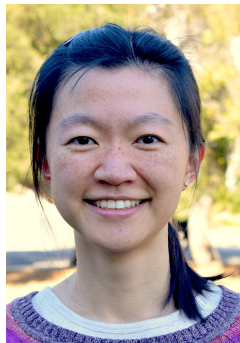


# Catalyzing Advocacy in Science and Engineering: Lessons Learned

Qinqin Yu, Vetri Velan, Erin Sullivan, Eric Lee

May 2, 2019

# Who we are



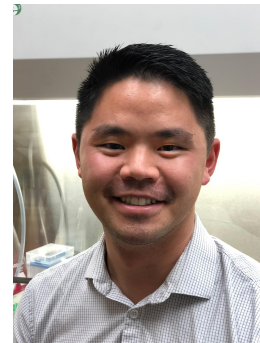
Qinqin  
3rd Year  
Physics PhD



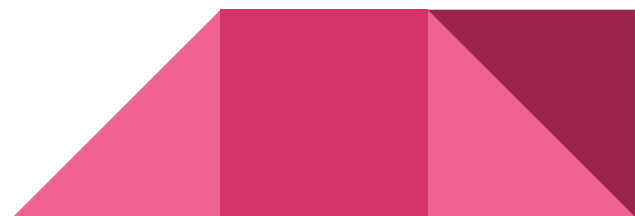
Vetri  
4th Year  
Physics PhD



Erin  
4th Year  
Chemistry PhD



Eric  
5th Year  
IDI PhD



# What is AAAS?



- American Association for the Advancement of Science
  - International nonprofit organization
  - No registered lobbyists
  - “Dedicated to advancing science for the benefit of all people”
- Education, Science Diplomacy, Policy/Advocacy, Public Engagement
- Science & Technology Policy Fellowships
  - Some states have similar fellowships including California (CCST) and New Jersey (Eagleton)

# CASE Workshop

- Began in 2014; number of participants has tripled
- 2.5 days learning about science funding, budget process, communication skills in Washington, D.C.
- 1 day of meetings with Congressional and Senatorial staffers on Capitol Hill





# Meetings with Staffers (and two Congressmen!)



Rep. Bill Pascrell (NJ-9)

As well as:

- Speaker Nancy Pelosi (CA-12)
- Minority Leader Kevin McCarthy (CA-23)
- Sen. Kamala Harris (CA)
- Rep. Barbara Lee (CA-13)
- Sen. Tammy Baldwin (WI)
- Rep. Dan Lipinski (IL-3)
- Rep. Bill Pascrell (NJ-9)



Rep. Eric Swalwell (CA-15)



Senator Dianne Feinstein (CA)

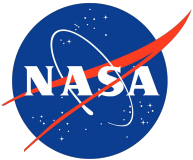


Rep. Mark DeSaulnier (CA-11)

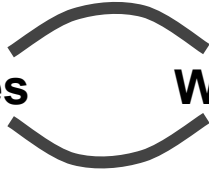


# Federal Budget 101

Executive



Agencies



White House

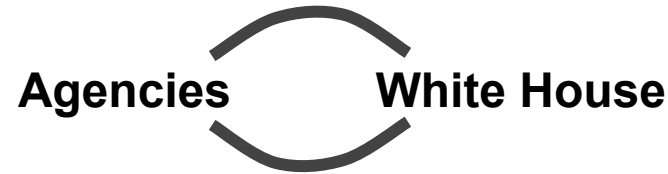


Etc.



# Federal Budget 101

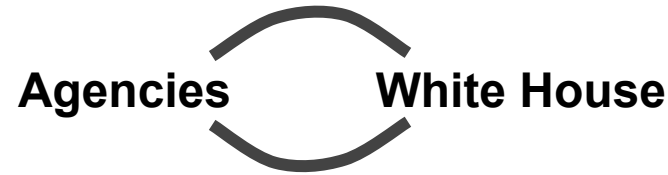
**Executive**



- Starts 18 months before deadline (October 1)
- Bottom-up and top-down approaches
- Science guidance from **OSTP** (*Office of Science and Technology Policy*) and **OMB** (*Office of Management and Budget*)

# Federal Budget 101

**Executive**

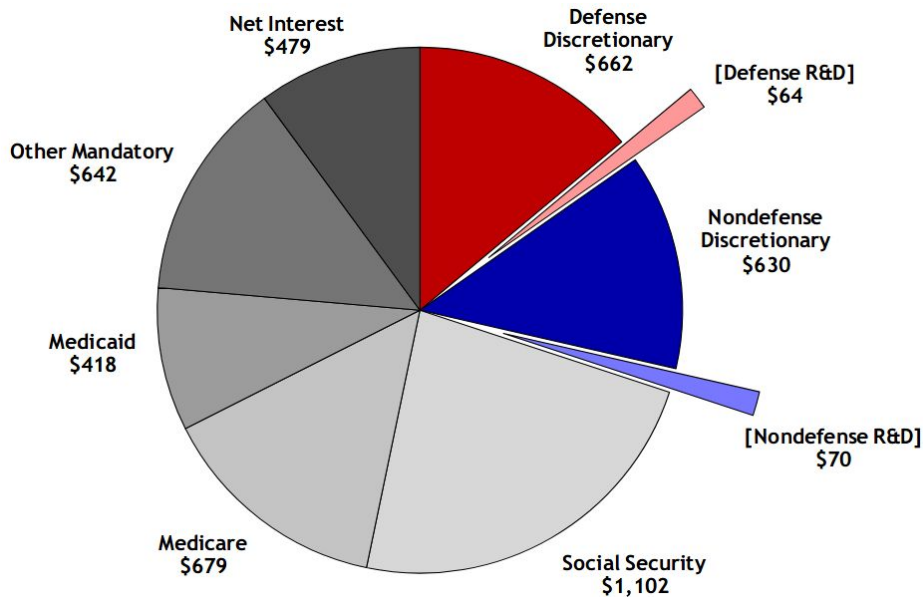


1 year from deadline:  
Agency requests reviewed by OMB

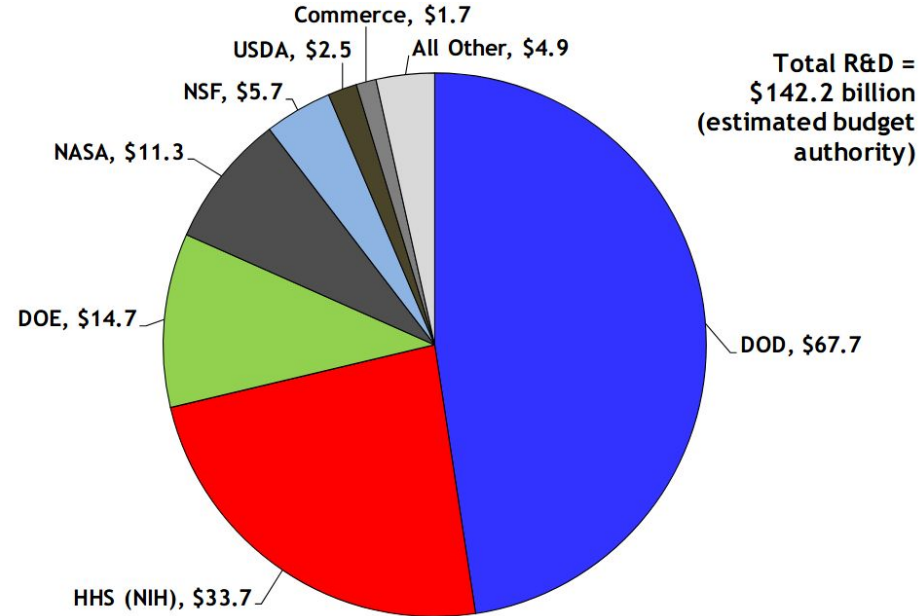


# Federal Budget 101

## President's Budget Request FY2020



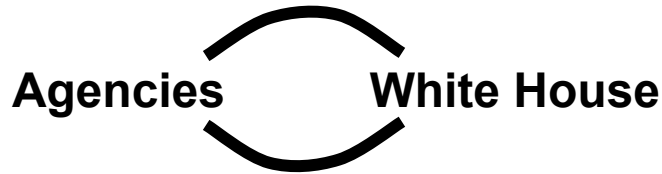
## R&D Budget Request FY2020



# Federal Budget 101

**Executive**

**Legislative**



**February Budget  
Request (Feb. 1)**



**POTUS  
signs off (by Oct. 1)**

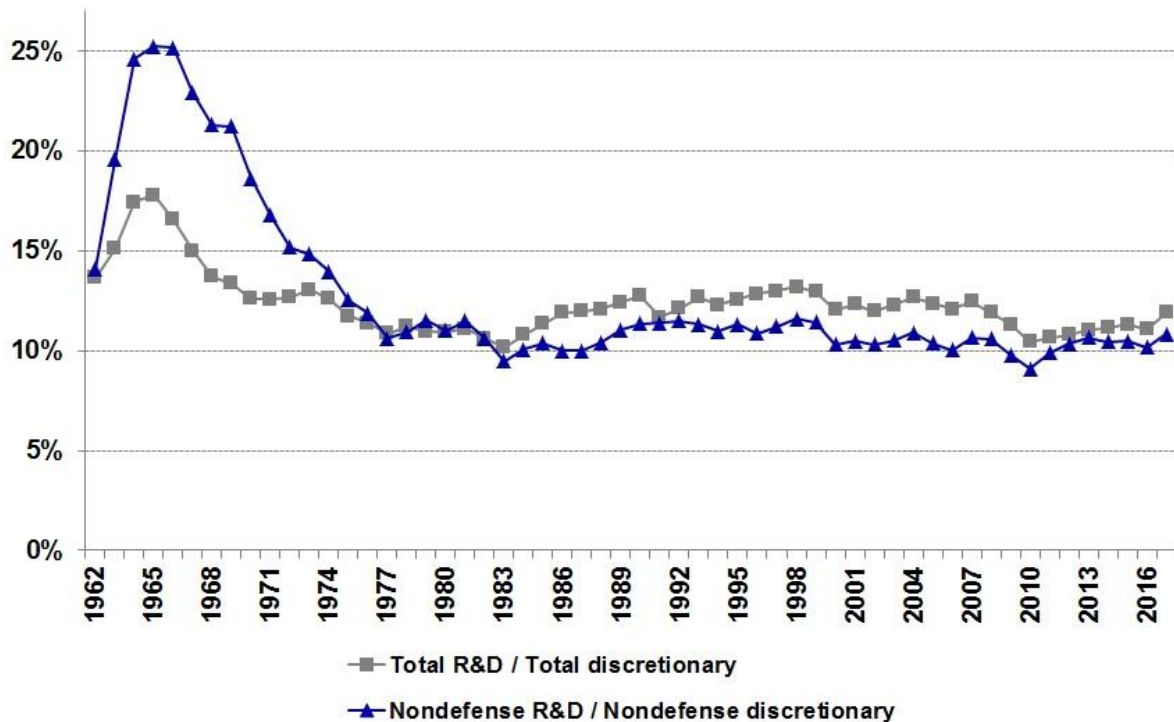


- 1. House/Senate Budget Committees**
- 2. Budget Resolution**
- 3. House/Senate Twelve Appropriations Committees**

- Agriculture, Rural Development, Food & Drug Administration
- Commerce, Justice, Science
- Defense
- Energy & Water Development
- Interior and Environment
- Labor, Health & Human Services, Education

## R&D as Percent of Discretionary Spending

percentage of outlays, 1962 - 2017

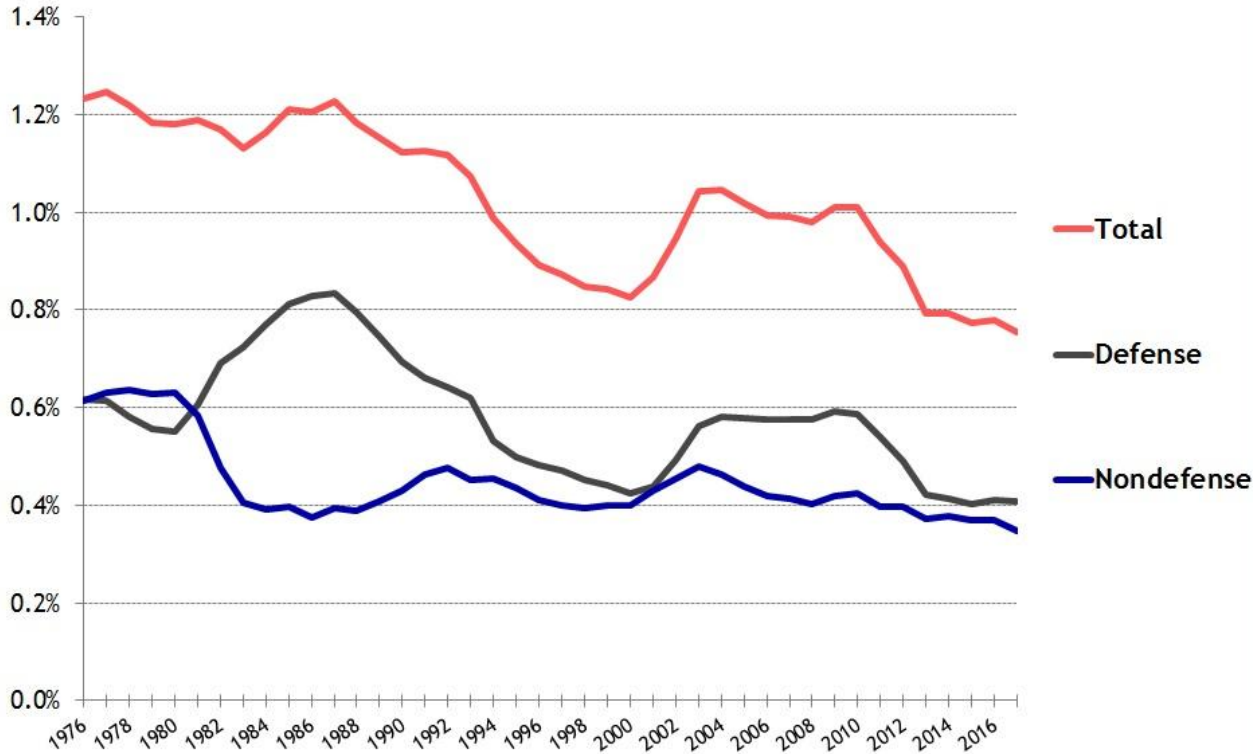


Percentage of discretionary budget has been constant over past ~35 years

Source: Budget of the U.S. Government FY 2017. © 2016 AAAS

# Trends in Federal R&D

As a percent of GDP



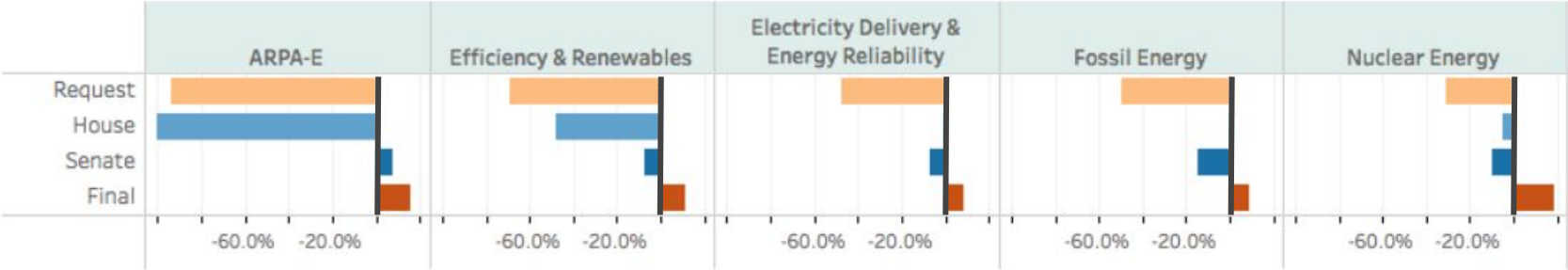
As percentage of GDP it has gone down over same time period

Source: AAAS analyses of historical budget and agency data and the FY 2017 request. GDP figures from OMB. R&D includes conduct and facilities. © AAAS

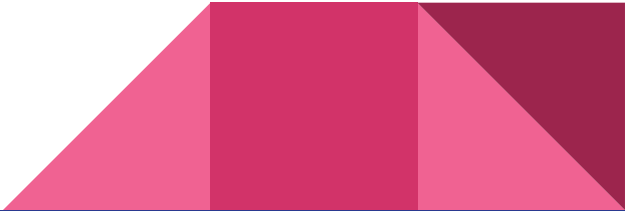
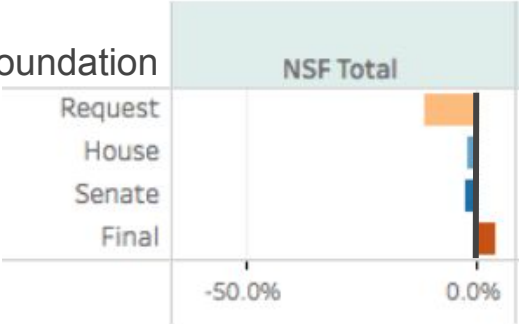


# “President proposes: Congress disposes”

## Energy Technology Offices



## National Science Foundation



# Budget initiative: quantum information science

Proposed in president's budget for FY 2018



## NATIONAL STRATEGIC OVERVIEW FOR QUANTUM INFORMATION SCIENCE

*Product of the*  
SUBCOMMITTEE ON QUANTUM INFORMATION SCIENCE  
*under the*  
COMMITTEE ON SCIENCE  
*of the*  
NATIONAL SCIENCE & TECHNOLOGY COUNCIL

SEPTEMBER 2018

# Congress: Its Structure and Processes

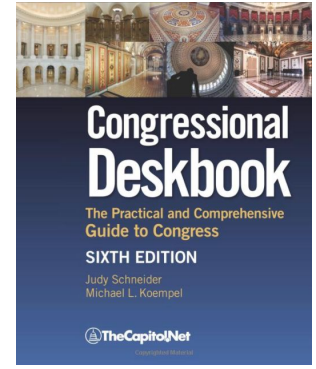


Why does Congress exist?

→ A main function of Congress is to **stop bad laws from being enacted.**



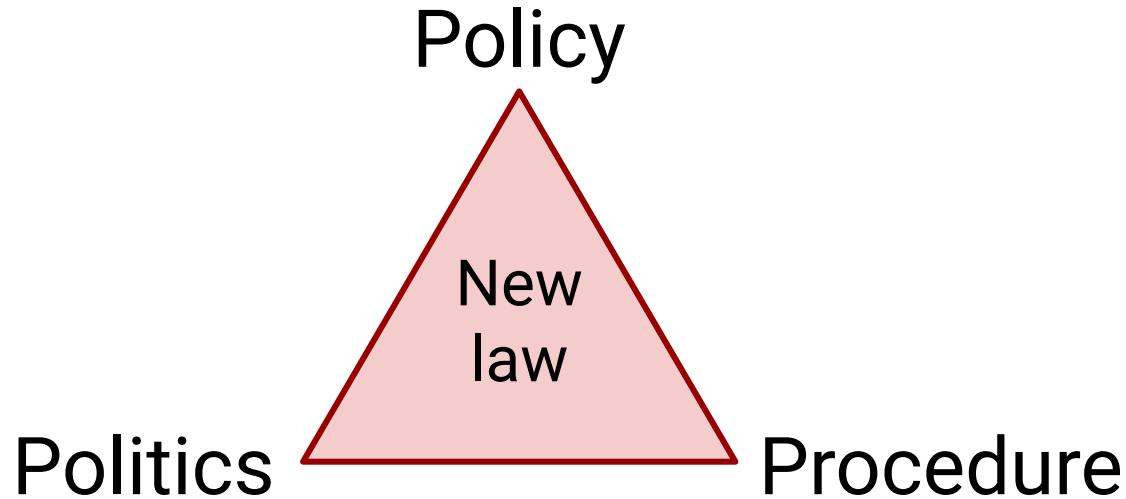
Judy Schneider  
US Congress extraordinaire!



600+ pages of everything  
you'd need to know!

# Congress: Its Structure and Processes

Why are so many bills introduced (~10,000), but so few bills passed (~100)?



All 3 must be in balance for a bill to be successful!

# How Congress Operates: Policy

- Legislation
- Regulation
- Implementation
- Structures

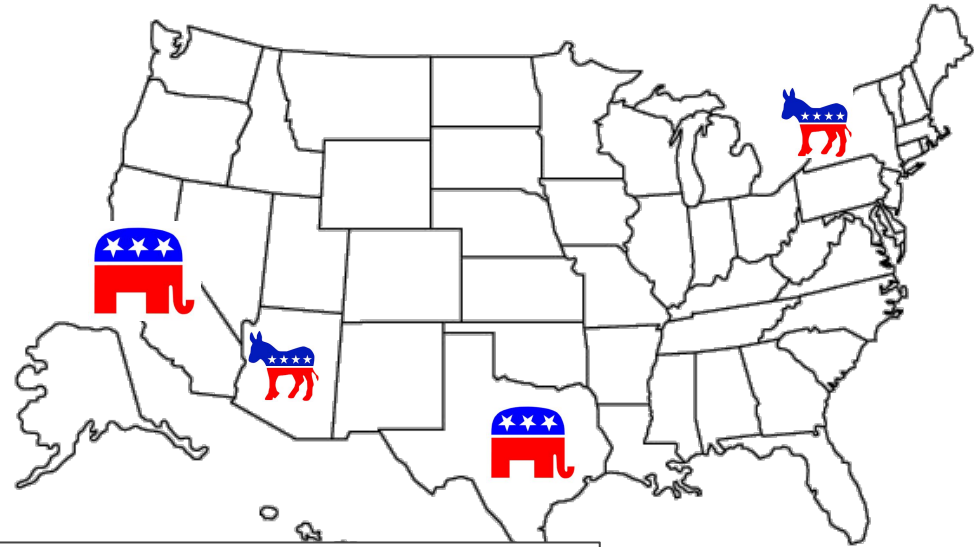
Example: climate change policy

However...



# How Congress Operates: Politics

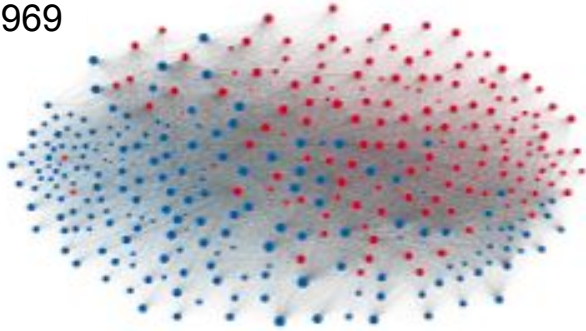
LOOK HOW MANY BILLS I  
INTRODUCED! SEE, I'M WORKING  
ON THESE ISSUES! VOTE FOR ME!



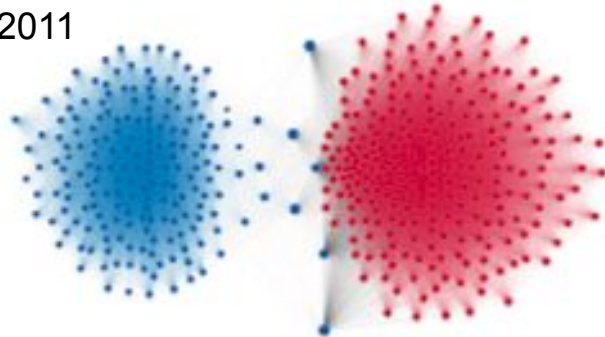
There can be huge intra-party  
differences in politics:  
All politics is local!

# Increased Partisan Polarization Over Time

1969



2011



Makes it tougher for scientists to use evidence to make their case



1992: 19%

VS.

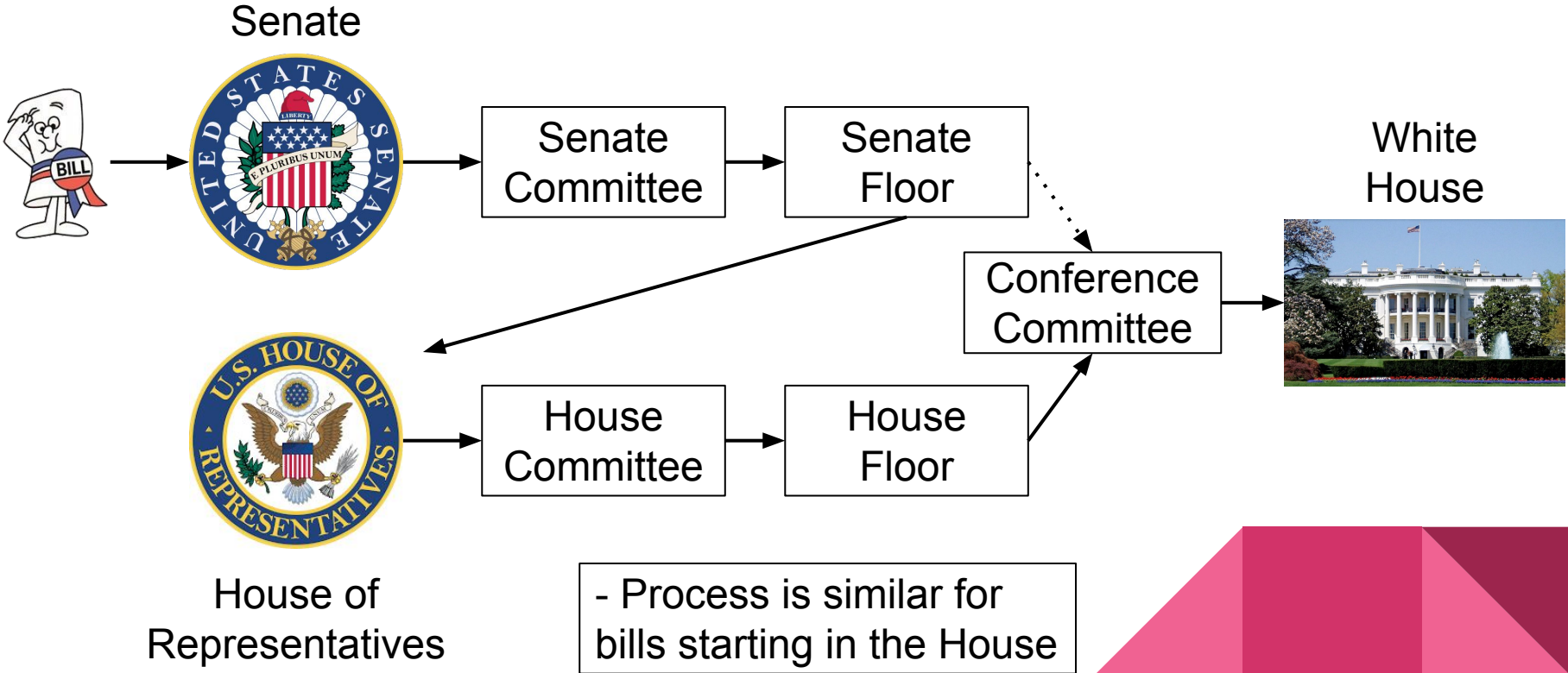
2016: 54%



OLD COUNTRY STORE

David Wasserman

# How Congress Operates: Procedure



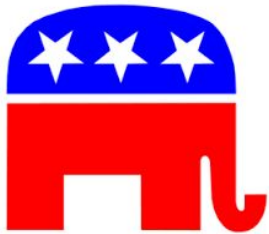


# How Congress Operates: Procedure

Procedure differs by chamber (Senate vs House of Representatives) and by party (Democrats vs Republicans)



- Committee chairs set schedules, agendas, number of subcommittees, etc.
- Reps: Chair term limits
- Dems: No term limits on chairs
- Politics plays into chair selection process



# How Congress Operates: Procedure

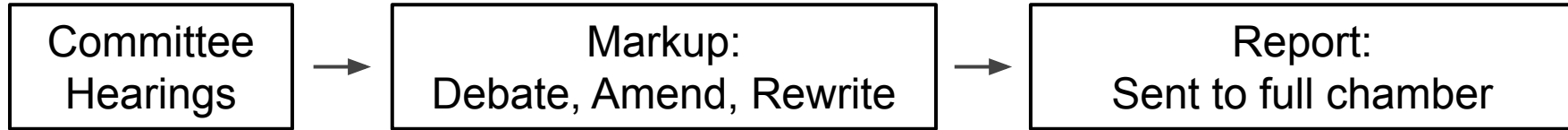
Committee work:

Committee  
Hearings



# How Congress Operates: Procedure

Committee work:



# How Congress Operates: Procedure

Procedure on the floor:

Senate



All Senators seen as equal:

- Bring up amendments
- Filibuster to stop bill



House of  
Representatives

“The House lives and dies by procedure.”



# How Congress Operates:

## Policy, Politics, Procedure

Process was *designed to be slow*

Often for a big piece of legislation:  
Politics has to change, and people have to change.

Don't be discouraged!



# How can we fit into the picture?

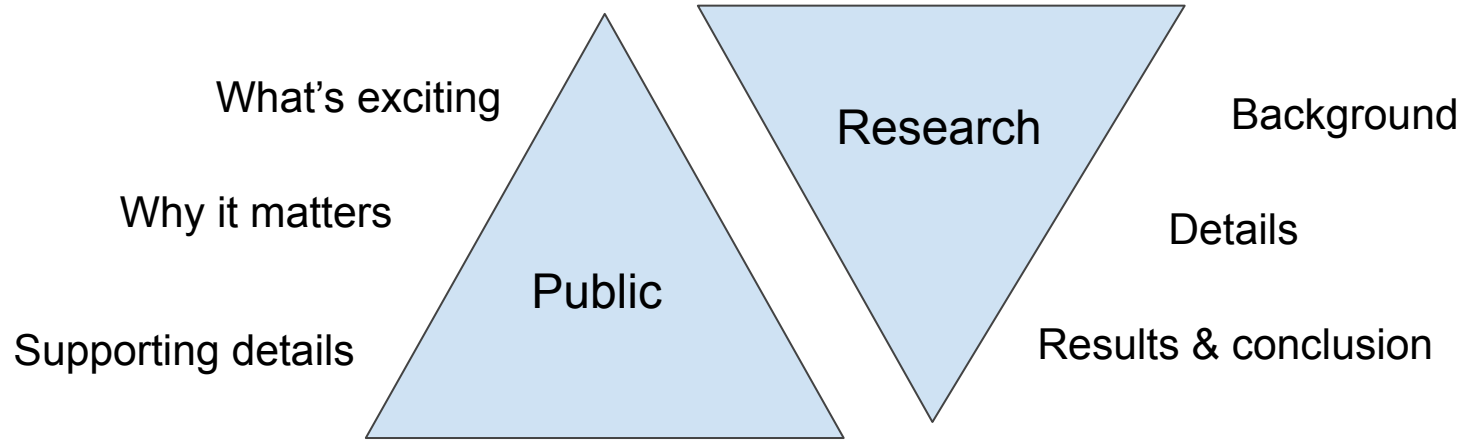
Realize that Congresspeople are influenced by

- (1) Media
- (2) Personal convictions
- (3) District

Exercise: practicing effective communication



# Public Engagement Styles



# Effective Communication

1. Know your audience: Be consistent, but tailor your message depending on the setting
  - a. E.g. Research funding → economic impact vs. importance of basic or applied research vs. international competition
2. Tell your story: Personal experiences are powerful!





# The 3 Ms

## MINIATURE

Who is your audience?

What 3 key points do you want to communicate?

1. Key Point #1
2. Key Point #2
3. Key Point #3

# The 3 Ms

## MEMORABLE

How can you make your message memorable?

Do you have a specific personal story to tell?



## The Rock Cycle



Fudge: Igneous Rocks



Chocolate Chip Cookies: Metamorphic Rocks



Layer Bars: Sedimentary Rocks

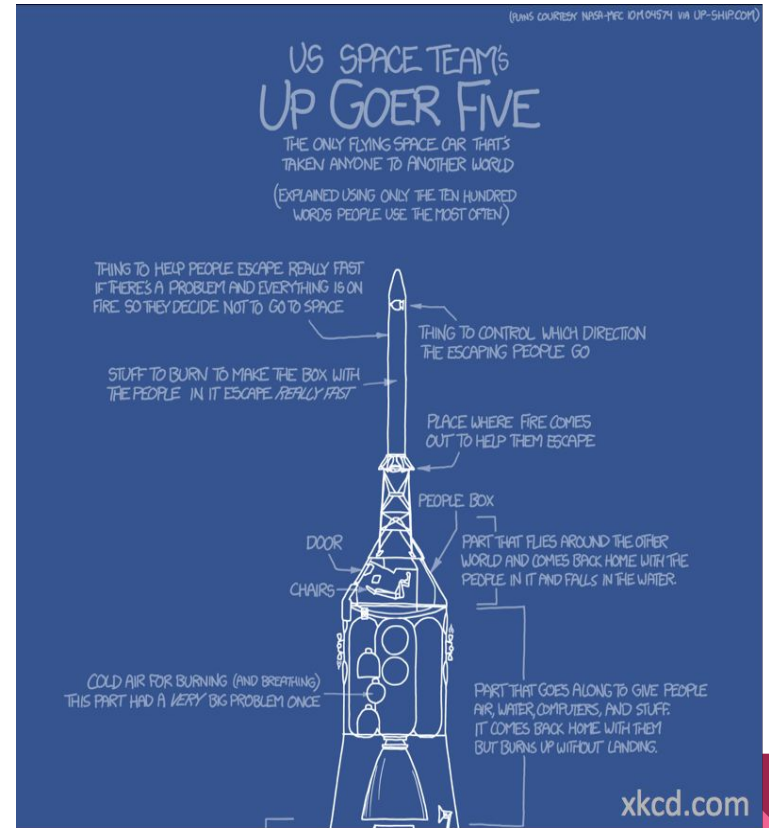


# The 3 Ms

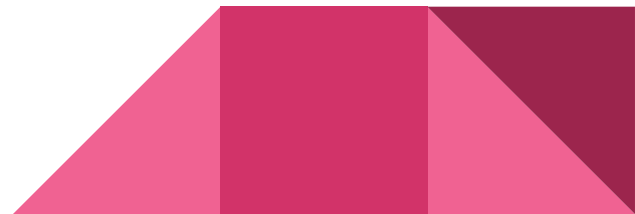
## MEANINGFUL

Consider your audience:

- Is your message meaningful?
- Are you using any technical jargon?



# Pitch examples



# Exercise: practicing 1 minute pitches

- Find a partner!
  - Pitch your research, a policy idea, or your major subject
  - Audience: Educated person with high school background on your subject
- 
- 1 minute pitch per person
  - 2 minute feedback per person



# What you can do

Vote

Meet with your local office in person

Policy through professional organizations (like the AAAS, APS, ACS...)

Call or write, online comments for bills (use expertise as scientist)

Join the Science Policy Group at Berkeley!

@UCB\_SciPolicy

<https://sciencepolicy.berkeley.edu/>



# What you can do: SEA Change

## STEM Equity Achievement

Bottom-up transformation of departments, universities, etc. in support of diversity and inclusion

Voluntary self-assessment for institutions who undergo reform to ensure removal of structural barriers for marginalized communities



# SEA CHANGE

<https://seachange.aaas.org/>



# Thank you to our funders

Vice Chancellor for Research  
Graduate Division  
Division of Mathematical & Physical Sciences  
College of Chemistry  
Department of Chemistry  
Physics Department  
LBNL Physics Division

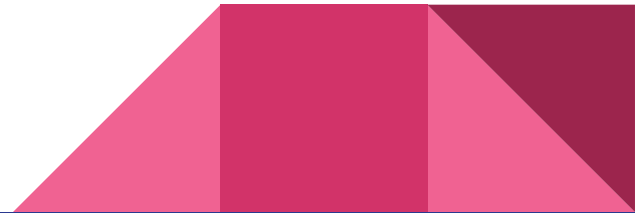
Special thanks to  
Michelle Moskowitz, Julia  
Rowe, and UC DC staff



...And THANK YOU!

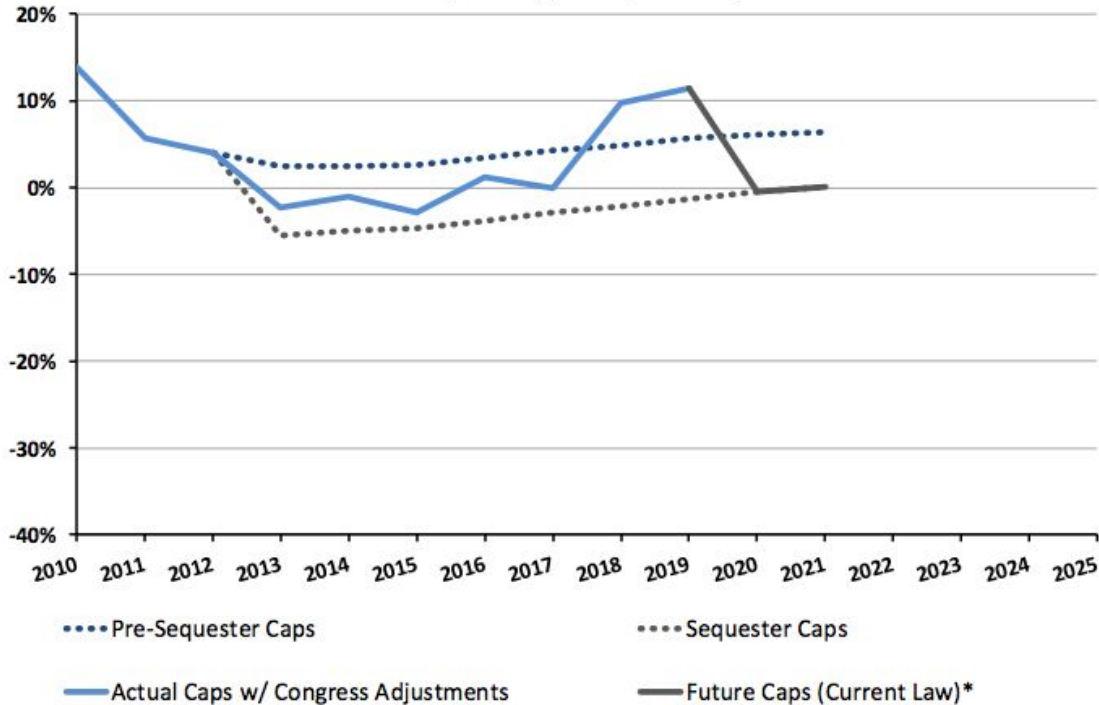


# Extra Slides



## Limits on NONDEFENSE Spending

Estimated percent change from 2017, inflation adjusted



- Budget Control Act (2011) enacts sequestration from 2013-2021
- Sequestration means cuts in federal spending
- Mostly caps discretionary spending

\*Current caps last through 2021. Based on past and current budget resolutions, the Budget Control Act and subsequent legislation, and the FY 2019 OMB summary tables. © AAAS 2018

# Science funding is decentralized



**Congress appropriates  
funding for  
agencies/institutes**



# Science funding is decentralized



**Congress appropriates  
funding for  
agencies/institutes**



# Science funding is decentralized



**Congress appropriates funding for agencies/institutes**



**Agencies and institutes grant research funds**



# Sub-committees for Science

Senate and House

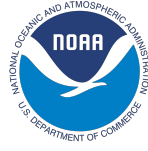
Appropriations Subcommittees  
on Commerce, Justice, Science



# Sub-committees for Science

Senate and House

Appropriations Subcommittees  
on Commerce, Justice, Science



\$7.8 billion budget in 2018  
0.2% of federal budget

# Sub-committees for Science

Senate and House

Appropriations Subcommittees  
on Commerce, Justice, Science



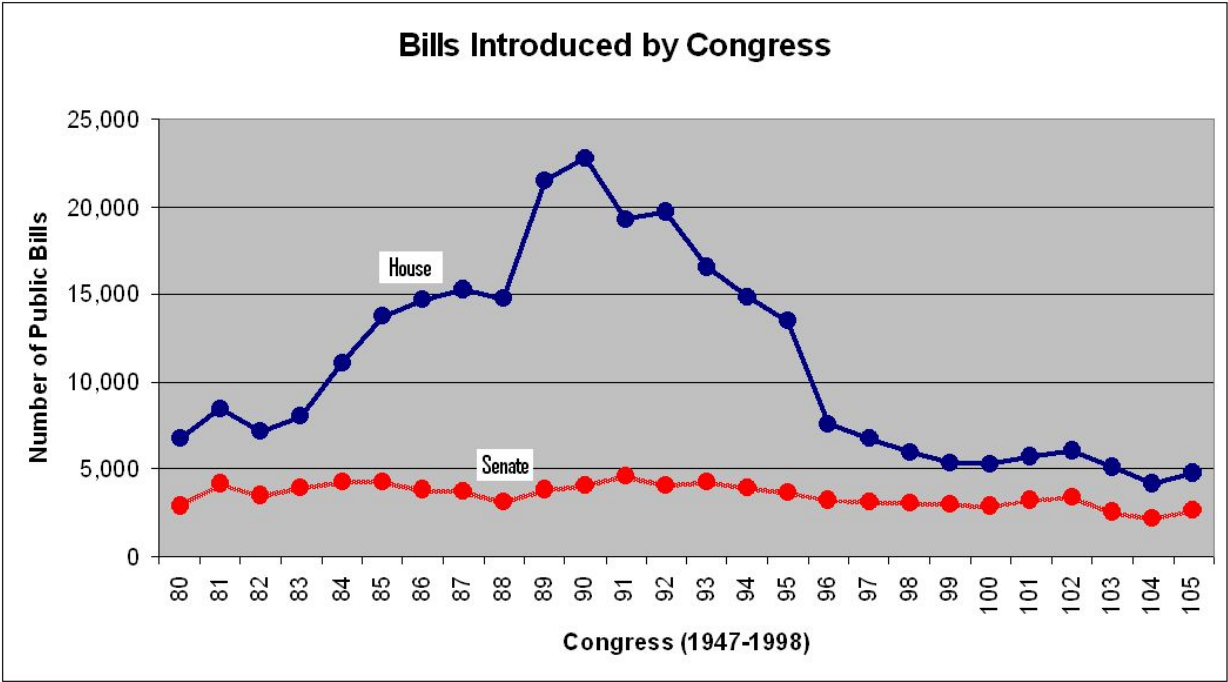
The NSF funds some 2,000 graduate students across the country each year. In the past three years, 284 UCB students earned an NSF fellowship!



# Recent Data from Congress

| Congress                | Enacted Laws | Passed Resolutions | Got A Vote | Failed Legislation | Vetoed Bills (w/o Override) | Other Legislation | TOTAL         |
|-------------------------|--------------|--------------------|------------|--------------------|-----------------------------|-------------------|---------------|
| <b>115<sup>th</sup></b> |              |                    |            |                    |                             |                   |               |
| Jan 3, 2017             | <u>164</u>   | <u>460</u>         | <u>561</u> | <u>5</u>           | <u>0</u>                    | <u>8,467</u>      |               |
| -present                | 2%           | 5%                 | 6%         | 0%                 | 0%                          | 88%               | <u>9,657</u>  |
| <b>114<sup>th</sup></b> |              |                    |            |                    |                             |                   |               |
| Jan 6, 2015             | <u>329</u>   | <u>708</u>         | <u>661</u> | <u>22</u>          | <u>9</u>                    | <u>10,334</u>     |               |
| -Jan 3, 2017            | 3%           | 6%                 | 5%         | 0%                 | 0%                          | 86%               | <u>12,063</u> |
| <b>113<sup>th</sup></b> |              |                    |            |                    |                             |                   |               |
| Jan 3, 2013             | <u>296</u>   | <u>663</u>         | <u>474</u> | <u>20</u>          | <u>0</u>                    | <u>9,184</u>      |               |
| -Jan 2, 2015            | 3%           | 6%                 | 4%         | 0%                 | 0%                          | 86%               | <u>10,637</u> |
| <b>112<sup>th</sup></b> |              |                    |            |                    |                             |                   |               |
| Jan 5, 2011             | <u>284</u>   | <u>722</u>         | <u>390</u> | <u>38</u>          | <u>0</u>                    | <u>10,865</u>     |               |
| -Jan 3, 2013            | 2%           | 6%                 | 3%         | 0%                 | 0%                          | 88%               | <u>12,299</u> |

# Recent Data from Congress



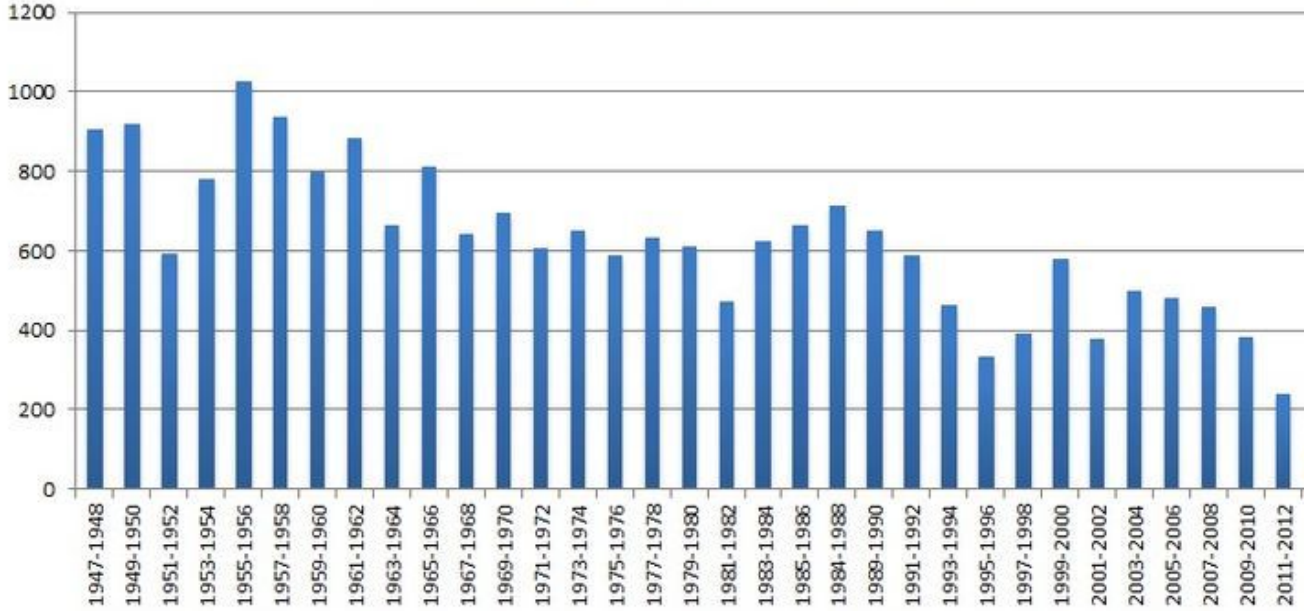
Congressional Bills Project: [www.congressionalbills.org](http://www.congressionalbills.org)

<https://www.govtrack.us>

<https://www.congress.gov>

# Recent Data from Congress

## Bills Passed By Congress - 1947 to 2014



Steve Benen, Maddow Blog

<https://www.govtrack.us>

<https://www.congress.gov>

# How Congress Operates: Procedure

## Committee Referral:

Senate



One committee with  
“Predominant”  
Jurisdiction

House of  
Representatives



“Primary” Committee  
assigned, but can be  
referred to others

Creative Drafting: “User fee” vs. “Tax”

# How Congress Operates:

## Policy, Politics, Procedure



This American Life  
Episode 642: The Impossible Dream



# How Congress Operates: Procedure

