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Office of  
Science

# **The Importance (and Pitfalls) of Outreach: A DOE Headquarters Perspective**

**NUFO Annual Meeting  
June 8, 2010**

Benjamin L. Brown, Ph.D.  
DOE Office of Science  
Office of the Deputy Director for Science Programs

# Outline

- Approaches to outreach
- Some challenges for DOE/SC outreach
- User facilities: A centerpiece of DOE/SC outreach
- Hill outreach



# Outreach is Important

## Public Trust

Science is a public endeavor

## Accessibility

Few non-scientists “seek out” science

## Focus

The exercise of explaining science to non-scientists has inherent value



# Outreach is Important

## Science is a public endeavor



### In the public eye

Society deserves to see a return on its investment in science, but researchers need help to make their case.

The US National Science Foundation (NSF) is unique among the world's science-funding agencies in its insistence that every proposal, large or small, must include an activity to demonstrate the research's 'broader impacts' on science or society. This might involve the researchers giving talks at a local museum, developing new curricula or perhaps forming a start-up company.

The requirement's goal is commendable. It aims to enlist the scientific community to help show a return on society's investment in research and to bolster the public's trust in science — the latter being particularly important given the well-organized movements currently attacking concepts such as evolution and climate change.

Unfortunately, the very breadth of the requirement can leave researchers struggling (see page 416). Few of them have training in the activities involved — especially when it comes to education and outreach — and the NSF has not done enough to provide a support infrastructure to help.

Such an infrastructure does exist in embryonic form. For example, a few research institutions, including Stanford University in Palo Alto, California, and the University of Wisconsin–Madison, already have centres that aim to connect scientists with experts in teaching, education and public outreach, to equip them with the necessary skills and to disseminate best practices. And a few places, such as the University

of New Mexico in Albuquerque, have developed workshops in which graduate students, postdocs and junior faculty members get professional training on how to interact with the public, media and government. Such efforts need to be expanded and institutionalized throughout the country.

Broader-impacts efforts also need to be better evaluated and rewarded. For example, the NSF should consider offering cash awards for the best broader-impact activities, the money from which could help to continue or expand the activities. This would motivate investigators to put greater effort into these endeavours, and would spread the word to other scientists about the sorts of activities that have proved successful.

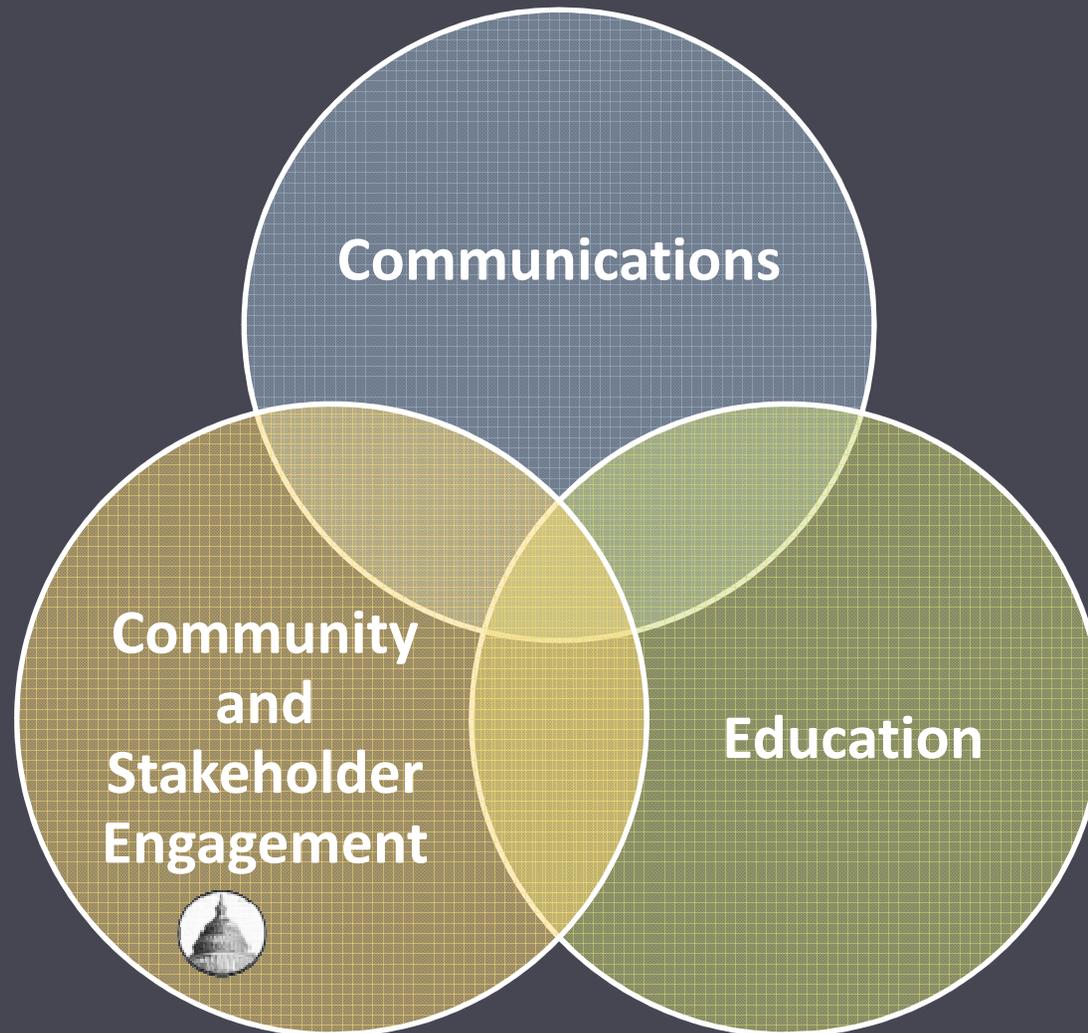
Such initiatives would motivate what is really needed: a fundamental change in the culture of science to value not just achievement in the laboratory, but also work that makes science a part of people's lives.

The US Congress can help. The America COMPETES Reauthorization Act, which would extend an earlier boost given to the budgets of the NSF and two other science agencies, requires grant applicants to show that they have received support from their institutions in meeting the broader-impacts requirement. It also calls on the NSF to clarify the requirement's goals and to improve evaluation of the outreach activities. The act is being held up by political manoeuvring, despite strong bipartisan support. Congress should pass it without delay.

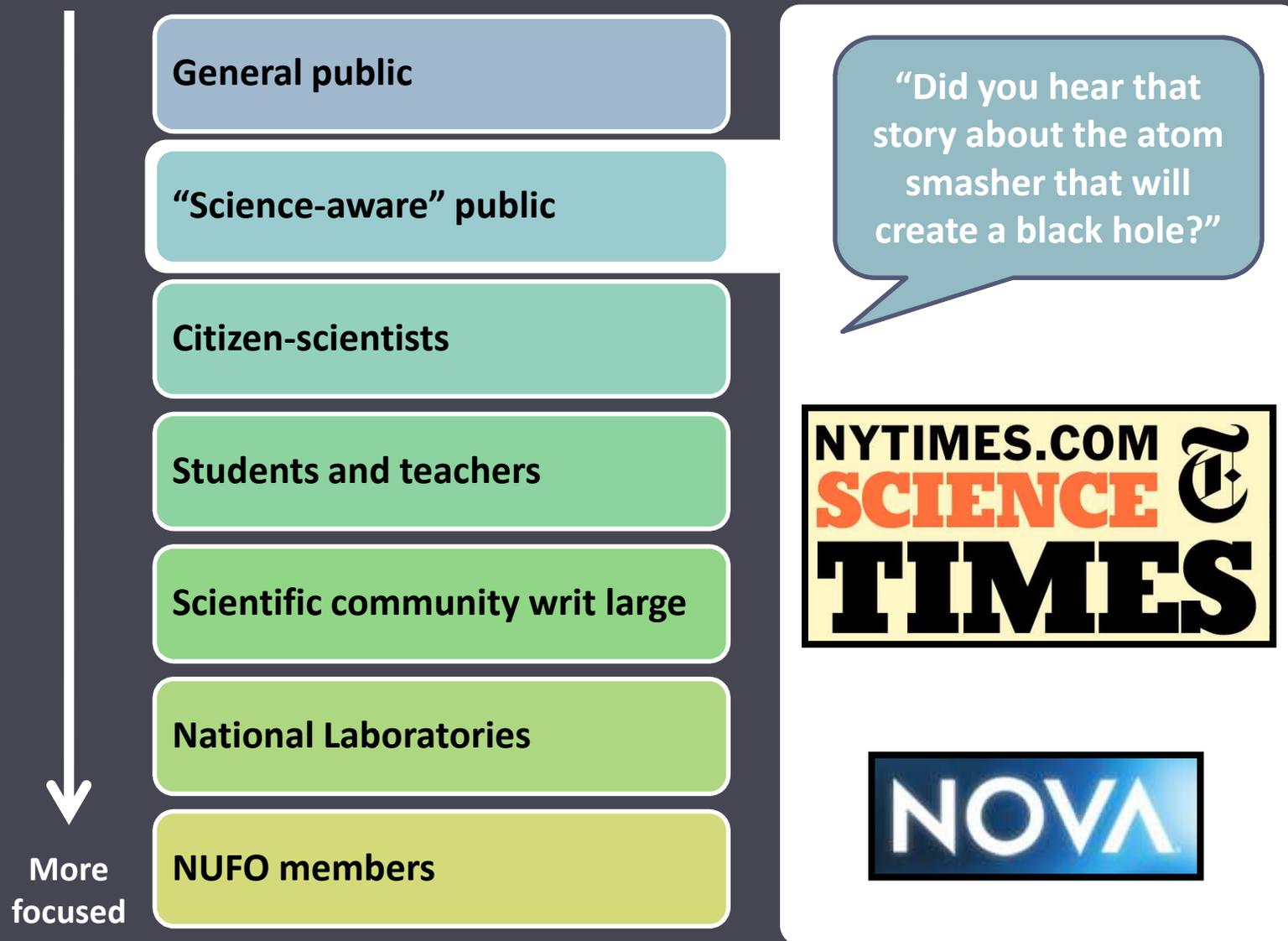
It is a truism to say that science and society are intertwined. But no relationship should be taken for granted. The NSF needs to help scientists show the world that their work is valuable. ■



# Outreach “Modes”



# Spectrum of Audiences



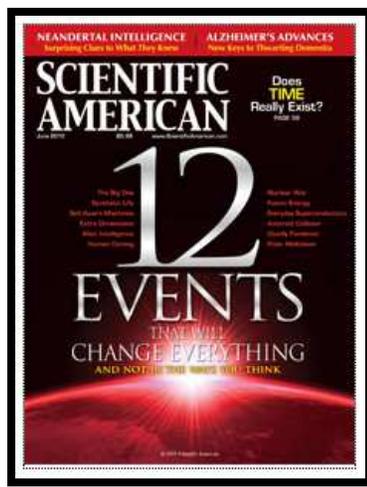
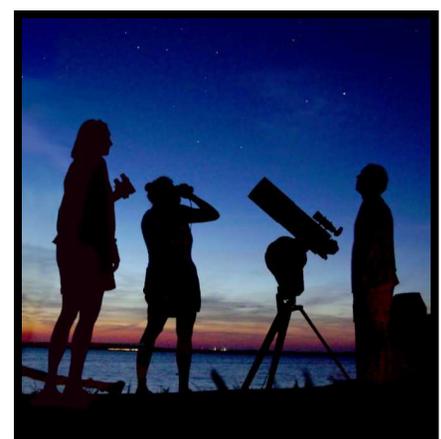
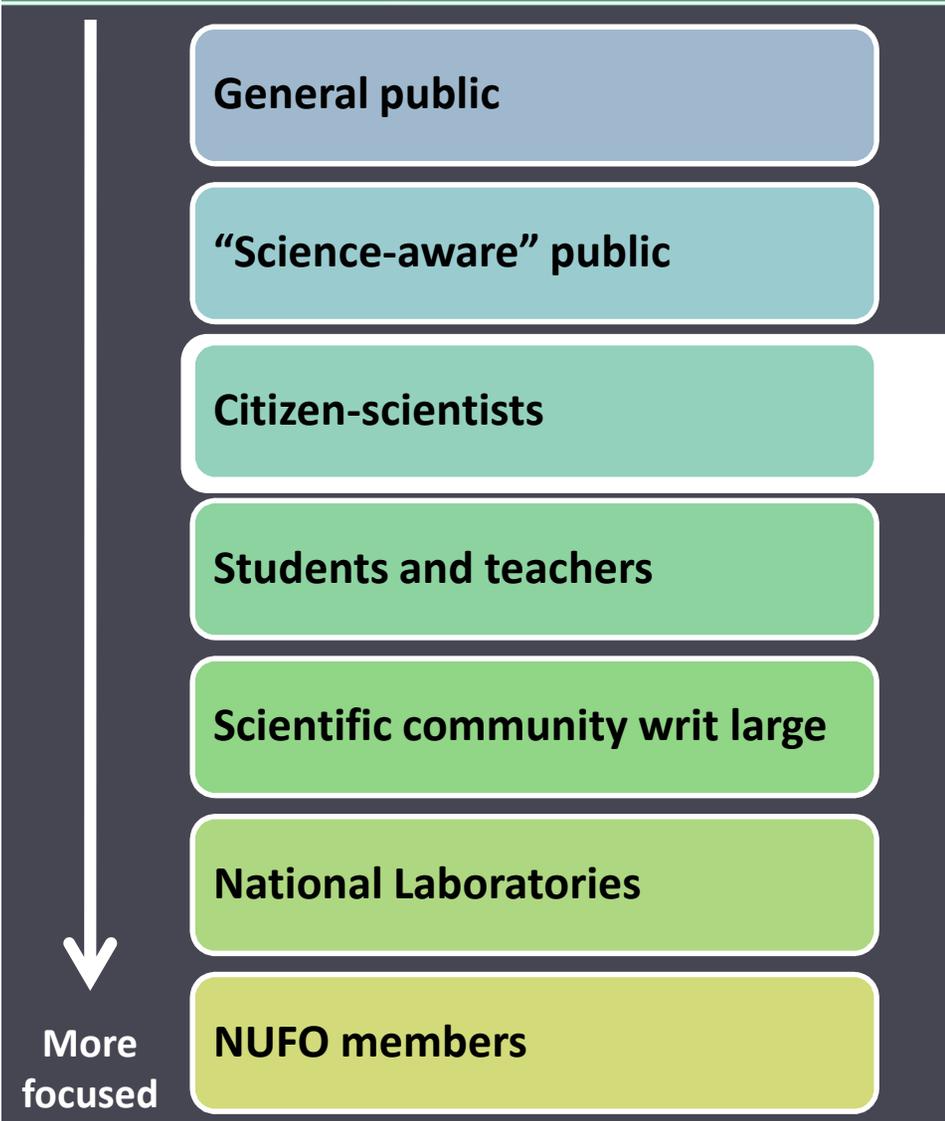
More focused



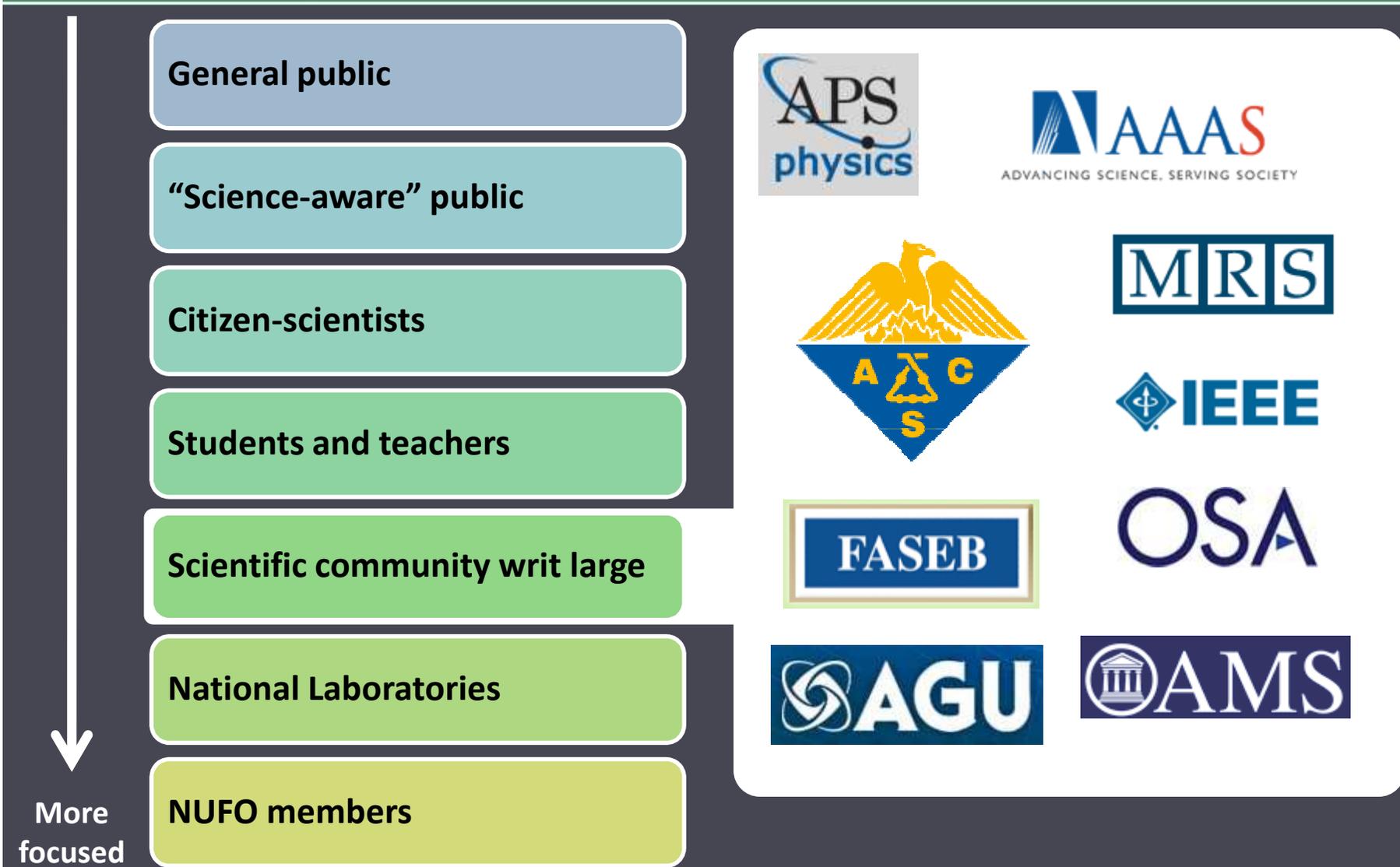
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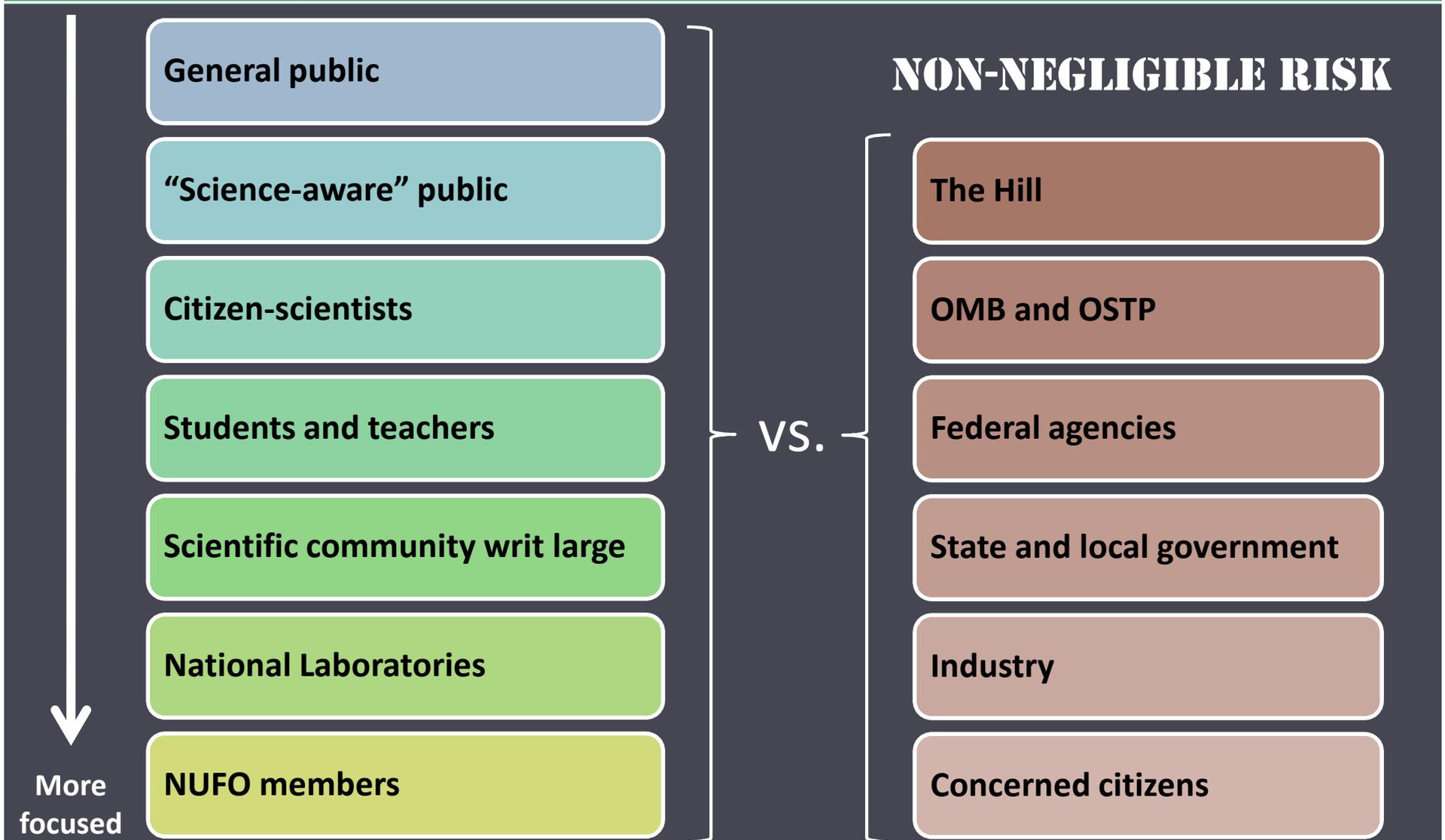
# Spectrum of Audiences



# Spectrum of Audiences



# Spectrum of Audiences: Risk Differential



# An Aside on Salesmanship



To many scientists,  
“sell” is a dirty word

“What is that good for?”



# An Aside on Salesmanship



Interpersonal interaction

“Stay on message”

As few words as possible

Link to something else people care about

Repetition, repetition, repetition



# DOE's (and NUFO's) Outreach Challenges



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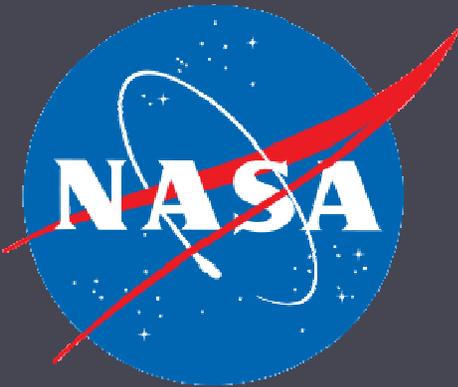
# DOE's (and NUFO's) Outreach Challenges



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# Outreach Without a Congressional Mandate . . .



**Education: \$183M**



**Education: \$873M**



**Education: \$54M**



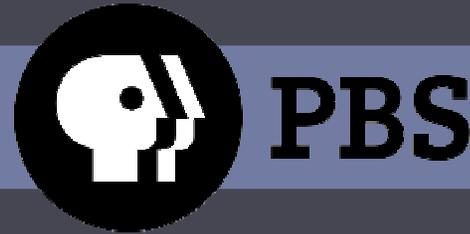
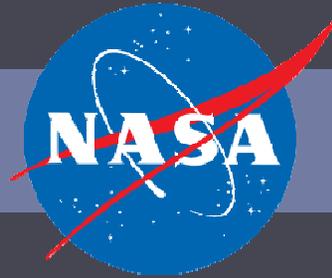
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**Education: \$0M**

**Workforce  
Development: \$21M**

# ... And Without a Recognizable Brand



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## ... And Without a Recognizable Brand



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- NUFO is distinct from DOE
- DOE = “Energy” (not “Science”)
- “What’s a ‘user facility’?”

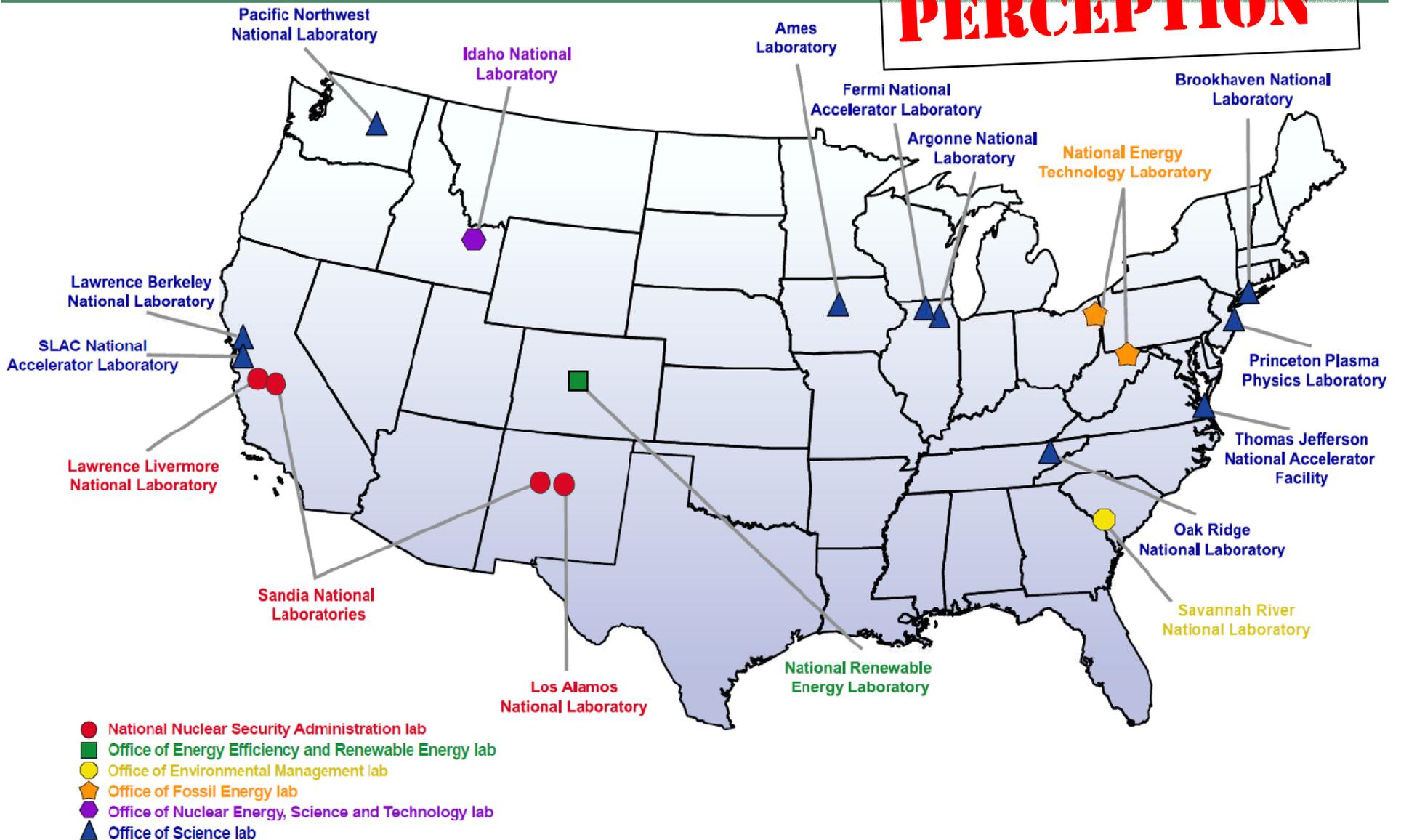


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# The DOE Map of the United States

**PERCEPTION**



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# The DOE Map of the United States

**REALITY**



The Office of Science supports:

- 27,000 scientists, engineers, students, and technicians
- 26,000 users of open-access facilities
- 300 leading academic institutions
- 17 DOE laboratories



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The user facilities are essential to  
DOE/SC outreach efforts.

# The Compelling Story of User Facilities

- Explain “what is a user facility?”
- Clear justification for user facilities
- Proven “track record” of scientific impact
- The marvel of big machines
- Vast diversity of users, including industry



# SC Supports World-Leading, Open Access Scientific User Facilities

*User numbers continue to increase with more than 26,000 users expected in FY 2011*

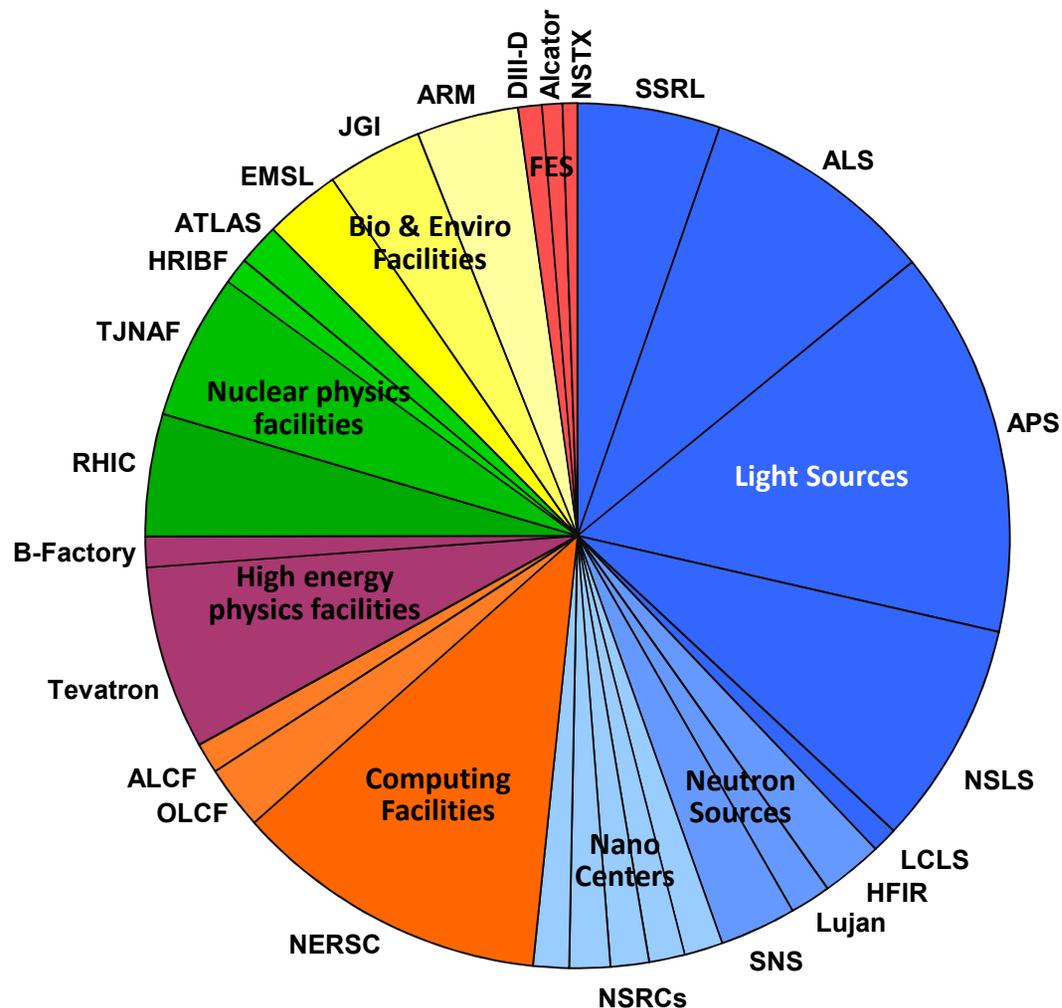
**Slide #4 of FY 2011  
Budget Rollout Briefing**

Numbers of Users at  
SC Facilities

	FY 2009	FY 2010 (Est)	FY 2011 (Est)
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ASCR	3,696	3,850	4,025
BES	11,509	12,780	13,560
BER	2,716	2,690	2,690
FES	542	575	580
HEP	2,960	2,600	2,100
NP	3,170	3,260	3,300
<b>Total</b>	<b>24,593</b>	<b>25,755</b>	<b>26,255</b>

Breakdown of the expected  
users in FY 2011 by facility.



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Office of Science FY 2011 Budget

# User Facilities are a Centerpiece of SC's Messaging



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# User Facilities are a Centerpiece of SC's Messaging



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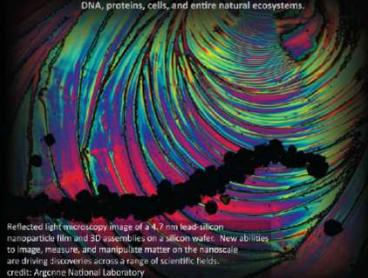
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Support for  
**25,000** users of open-access facilities  
**25,000** researchers, students, and technicians  
**300** leading academic institutions  
**17** national laboratories

## Science for Discovery

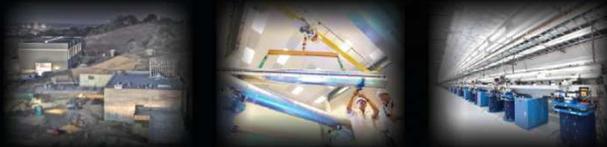
Unraveling Nature's deepest mysteries, from the study of subatomic particles; to atoms and molecules that make up the materials of our everyday world; to DNA, proteins, cells, and entire natural ecosystems.



Reflected light microscopy image of a 4.7 nm lead-silicon nanoparticle film and 3D assemblies on a silicon wafer. New abilities to image, measure, and manipulate matter on the nanoscale are driving discoveries across a range of scientific fields.  
credit: Argonne National Laboratory

## 21<sup>st</sup> Century Tools of Science National Scientific User Facilities

Providing the Nation's researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld, the environment, and the atmosphere.



The new Linac Coherent Light Source at SLAC National Accelerator Laboratory produces pulses of x-rays more than a billion times brighter than the most powerful existing sources. The machine's x-ray pulses can capture "snapshots" of atoms and molecules in motion, revealing the inner workings of chemistry, technology, and life itself.  
credit: SLAC National Accelerator Laboratory

## Science for National Need

Advancing a clean energy agenda through basic research on energy production, storage, transmission, and use; advancing our understanding of the Earth's climate through basic research in atmospheric and environmental sciences and in climate modeling; supporting DOE's missions in national security.



As the sun rises over Eastern Europe, the instantaneous net ecosystem exchange of carbon dioxide is shown in the Eastern Hemisphere. Strong uptake is shown in green-to-white and is strongest in the tropics. Release of carbon dioxide to the atmosphere is shown in red-to-white, and is strongest over the Congo, where the sun is not shining.  
credit: Oak Ridge National Laboratory



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# User Facilities are a Centerpiece of SC's Messaging

## 21<sup>st</sup> Century Tools of Science National Scientific User Facilities

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credit: SLAC National Accelerator Laboratory



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# Hill Outreach



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# Outreach from the Hill's Perspective

The  
Deficit

Jobs!!!

Health  
Care

Gulf Oil  
Spill

Financial  
System

Wars in Iraq  
and  
Afghanistan

Veterans

Immigration

Energy and  
Climate Change

Terrorism

Science and  
Innovation



# The Hill from the Scientific Community Perspective



Many scientists feel that Congress is fickle/disingenuous



# The Distinct Audiences of the Hill

- Appropriators:



- Authorizers



- Members with a home-State or home-district stake



- Everybody else

There are very few people on the Hill who think about science on a regular basis.



# Modes of Hill Outreach

Generally effective *if done consistently*:

- Public expo
- “Fly-in” or Congressional Visit Days: coordinated office visits *en masse*
- Targeted office visits
- Invitations to Members and/or staff to attend an event
- Newspaper ads and editorials
- Telephone

Generally less effective:

- Email
- Web outreach
- Open-ended invitations

What separates  
**Outreach** from  
**Advocacy** from  
**Lobbying**  
?



## Pros and Cons of Visibility on the Hill

- Dangers of high visibility
  - Earmarks, both “hard” and “soft”
  - Target for legislative “fixes”
  - Frequent Hill queries
  - Easy target for budget reductions (i.e., “now that you’ve popped out of that fox hole I’ll take that, thank you”) or politicization (e.g., COMPETES)
- Dangers of low visibility
  - Easy target for budget reductions (i.e., If you are silent you are invisible)
  - Constant staff turnover on the Hill; even the technically literate staff need education and refreshers



# The Compelling Story of User Facilities – the Hill Version

- Explain “what is a user facility?”

Is that like the SSC?

- Clear justification for user facilities

Science is great, but shouldn't we focus on new energy technologies?

- Proven “track record” of scientific impact

Why are there so many light sources?

- The ~~marvel~~ <sup>cost</sup> of big machines

Why are we paying to help run the LHC in Switzerland?

- Vast diversity of users, including industry

Why does industry have to pay for run time?

Do small businesses have enough access?



## Other Pitfalls of the Hill

- The “conversation” on the Hill can sometimes be in a very different place than the “real world.”
- Choose your messengers wisely
- Hill outreach requires a risk-benefit analysis:  
Does the risk of falling flat or stepping in a policy pothole outweigh the benefit of enhanced visibility?



# Conclusion

- Outreach has meaningful impact
- NUFO's greatest outreach asset is its members
- NUFO can play an important role in telling the story of the user facilities

Thank you for your dedication!

