Communicating your Research to a Broad Audience

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CI Fellow Workshop
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Who I am and how I got here

Science journalists come in many forms; they play many different functions in the knowledge ecosystem.

I am *not* a trained scientist. No PhD. or science research experience. Last formal training as an undergrad.

I *am* a journalist who finds science fascinating as a subject for articles, films, art and who believes promoting science is important to society.

Who I am and how I got here

Not only science.

Also the *people, processes and creativity* that underlie the pursuit and progress of science.

In that sense, I'm much like my readers…

hungry for STORIES!

Who I am and how I got here

This interest took me:

- to West Texas to document efforts to protect prairie dogs;
- into Newark high schools to study innovative approaches to science-learning;
- to Lake Okeechobee to report on the draining of the everglades;
- and to experimental forests where brain-eating flies were being introduced to control fire ant populations.

(In other words, pretty cool places.)

Who I am and how I got here

Flashback to 2007….

A Science Writer position was listed at the Texas Advanced Computing Center (TACC), based at The University of Texas at Austin

Knowing almost nothing about supercomputers, I applied and got the job. So began my CS/CI education….

Who I am and how I got here

What I didn't know then but know now….

The National Science Foundation had insisted that TACC include a communications person as an add-on component to the "*Ranger*" supercomputer.

(Ranger was a $50 million system that our center had just competed for and won.)

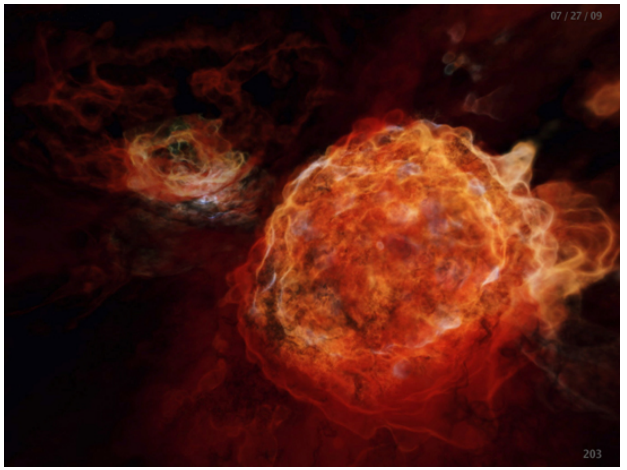
Who I am and how I got here

Ranger (and supercomputers in general) needed a publicist!

Not to mention the computational scientists who used them.

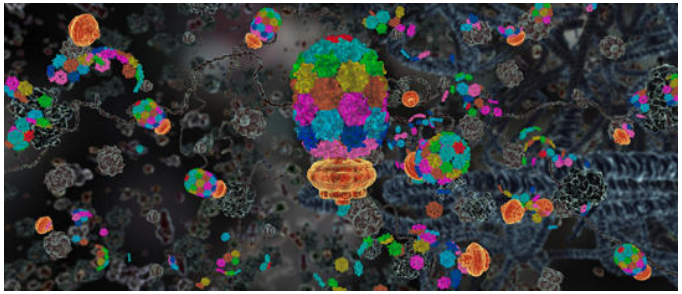
Supercomputing Guy

For the last 7 years, worked as an embedded reporter at TACC



Represent the uses and significance of high performance computing (HPC) in 21st century science

Probably have written as many articles about scientific computing as anyone else during that time.



Going National

In Fall 2013, I started at NSF in Washington, D.C.

Will serve 1-3 years as a rotator in the Office of Legislative and Public Affairs

Computing, Information Science and Engineering (CISE) directorate is my beat.

Role in the ecosystem

Many names for what I do:

Public Affairs Specialist
Press Officer
Science Writer
Public Relations Coordinator
Public Information Officer
External Relations Manager
PR flack….

Or:
Science grunt/
Technical translator/
Knowledge infantryman

PR Guy

Stigma associated with PIO's among journalists.

(True? Fair?)

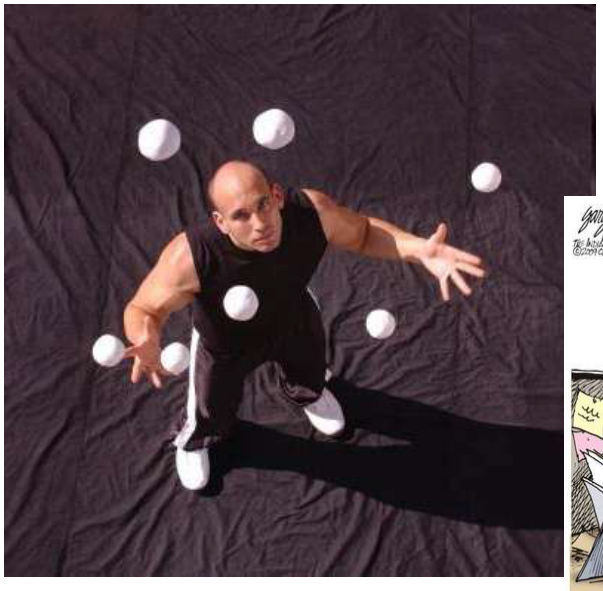
- *"Not real reporting"*
- *"Hype"*
- *"Uninformed"*

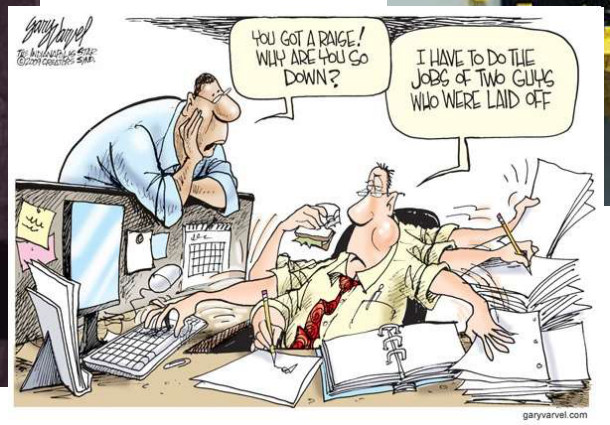
Yet… science journalism is in retreat among newspapers, magazines, TV stations.

Increasingly, news is drawn directly from PIOs. Growing sense of importance to health of science.

The Truth about Journalists

- **Fact:** Reporters don't find out about the science they cover by reading journal articles





4 things you didn't know about your press officer (and why you should care)

1. Your PO writes for a living

2. His/her job is to tell the media about your work

3. Your PO has media contacts and dissemination tools you don't have

4. This is the stage where you have the most control

Enough about me

Show of hands:

Who has been interviewed (or had their research covered) by the media?

How did it work out?

Good experiences?

Bad experiences?

Informal Communication Survey

Who blogs, tweets, pitches to reporters or their university press officer, writes op-eds or does public outreach or any kind about their research?

What do you do?

Why not communicate?

Fear and/or negative perspective of the media: *"They're going to misrepresent me!"*

Some Common Concerns About Media Interaction . . . debunked

I'll be misquoted / You can record the discussion, request a courtesy review, or if you're dealing with something sensitive, you can reply with a carefully-worded email

I'll be taken out of context / see above

I'll look stupid ("peer sneer") / If subject matter is outside your field of expertise, re-direct the reporter to another source

I'll mistakenly contradict agency policies in print / Please don't respond to a press query without calling your or your funding agency's public affairs officer first. They'll provide coaching, tips, even talking points if necessary (and we will be present at the interview if necessary, particularly television)

I'll be hounded by the press / Press should go through our office first – we'll work with you to schedule the interview

By preparing <u>together</u>,

we can address and minimize these concerns

Media outreach

- Why do it?
- What to expect?
- Where to get help?

Media outreach

Why do it?

1) Because we owe it to taxpayers

Media outreach

NSF Broader Impacts Criteria

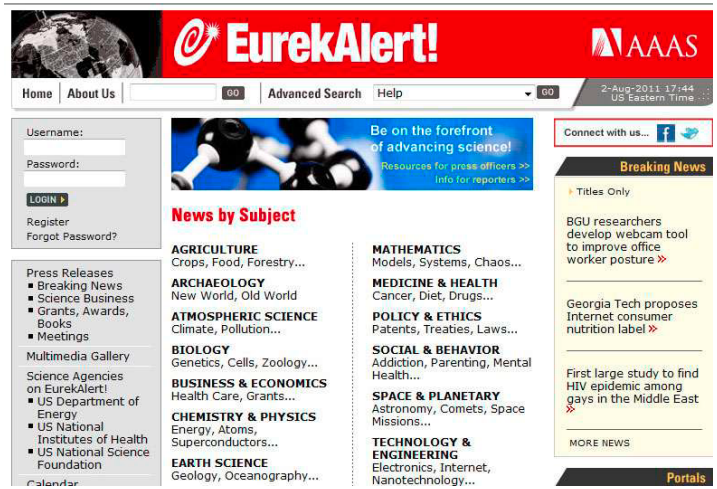
- 1. Advance discovery and learning
- 2. Broaden the participation of
- underrepresented groups
- 3. Enhance infrastructure for research and education
- **4. Disseminate results broadly**
- 5. Benefit society

The media can help.

Media outreach

Why do it?

2) Because journals ask you to



Media outreach

Why do it?

3) Because the media needs you to

Once, 70 major American newspapers had science sections. Now, few do.

"Science is always the first thing that gets cut when times get tough."
-Ira Flatow, NPR

Need more reasons?

Communication is important to:

- **Research and business communities** - spreading knowledge, connecting researchers/companies
- **Policy-makers** - communicating value of federally funded research programs
- **General public** - spreading knowledge, communicating value of computer science, etc.

Need more reasons?

Benefits

Working with journalists can provide accurate, informative updates about your research to stakeholders. Specifically, taking the time to work with journalists can help you:

Need more reasons?

Reach a Wider Audience: Journalists can help you reach the broader public, decision-makers, and grant-makers, not just those actively seeking information.

Raise Awareness: Consistent and accurate news coverage could increase public awareness of your work and of science in general.

Create Positive Attitudes: Bringing current successes and future goals of science to the attention of the public could help generate enthusiasm for research and support for funding.

Media outreach

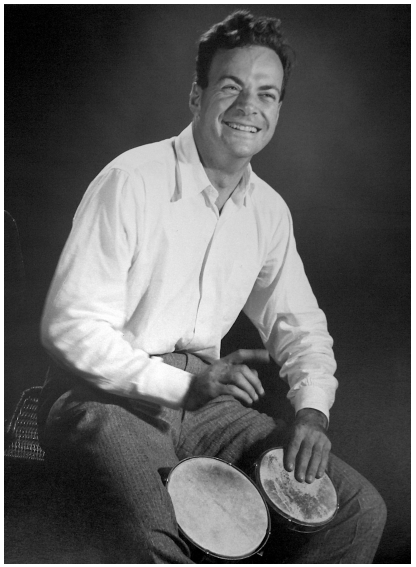
We've talked about why.

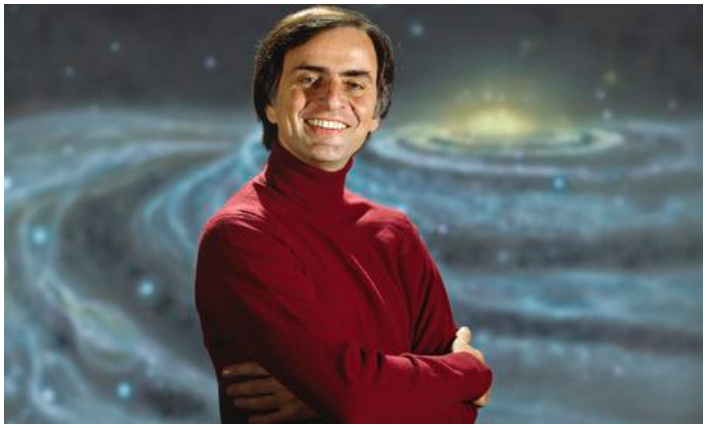
But how?

Public scientists: a growing breed

Classic science communicators:

- Richard Feynman
- Carl Sagan
- Neil Degrasse Tyson

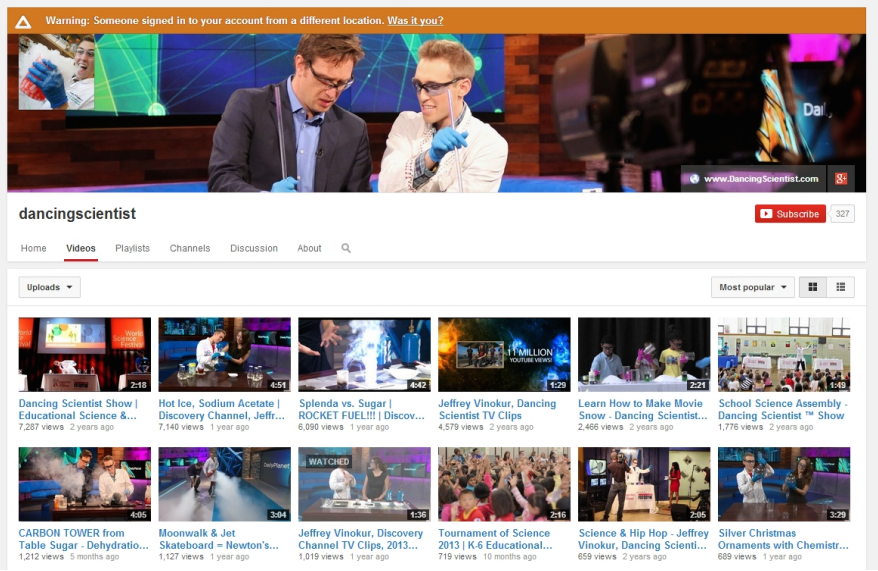




Public scientists: a growing breed

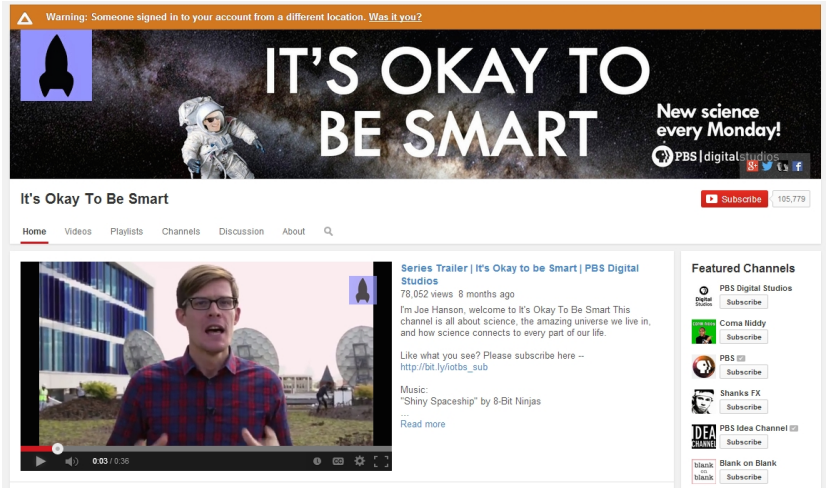
How about this guy:

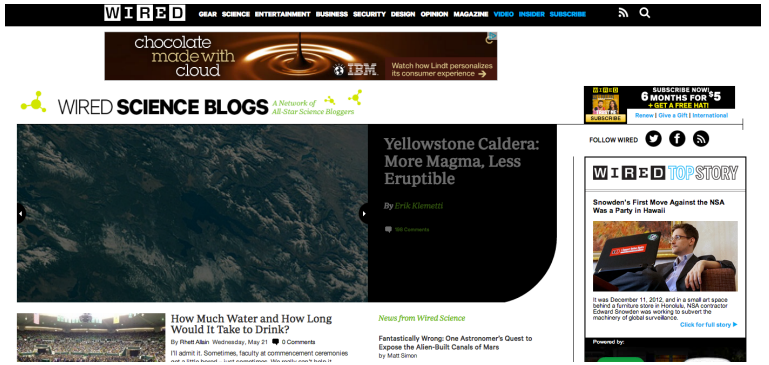
The Dancing Scientist?

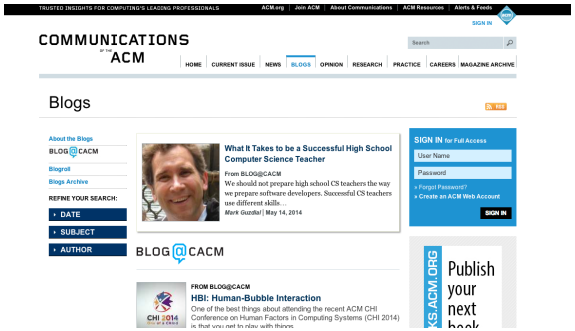


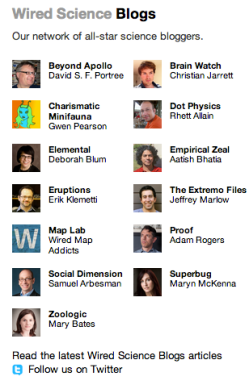
Public scientists: a growing breed

Or these folks…









An *explosion* in the number/diversity of ways to be a public scientist.

Find your own way

- Lots of different ways to get your message out.
- Doesn't have to be dramatic, time-consuming or silly.

What's news? What's not?

What the media are looking for in a story and why your work may be more newsworthy than you think…

What's news? What's not?

Publication of a scientific paper

What's news? What's not?

Sometimes the secret is timing

Research Article

Long-distance pine pollen still germinates after meso-scale dispersal[1]

Claire G. Williams[2]

Forest History Society and NESCent, William Vickers Avenue, Durham, North Carolina 27701 USA

ABSTRACT

Viability of long-distance pollen links ecological models to the genetic structure of forest tree populations, determining how forests will adapt to climate change and how far genes flow from genetically modified (GM) pine plantations. Addressing this landscape-scale inquiry is feasible when the pollen source, the delivery system, and the receiver field can be made explicit. To this end, I measured long-distance pollen germination along a 160-km transect along the North Carolina coastline, including 45000 ha of mature *Pinus taeda* plantations and barrier islands. Using this system, I tested three hypotheses: (1) pine pollen germinates after dispersal on meso-scale distances, (2) sodium chloride exposure reduces germination of pollen captured over open saltwater, and (3) viable pine pollen is present at high altitudes before local peak pollen shed. The experimental findings are as follows: pine pollen had germination rates of 2 to 57% after dispersal at distances from 3 to 41 km, sodium chloride solutions mildly reduced *P. taeda* pollen germination, and viable pine pollen grains were captured at an altitude of 610 m. GM pine plantings thus have a potential to disperse viable pollen at least 41 km from the source. Wind and rainfall, as integral parts of regional atmospheric systems, together exert a powerful influence on the genetic structure of forest tree populations.

Key Words: aerosols • climate change • conifer reproductive biology • genetically modified (GM) forest trees • heterosporey • long-distance dispersal • male gametophyte • North Carolina • Pinaceae • *Pinus taeda* • U.S. Forest Health Initiative

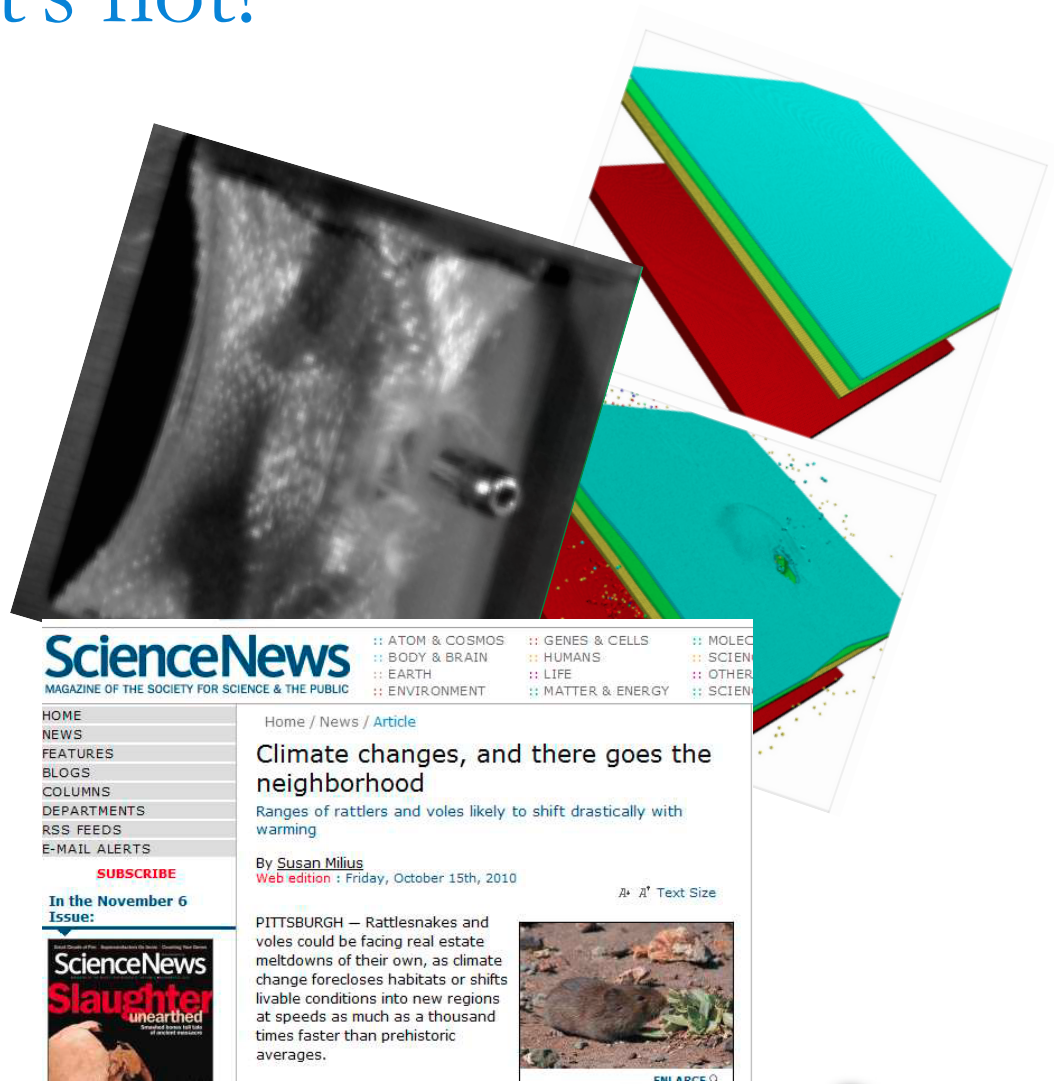
Received for publication 24 August 2009. Accepted for publication 16 February 2010.

Guess when this came out?

What's news? What's not?

What is also (sometimes) news?

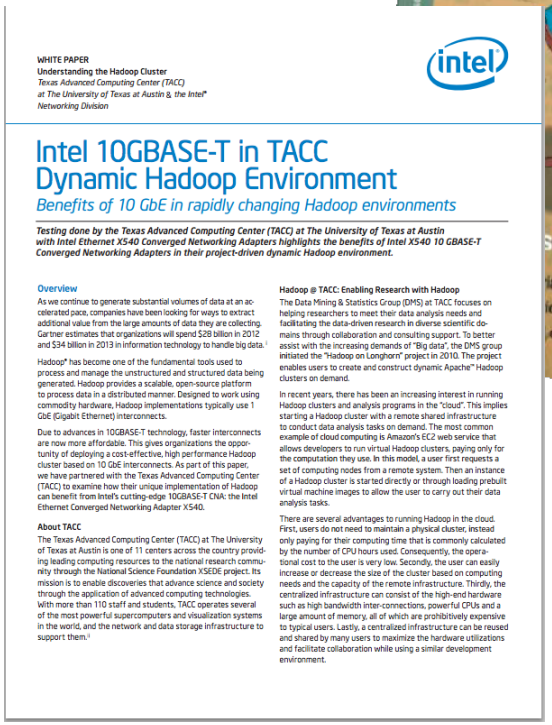
- A talk at a conference or meeting
- A patent or spin-off company
- Things that are just plain cool!



What (usually) ISN'T news?

Exhibit A:
review papers

Exhibit B:
white papers / policy papers



WHITE PAPER
Understanding the Hadoop Cluster
Texas Advanced Computing Center (TACC)
at The University of Texas at Austin & the Intel® Networking Division

intel

Intel 10GBASE-T in TACC Dynamic Hadoop Environment

Benefits of 10 GbE in rapidly changing Hadoop environments

Testing done by the Texas Advanced Computing Center (TACC) at The University of Texas at Austin with Intel Ethernet X540 Converged Networking Adapters highlights the benefits of Intel X540 10 GBASE-T Converged Networking Adapters in their project-driven dynamic Hadoop environment.

Overview

As we continue to generate substantial volumes of data at an accelerated pace, companies have been looking for ways to extract additional value from the large amounts of data they are collecting. Gartner estimates that organizations will spend $28 billion in 2012 and $34 billion in 2013 in information technology to handle big data.[1]

Hadoop* has become one of the fundamental tools used to process and manage the unstructured and structured data being generated. Hadoop provides a scalable, open-source platform to process data in a distributed manner. Designed to work using commodity hardware, Hadoop implementations typically use 1 GbE (Gigabit Ethernet) interconnects.

Due to advances in 10GBASE-T technology, faster interconnects are now more affordable. This gives organizations the opportunity of deploying a cost-effective, high performance Hadoop cluster based on 10 GbE interconnects. As part of this paper, we have partnered with the Texas Advanced Computing Center (TACC) to examine how their unique implementation of Hadoop can benefit from Intel's cutting-edge 10GBASE-T CNA: the Intel Ethernet Converged Networking Adapter X540.

About TACC

The Texas Advanced Computing Center (TACC) at The University of Texas at Austin is one of 11 centers across the country providing leading computing resources to the national research community through the National Science Foundation XSEDE project. Its mission is to enable discoveries that advance science and society through the application of advanced computing technologies. With more than 110 staff and students, TACC operates several of the most powerful supercomputers and visualization systems in the world, and the network and data storage infrastructure to support them.[2]

Hadoop @ TACC: Enabling Research with Hadoop

The Data Mining & Statistics Group (DMS) at TACC focuses on helping researchers to meet their data analysis needs and facilitating the data-driven research in diverse scientific domains through collaboration and consulting support. To better assist with the increasing demands of "Big data", the DMS group initiated the "Hadoop on Longhorn" project in 2010. The project enables users to create and construct dynamic Apache™ Hadoop clusters on demand.

In recent years, there has been an increasing interest in running Hadoop clusters and analysis programs in the "cloud". This implies starting a Hadoop cluster with a remote shared infrastructure to conduct data analysis tasks on demand. The most common example of cloud computing is Amazon's EC2 web service that allows developers to run virtual Hadoop clusters, paying only for the computation they use. In this model, a user first requests a set of computing nodes from a remote system. Then an instance of a Hadoop cluster is started directly or through loading prebuilt virtual machine images to allow the user to carry out their data analysis tasks.

There are several advantages to running Hadoop in the cloud. First, users do not need to maintain a physical cluster, instead only paying for their computing time that is commonly calculated by the number of CPU hours used. Consequently, the operational cost to the user is very low. Secondly, the user can easily increase or decrease the size of the cluster based on computing needs and the capacity of the remote infrastructure. Thirdly, the centralized infrastructure can consist of the high-end hardware such as high bandwidth inter-connections, powerful CPUs and a large amount of memory, all of which are prohibitively expensive to typical users. Lastly, a centralized infrastructure can be reused and shared by many users to maximize the hardware utilizations and facilitate collaboration while using a similar development environment.

What (usually) ISN'T news?

Also (usually) not news:

- Grants, awards and fellowships
- New programs, centers, institutes, etc.
- Building dedications

Don't assume what you're working on isn't newsworthy. Talk to your press officer. Lots of opportunities and outlets out there.

Know your audience

Communication is one of the most important aspects of science.

What is it that we human beings ultimately depend on? We depend on our words. We are suspended in language. Our task is to communicate experience and ideas to others.

-NIELS BOHR

Most of the fundamental ideas of science are essentially simple, and may, as a rule, be expressed in a language comprehensible to everyone.

-ALBERT EINSTEIN

Know your audience

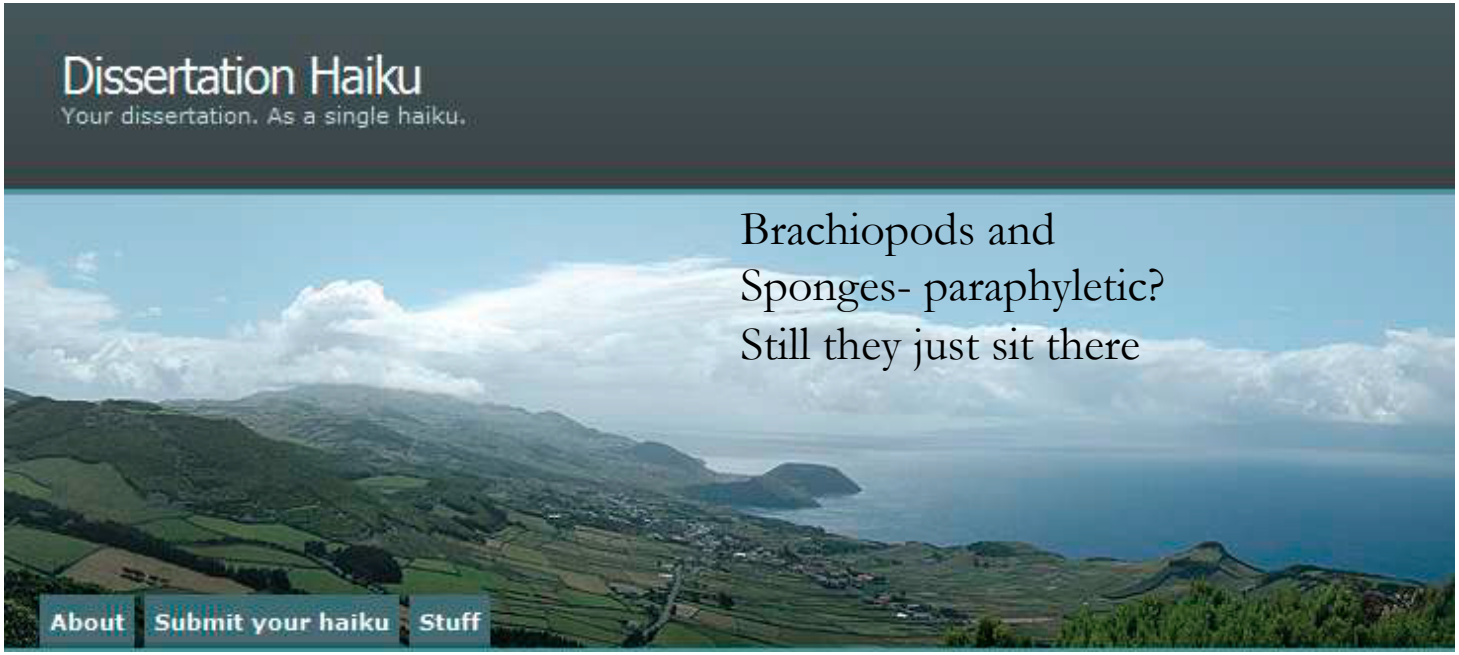
How you communicate depends on who/what you're talking to/about:

- publishing research results in a peer-reviewed journal,
- talking to a reporter,
- interacting with students,
- or discussing your research with the public.

Respond appropriately!

Explaining your work in a quick & compelling way: a few tips

Dissertations are long and boring.



By contrast, everybody likes haiku.

http://dissertationhaiku.wordpress.com

When engaging larger audiences brevity is key

Here's why:

TV story = 80 seconds

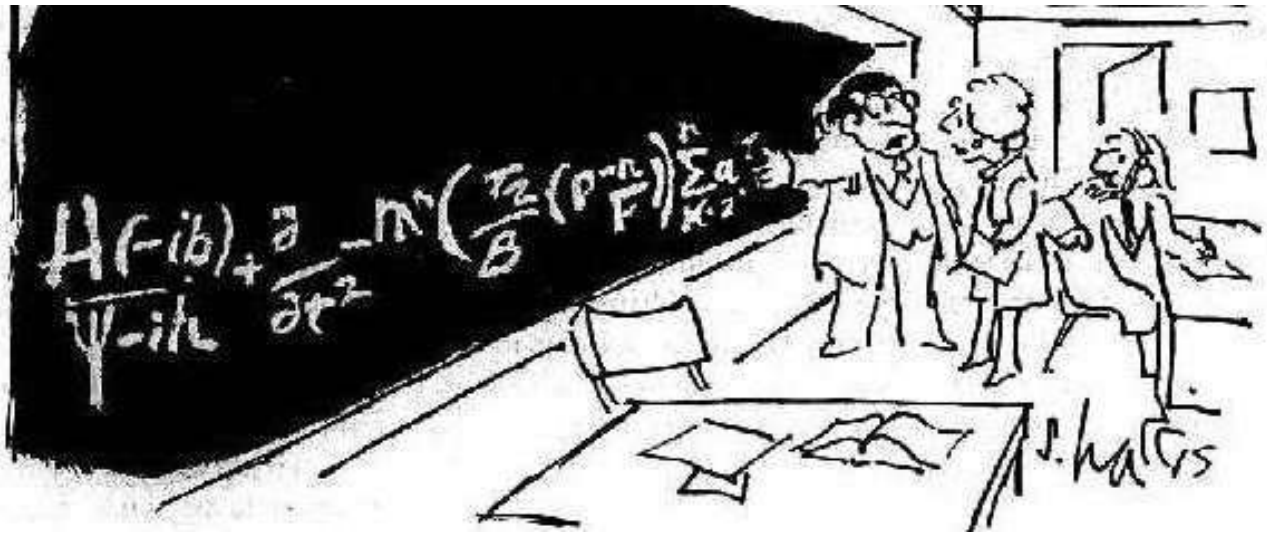
Radio story = 45 seconds

Newspaper article = 400-600 words

Undergraduate attention span = 10 min

When engaging larger audiences brevity is key

Say it simply



"But this is the simplified version for **the general public."**

More tips

Try not to slide into incomprehensible jargon

Analogies are your friend

It's ok to repeat yourself

The Index of Banned Words (The Continually Updated Edition)

By Carl Zimmer | November 30, 2009 3:35 pm

Over the summer, I posted a list of words I banned from my science writing class at Shoals Marine Lab. Readers offered some equally abysmal suggestions. And this fall, teaching a seminar at Yale, I came across some others. I suspect that this list is just going to keep growing. So I'm giving it a home here, where I can add in new entries as they arise in assignments in my classes. You can easily direct people to it through this url: http://bit.ly/IndexBanned (caps required).

By assembling this list, I don't mean to say that no one should *ever* use these words. I am not teaching people how to write scientific papers. What I mean is that anyone who wants to learn how to write about science–***and*** to be read by people who aren't being paid to read–should work hard to learn how to explain science in plain yet elegant English–not by relying on scientific jargon, code-words, deadening euphemisms, or meaningless cliches.

Here's a post where I go into more depth about why words matter-
ences, paragraphs, etc.]

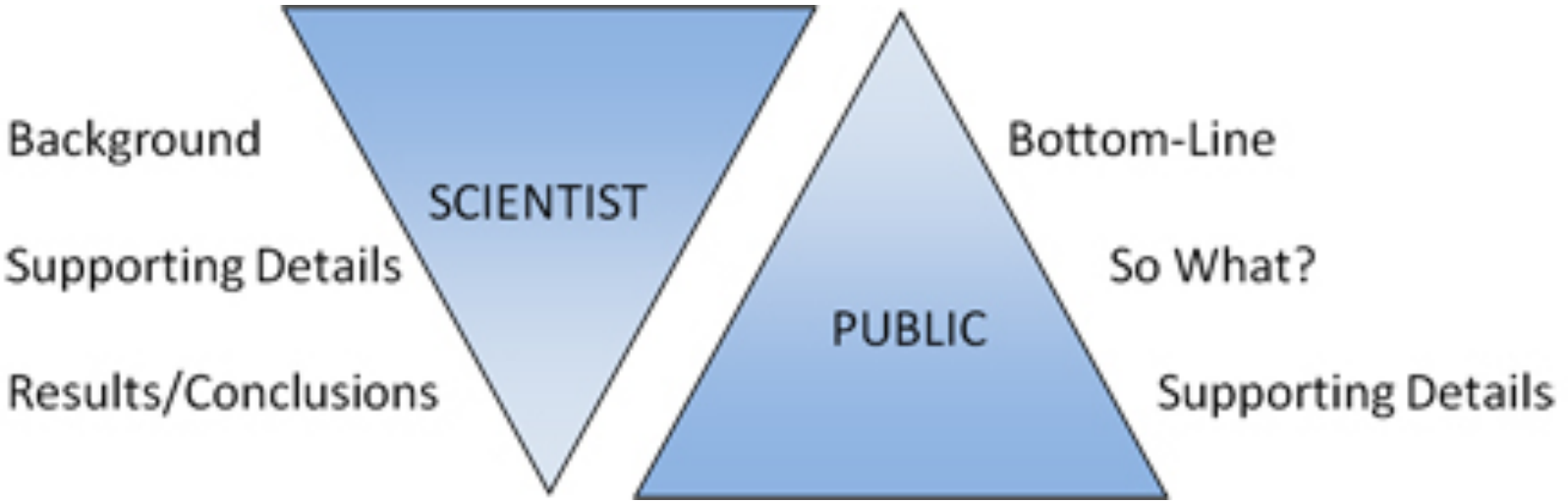
in prose)

Turn your writing upside down

Scientists and the public have different communication styles.

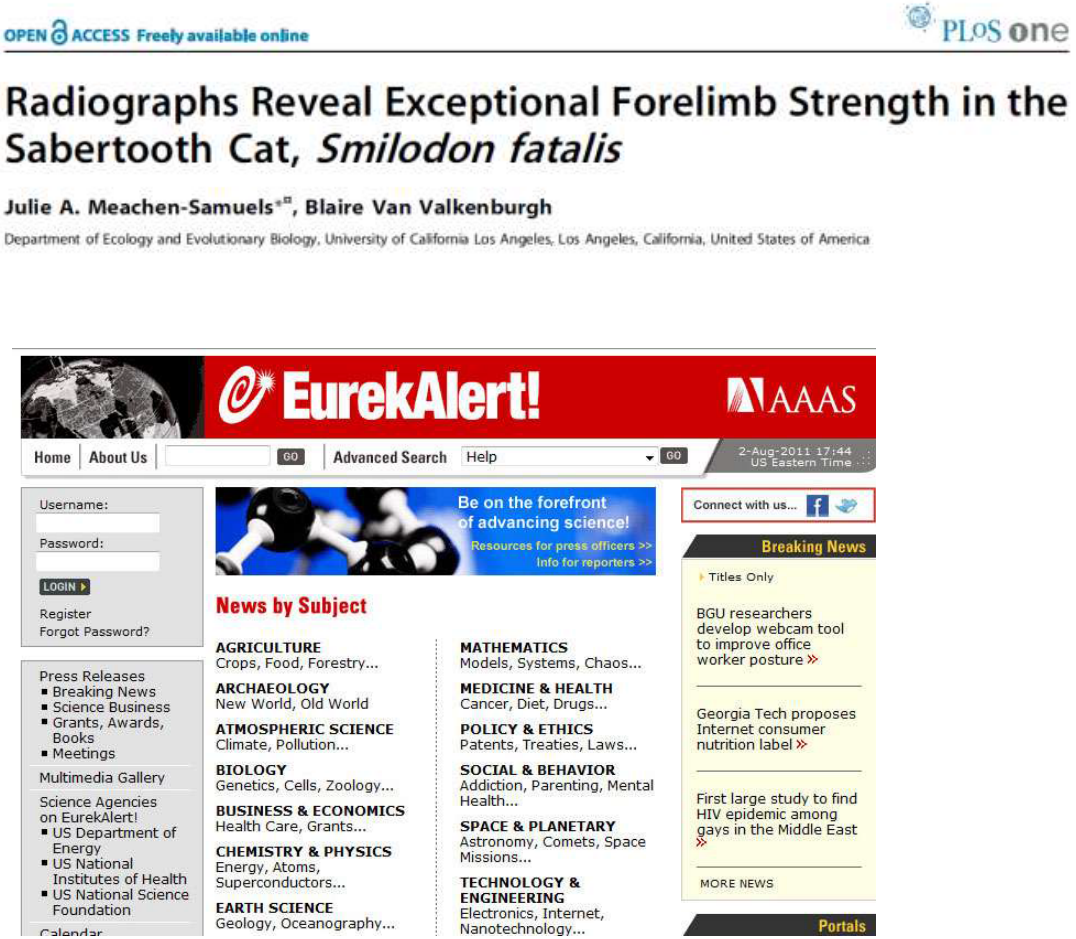
Scientists often start by placing research in a historical context, the public wants to know the point from the beginning.

Turn your writing upside down



- How do you translate detailed and complex material into a clear, streamlined structure?
- **What's the Point?** Start out by explaining the "big picture" and why the audience should care. Then go into an appropriate level of detail to emphasize your points.
- **3-Point Structure:** What are the three things you want your audience to remember? Organize your message around these points.

Titles matter



OPEN ACCESS Freely available online

PLoS one

Radiographs Reveal Exceptional Forelimb Strength in the Sabertooth Cat, *Smilodon fatalis*

Julie A. Meachen-Samuels*, Blaire Van Valkenburgh

Department of Ecology and Evolutionary Biology, University of California Los Angeles, Los Angeles, California, United States of America

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Genetics, Cells, Zoology...

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Breaking News

Titles Only

BGU researchers develop webcam tool to improve office worker posture »

Georgia Tech proposes Internet consumer nutrition label »

First large study to find HIV epidemic among gays in the Middle East »

MORE NEWS

Portals

Titles capture the public's imagination

Public release date: 2-Jul-2010
[Print | E-mail | Share] [Close Window]

Contact: Robin Ann Smith
rsmith@nescent.org
919-668-4544
National Evolutionary Synthesis Center (NESCent)

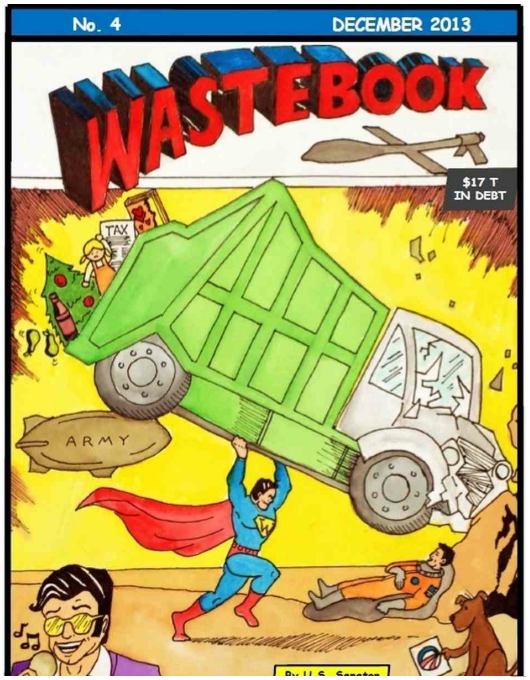
Why you should never arm wrestle a saber-toothed tiger

X-ray analysis reveals that sabertooth forelimbs were exceptionally strong compared to their feline cousins

Durham, NC — Saber-toothed cats may be best known for their supersized canines, but they also had exceptionally s
pinning prey before delivering the fatal bite, says a new study in the journal *PLoS ONE*.

But be careful not to go to far

- On the flip side – the Coburn Wastebook
- Don't get too cute (or let your communications person get too cute)
- Careful consideration of your wording is critical!



63. Need Brains! Fighting Zombies with Pluses and Minuses – (NC) $150,000

Somehow zombies have gnawed their way onto Uncle Sam's payroll.

This year, the National Science Foundation (NSF) paid an interactive media firm to create a "Web-based, action-adventure, narrative-based, role-playing game where the player defends against zombies in an effort to save the human race."[625] While zombies are hardly something most people will ever encounter, the goal of the game is to teach middle school students how to apply math skills in "real-world tasks."[626]

NSF awarded the game designer $150,000 to craft the zombie experience.[627] Even with enough money to buy thousands of textbooks, the grant designer will not be building a full game. Instead, three "mini-games" will be designed and tested with just 80 middle school students.[628] Ironically, the same amount of funding could have paid the annual salaries of almost 5 teachers in North Carolina.[629]

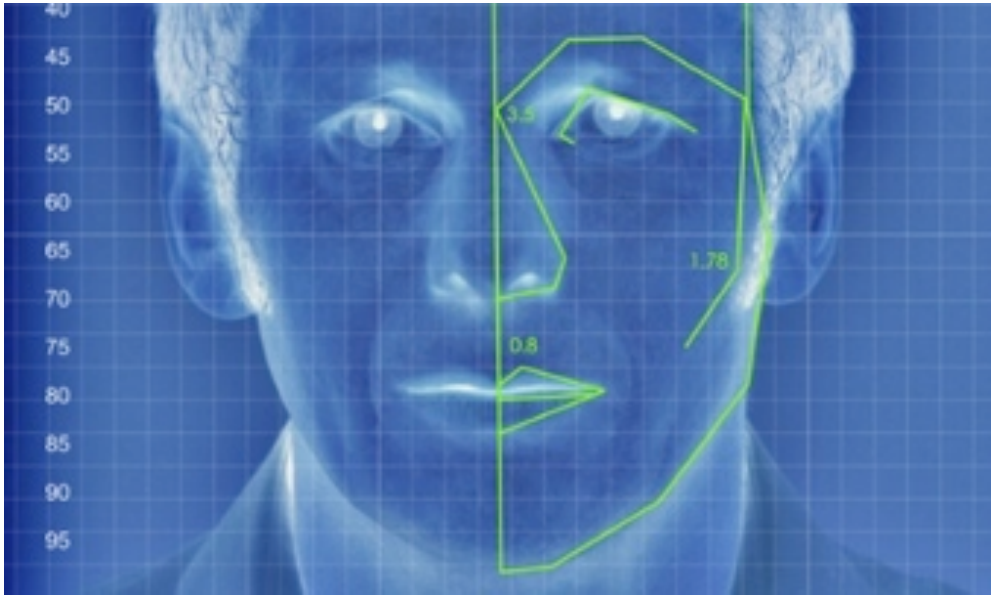
CS/CI specific challenges

Ideas in computer science, cyber-infrastructure and related fields can be abstract and difficult to visualize.

```
void CMymfc28CView::OnTestSpaceship()
{
    // TODO: Add your command handler code here
    CLSID clsid;
    LPCLASSFACTORY pClf;
    LPUNKNOWN pUnk;
    IMotion* pMot;
    IVisual* pVis;

    HRESULT hr;
    if ((hr = ::CLSIDFromProgID(L"Spaceship", &clsid)) != NOERROR)
    {
        TRACE("unable to find Program ID -- error = %x\n", hr);
        return;
    }
    if ((hr = ::CoGetClassObject(clsid, CLSCTX_INPROC_SERVER, NULL, IID_IClassFactory,
        (void **) &pClf)) != NOERROR)
    {
        TRACE("unable to find CLSID -- error = %x\n", hr);
        return;
    }

    pClf->CreateInstance(NULL, IID_IUnknown, (void**) &pUnk);
    pUnk->QueryInterface(IID_IMotion, (void**) &pMot); // All three
    pMot->QueryInterface(IID_IVisual, (void**) &pVis); //  pointers
                                                       //  should work
    TRACE("main: pUnk = %p, pMot = %p, pDis = %p\n", pUnk, pMot, pVis);

    // Test all the interface virtual functions
    pMot->Fly();
    int nPos = pMot->GetPosition();
    TRACE("nPos = %d\n", nPos);
    pVis->Display();

    pClf->Release();
    pUnk->Release();
    pMot->Release();
    pVis->Release();
    AfxMessageBox("Test succeeded. See Debug window for output.");
}
```

Show and Tell

- As much as possible, connect to tangible, real-world activities.
- Try to find angles, images and approaches that resonate with the public.



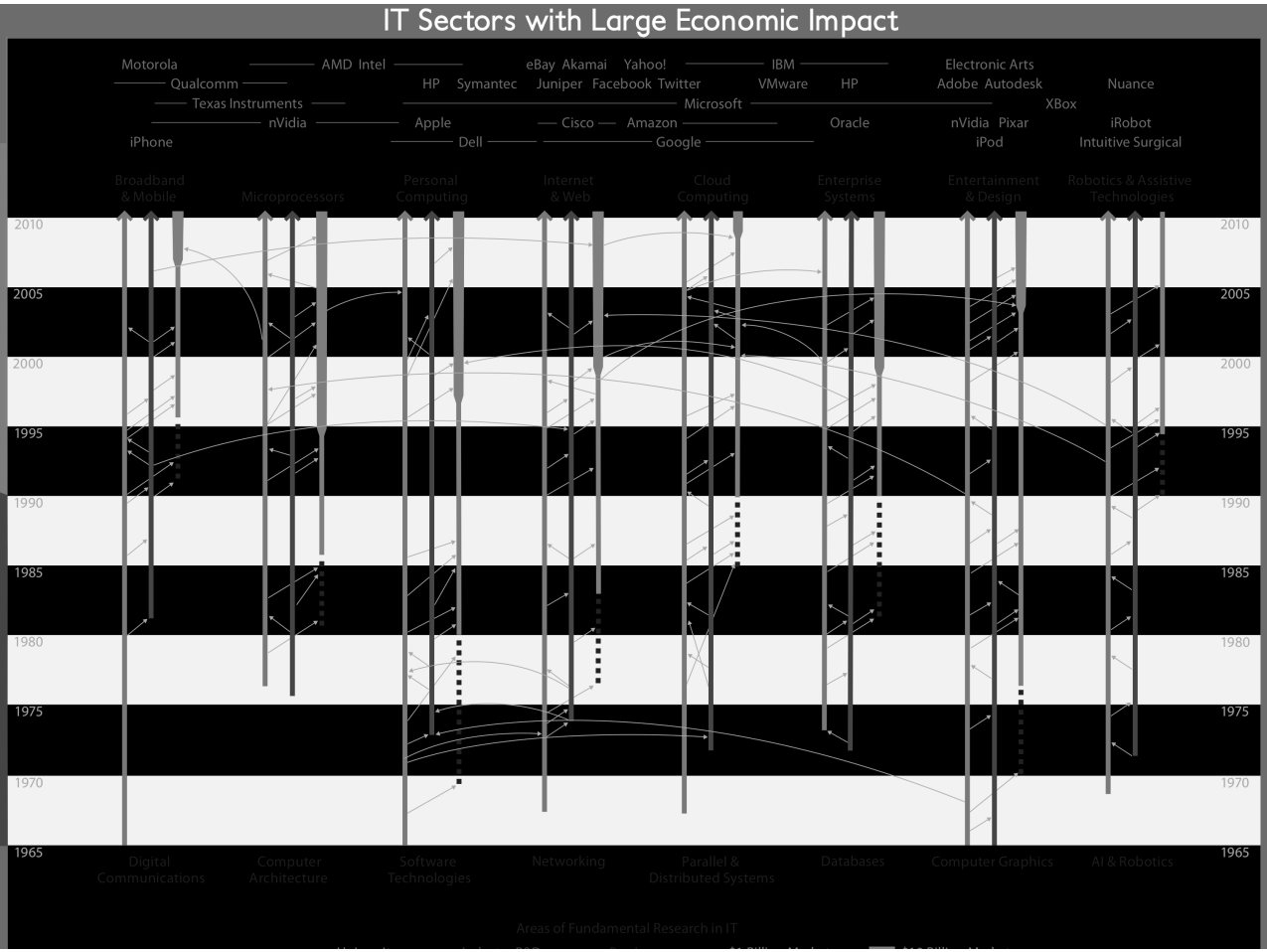
Make connections to the broader context

Fundamental research in IT underpins the creation of billion-dollar-plus IT market segments and a vital U.S. IT industry through a complex partnership between universities, industry, and government.

The first version of this figure was published in the 1995 report *Evolving the High Performance Computing and Communications Initiative to Support the Nation's Information Infrastructure*. The original figure, which was updated in 2002 and 2003, dispelled the assumption that the commercially successful IT industry is self-sufficient. It underscored the extent to which industry instead builds on government-funded university research—sometimes through long incubation periods of years and even decades.

As illustrated in this figure from the 2012 report *Continuing Innovation in Information Technology*, computing research and its impacts have since continued to evolve and blossom. The figure illustrates how fundamental research in IT, conducted in industry and universities, has led to the introduction of entirely new product categories that ultimately became billion-dollar industries. It reflects a complex research environment in which concurrent advances in multiple subfields have been mutually reinforcing, stimulating and enabling one another and leading to vibrant, innovative industries exemplified by top-performing U.S. firms. Such research often starts as a search for fundamental knowledge but time and again produces practical technologies that enable significant economic impact.

The gray lines illustrate the rich interplay between academic research, industry research, and products and indicate the cross-fertilization resulting from multi-directional flows of



Getting better all the time

How do you communicate so that individuals outside your field can understand the meaning?

- **Experiment:** Try out language on friends, families and colleagues who do not hold the same technical background as you
- **Learn from Others:** Actively read and follow other successful science communicators in your field to help expand the terms and analogies you can use that work with public audiences.
- **Trial and Error:** Learn from your experiences and take the chance to adjust your word choices when you notice situations where communication hasn't gone as well as you had hoped.

What do I do when a reporter calls?

Give yourself time and consider consulting with NSF on how best to respond. Say, **"Thanks for calling, but you've caught me in the middle of something. If you give me a sense of your topic and deadline, I'd be happy to get back to you.**

Call your press officer or public information officer.

Never give an interview for which you aren't prepared

NEVER speak "off-the-record."

The "Off the Record" Myth

There is no universally accepted definition of what "off the record" means. It means what the **reporter** thinks it means

Assume that anything and everything you say to a reporter is ON the record

You cannot "take back" something that you already have said in an interview

Never say <u>anything</u> you would not wish to see mentioned on CNN

The Bottom line: Never speak "off-the-record."

Questions you might be asked

- Big picture: So what? Why should we care?
- Can you think of any good analogies?
- Do you have any images we could use?
- What's next?
- Is there anything that I haven't asked that you'd like to comment on?

Remember: *An interview is strictly business*

While keeping it friendly, the interview is not a good venue for chit chat. You are always on the record.

Don't repeat negative questions or comments. Speak clearly and help the reporter understand the issue. This is no place for emotional arguments, lectures, or other forms of debating or cajoling.

And finally, deadlines are tight, and reporters need all the time they can get to prepare an accurate story. Be brief.

More tips

Got a paper in review? Think it's likely to be accepted?

Contact your press officer/public information officer (yes, you have one)

You're not in it alone

Seek out someone like me in your department, at your university, or at any organization that played a role in your work.

Have a conversation.

Tell them what you're working on and what your research roadmap looks like. See where there may be opportunities for promotion

Call me too

Or better yet, contact *ME*, your friendly neighborhood NSF public affairs specialist!

I'm here to work with you on any NSF-related promotions.

(And to consult on non-NSF research too.)

More tips

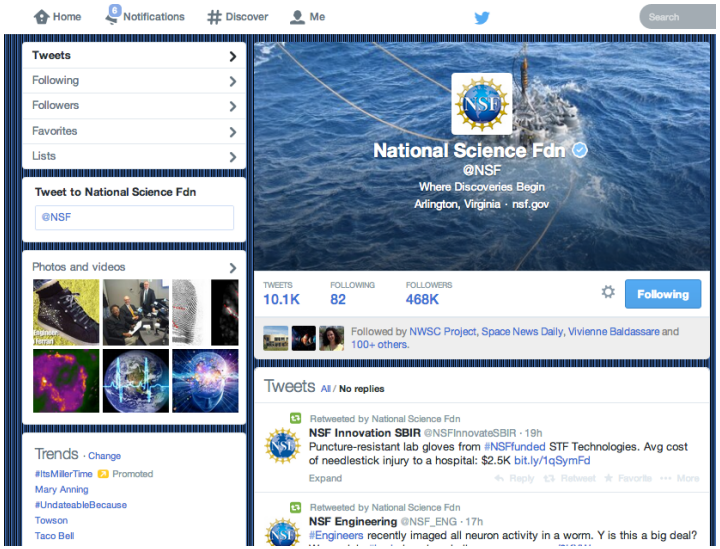
Timing is everything

Alert your press officer to papers in the pipeline. At acceptance works best.

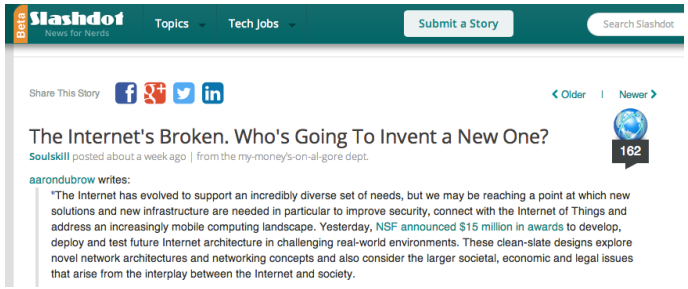
Not just one way

News releases are not always the best or only means to communicate.

Video, social media, citizen science applications, creative storytelling… the sky's the limit!



The NEW REDDIT JOURNAL of SCIENCE



Recap

Why?
- Because NSF/taxpayers want you to
- Because journals ask you to
- Because the media and the public need you to

How?
- Say it simply
- Don't use jargon
- Do use analogies, similes, metaphors
- Contact your press officer

When?
- Before publication is best

Practice makes perfect

Interactive exercise:

Elevator pitch OR research statement for media.

- Take 3 minutes to draft a quick elevator pitch or 3-part statement that describes the key aspects of your research.
- Imagine yourself talking to a reporter, someone at a cocktail party or the director of the NSF.
- What would you say? Write it down.

Now you!

- Pair up with someone sitting next to/near you.
- Take a moment to go over your notes and then, without looking at the paper, deliver your elevator pitch.
- Partner: ask 1 or 2 follow-up questions from the perspective of a non-specialist.
- Offer one compliment and one constructive criticism of the pitch.
- Reverse roles. Repeat.

Q&A

Thanks for listening!

If there's time, let's have a discussion about how your research can reach a broader audience (or whether you want it to).

I'll be available this evening and tomorrow if anyone would like a 1-on-1 media relations consultation.

Contact information

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