Science in Turbulent Times

Federal Demonstration Partnership

August 28, 2012

AAAS
ADVANCING SCIENCE, SERVING SOCIETY

As Charles Dickens would say…..

- We're living in the best of times
- And the worst of times

On the one hand

We're living in the best of scientific times

AAAS

Advances in science are coming at a fantastic pace

- The rate of incremental advance is accelerating
- New technologies are enabling quantum jumps in understanding
  - With great practical significance
- “Transformative” or “breakthrough” research is getting easier to get funded
  - “High risk/high payoff”

Science and technology have never been more important or prominent in modern life

Some major global societal issues

- Environmentally sustainable development
- Need for renewable energy sources
- Information and communications technology
- Universal access to education
- Poverty and economic opportunity
- Technology-based manufacturing and jobs
- Intellectual property rights
- Terrorism
- International security
- Natural disasters
- Science and technology capacity building
- Vaccines and medical therapies against infectious diseases
- Quality and accessibility of health care

AAAS

Corollaries:

- For people to prosper in modern society, they need fundamental understanding and comfort with S&T
- For nations to prosper they need
  - Scientific capacity
  - National policies that reflect the best science
- For science to prosper, the science-society relationship must be positive and strong

AAAS

At the same time, the scientific enterprise is experiencing some significant turbulence

An array of forces are converging to make the overall climate for science rocky, at best

Some of the forces are *internal* to science…

AAAS

An array of issues *within* science are not going so well…and negatively affect the broader (societal) context for science

- Incidents of scientific misconduct
- Human subjects concerns
- Animal welfare issues
- Conflict of interest problems
- Publishing by press release
- Hyperbolic or exaggerated claims
- Appearing to suppress dissenting views
- Mistakes in scientific papers

These are factors *internal* to science

- There are *external pressures* as well
  - Not all are bad
    - But shouldn't be ignored

Science is becoming more global

- And America’s pre-eminence is at risk

AAAS

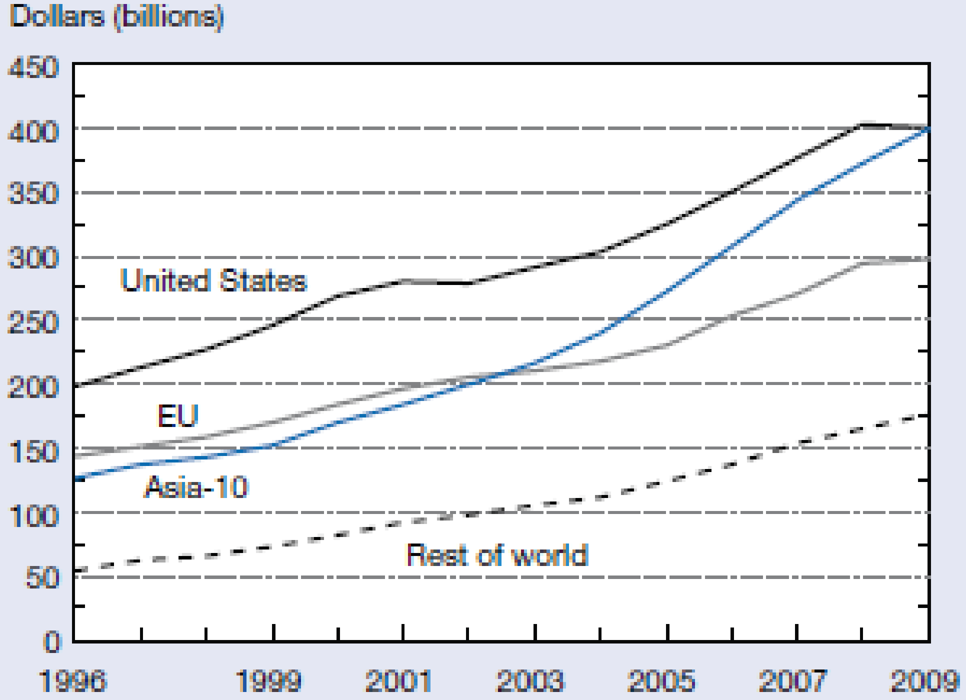
More and more countries are investing in science and building their own *national* science enterprises

The motivation is typically tied to

- Solving local problems
- Overall health and quality of life of their people
- Innovation and the economy

Figure O-2

R&D expenditures for United States, EU, and 10 Asian economies: 1996–2009

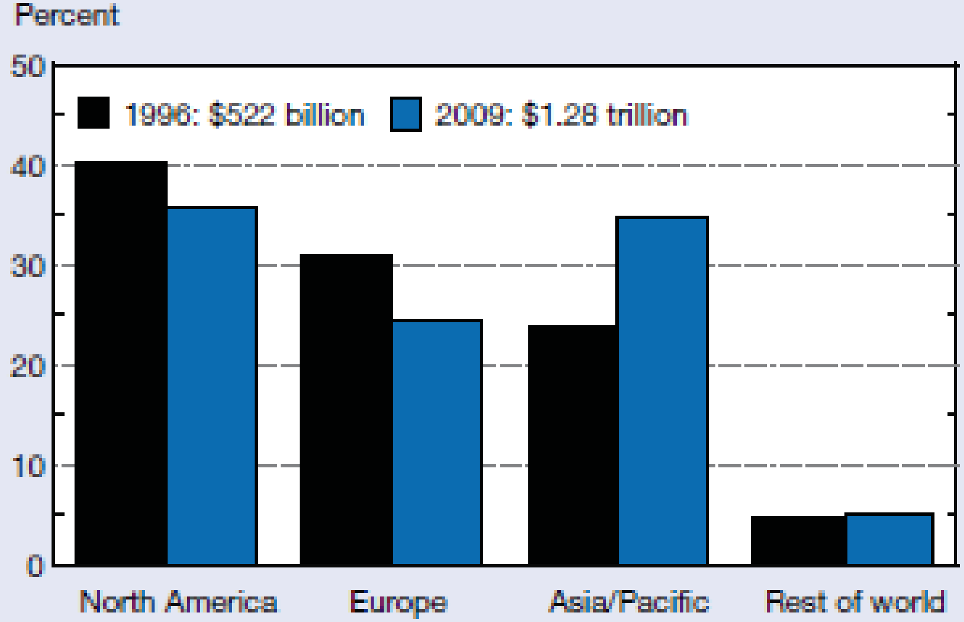


Asia-10 = China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand; EU = European Union

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, special tabulations (2011) of Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (2011-1 and previous years) and United Nations Educational, Scientific and Cultural Organization Institute for Statistics, http://stats.uis.unesco.org.

Science and Engineering Indicators 2012

Figure O-5
Location of estimated worldwide R&D expenditures: 1996 and 2009

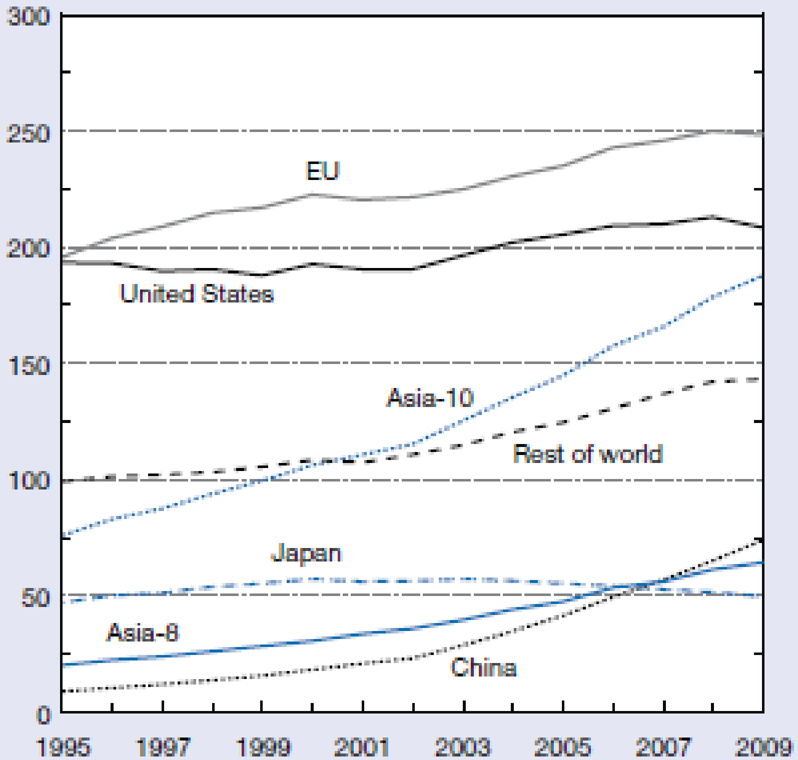


SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, special tabulations (2011) of Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (2011-1 and previous years) and United Nations Educational, Scientific and Cultural Organization Institute for Statistics, http://stats.uis.unesco.org.

Science and Engineering Indicators 2012

Figure O-13

S&E journal articles produced, by selected region/country: 1995–2009



Asia-8 = India, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand; Asia-10 = Asia-8 plus China and Japan; EU = European Union

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, special tabulations (2011) of Thomson-Reuters, Science and Social Sciences Citation Indexes, http://thomsonreuters.com/products_services/science/, and The Patent Board™.

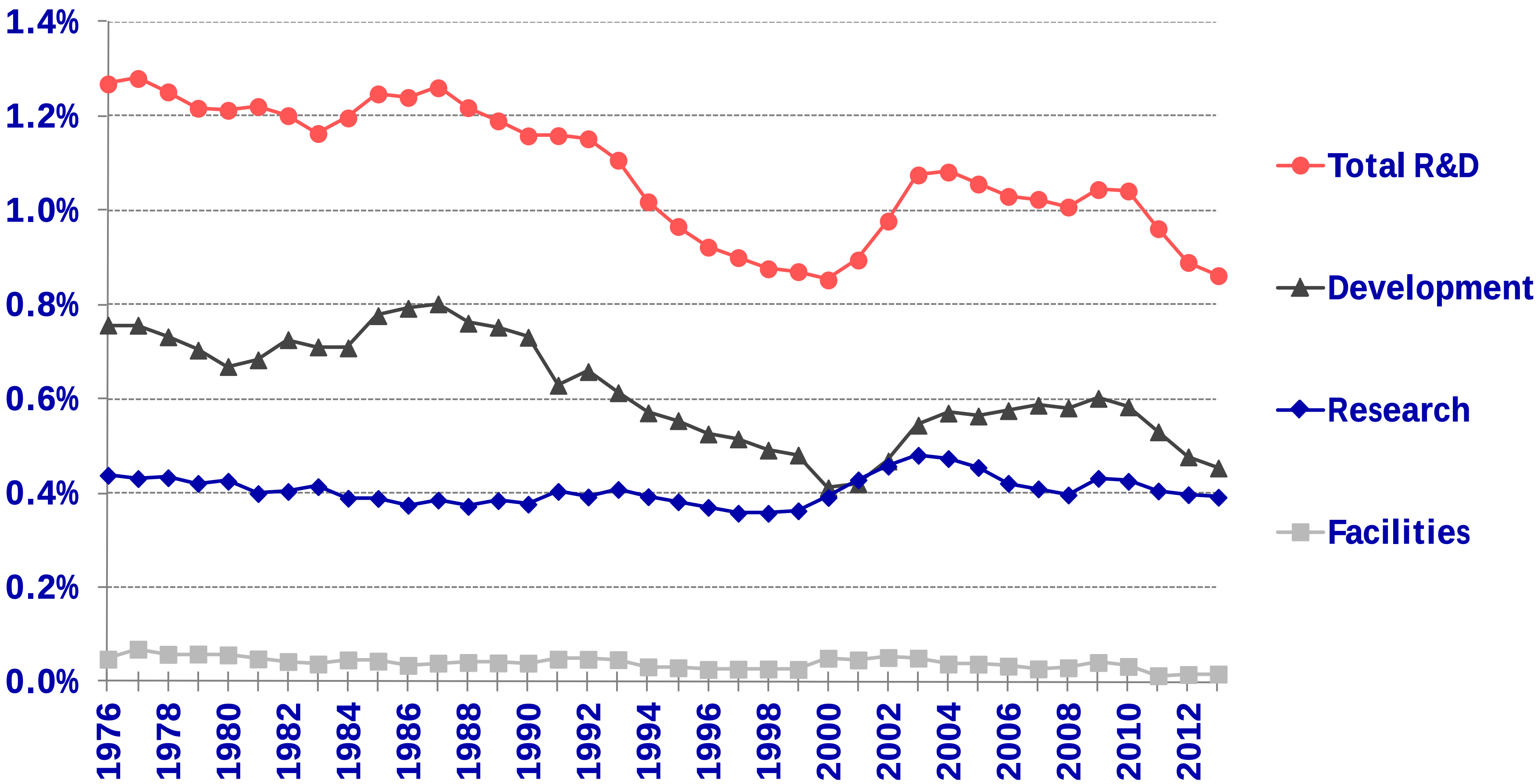
Science and Engineering Indicators 2012

Funding is the BIG external factor

- Prospects are iffy at best

Trends in Federal R&D

percent of GDP

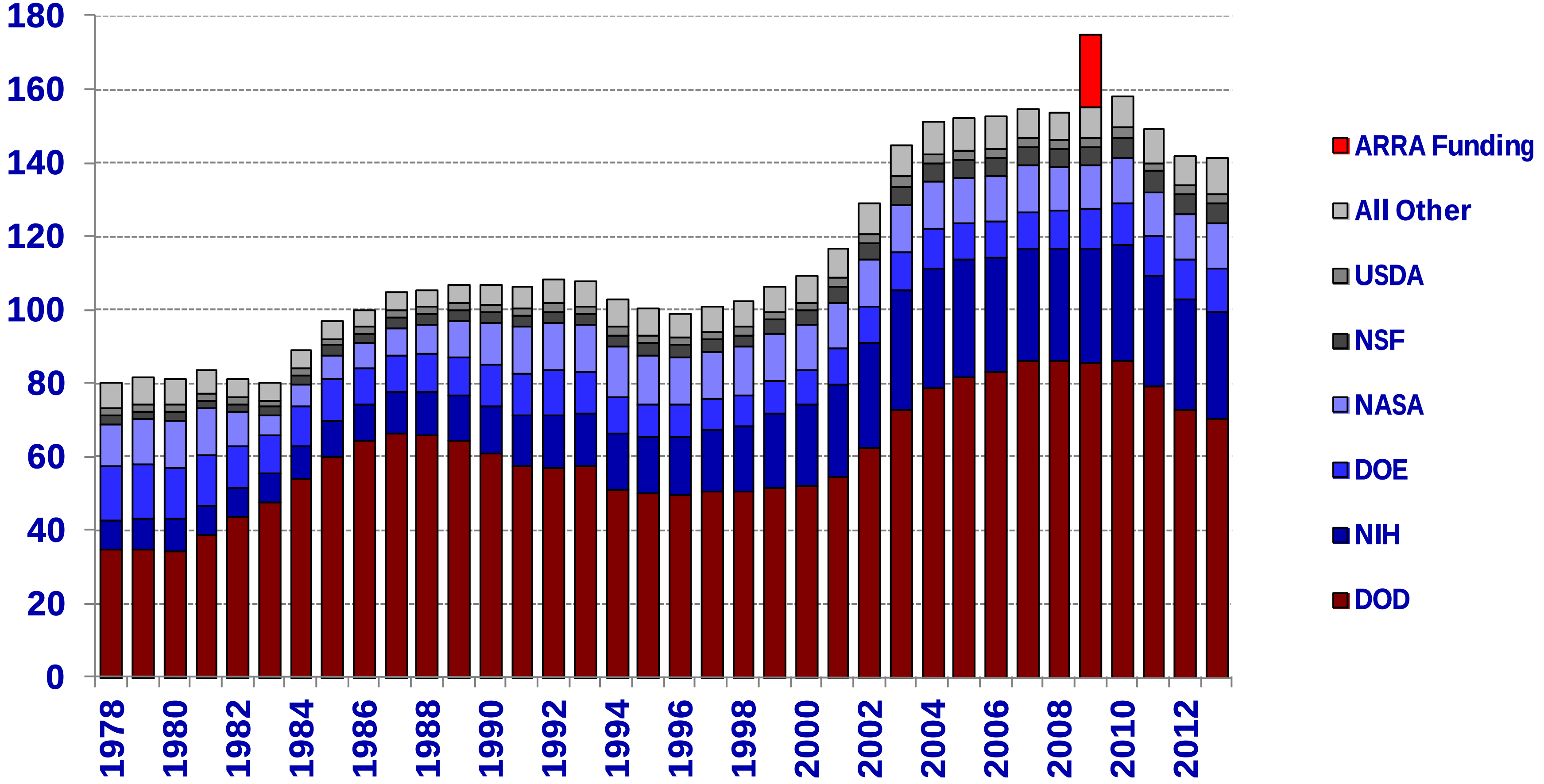


Source: Up to 1994 - National Science Foundation / National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development; 1995 to Present - *AAAS Report: Research and Development* series; GDP figures are from *Budget of the U.S. Government FY 2013*.

FY 2012 and FY 2013 figures are latest estimates.

Trends in R&D by Agency

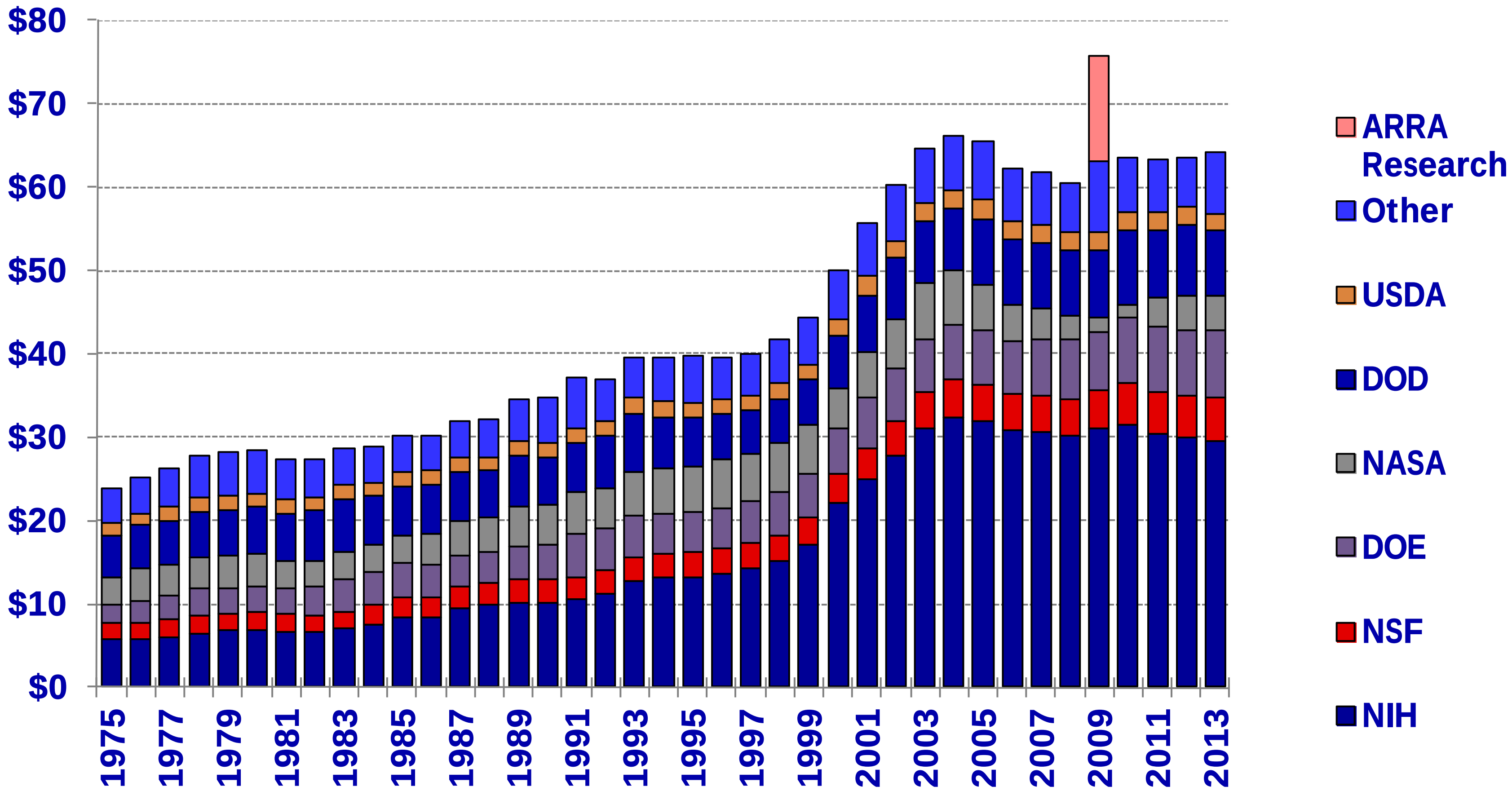
in billions of constant FY 2012 dollars



Source: *AAAS Report: Research & Development* series.
FY 2012 and FY 2013 figures are latest estimates.
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

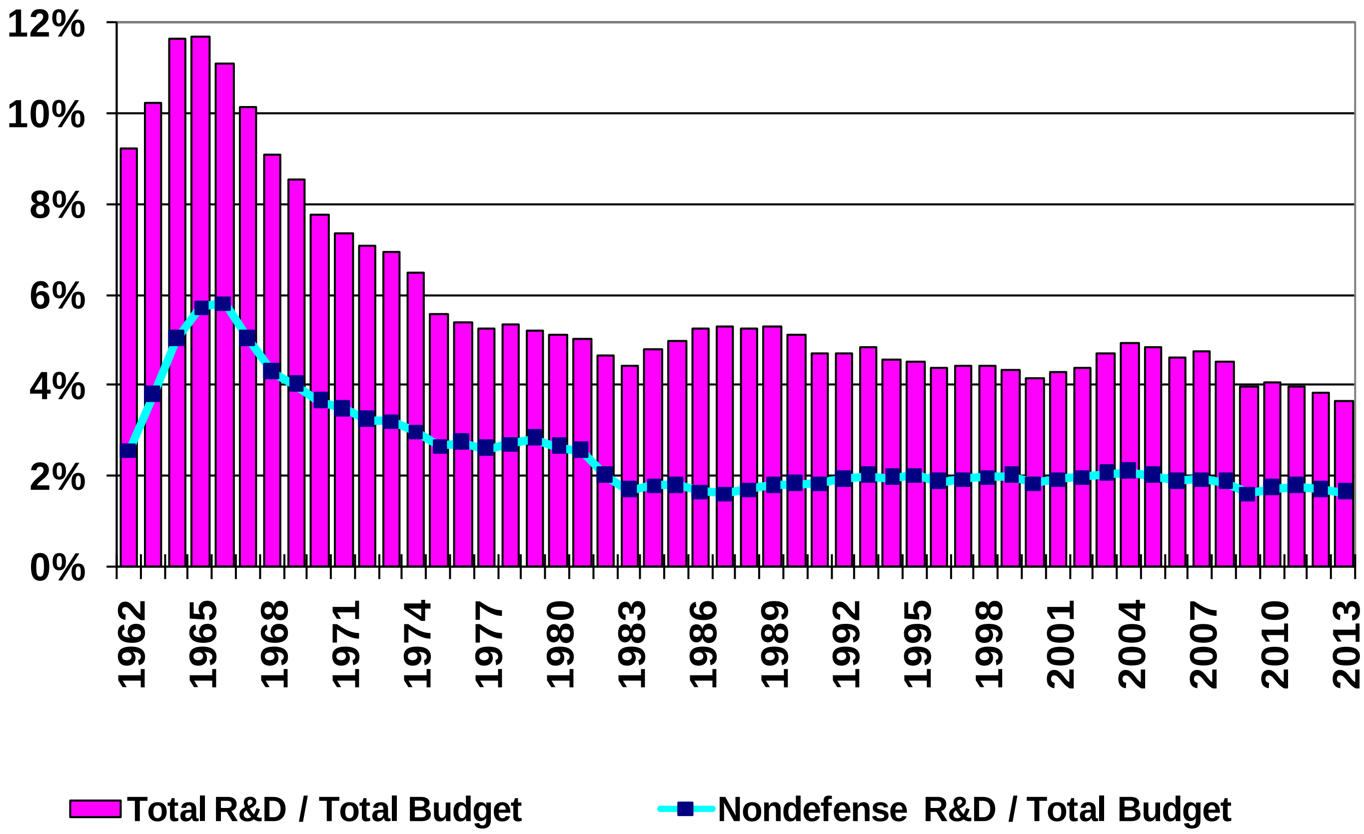
Trends in Research by Agency, FY 1975-2013

Billions of FY 2012 Dollars



Source: 1975-1994 figures are from the NSF federal funds survey; remainder is from AAAS R&D reports. FY 2012 figures are latest estimates, FY 2013 is the President's budget.

R&D as Percent of the Federal Budget:
FY 1962-2013, in outlays



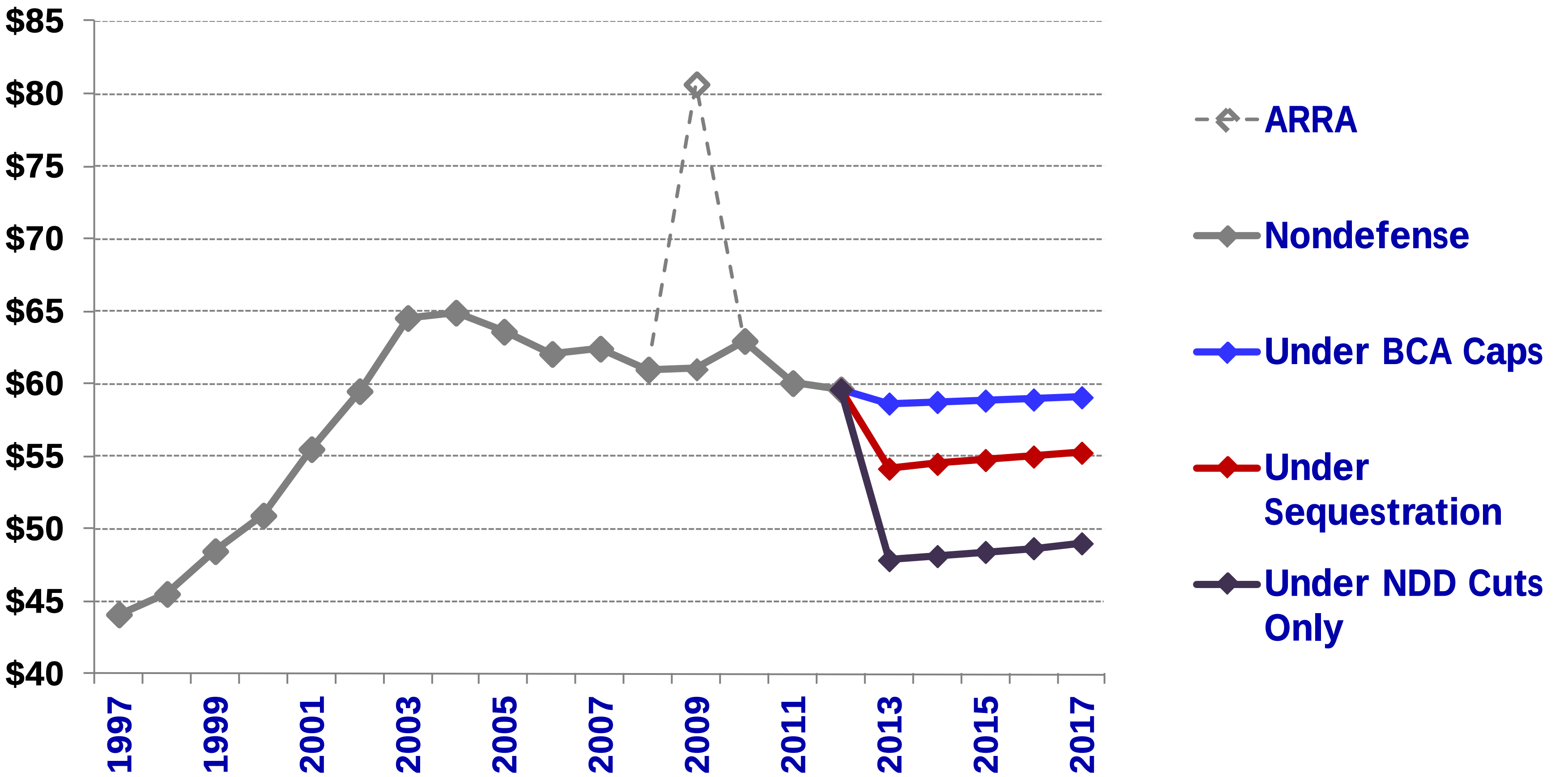
Source: AAAS, based on *Budget of the U.S. Government FY 2013* Historical Tables. FY 13 data are budget proposals.

AAAS

What about THE SEQUESTER?

Federal Nondefense R&D Under BCA Caps With and Without Sequestration

in billions of constant FY 2012 dollars



Source: Based on AAAS estimates of R&D funding and the FY 2013 budget, and CBO analyses of the Budget Control Act.

AAAS


SUMMARY
RESEARCH UNIVERSITIES
AND THE FUTURE OF AMERICA
Ten Breakthrough Actions Vital to
Our Nation's Prosperity and Security
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

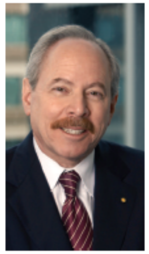
AAAS

Never Discuss Floods With Noah In the Audience

The regulatory burden problem

- FDP said (2007) 42% of an American researcher’s research time is spent on administrative tasks!
  - Some of it’s the government
  - Some of it’s the universities themselves

EDITORIAL



Alan I. Leshner is the chief executive officer of the American Association for the Advancement of Science and executive publisher of *Science*.

Reduce Administrative Burden

THE ADMINISTRATIVE BURDEN ON PRACTICING SCIENTISTS HAS GROWN TREMENDOUSLY OVER the past decades and is limiting their ability to get important scientific work done. As the United States prepares for a new president to take office, there is an opportunity to take a fresh look at many of the government policies and regulations that concern the conduct of science. How might we find ways to reduce the administrative burden while still ensuring accountability to science funders, appropriate safeguards for human subjects, and broader societal protection from real dangers that can accompany some scientific research?

A 2007 survey by the U.S. Federal Demonstration Partnership (A Profile of Federal-Grant Administrative Burden among Federal Demonstration Partnership Faculty) found that 84% of faculty in the United States believed that the administrative burden associated with federally funded grants had increased significantly in recent years. Most notably, the study indicates that of the total time that faculty devote to research, 42% is spent on pre- and post-award administrative activities. Some activities respond to university or host institution policies, whereas others respond to an array of governmental rules that are poorly integrated. The most time-consuming research-related activities include too-frequent progress report submissions, navigating the complex and disparate rules for project revenue management, and institutional review board protocol development and revisions. The need to respond to new post-9/11 security concepts such as "dual-use research" or "sensitive but unclassified science" has also added substantially to the workload.

Virtually all of the issues underlying the governmental and institutional rules merit serious attention. Ensuring animal welfare and human subject protections are vitally important. Scientific fraud of any kind is intolerable. Conflicts of interest are inappropriate in any setting. Some science can be misused, and we owe society appropriate safeguards. Citizens deserve assurance that the scientific community is attending to these issues, and they are entitled to full accountability for the use of their investments in science.

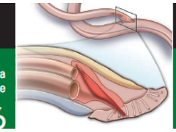
However, as the U.S. National Academy of Sciences' 2007 report Science and Security in a Post-9/11 World pointed out very clearly, we also need to prevent overreaction. We must maintain the openness that has so productively characterized the science and technology enterprise in the United States. We also need to be certain that our approaches to scientific regulation are as cost-effective as possible. A Council on Government Relations study (Report of the Working Group on the Cost of Doing Business, 2003) reported that for each of 25 surveyed U.S. institutions, the cost of compliance activities had increased some $3 million per year over 5 years.

An ideal goal would be for every science-related rule or regulation to be rationalized and streamlined. As a group, they should be integrated as much as possible so as to reduce unnecessary duplication. New versions should address the lack of uniformity across agencies. Because the policies are variously the responsibilities of federal and state governments and of research-conducting institutions, this streamlining will require a joint effort of all sectors. The Federal National Science and Technology Council, representing the leaders of the U.S. government's science-supporting agencies, created a Research Business Models Subcommittee in 2003 to work on this problem. Their findings and efforts have not yet been felt extensively in the field, but this subcommittee might be an ideal convener for this broad rules review.

Whoever takes the lead in reducing administrative burden might consider a somewhat unorthodox approach to reviewing and revising existing regulations. Rather than starting with the evaluation of each existing policy one at a time, it might ultimately be better to start anew from an integrated list of all the issues that must be addressed, and then take an entirely fresh look at what rules and regulations should be applied. Although this might trigger fears of "reinventing the wheel," it also might prove the point of another old adage: "Never underestimate the value of 'square one.'"

– **Alan I. Leshner**

10.1126/science.116834



LETTERS

edited by Jennifer Sills

Reducing Red Tape for Research in Europe

IN 2010, THOUSANDS OF EUROPEAN researchers signed a petition—the "Trust Researchers" Declaration—calling for less bureaucracy in the funding system (*1*). They argued that they spent too much time on proposal writing, project management, evaluation, reporting, and audits, and therefore not enough time in labs or in the field.

We in the European Commission and the European Parliament are listening. Our research programs should not be designed for accountants and bureaucrats, but for scientists and innovators. We have worked hard to find ways to reduce the administrative burden on Europe's talented researchers, while remaining fully accountable to the taxpayer. We recognize that clear and simple rules, consistently applied, equal good financial control.

For 18 months, we talked to a range of stakeholders and research communities about the best way to maximize value for our investment in research. These consultations provided valuable input to the new European research and innovation program for the 2013 to 2020 period, named HORIZON 2020, and the financial rules under which it operates. We have already simplified the current research funding program. There is now greater flexibility in how personnel costs are calculated, based on the grantholders' usual accounting rules. Small and medium enterprise owners are now entitled to receive a flat-rate reimbursement for their work in the event that they do not receive a formal salary.

Horizon 2020 brings together all previous EU research and innovation funding instruments under a single program, providing funding for everything from basic research to demonstration and market uptake. The simplified program architecture streamlines access to funds and standardizes rules and criteria for proposal evaluations, intellectual property rights, and eligibility of costs.

In Horizon 2020, the current complex matrix of reimbursement categories will be replaced by a single reimbursement rate per project and a single flat rate for overheads. There will be fewer requirements for timesheets to justify personnel costs. Horizon 2020 will also allow scope for experimenting with alternatives to cost reimbursement. A results-based approach with lump sums for whole projects or the use of inducement prizes would remove the administrative effort for reporting costs incurred. However, such approaches require adequate mechanisms for establishing lump sum payments and for defining measurable deliverables against which the lump-sum or the prize would be paid. Project audits in Horizon 2020 will focus on fraud detection and prevention, rather than detecting and correcting errors as in the past. We hope this shift will lead to a reduction in the audit burden for participants.

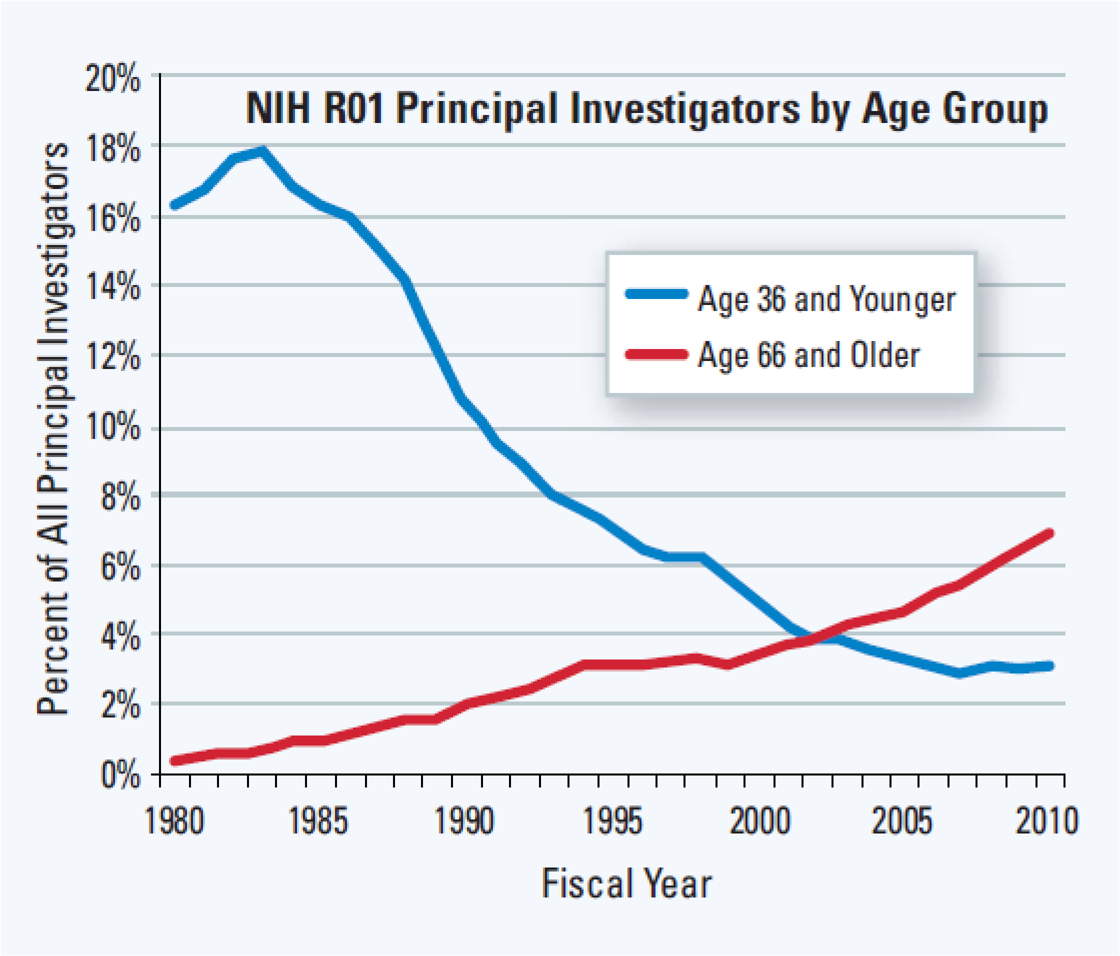
The new approach will reduce the time and cost in making applications and reduce the cost to the European Commission of managing the schemes. We aim to cut the time from submission of proposals to signature of the grant agreement by about one-third. This will allow projects to get off the ground much more quickly. It also means that the European taxpayer will be getting more output from their investments as scientists' time is freed up for the real work.

MARIA DA GRAÇA CARVALHO[1]* AND MÁIRE GEOGHEGAN-QUINN[2]

AAAS

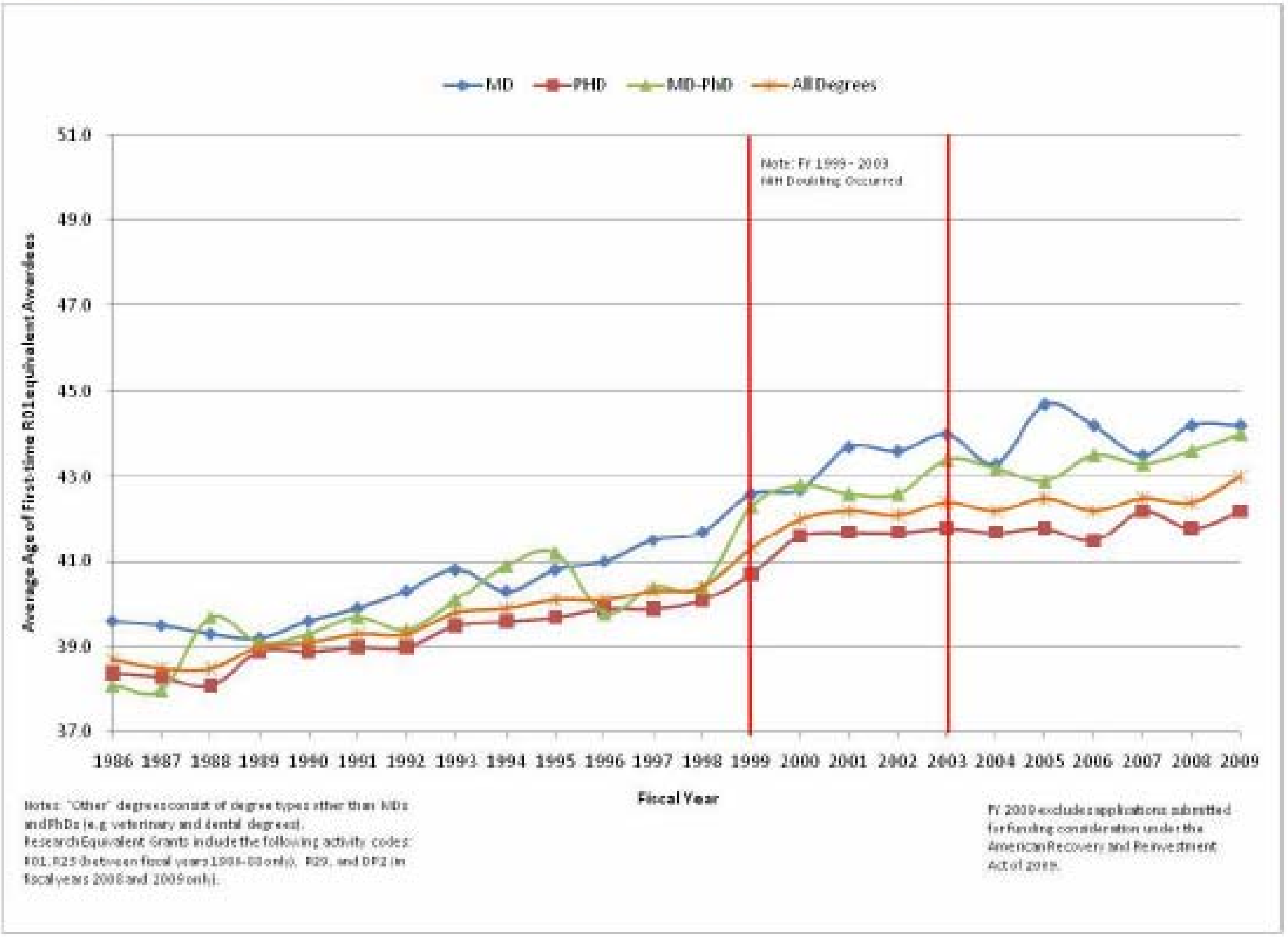
Pipeline problems

- Have we enough new scientists coming along?
- Aging of the “young” investigator pool
    - NSF new PI is 6-7 years post-Ph.D. (about 36 or older)
    - NIH – age 42 for Ph.D.’s, 44 for M.D.’s
- Are we stifling creativity?
    - Too many postdocs before independence



NIH R01 Principal Investigators by Age Group
Age 36 and Younger
Age 66 and Older
Percent of All Principal Investigators
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
1980
1985
1990
1995
2000
2005
2010
Fiscal Year

Average Age Of First-time R01-equivalent Principal Investigators By Degree



AAAS

Solutions to the pipeline problem

- Don’t need more advice
- Don’t need more mentoring
  - Multi-post-doc world
  - K’s galore
- Do need grants
  - Reasonable size and duration

AAAS

Solutions to the pipeline problem

- Give them decent grants
  - NSF CAREER Awards
  - NIH Pathway to Independence Awards
  - New Howard Hughes program
- Just give them R01's

Alan I. Leshner is the chief executive officer of the American Association for the Advancement of Science and executive publisher of *Science*.

Just Give Them Grants

THE INTERDEPENDENT GOLD STANDARDS OF A SUCCESSFUL CAREER IN ACADEMIC RESEARCH are publication in prestigious journals and securing funding for one's independent research. There has been much discussion among scientists and funders about how best to launch such a career and how to fill the pipeline of young scientists to sustain the momentum of science (see also discussions at www.sciencecareers.org).

A major problem is that in many countries, research funding is quite constrained, so it's getting increasingly difficult for new investigators to secure their first grants. As a result, investigators are older and older when they finally begin independent work. On average, a recipient of a Starting Independent Researcher Grant from the European Research Council (ERC) is 35.6 years old and about 6 years past earning the Ph.D. New investigators supported by the U.S. National Science Foundation are also typically 6 to 7 years post-Ph.D. In the biomedical sciences, the average age at which an investigator first obtains a regular research grant from the U.S. National Institutes of Health (NIH) is 42 for a Ph.D. and 44 for MDs. No wonder there is concern about filling the pipeline of scientists. One has to wait until near middle age before getting one's own research program in full gear. (Next month, the American Academy of Arts and Sciences will release a report on supporting young investigators and high risk–high reward research.)

This prolonged wait for a grant is not the only problem. A new investigator often has to have completed two or three postdoctoral training periods before securing a tenure-track position. As emphasized in the U.S. National Research Council's Bridges to Independence 2005 report, this extensive post-Ph.D. training, in which one often focuses on a mentor's research agenda rather than one's own, may stifle innovation and overly narrow young scientists' interests. If this is true, our models for postdoctoral training need revision.

Virtually every research funding agency has experimented with approaches to recruiting and funding young scientists, and many have been abandoned. Some small seed-grant programs were discarded because they didn't provide enough resources. Some special programs have included mentoring components on the basis of the argument that even after substantial postdoctoral training, young investigators would benefit from even more lab leadership training. And some special programs have been abandoned because their awards were more stigmatizing than beneficial. One such example is the FIRST Award (R-29) from the NIH, given up in part because many universities treated it as funding for those who could not get a "real" regular research grant, and thus it was not credited toward getting tenure. This argues for uniformity in how we support new investigators, instead of mounting special programs. One possibility is to review new investigators as a group, rather than having them compete with more seasoned investigators with established track records and extensive preliminary data.

What should we do? If the consensus is that young scientists really need a regular research grant to launch their careers, why not simply tilt funding decisions more toward new investigators? After all, there are many more meritorious proposals from junior investigators, which have passed muster through peer review, than can be funded. The tilt would, of course, result in fewer senior investigators getting funded or receiving multiple grants, but if we are genuinely concerned about the pipeline, we will need to make this tradeoff.

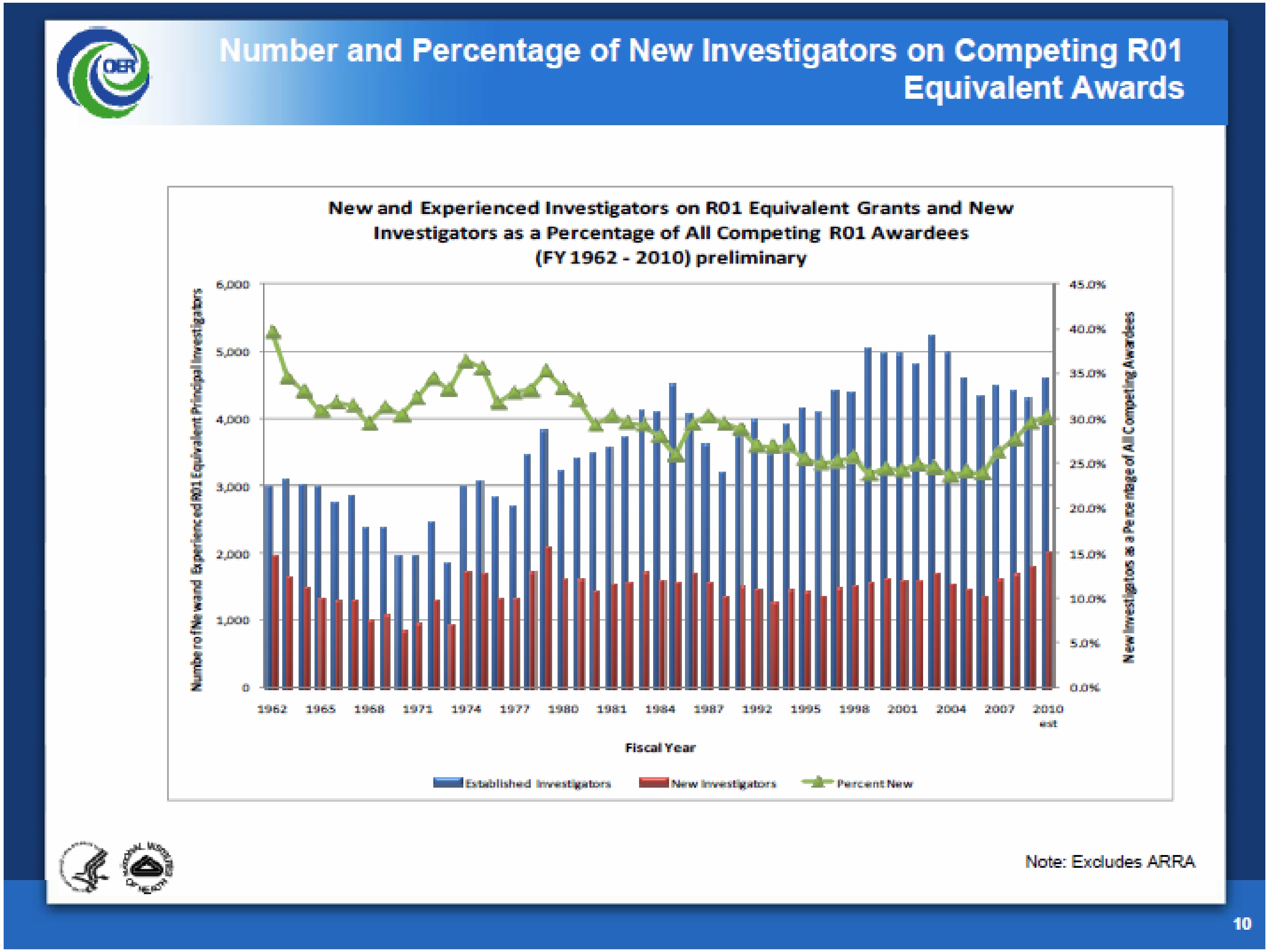
Some such initiatives have begun. Last year, the proportion of NIH research grants going to new investigators was over 25% for the first time in nearly a decade. The ERC plans to award about one-third of its frontier research funding as Starting Grants. And the United Kingdom's Medical Research Council is providing protected research time for younger faculty through New Investigator Research Grants.

These endeavors are clearly a start, but the number of young investigators being funded is still relatively small. More such efforts are needed to encourage young scientists who are contemplating research careers and to foster innovation and creativity while they are at their peak. This would demonstrate a real commitment of the scientific enterprise to ensuring its own continuity.

– Alan I. Leshner

CREDIT: GETTY

10.1126/science.1159794


Number and Percentage of New Investigators on Competing R01 Equivalent Awards
New and Experienced Investigators on R01 Equivalent Grants and New Investigators as a Percentage of All Competing R01 Awardees
(FY 1962 - 2010) preliminary
Number of New and Experienced R01 Equivalent Principal Investigators
New Investigators as a Percentage of All Competing Awardees
6,000
5,000
4,000
3,000
2,000
1,000
0
45.0%
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
1962
1965
1968
1971
1974
1977
1980
1981
1984
1987
1992
1995
1998
2001
2004
2007
2010 est
Fiscal Year
Established Investigators
New Investigators
Percent New
Note: Excludes ARRA
10

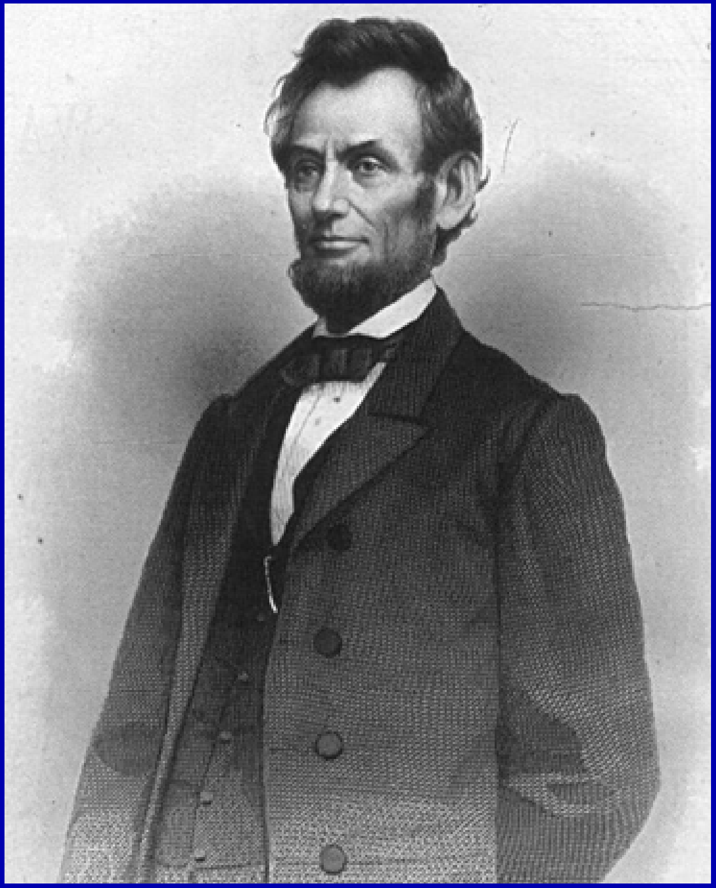
These are all issues parochial to the science community

- And solvable internally
  - Maybe
  - At least “approachable” internally

The science-society relationship is not so smooth

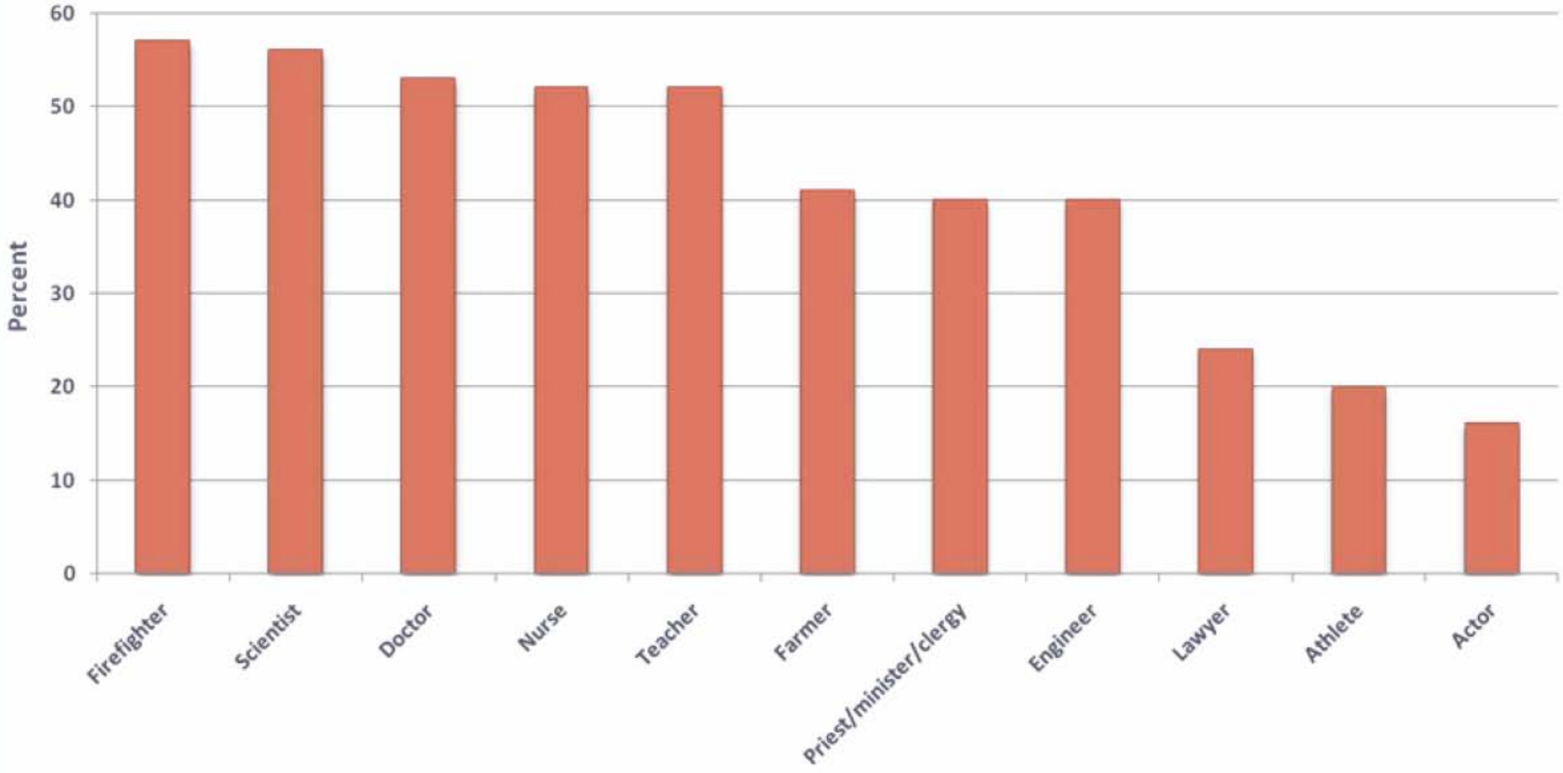
Public sentiment is everything. With public sentiment, nothing can fail; without it, nothing can succeed.

Abraham Lincoln



People generally still respect science and technology….

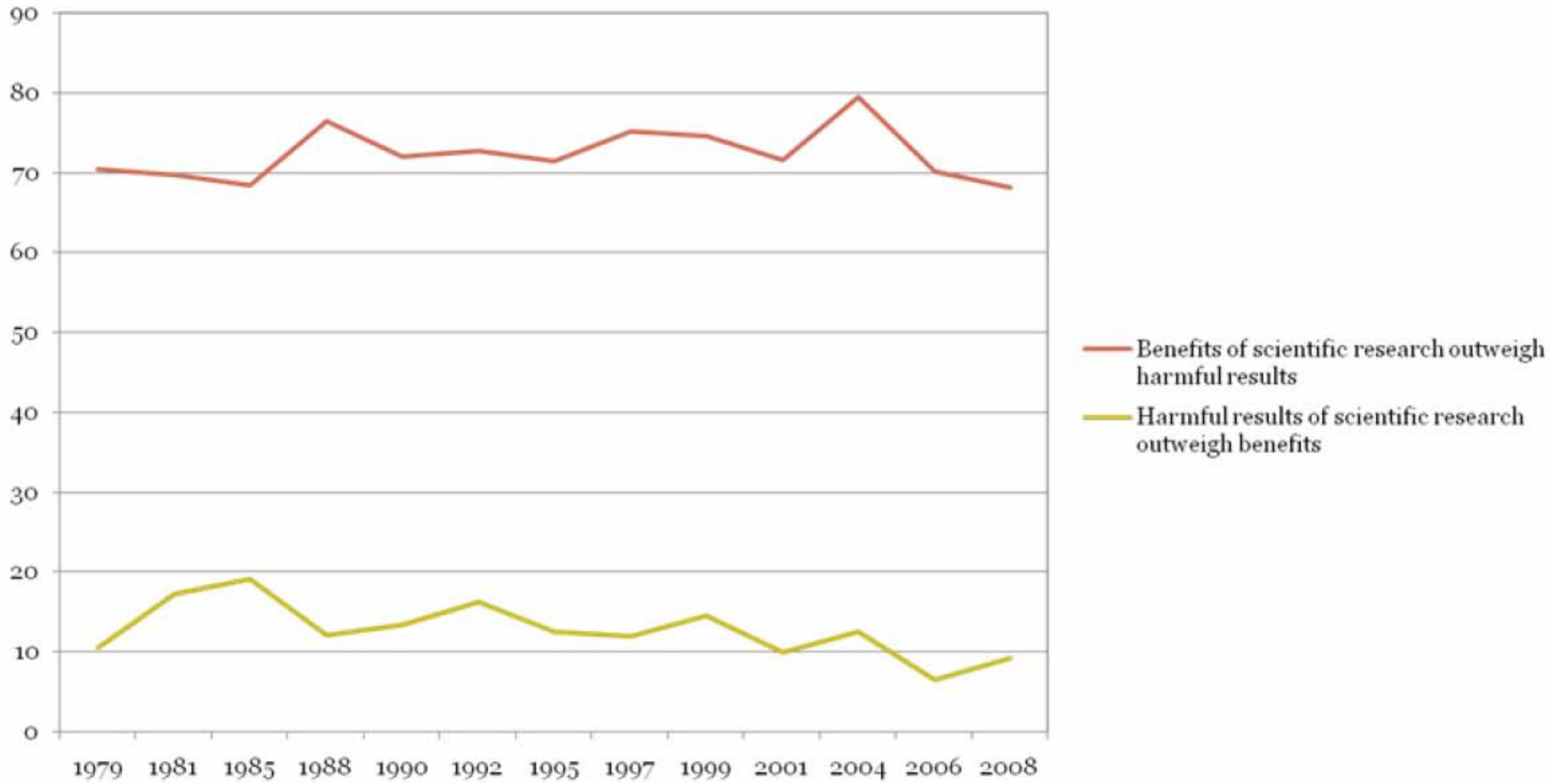
Prestige of Scientists and Engineers



Science and Engineering Indicators 2010

www.nsf.gov/nsb/sei/

Public Attitudes Toward Scientific Research



Science and Engineering Indicators 2010

AAAS

But Public Is Less Positive than Scientists about U.S. Science

U.S. scientific achievements…	Public %	Scientists %
Best in the world	17	49
Above average	47	45
Average	26	5
Below average	5	1
DK/No answer	4	*

Source: Pew/AAAS Survey, 2009

They have little understanding of what is and is not science

- 60% of Americans believe in extrasensory perception
- 47% still do not answer “*true*” to the statement: “Human beings developed from earlier species of animals”
- 41% think astrology is somewhat scientific

Science and Engineering Indicators, 2004

AAAS

Science-society tension can result from

- Widespread misunderstanding
    - Vaccines and autism
    - GMO's
- Political or economic inconvenience
    - Climate change
- Conflict with peer group beliefs
- Conflict with core human values

AAAS

Current scientific issues that abut against core values

- Embryonic stem cell research
- Studying “personal” topics
  - Sex
  - Genetics of behavior
- Teaching “Intelligent Design” versus evolution in science classrooms
- Origins of the universe
- Synthetic biology
- Neuroscience – mind/body issues

Only scientists are stuck with what science says

- The rest of the public can disregard, deny, or distort findings
  - With relatively little immediate consequence

The purpose of science is to tell us about the nature of the natural world

- Whether we like the answers or not!

AAAS

This science-society tension has consequences

- Science is less able to serve societal needs
- Public support of science is undermined
- Society wants to exert influence on what science is (or is not) done

What to do about the science-society tension?

We always feel we need more public education or communication about science

- And we do

But here’s where we need to get a bit more nuanced

The right approach to communication depends on the goal:

- Simply share the excitement
- Garner public support of scientific research
- Fulfill “broader impacts” or other outreach requirements of funding

Traditional “public communication” might well do

- Solve “problems” and reach common ground

Need to shift to “public engagement” approach

We often can’t just “educate” our way out of science-society tension

- The problem is not <u>just</u> lack of understanding
    - People do understand much of what we’re saying or want to do
    - They don’t like it
        - The conflict with their core values trumps their view of societal benefits

AAAS

In “public engagement” we are changing not only the style and content but also the *intent* of the conversation:

Communicating to the public → Communicating with the public

AAAS

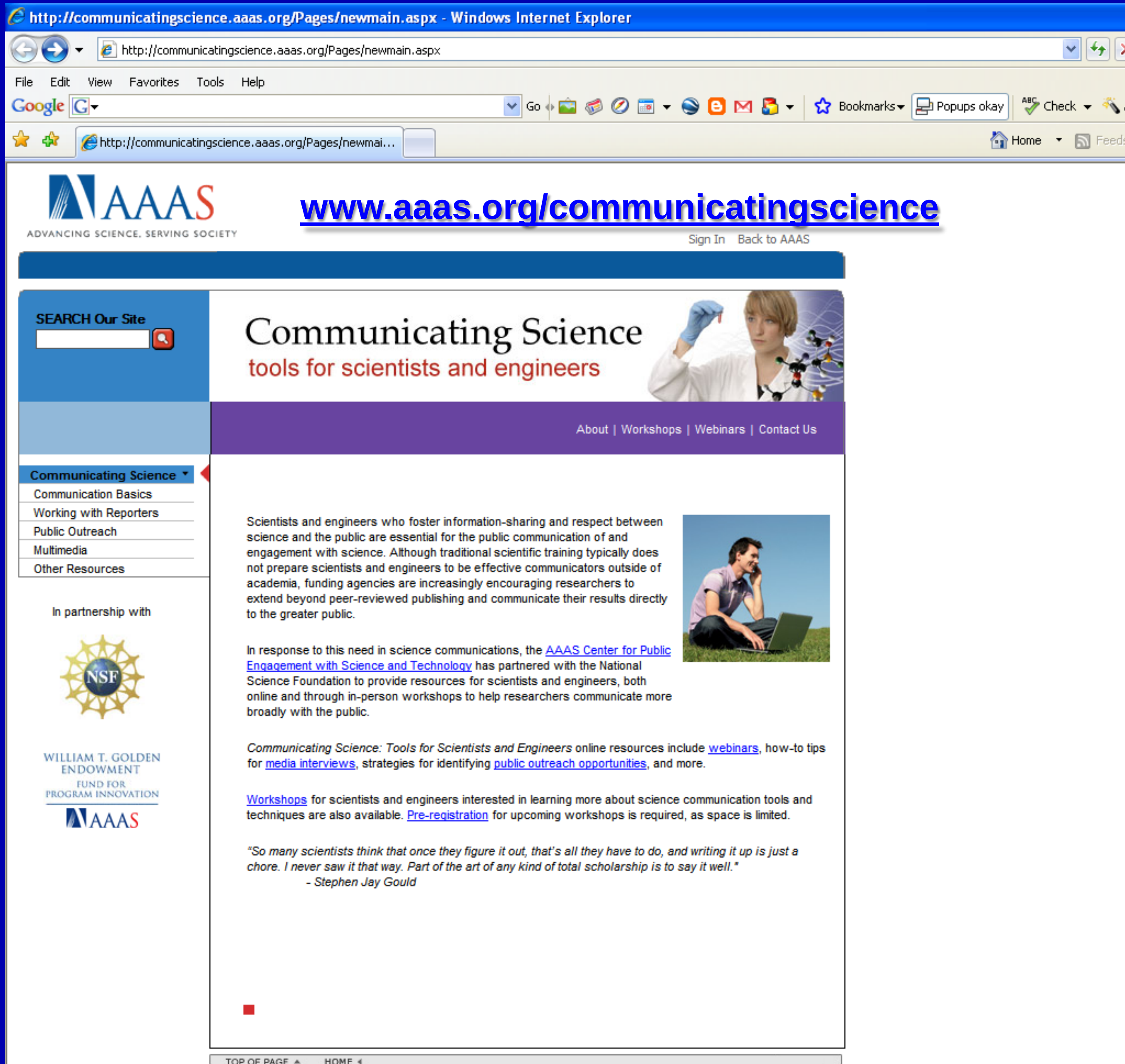
We need to listen to the public about:

- Their concerns about science and technology and their concomitants
  - Risks and benefits
  - Encroachment on human values
- Their priorities among research areas
- Questions they would like or need us to answer
  - Help frame the research agenda

AAAS

Effective science communication is not easy

- Many scientists are not prepared to talk about their work and its implications with the public
- Listening to and respecting public concern can be difficult for scientists
  - It’s a learned skill



http://communicatingscience.aaas.org/Pages/newmain.aspx - Windows Internet Explorer

AAAS
ADVANCING SCIENCE, SERVING SOCIETY

www.aaas.org/communicatingscience

Sign In Back to AAAS

SEARCH Our Site

Communicating Science
tools for scientists and engineers

About | Workshops | Webinars | Contact Us

- Communicating Science
- Communication Basics
- Working with Reporters
- Public Outreach
- Multimedia
- Other Resources

In partnership with

NSF

WILLIAM T. GOLDEN ENDOWMENT FUND FOR PROGRAM INNOVATION
AAAS

Scientists and engineers who foster information-sharing and respect between science and the public are essential for the public communication of and engagement with science. Although traditional scientific training typically does not prepare scientists and engineers to be effective communicators outside of academia, funding agencies are increasingly encouraging researchers to extend beyond peer-reviewed publishing and communicate their results directly to the greater public.

In response to this need in science communications, the AAAS Center for Public Engagement with Science and Technology has partnered with the National Science Foundation to provide resources for scientists and engineers, both online and through in-person workshops to help researchers communicate more broadly with the public.

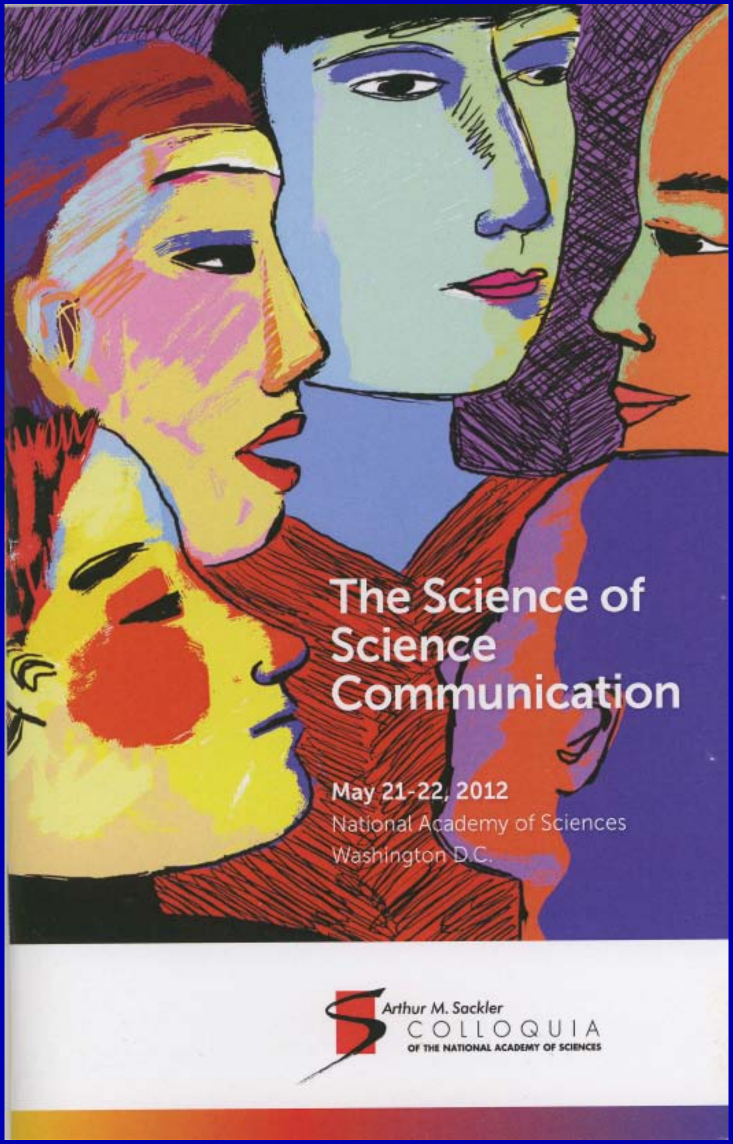
Communicating Science: Tools for Scientists and Engineers online resources include webinars, how-to tips for media interviews, strategies for identifying public outreach opportunities, and more.

Workshops for scientists and engineers interested in learning more about science communication tools and techniques are also available. Pre-registration for upcoming workshops is required, as space is limited.

"So many scientists think that once they figure it out, that's all they have to do, and writing it up is just a chore. I never saw it that way. Part of the art of any kind of total scholarship is to say it well."
- Stephen Jay Gould

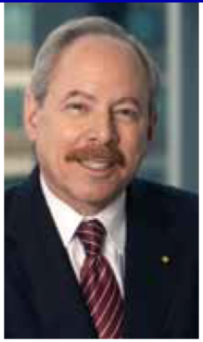
TOP OF PAGE HOME


www.aaas.org/communicatingscience
Communicating Science
Tools for Scientists and Engineers
NSF
AAAS
ADVANCING SCIENCE, SERVING SOCIETY


The Science of
Science
Communication
May 21-22, 2012
National Academy of Sciences
Washington D.C.
Arthur M. Sackler
COLLOQUIA
OF THE NATIONAL ACADEMY OF SCIENCES

We’ve learned some important lessons

EDITORIAL



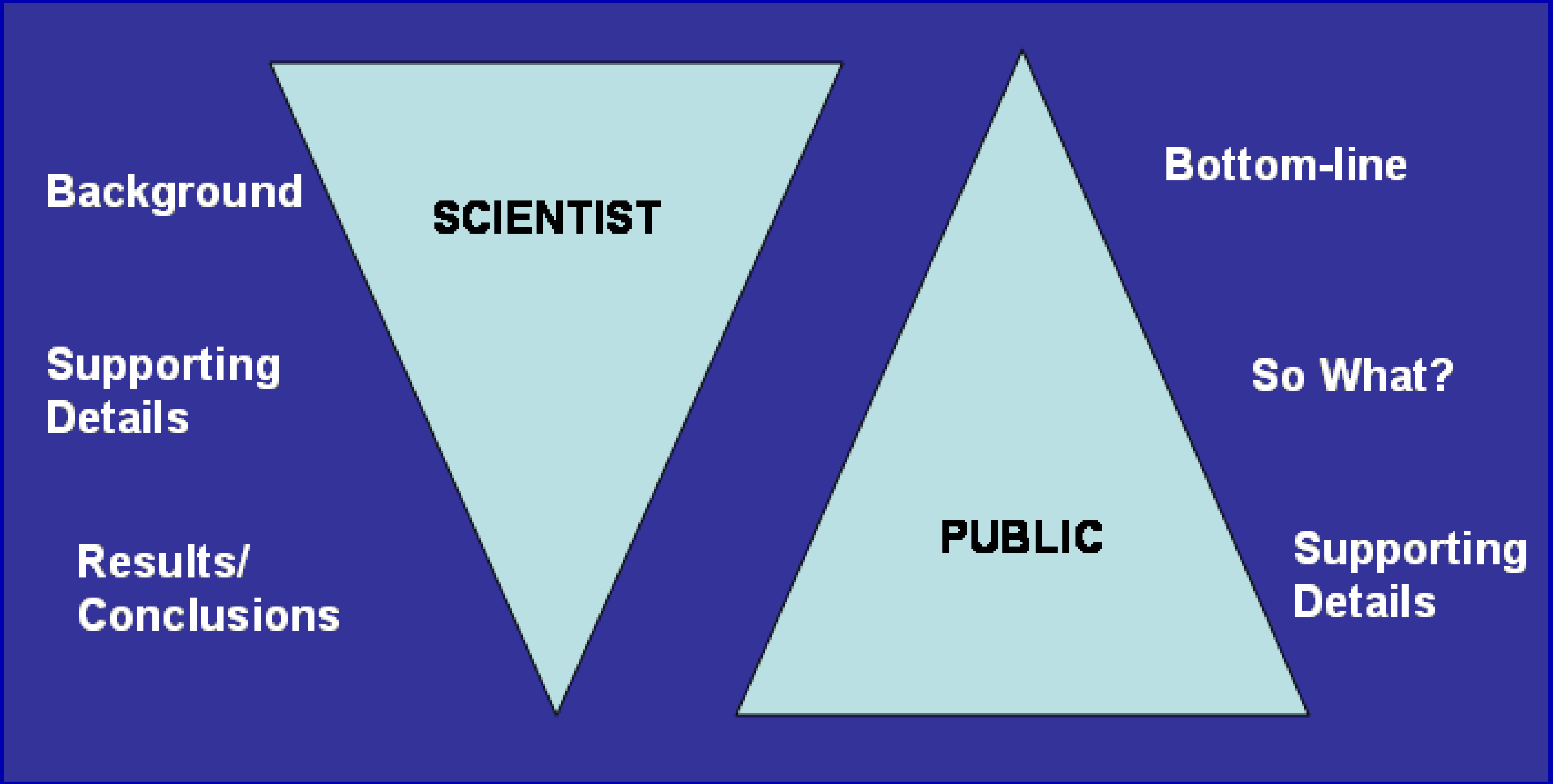
Alan I. Leshner is the chief executive officer of the American Association for the Advancement of Science and executive publisher of *Science*.

Capably Communicating Science

THERE IS NO SHORTAGE OF TOPICS WHERE POLICYMAKERS OR OTHER MEMBERS OF THE PUBLIC SEEM to persistently misunderstand, misrepresent, or disregard the underlying science: climate change, genetically modified foods, vaccines, or evolution, among others. Consequently, the call for scientists to do a better job of communicating both the meaning and the nature of their work is getting louder. Public understanding of science not only affects people's ability to appreciate and make full use of the products of science, it also contributes to the extent of support for scientific research. Yet far too many scientists are reluctant to engage with people outside their own community. The reasons range from a belief that this responsibility lies outside a scientist's "job description" to an expressed ignorance about how to go about it. In an attempt to find better solutions to this problem, the U.S. National Academy of Sciences convened a meeting of over 450 scientists, policy-makers, journalists, and other professional communicators to examine the underlying dynamics of science communication.* The good news is that empirical studies across many disciplines, particularly in the behavioral and social sciences, are providing very useful baseline information about public attitudes as well as knowledge about science and some fundamental principles that can help guide scientists to engage more effectively with both the public and policy-makers.†

How does the public come to interpret and use science? Valuable studies have been carried out to discover what determines public attitudes toward subjects such as nanotechnology and nuclear power, and some of the results are surprising. For example, some studies point to an individual's ideological views or cultural identity as having greater influence on his or her opinions than an understanding of the facts. Often, simply increasing public knowledge about an issue

Differences in Communication Styles



AAAS

People need to know about science as an *enterprise*

- What makes something scientific?
- What "research" is all about?
  - What is and isn't research?
- The limits of scientific investigation
  - Natural explanations of the natural world

AAAS

The gist of the message is all that matters

- No caveats or clauses

The way an issue is “framed” can make all the difference

- Climate change more acceptable as a concept if seen as a *technological challenge*, not as a *regulatory issue*

We need to remain the “fact people”

- Leave your personal values at home
  - It’s unfortunate that scientists are also people
- Credibility is conferred by the audience, not the speaker

Go “Glocal”!

Julia Taguena Parga, 2005

AAAS

Glocal = working with local opinion leaders and resources

- Local media and op-eds
- Clergy
- School officials
- Local government leaders/politicians
- Science museums and centers
- Community groups
- Town meetings

AAAS

In-person engagement works best

- Group problem solving
- Hands-on exhibits or demonstrations
- Lab visits, science camps, museums
- Science fair
- Science café
- “Over the neighbor’s fence”

Engage with, don't *harangue*, the public

Public engagement is best when it focuses on something

- A contentious topic
- A problem to solve
- An opinion you really want
- New and diverse ideas

In public engagement, we do seek common ground

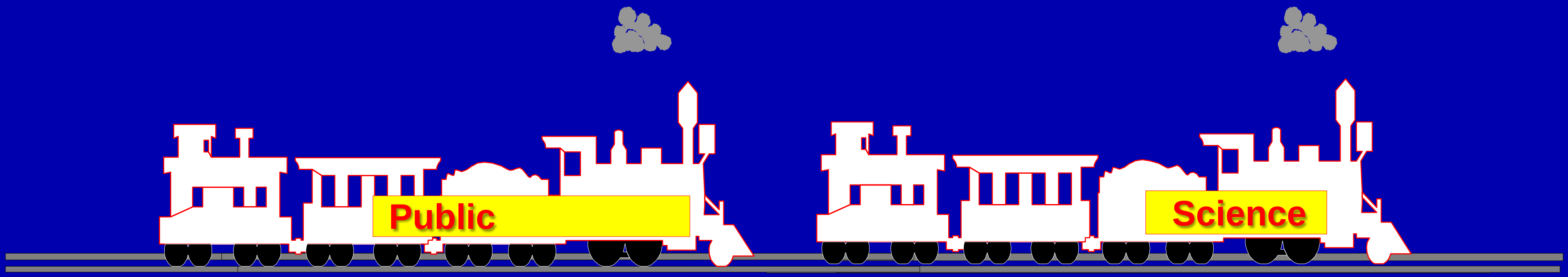
- But may have to settle for better understanding and respect

…….Daniel Yankelovich, 2010

AAAS

Understanding must work both ways

- Public understanding science
- Scientists understanding the public



We Need the S&T Community and the Public Going in the Same Direction