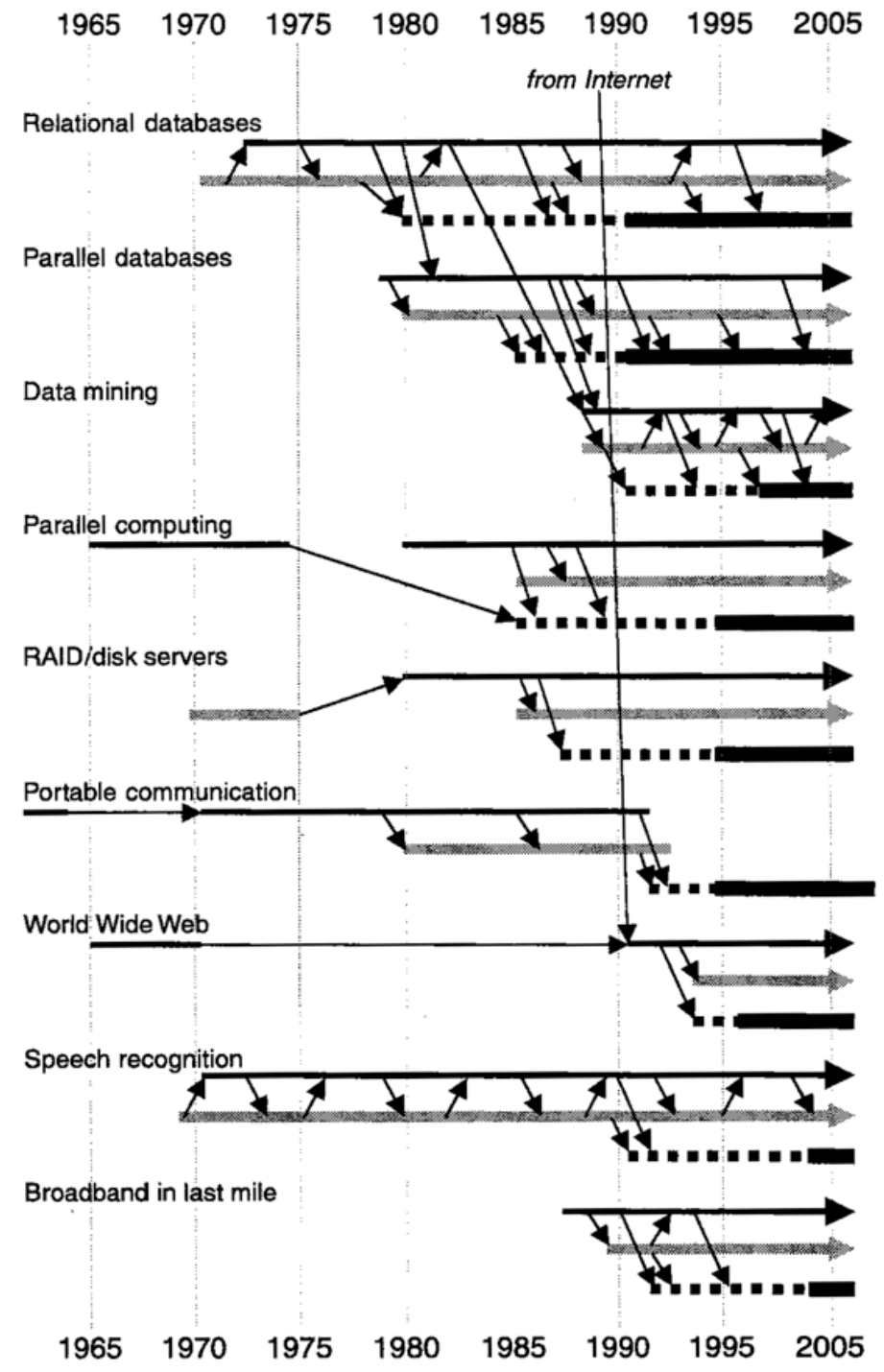
America is the world leader in IT innovation because of a complex interplay of universities, industry and the federal government

Industry worries about the next product cycle

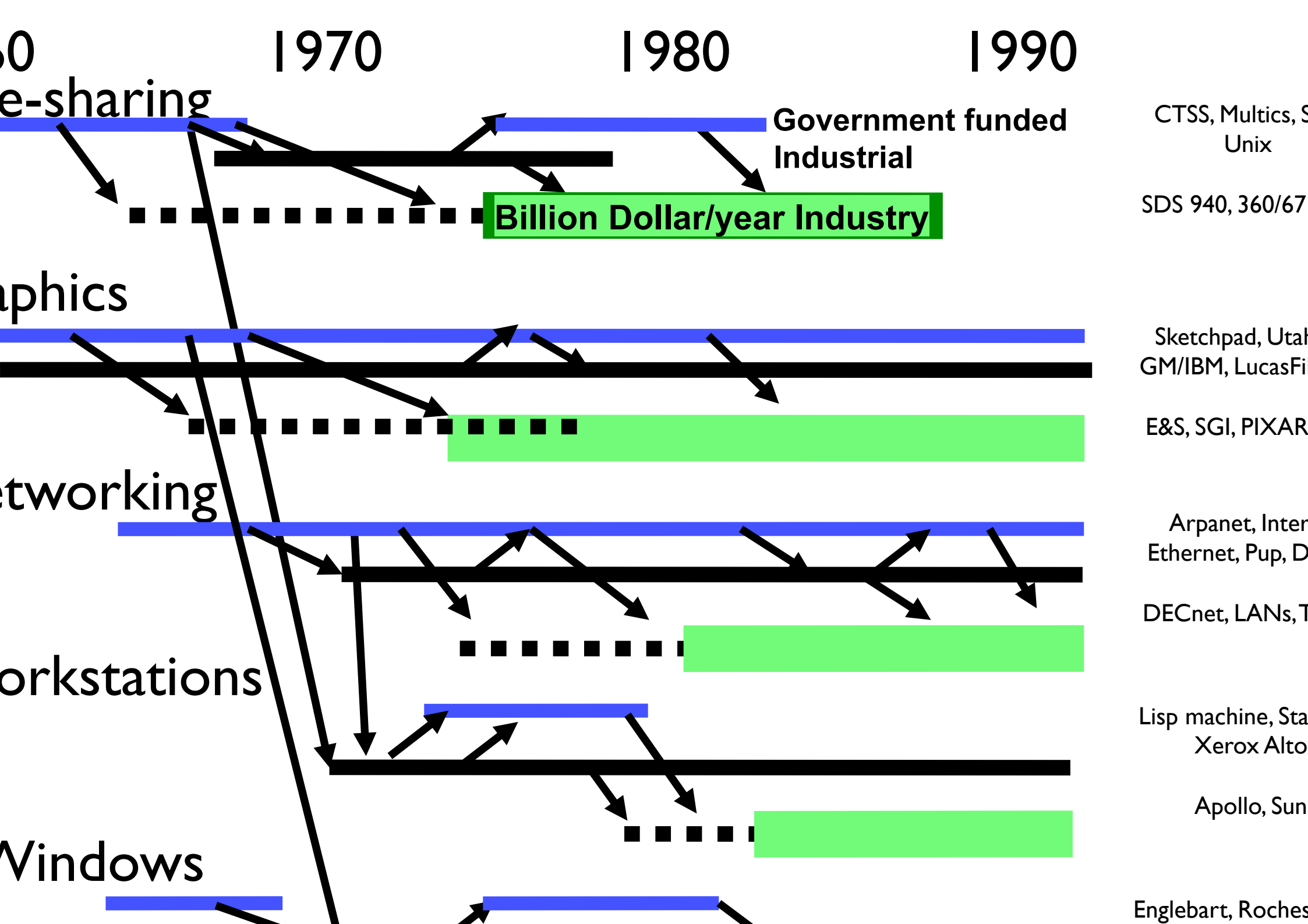
Essentially every aspect of IT upon which we rely today bears the stamp of federally supported research



- CTSS, Multics / BSD
- Unix
- SDS 940, 360/67, VMS
- Berkeley, CMU, CERN
- PARC, DEC, IBM
- Novell, EMC, Sun, Oracle
- Sketchpad, Utah
- GM/IBM, Xerox, Microsoft
- E&S, SGI, ATI, Adobe
- Spacewar (MIT), Trek (Rocheste
- Atari, Nintendo, SGI, Pixar
- ARPANET, Aloha, Internet
- Pup
- DECnet, TCP/IP
- Rings, Hubnet
- Ethernet, Datakit, Autonet
- LANs, switched Ethernet
- Lisp machine, Stanford
- Xerox Alto
- Xerox Star, Apollo, Sun
- Engelbart / Rochester
- Aito, Smalltalk
- Star, Mac, Microsoft
- Berkeley, Caltech, MOSIS
- many
- Berkeley, Stanford
- IBM 801
- SUN, SGI, IBM, HP



- Berkeley, Wis
- IBM
- Oracle, IBM, S
- Tokyo, Wiscon
- IBM, ICL
- ICL, Teradata,
- Wisconsin, S
- IBM, Arbor
- IRI, Arbor, Pla
- Iliac 4, CMU,
- IBM, Intel
- CM-5, Terada
- Berkeley
- Striping/Data
- many
- Berkeley, Pur
- Linkabit, Hug
- Qualcomm
- CERN, Illinois
- Alta Vista
- Netscape, Yah
- CMU, SRI, M
- Bell, IBM, Dra
- Dragon, IBM
- Stanford, UC
- Bellcore (Telc
- Amati, Alcate



by Source

Federal Share

Industry Share

Other

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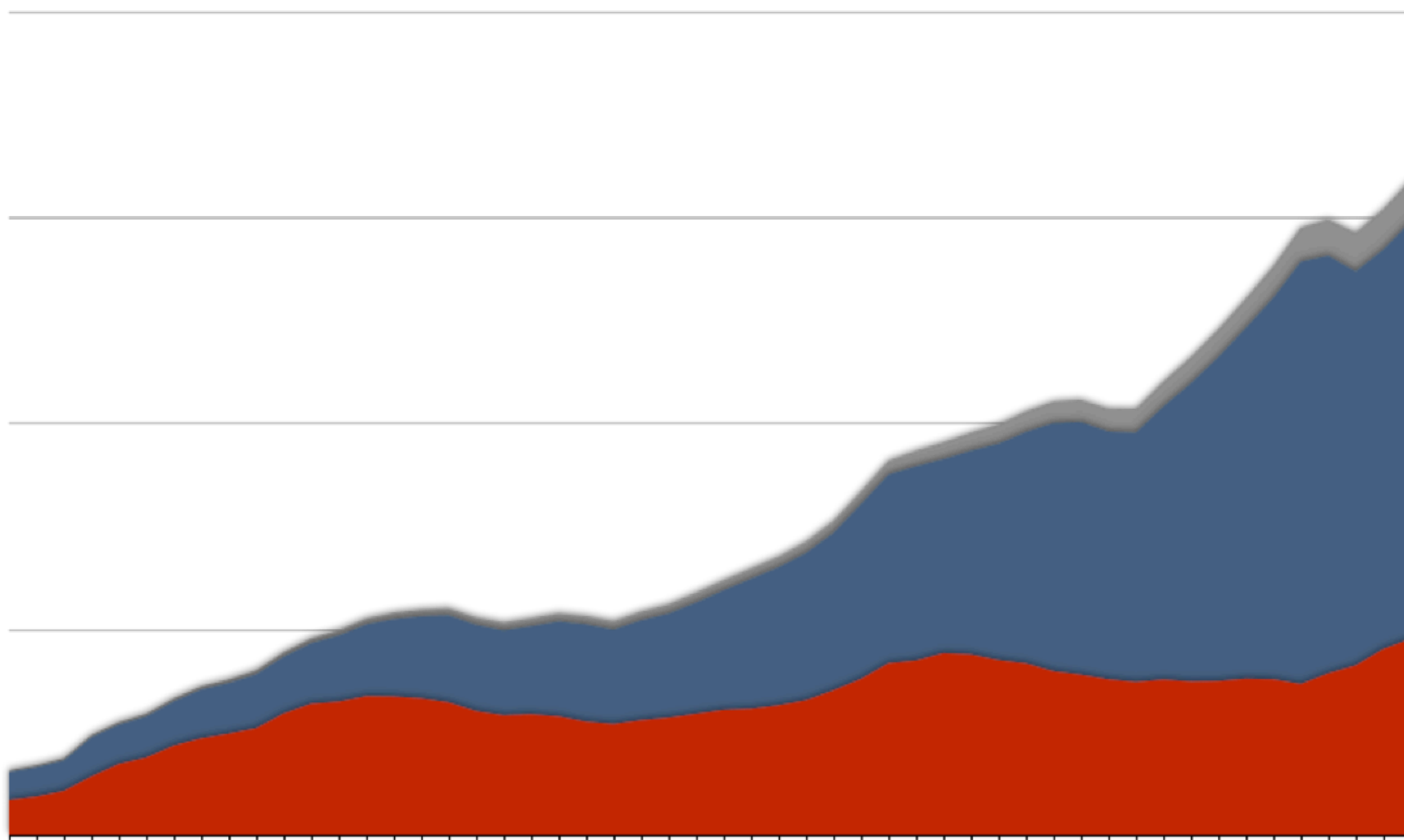
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1954 1956 1958 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004



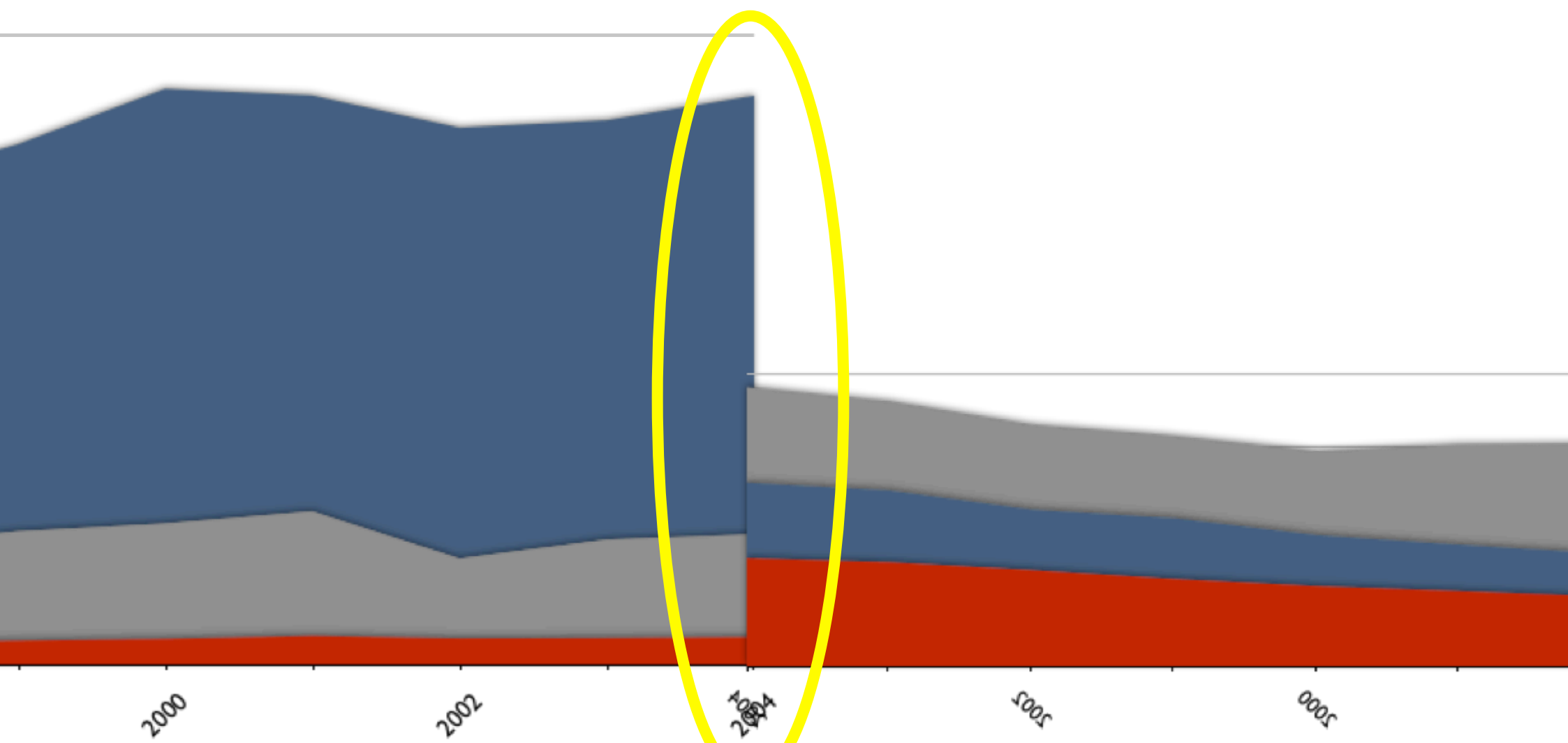
Basic Research

Applied Research

Development

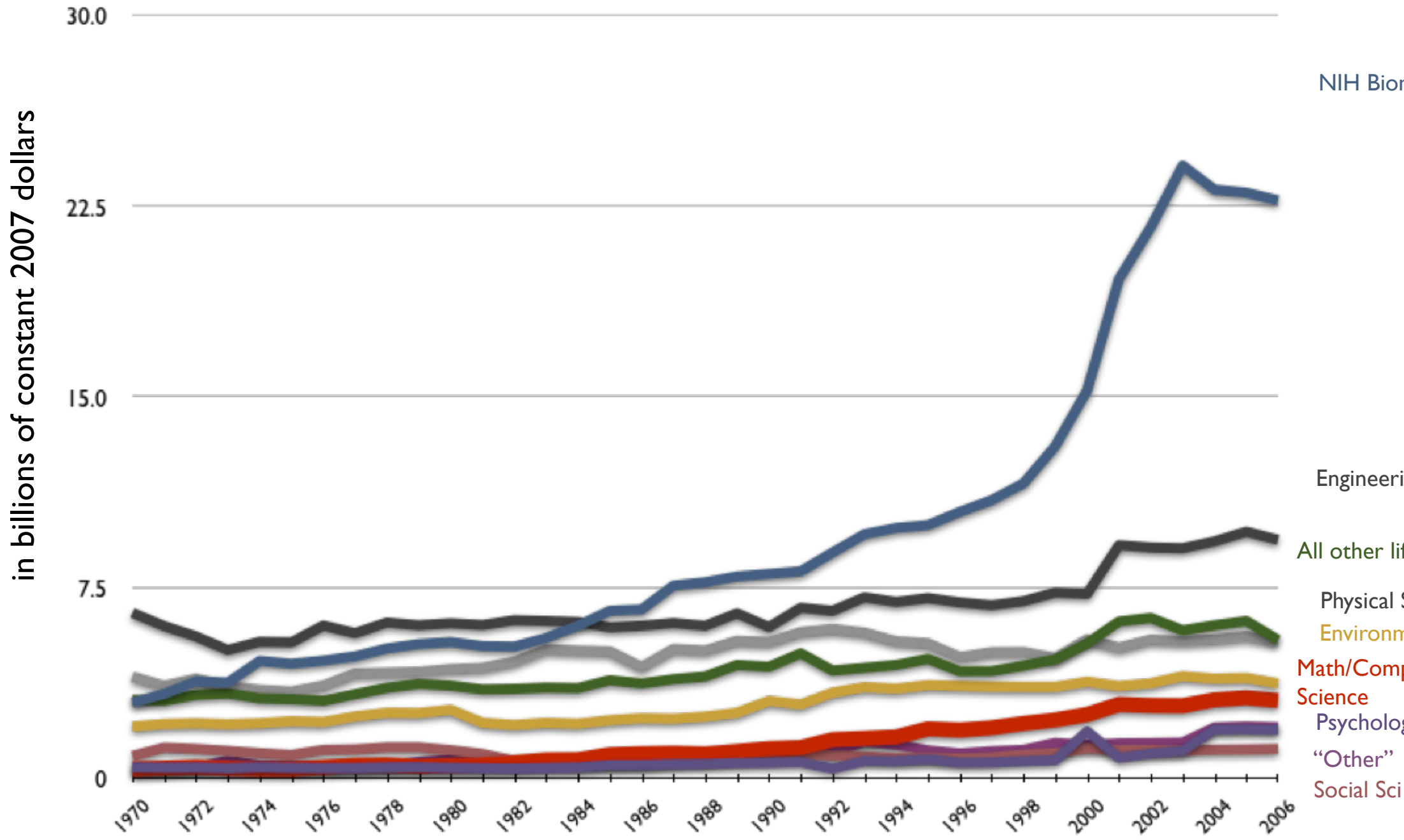
Industry

Federal



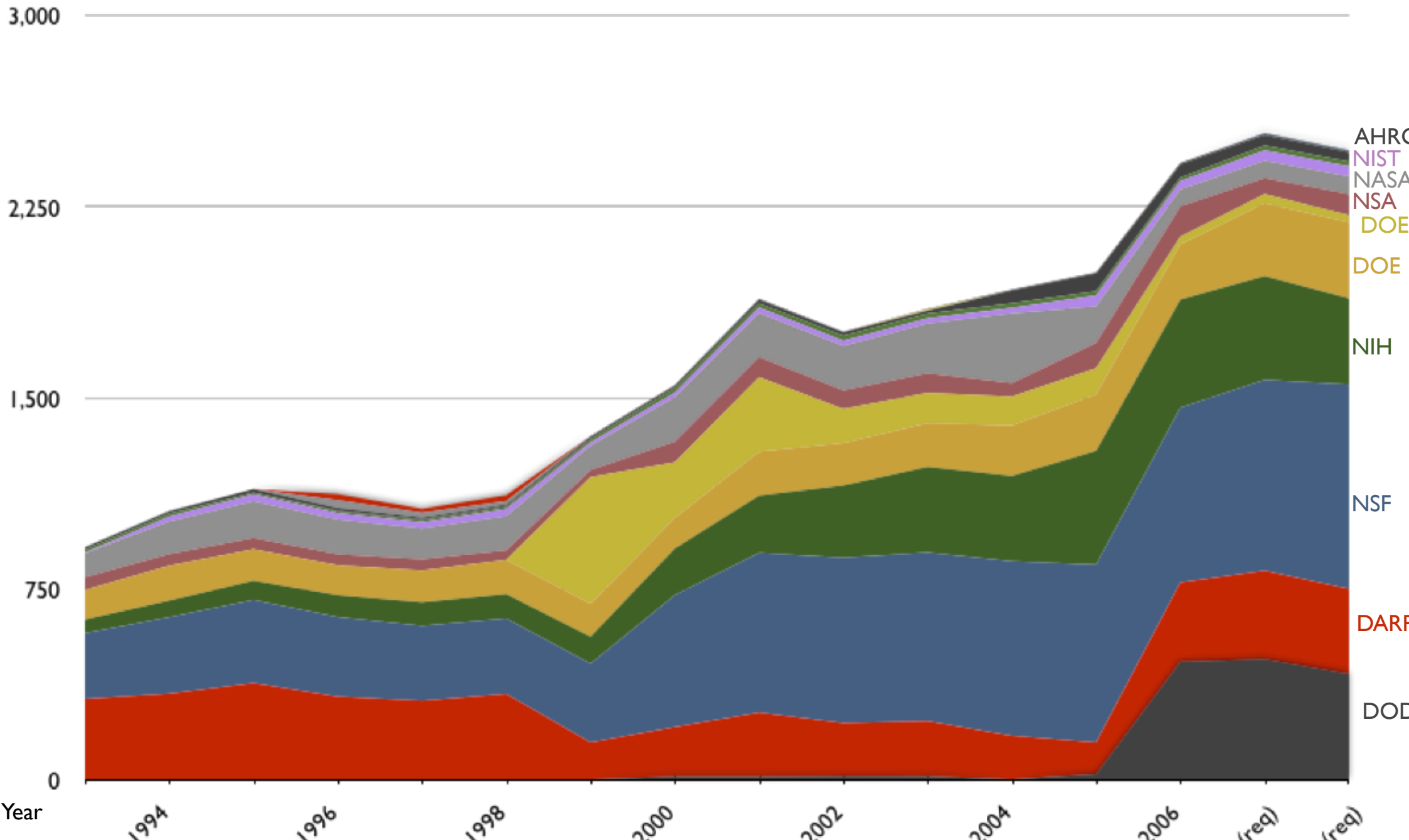
by Agency

1970 - 2006

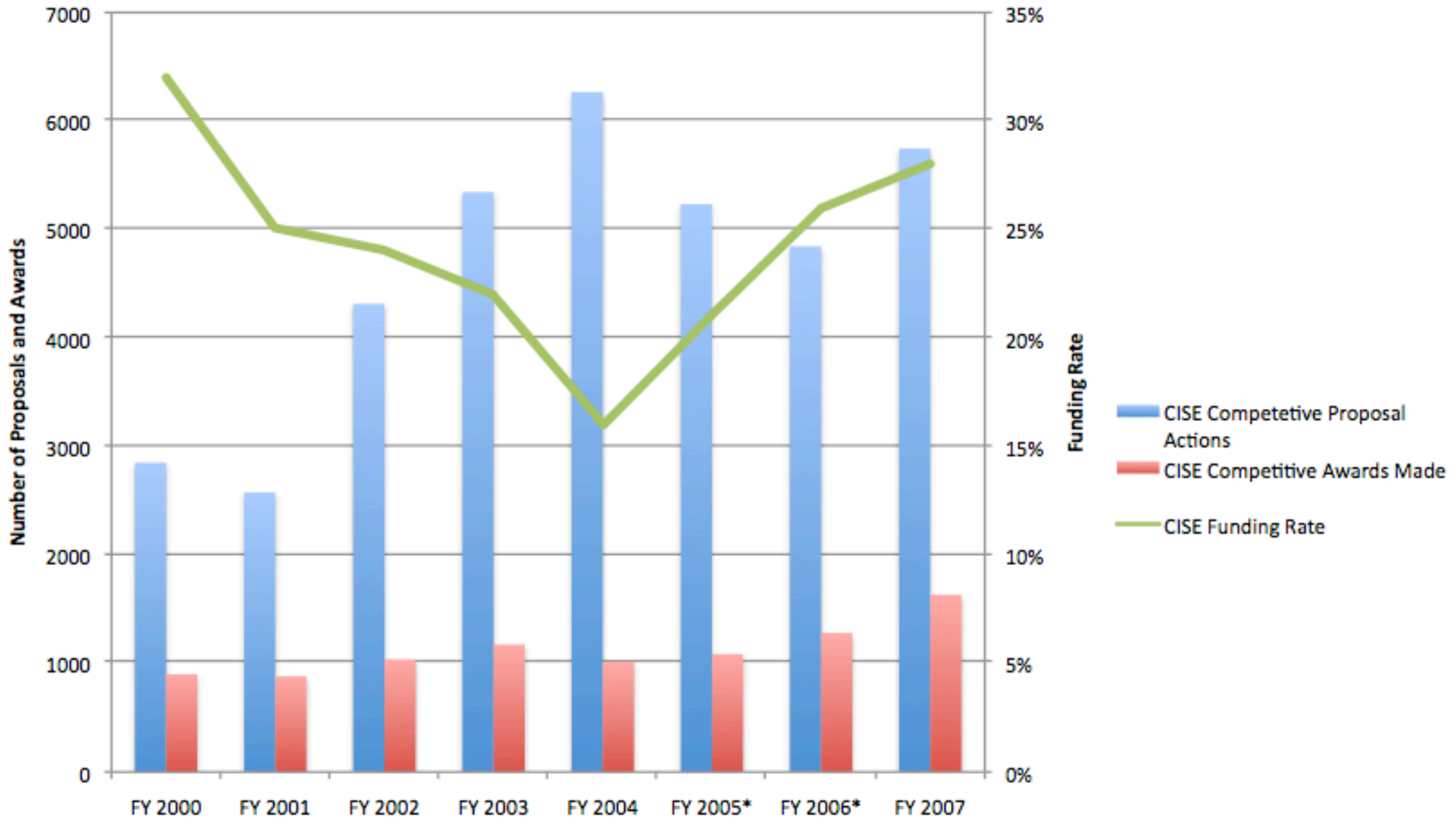


FY 1976 - 2008

By Agency
(adjusted)



Funding Rate for Competitive Awards in CISE



* CISE employed 18-month proposal submission cycles for 50 percent of its programs in 2005 and 2006, returning to a 12-month cycle for all programs in 2007, in an effort to increase annual award success rates by limiting the number of proposals received.



Science Coalitions

- ASTRA
- CNSF
- CNSR
- ESC
- AAAS ISWG
- R&D Caucus
- STEM E-LC



Task Force on the Future of American Innovation



USACM



Business Roundtable





Task Force Strategy

Four pronged:

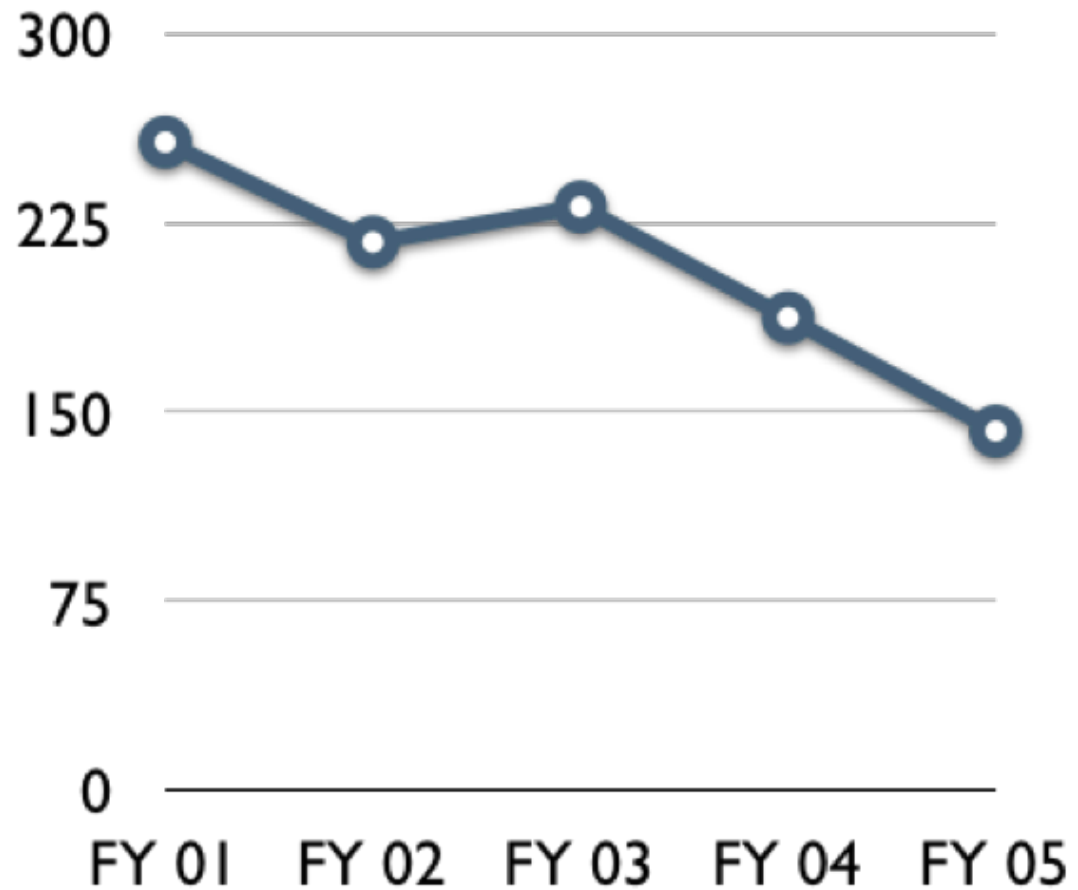
- DC-based advocacy
- Local/regional advocacy effort
- Elevation of issues in national press
- Presidential campaigns

Issues with DARPA

DARPA funding for NITRD has declined 4 percent since FY01

DARPA NITRD Investments

(in millions, unadjusted)



Decrease in support for university research
Short term focus
Go/No-Go decisions

Classification

critical time for the nation, some of the best minds in
U.S. are no longer doing defense-related research.

And students aren't being trained.

a very successful model for funding innovation no longer
exists.

The New York Times

Pentagon redirects its research dollars

by John Markoff

April 2, 2005

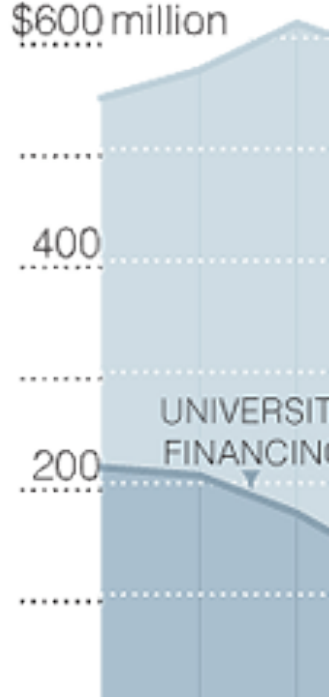
Darpa total
computer science
financing

\$600 million

400

200

UNIVERSITY
FINANCING



Washington Post

Incredible Shrinking Curiosity

The New York Times

Research worth fighting for

The New York Times

Bush disarms, unilaterally

The Mercury News

Quiet Change in Priorities Poses Dire Threat

ROLL  CALL

Bad Policy Choices are Worrisome for

DOLL CALL



Congress Must Increase Bush's Science Budget



An Endless Frontier Postponed



The Imagination Drain



Scientists Complain About Pentagon Cuts

The New York Times

usually Unprotected

THE WALL STREET JOURNAL.

America Gasps For Breath in the R&D Marathon

The New York Times

A Techie, Absolutely, And More



Investing in Tomorrow

The Washington Post



Americans weary of partisan bickering in Washington might be surprised to learn that elected officials from both parties—along with leaders in business, labor and education—are joining forces to address one of the nation's key long-term challenges: winning the innovation race.

Across the political spectrum, there is growing consensus that America's future economic competitiveness largely depends on scientific and technological innovation—and that steps must be taken to ensure our economy remains among the most innovative in the world. Other countries are building cutting-edge research and educational institutions, and graduating increasingly qualified science and engineering students in greater numbers than ever. That puts the U.S. at a growing competitive disadvantage.

In his State of the Union address, the president announced the American Competitiveness Initiative, to encourage innovation throughout our economy. In Congress, several bills that are also aimed at boosting competitiveness through innovation have attracted wide, bipartisan support.

Action in Washington has been stimulated in part by reports from the National Academy of Sciences, the Council on Competitiveness, the Task Force on the Future of American Innovation and other groups representing an array of industry, education and workforce leaders. Each recommends policies to strengthen U.S.

leadership in science and technology in response to rising global competition.

Innovation requires a well-educated, highly skilled workforce. America needs to expand and improve education, particularly in math, science and engineering. Meanwhile, we need immigration policies that enable U.S. technology industries to hire talented foreign workers whose specialized skills are in short supply domestically.

Innovation also requires long-term investment in research and development. We need to sustain the federal government's historic commitment to support basic research, particularly in universities, and we should consider policies that would encourage additional private investment in R&D.

Amid growing global competition, the United States must reinforce the foundation of its prosperity.

Finally, innovation in science and technology requires a strong regulatory and physical infrastructure. We need to update and improve access to advanced information services, transportation, healthcare and energy. And we must encourage innovation by strengthening and modernizing how we protect intellectual property.

These and other recommendations form an innovation agenda that is winning wide support. What is most needed, however, is a sense of urgency. Worldwide, competition is intensifying and innovation is accelerating. For America to stay competitive, Congress must move on legislation with deliberate speed.



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AMERICA UNKING SCIENCE?

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L. D. LEMONICK

TIME

FROM THE MAGAZINE

Sunday, Feb. 05, 2006

Are We Losing Our Edge?

The U.S. still leads the world in scientific innovation. But years of declining fresh competition from abroad threaten to end our supremacy

By MICHAEL D. LEMONICK

Gabriel Aeppli was born in Switzerland, but when he was 1 year old, his father moved the family to the U.S. to pursue a career as a mathematician. Back then, America was a "scientific superpower," a place where enormous resources, academic freedom, a tradition of excellence, and a history of excellence lured everyone from astronomers to zoologists to the rest of the world, and like Aeppli's father, many of them never had any interest in leaving.

Aeppli, now 48, attended M.I.T., where he got a Ph.D. in electrical engineering. He went on to work at Bell Labs, the legendary research arm of AT&T. Then he moved to the NEC research laboratory, outside Princeton, N.J., as a senior research scientist. "Industrial labs used to be well-funded havens for freewheeling scientific inquiry," says Aeppli, "my career was limited because opportunities to lead were very few." He took an academic job in Britain. He now holds a chair in physics at University College London and also directs the London Center for Nanotechnology. "I've been able to start with a clean sheet of paper and create something unique in a world-class city," he says. "That's not something that could be done anywhere else."

Edison Liu is a Hong Kong native who studied in the U.S. and eventually returned to become the director of the division of clinical sciences at the National Cancer Institute. The government of Singapore made him an offer he couldn't refuse: the directorship of a brand new Genome Institute along with a \$25 million starting budget--part of a \$1 billion integrated network of life-science research centers and biotech startups called Biopolis. Says Liu: "I came because I saw that the entire leadership of the country was thirsting for biology."

If those were just isolated cases, they would be easy to dismiss. Such stories would become disturbingly common. After more than a half-century of unchallenged



WHERE IN THE WORLD WILL THE NEXT BIG IDEA COME FROM?

The United States has long been the acknowledged world leader in innovation, a strength that is the foundation of America's national security and future job growth. But today, other countries are building world class research and educational institutions and are graduating increasingly qualified science and engineering students at a faster pace than ever before.

Make no mistake: The search for scientific breakthroughs and new technologies will go forward whether we lead or follow. To remain at the forefront, America must increase investments in basic research, improve math and science education, provide incentives for research and development and attract and retain the brightest minds from all around the globe.

We call on our leaders to help keep America the driving force in innovation.

www.InnovateAmerica.org

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GOVERNOR MITT ROMNEY
Massachusetts

ng the key influencers/marketers:

Norm Augustine

Chuck Vest

Lamar Alexander

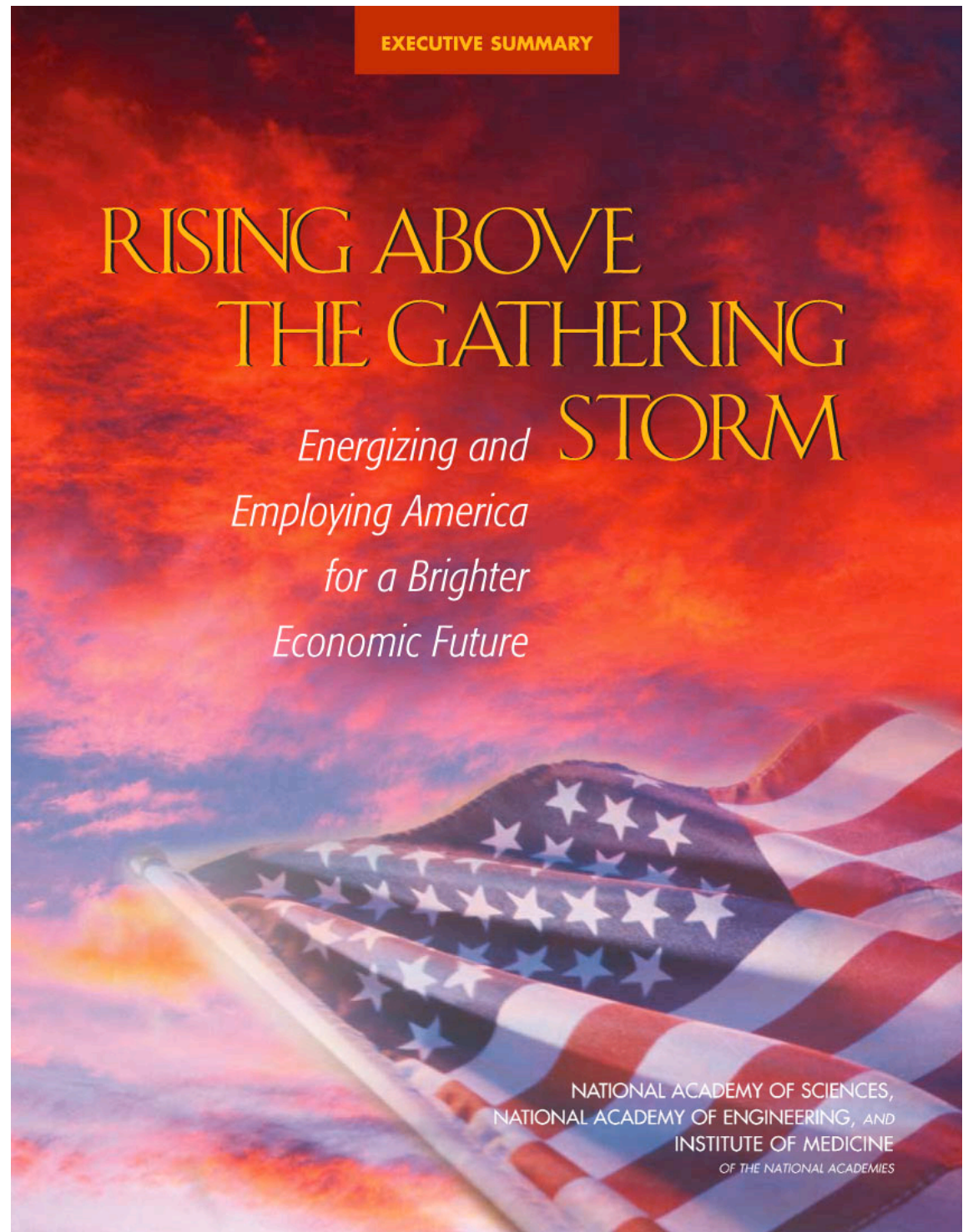
John Chambers

Craig Barrett

Gordon Moore

Bill Brody

CoC/InnovateAmerica



CRA Mattered in This Debate

- The point is not to be self-congratulatory or to over-state the role that we played
- But we did have a strategy and it was effective!
 - Get the facts straight about DARPA and computer science
 - This really got the ball rolling!
 - Hitch ourselves to the Duderstadt and Augustine National Academies reports, rather than going it alone
 - We became the poster children for their message

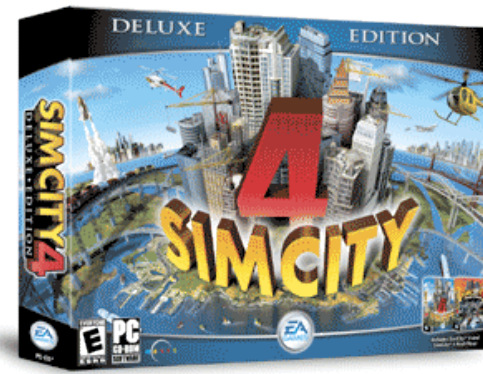
Has Changed the World



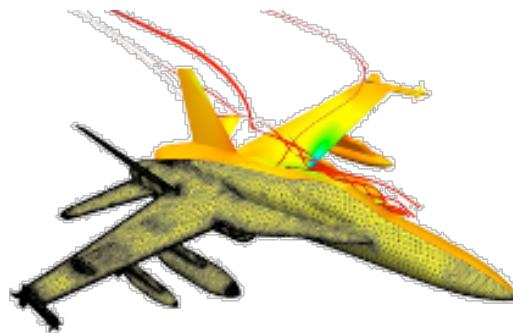
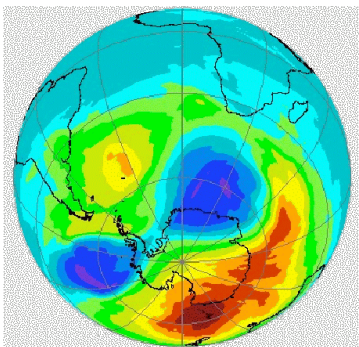
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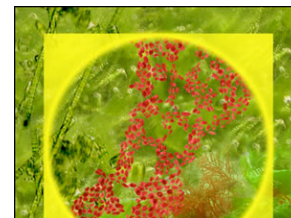
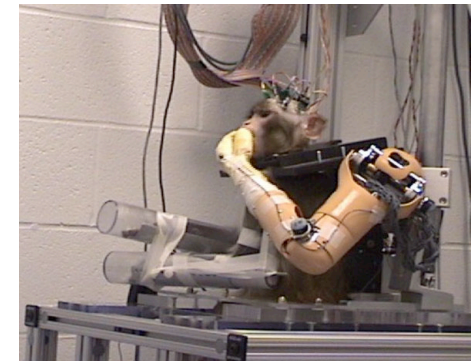
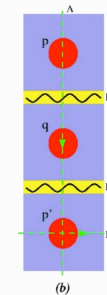
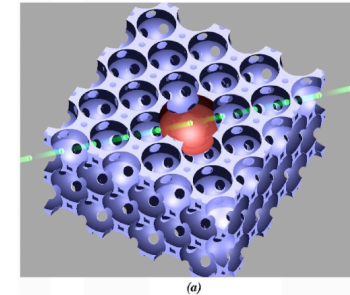
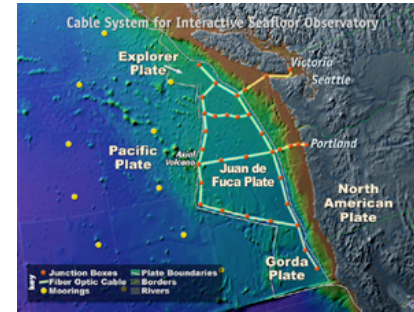
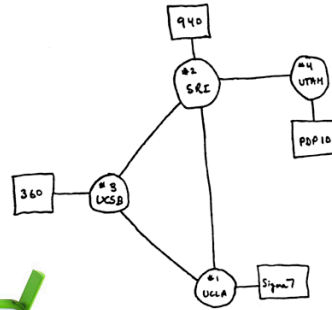


Advances in computing

- change the way we live, work, learn, and communicate
- drive advances in nearly all other fields
- power our economy
- are the cornerstone of our national security

The future is full of opportunity

- Designing a next Internet - GENI
- Driving advances in all fields of science and engineering
- Wreckless driving
- Personalized education
- Predictive, preventive, per medicine
- Quantum computing
- Transforming the developing world
- Personalized health monitoring => quality of life
- Data-intensive supercomputing
- Neurobotics
- Synthetic biology
- The algorithmic lens => Cyber-enabled Discovery and Innovation



Computing is a field of tremendous intellectual excitement.

Computing is where the jobs are.

- Researchers
- Students and potential students
- Policy setters
- Funders
- The public

questions shape our intellectual future? What attracts the best and brightest of a new generation?

are the next big computing ideas, the ones that will define the future of computing, galvanize the very best students, and catalyze research investment and support?

The challenge is to do this without harming the search environment that has created the computing world of today.



Who Is the CCC?

- The CCC is broadly inclusive of the computing research community.
- Any computing researcher who wishes to be involved will be encouraged to be involved.
- The CCC Council's role is to stimulate and facilitate visioning.

The Council is responsible not for doing the visioning, but for putting processes into place that stimulate and facilitate visioning by the computing research community.

Edward Lazowska, University of Washington, Chair

Three-year terms

Bill Feiereisen, Los Alamos National Laboratory

Susan Graham, University of California at Berkeley

David Kaeli, Northeastern University

John King, University of Michigan

Peter Lee, Carnegie Mellon University

Two-year terms

Andrew McCallum, University of Massachusetts

Beth Mynatt, Georgia Institute of Technology

Fred Schneider, Cornell University

David Tennenhouse, New Venture Partners

Dave Waltz, Columbia University

One-year terms

Greg Andrews, University of Arizona

Anita Jones, University of Virginia

Dick Karp, University of California at Berkeley

Bob Sproull, Sun Microsystems

Karen Sutherland, Augsburg College

Role of the CCC

- Mobilization
 - Shaping the voice of the community
- Brokerage
 - Strengthening the marketplace of ideas
- Advocacy
 - Promoting research support
- Performance
 - Proactive position on the field's value

The CCC Process

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2. Crystallization and Broadening

Broadening of involvement, and crystallization of the vision



CCC provides community and support for activities

3. Program formulation

Work with agency staff to formulate a specific program



CCC provides guidance and relationships

4. Program Realization

Agency places the program into its budget request



CCC provides connections and opportunities

5. Execu

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Computing Community Consortium
was established to catalyze the
computing research community to

- Debate long range, more audacious research challenges
- Build consensus around research visions
- Evolve the most promising visions toward initiatives

To Bring the Spark Back to Computing Research



FRIDAY, 09-MAY-2008 14:11:05 EDT

The Computing Community Consortium supports the computing research community in creating compelling research visions and the mechanisms to realize these visions.

CCC Blog by CCC COUNCIL

An immediate, online mechanism for dissemination of visioning concepts and community discussion/debate about them. www.cccblogger.org

CCC Seeds Effort to Explore Big-Data Computing

by CCC COUNCIL

Under sponsorship by the CCC, the Big-Data Study Group will explore and enable opportunities for research and applications of high-performance, data-intensive computing systems, benefiting application areas ranging from astronomy to machine translation....

CCC Seeds Effort to Understand Issues in Robotics

by CCC COUNCIL

A fundamental objective of the study is to ensure that basic research addresses the key problems that will allow American companies to have a leading role in the development of future generations of robots.

The Promise of IT
the future

MYTHBUSTING
coming soon

roadmaps
coming soon

ONGOING EFFORTS
where are we...

Big-Data Computing
...data-intensive computing

Robotics
...future generations of robots.

Theoretical CS
...efficient computation

CPS
...Cyber-Physical Systems

NetSE
...Network Science & Engineering

Search

cra.org | cloud

Big-Data
Computing
Study Group:
Presentations

workshop

conference

ENABLED BY



WITH SUPPORT
FROM



create within the computing research community more audacious thinking

bring the computing research community together to discuss, prioritize and envision our future research needs and thrusts

ensure the ideas developed become funded research programs and/or instruments

communicate these challenges, needs and thrusts to the broader national community

increase the excitement within computing research and use that excitement to attract students representative of our diversity into computing research careers

Requirements for success

Community involvement

Computing community must believe in the mission & operation of CCC

Support from funding agencies

Funding agencies must be open to the directions identified by the visioning processes

Effective leadership

Dedicated and visionary people must be willing to serve as chair & council members

Dream, Strategize, Realize



Twenty years from now, you will be more disappointed by the things you didn't do than by the ones you did. So throw off the bow lines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore

so that's what
CRA
is doing for you

Andrew Bernat
abernat@cra.org
www.cra.org