MAKING A FEDERAL CASE FOR COMPUTING

- Moderator: Fred Schneider
- Peter Harsha, CRA
- Greg Hager, Johns Hopkins, CCC past-Chair
- Kent Foster, Microsoft
- Martha Pollack, University of Michigan
MAKING A FEDERAL CASE FOR

Peter Harsha
Director of Government Affairs
CRA

Snowbird Conference 2016
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David Tennenhouse, VMWare
Jeff Vitter, University of Mississippi
Jeannette M. Wing, Microsoft
1. WHY DOES CRA DO POLICY?
2. THE CHALLENGES WE FACE

GOAL: PAINT A CLEAR PICTURE OF THE SITUATION IN DC
WHY DO WE “DO” POLICY?
CRA MISSION

CRA's mission is to enhance innovation by joining with industry, government and academia to strengthen research and advanced education in computing.

CRA executes this mission by leading the computing research community, informing policymakers and the public, and facilitating the development of strong, diverse talent in the field.
We’re part of an active computing policy community

- ACM Ed Policy/USACM
- code.org, CSEC
- IEEE-CS/IEEE-USA
- SIAM
- CASC
- EDUCAUSE
- AAAI
- NCWIT
- Industry Groups
- EFF, EPIC, CDT…
“ENSURING THE HEALTH OF THE R&D ECOSYSTEM”

• Access to Talent
• Impediments to Research
• Research Funding and Priorities
CHALLENGES
# of Lobbyists (FY18)

11,520

Lobbying Expenditures

$3.22 billion

Working “S&T” 404
FY 2017 FEDERAL BUDGET

$4.0 TRILLION
FY 2017 FEDERAL BUDGET

MANDATORY SPENDING
$2.54 TRILLION

DISCRETIONARY SPENDING
$1.21 TRILLION

INTEREST
$306 BILLION
FY 2017 FEDERAL BUDGET

DISCRETIONARY SPENDING
$1.21 TRILLION
FY 2017 FEDERAL BUDGET

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Agriculture
CJS
Defense
Energy and Water
Financial Services
Homeland Security
Interior and Environment
Labor/HHS/Education
Legislative Branch
Military/Veterans
State/Foreign Ops
Transportation/HUD
APPROPRIATIONS IS A ZERO-SUM GAME

Commerce, Justice, Science Bill

- National Science Foundation
- NIST
- NOAA
- NASA
- FBI / Dept. of Justice
- Census
NSF, COPS OR SPACESHIPS?
LONG-TERM FISCAL CHALLENGES
Growth in Mandatory Spending vs. Discretionary

Source: Congressional Budget Office projection
AUTOMATIC SPENDING GROWS OVER TIME

- Automatic Spending
- All Other Spending

1965: 34% Automatic, 66% All Other
2015: 68% Automatic, 32% All Other
2026: 78% Automatic, 22% All Other

Authorized by Chairman Tom Price, M.D., House Budget Committee
Source: CBO
INTEREST VS. OTHER SPENDING
(In 2026 Under Current Law)

NET INTEREST: $830 Billion

DEFENSE: $719 Billion

MEDICAID: $642 Billion

EDUCATION: $125 Billion

TRANSPORTATION: $109 Billion

SCIENCE, SPACE, TECH: $38 Billion

Source: CBO

Authorized by Chairman Tom Price, M.D., House Budget Committee
ATTITUDES HAVE CHANGED
CONGRESS IS MORE POLARIZED THAN EVER

• Not a single Democratic Senator was more conservative than any GOPer. Not a single GOP Senator is more liberal than any Dem.

• The House is equally polarized, with only five GOPers ranking more liberal than the most conservative Dem, and only four Dems more conservative than the most liberal Republican.

From a 2011 National Journal Study of the 2010 election cycle.
Democrats and Republicans More Ideologically Divided than in the Past

Distribution of Democrats and Republicans on a 10-item scale of political values

1994

1994

2004

2004

2014

2014

Consistently liberal
Consistently liberal
Consistently liberal
Consistently liberal

MEDIAN Democrat
MEDIAN Democrat
MEDIAN Democrat
MEDIAN Democrat

Consistently conservative
Consistently conservative
Consistently conservative
Consistently conservative

MEDIAN Republican
MEDIAN Republican
MEDIAN Republican
MEDIAN Republican

Source: 2014 Political Polarization in the American Public
Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). The blue area in this chart represents the ideological distribution of Democrats; the red area of Republicans. The overlap of these two distributions is shaded purple. Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B).
Republicans Shift to the Right, Democrats to the Left

Distribution of Republicans and Democrats on a 10-item scale of political values

1994
- Median Democrat
  - Consistently liberal: 64% of Republicans
  - Consistently conservative: 70% of Republicans

2004
- Median Democrat
  - Consistently liberal: 70% of Democrats
  - Consistently conservative: 68% of Democrats

2014
- Median Democrat
  - Consistently liberal: 92% of Republicans are more conservative than the median Democrat
  - Consistently conservative: 94% of Democrats are more liberal than the median Republican

Source: 2014 Political Polarization in the American Public
Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B).

PEW RESEARCH CENTER
Polarization Surges Among the Politically Engaged

Distribution of Democrats and Republicans on a 10-item scale of political values, by level of political engagement

Among the politically engaged

1994

2004

2014

Among the less engaged

Source: 2014 Political Polarization in the American Public
Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B). Politically engaged are defined as those who are registered to vote, follow government and public affairs most of the time and say they vote always or nearly always.

PEW RESEARCH CENTER
A Rising Tide of Mutual Antipathy

**Democratic attitudes about the Republican Party**

- 1994: 16%
- 2014: 79%

**Republican attitudes about the Democratic Party**

- 1994: 68%
- 2014: 82%

Source: 2014 Political Polarization in the American Public

Notes: Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents.

PEW RESEARCH CENTER
THIS POLARIZATION HAS CHANGED ATTITUDES ABOUT SCIENCE
• Comity and bipartisanship on the committee probably peaked in about 2007-8 with *Gathering Storm* and the America COMPETES Act
• Breakdown started in earnest in 2010, during reauthorization of COMPETES
• GOP tried to kill bill to deny Dems a win in an election year
• In 2012, Sen. Tom Coburn attacked NSF as wasteful for “silly-sounding” research
• In 2013, Coburn/McCain and Cantor/L. Smith attacked NSF over political science and social science funding
• 2014 L. Smith attacks Dept. of Energy over Climate Change and Sustainability research
• 2015 L. Smith amends CJS to target SBE
FIRST ACT/AMERICA COMPETES REAUTHORIZATION OF 2015

• Reauthorization of 2007 COMPETES Act
• NSF “Accountability”
• Reduced funding overall
• Specific cuts to SBE
• CRA opposed the bill (along with 43 other groups)
• Bill passed House on party-line vote
RECAP

• Increasingly polarized Congress
• Increasingly polarized Electorate
• The only congressional committee with Science as its sole jurisdiction becoming more polarized…
THIS THING IN NOVEMBER
• Clinton’s views on science policy are fairly well-established
• Published a 15 page issue brief on her Science and Technology platform: http://cra.org/blog
• First priority is “Invest in Computer Science and STEM Education”
• Likely to be a lot of continuity from the Obama administration.
THIS THING IN NOVEMBER

• Trump’s views are less well known.
• Trump on Tech Policy:
  • “We’re losing a lot of people because of the internet.”
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  • “We’re losing a lot of people because of the internet. We have to see Bill Gates and a lot of different people that really understand what’s happening. We have to talk to them about, maybe in certain areas, closing that internet up in some ways. Somebody will say, ‘Oh freedom of speech, freedom of speech.’ These are foolish people.”
THIS THING IN NOVEMBER

• Trump on Science Funding:
  • [in answer to a question about his support for NASA] “Right now, we have bigger problems — you understand that? We've got to fix our potholes. You know, we don't exactly have a lot of money.”

• So, there are certainly opportunities for education.

• Transition papers will be useful in either case.
THIS THING IN NOVEMBER

• Trump does have an advisor for Energy policy:
  • Rep. Kevin Cramer (R-ND)

• Three policy advisors, but none focused on science policy

• Chris Christie would manage the transition team
ELECTION EFFECT ON CONGRESS

- Does either candidate have coattails?
- Does Trump have anti-coattails?
  - Does Trump at the top of the ticket suppress GOP votes? Does it hurt GOP candidates down-ticket?

- A Clinton win and a GOP majority in the House and Senate = essentially status quo
- Any other scenario changes the policy calculus….
SO THE CHALLENGES ARE DAUNTING
AND WE HAVE A MUCH MORE LIMITED TOOL BOX...
FORTUNATELY, WE’VE GOT A PRETTY GOOD STORY
INFORMATION TECHNOLOGY R&D AND U.S. INNOVATION

• Advances in information technology are transforming all aspects of our lives: commerce, education, employment, health care, manufacturing, government, national security, communications, entertainment, science, and engineering.

• Advances in information technology also drive our economy – both directly (the growth of the IT sector itself) and in productivity gains across the economy. Advances in computing are enabling innovation in all fields.

• The history of innovation in computing is impressive, but the future opportunities are even more compelling: the future of networking, revolutionizing transportation, personalized education, powering the smart grid, empowering the developing world, improving health care, enabling advanced manufacturing, driving advances in all fields of science and engineering.

It’s impossible to imagine a field with greater opportunity to change the world.

• The IT R&D ecosystem is crucial to continued innovation in IT, and federal support is at the heart of that ecosystem. Essentially every aspect of IT upon which we rely today bears the stamp of federal support.

“In order to sustain and improve our quality of life, it is crucial that the United States continue to innovate more rapidly and more creatively than other countries in important areas of IT. Only by continuing to invest in core IT science and technology will we continue to reap such enormous societal benefits in the decades to come.”

– President’s Council of Advisors for Science and Technology
(in Designing a Digital Future, December 2010)
Advances in IT are transforming all aspects of our lives
Conduct commerce...
...how we learn...
...our employment...
...our health care...
...how we manufacture...
...how government functions...
...how we preserve our national security...
...how we communicate...
...and how we’re entertained.
Advances in IT also drive our economy
• Computing drives our economy, not just through the growth of the IT industry, but also through productivity gains across the entire economy
• Remarkable economic growth between ’95 and ’02 was spurred by productivity growth enabled almost completely by factors related to IT¹
• IT enables productivity growth, enables the economy to run at full capacity, enables goods to be allocated more efficiently and the production of higher quality goods and services²

Advances in computing are enabling innovation in all other fields...
In Science and Engineering...

Computer modeling, visualization and data analysis have joined observation, theory, and experiment as the drivers of scientific discovery.

Created by Matthew Hall of NCSA's Advanced Visualization Laboratory
The history is impressive, but the future is even more compelling
• The future of networking
• Revolutionizing transportation
• Delivering personalized education
• Enabling the smart grid
• Empowering the developing world
• Improving health care
• Driving advances in *all* fields of S&E
It’s impossible to imagine a field with greater opportunity to change the world.

It’s impossible to imagine a field with greater opportunity to provide amplification to the forces of change in the world.
The IT R&D ecosystem is crucial to innovation in IT, and federal support is at the heart of that ecosystem
“[An] extraordinarily productive interplay of federally funded university research, federally and privately funded industrial research, and entrepreneurial companies founded and staffed by people who moved back and forth between universities and industry.”

-NRC on the federal IT R&D Program
ESSENTIALLY EVERY ASPECT OF INFORMATION TECHNOLOGY ON WHICH WE RELY TODAY BEARS THE STAMP OF FEDERAL SUPPORT.
Where the STEM Jobs Will Be
Projected Annual Growth of Total STEM Job Openings 2012-2022:

- Computing: 49%
- Life Sciences: 7%
- Engineering: 29%
- Mathematics: 2%
- Physical Sciences: 5%
- Social Sciences: 8%


Where the STEM Jobs Will Be
Projected Annual Growth of NEWLY CREATED STEM Job Openings 2012-2022:

- Computing: 65%
- Engineering: 17%
- Life Sciences: 4%
- Social Sciences: 7%
- Mathematics: 3%
- Physical Sciences: 4%
WE’RE OPPORTUNISTIC...

• Congressional testimony
WE’RE OPPORTUNISTIC...

• Congressional testimony
• We host our own events and partner with others
CRA CONGRESSIONAL FALL FLY-IN SEPTEMBER 13-14, 2016!

CRA Fall Fly-in Participants, September 2015
Deconstructing The iPad

How Federally Supported Research Leads to Game-Changing Innovation
WE’re opportunistic…

- Congressional testimony
- We host our own events and partner with others
- We’ve developed a good “brand”
- We strive to engage the community in policymaking — LiSPL
LiSPI 2017
CRA/CCC Leadership in Science Policy Institute

November 2017
Washington, DC

Nominations
Sept 2017
WE’RE OPPORTUNISTIC...

- Part of a broader science advocacy community that’s looking for good stories to tell
- Join coalitions around our interests
  - CNSF, CNSR, TFAI, ESC, CSEC
- We leverage our interactions with the press
We leverage social media (or try to…)

http://cra.org/blog  On Facebook  @CRATweets
AND WE’VE HAD SOME SUCCESS...
“This is our generation’s Sputnik moment. Two years ago, I said that we needed to reach a level of research and development we haven’t seen since the height of the Space Race. In a few weeks, I will be sending a budget to Congress that helps us meet that goal. We’ll invest in biomedical research, information technology, and especially clean energy technology – an investment that will strengthen our security, protect our planet, and create countless new jobs for our people.”
If we want America to stay on the cutting edge, we need young Americans to master the tools and technology that will change the way we do just about everything.

- President Obama in a video on behalf of the Hour of Code
NSF’s entire increase is provided to core research and education activities, which are critical to innovation and U.S. economic competitiveness, including funding for an advanced manufacturing science initiative and for research in cyber-security and cyber-infrastructure.
**NSF Directorate Budgets and the FIRST Act**
Percent change from FY 2000 funding levels, constant dollars

*Adjusted for comparability. Based on historical agency data and proposed authorizations in the FIRST Act. © 2014 AAAS*
MORE RECENT “SUCCESSES”

- Sought for input on DIGIT Act
- NITRD Reauthorizations
- STEM Ed Act, Senate COMPETES
HOW CAN WE DO MORE?
• We want to do a better job of making the case to other agencies
  • CCC is incredibly useful here
• We want to get the community more engaged in making policy
  • Congressional dysfunction means agency processes are even more important!
LiSPI 2017
CRA/CCC Leadership in Science Policy Institute

Fall 2017
Washington, DC

Nominations
September 2017
CRA’S NEXT CONGRESSIONAL FALL FLY-IN

• September 13-14, 2016
MAKE THE CASE FOR COMPUTING IN YOUR OWN SPHERES OF INFLUENCE!
WITHOUT A STRONG CASE AND SUPPORT FROM A BROAD COMMUNITY – INDUSTRY, HIGHER EDUCATION, SCIENTIFIC SOCIETIES – THE NEED FOR RESEARCH FUNDING WILL FACE A CHILLY RECEPTION AMONG POLICYMAKERS
Thanks!

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@CRATweets

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