

Writing about science

SLAC Summer Institute 2013

Kelen Tuttle
Editor-in-Chief, *symmetry* magazine

Motivation: Why bother?

- **Funding**

Organizations, including Congress, fund what they can understand



Motivation: Why bother?

- **Funding**
Organizations, including Congress, fund what they can understand
- **Recognition**
Recognition by the media and the public supports further funding and determines how science is valued in our society



Motivation: Why bother?

Palo Alto Weekly, Reader comment, Feb 18, 2011

"Also missing from this discussion is the value of the SLAC projects in the grand scheme of things. It's not hard to find any number of scientists waxing euphoric over the "great work" that goes on in government-sponsored Megascience/Megalabs. **But how has this science actually bettered our lives?**

The SLAC people have done very little to explain to the US people what they do with our money. Ultimately, there is only so much "high energy physics" that the taxpayer can afford to fund. So .. where is the money going?"

Motivation: Why bother?

- **Funding**
Organizations, including Congress, fund what they can understand
- **Recognition**
Recognition by the media and the public supports further funding and determines how science is valued in our society
- **Encouraging scientific collaboration**
Making connections is what science is all about; the big leaps in understanding often come when two disparate fields come together



Motivation: Why bother?

- **Funding**
Organizations, including Congress, fund what they can understand
- **Recognition**
Recognition by the media and the public supports further funding and determines how science is valued in our society
- **Encouraging scientific collaboration**
Making connections is what science is all about; the big leaps in understanding often come when two disparate fields come together
- **Attracting and recruiting talent**
To bring the best and brightest young minds to science, we need to get them excited about today's research

Motivation: Why me?

Meanwhile, traditional science journalism is on the decline

- As newspapers lose advertising to the internet, they're cutting back on "specialized" sections – including science sections
- This has led to fewer science journalists
 - When science *is* covered, often it's by someone who doesn't understand it well

Less traditional sources have become more important for relaying news

- Communications offices now direct their "press releases" to the public
- Scientists are following suit. Just look at Lisa Randall or Sean Carroll.

Bottom line: The burden is on us to get science news out, do it correctly, and make it interesting.

Okay, I'm in! What can I do?

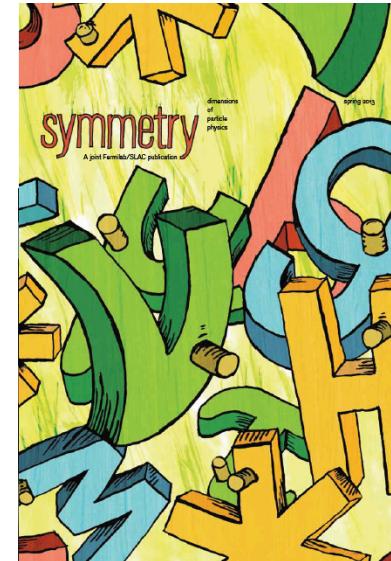
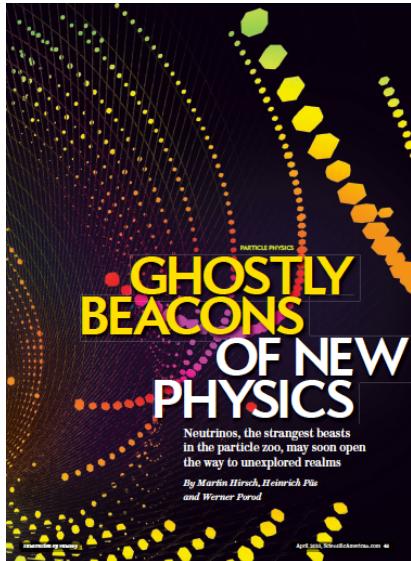
There's great opportunity, especially in the "new" media

- Blogs
- Twitter
- YouTube

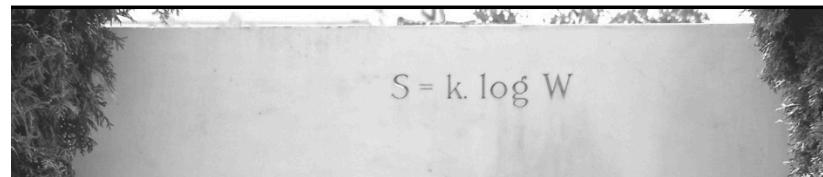
In addition, some of the more traditional outlets also encourage scientists to write for them

- *Scientific American*
- *Symmetry*
- Institution press offices

Even just getting to know a journalist is a great start – They're always looking for ideas!



Sean Carroll



Tricks of the trade: Consider your audience

If you remember nothing else from this presentation, remember to ask:

- **Who's the audience?**
 - If it's the general public, would your grandmother understand what you're trying to say? Be bilingual.
- **Use words your audience can understand: Avoid jargon**
 - Use analogies wherever possible:
“The diameter of an atom ranges from about 0.1 to 0.5 nanometers.”
Atoms are so small, 20,000,000 span a pinhead.
An atom is a million times smaller than the thickest human hair.

Tricks of the trade: Perfection is the enemy of good

- Don't obsess about facts and details

"[The Standard Model] foresaw four long-range force particles—referred to as gauge bosons—whereas nature has but one: the photon. The other three have a short range, less than about 10–17 meters, less than 1 percent of the proton's radius. According to Heisenberg's uncertainty principle, this limited range implies that the force particles must have a mass approaching 100 billion electron volts (GeV)."

-from Scientific American

Another way to express much the same idea:

"One measurement of the success of a civilization, I think, is how long it takes for it to discover all the fundamental particles and their interactions. It's taken us 116 years. I think that's really quite good!"

-Beate Heinemann, UC Berkeley and Lawrence Berkeley National Lab

Tricks of the trade: Make it personal

It's ok to talk about yourself – information alone doesn't sell an idea

- In fact, telling your personal story (and using the first person) will make it more interesting to your readers
 - There's a reason why magazines like *Us* and *People* exist! People love to hear about other people's lives – including yours
- You can offer something that non-scientists (like myself) can't
 - You carry the weight
 - You can share your passion and interest – makes it more meaningful
- Conversely, you don't need to acknowledge everyone in every piece. You can talk about yourself and express that you didn't do all the work on your own without listing every coauthor.

Tricks of the trade: Keep it simple and short

- The goal isn't to express the details, the fine points, the math. Instead, try to get the general ideas across.
- Try to express just one message in each piece. What's the one idea you want your readers to learn?
- Keep it brief – people don't have all day to read your piece! Can you explain it in 60 seconds (200 words)?

June 2013

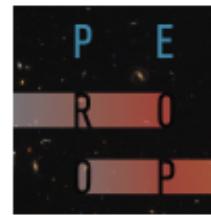


June 4, 2013

[explain it in 60 seconds: Unification of forces](#)

What if, like the individual threads that form a piece of cloth, all of nature's forces can be woven together into one comprehensive force?

February 2013



February 18, 2013

[explain it in 60 seconds: Spectroscopy](#)

Spectroscopy is a technique that astronomers use to measure and analyze the hundreds of colors contained in the light emitted by stars, galaxies and other celestial objects.

April 2013



April 23, 2013

[explain it in 60 seconds: Plasma acceleration](#)

Like surfers on huge ocean waves, electrons can ride waves of plasma to very high energies.

January 2013

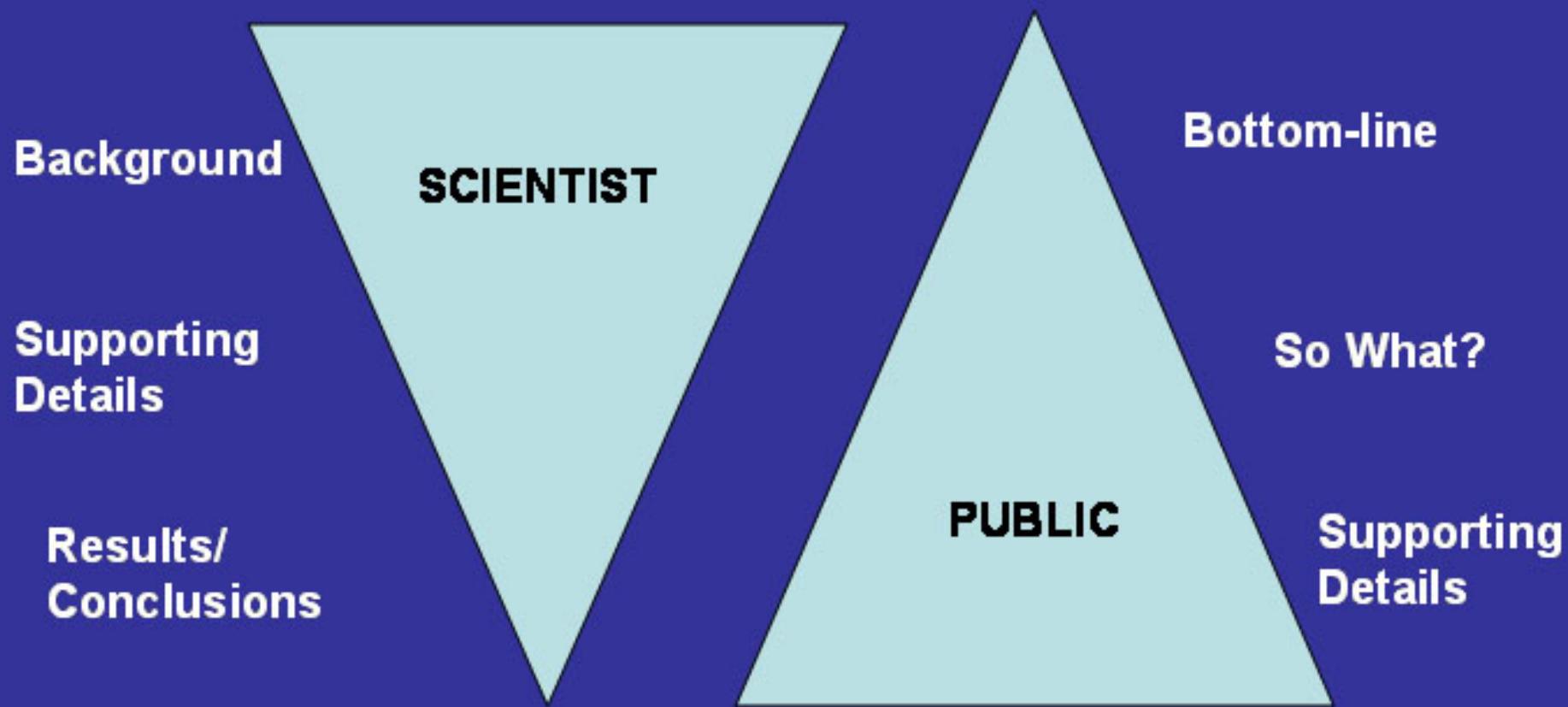


January 8, 2013

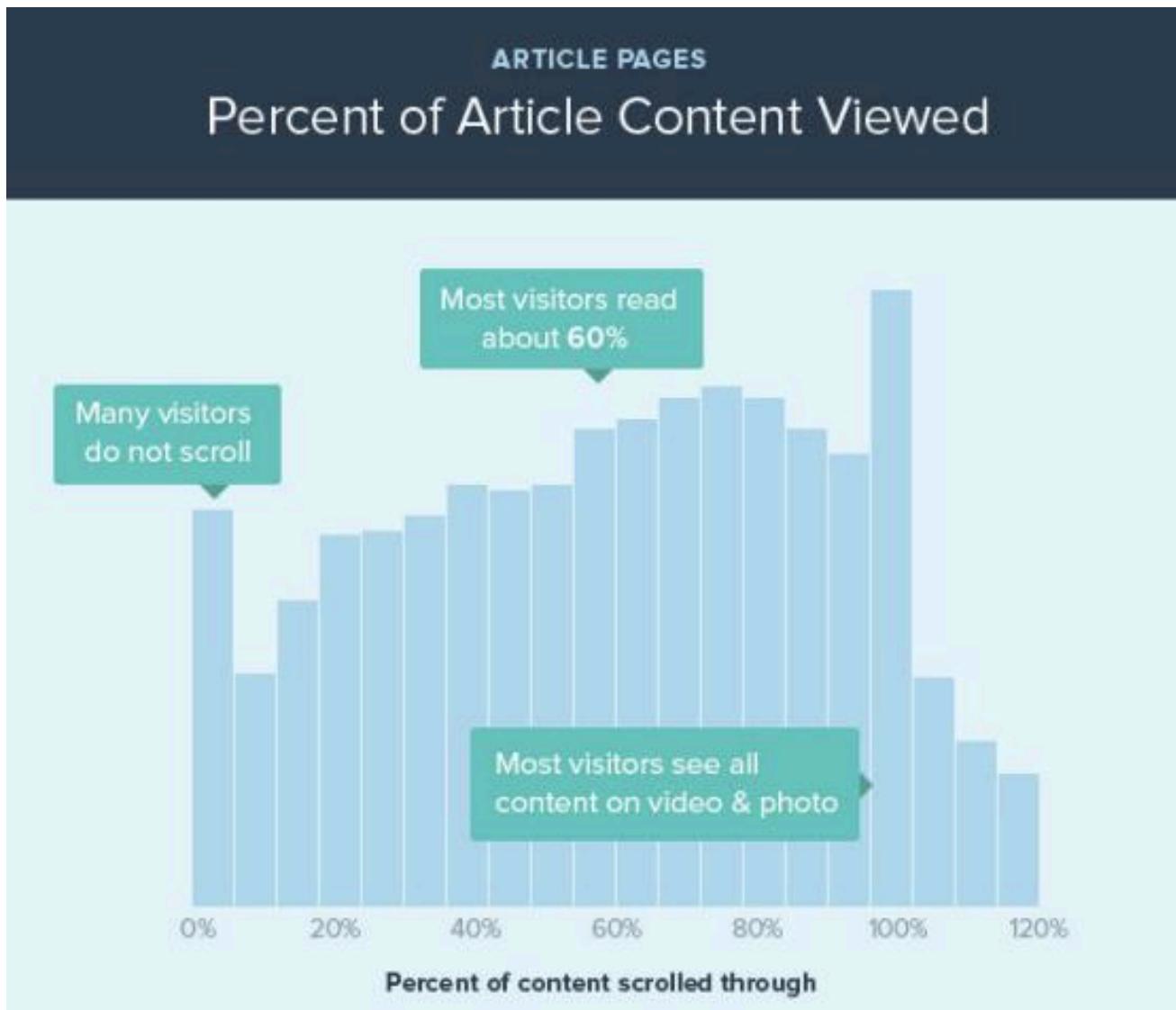
[explain it in 60 seconds: Bosons](#)

All particles fall into one of two classes, bosons or fermions. Two bosons with identical properties can be in the same place at the same time, but two fermions cannot.

Tricks of the trade: Get to the point



Tricks of the trade: Get to the point



Tricks of the trade: Get to the point



Tricks of the trade: 1-2-3 punch

1. Begin with an intriguing “lede” – a surprising or fun statement that makes the reader want to read on
2. Follow quickly with the results – what’s been discovered?
3. Then tell your reader why she should care – so what?

Tricks of the trade: 1-2-3 punch example

Future LHC super-magnets pass muster

Lede

In the past four years, scientists at the Large Hadron Collider have accomplished unprecedented feats of physics, all with their particle accelerator working at half its design capacity. The future is looking even brighter, literally.

Results

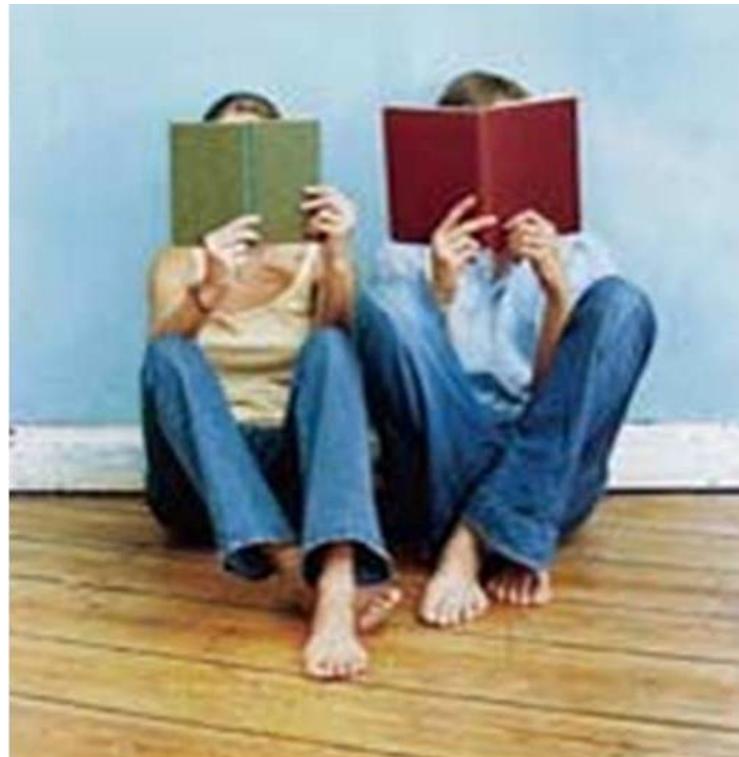
Last week the US LHC Accelerator Research Program, or LARP, successfully tested a new type of magnet required to boost the power of the LHC by a factor of 10.

So what?

The improved magnets are one of the most critical components in a series of LHC upgrades that will be implemented over the next ten years. Along with other upgrades, the magnets will allow the LHC to collect a larger amount of data at higher energies, making it possible to search for more massive new particles than ever before.

Tricks of the trade: Test it out!

- Once you've written something, have a member of your intended audience read it.
- We do this for every “explain it in 60 seconds” article, and are often surprised what people don't understand.



Tricks of the trade: Read what you want to write

- If there's a particular audience you would like to write for, read what other people are writing for that audience
- Some of the best science blogs include:
 - Cocktail Party Physics / Scientific American (Jennifer Ouellette)
 - Preposterous Universe (Sean Carroll)
 - Quantum Diaries / InterActions (various particle physicists)
 - Bad Astronomy / Slate (Phil Plait)
 - Not Exactly Rocket Science / National Geographic (Ed Yong)

Resources

- Just about every institution has a Communications or Public Affairs office. They can help!
- National Association of Science Writers (www.nasw.org)
 - Resources for aspiring science writers
<http://www.nasw.org/resource/beginning/>
 - Field Guide for Science Writers
<http://www.nasw.org/bookstore/field.htm>
- Northern California Science Writers Association (www.ncswa.org)
 - One of nine local science writer groups affiliated with NASW
- MIT Knight Science Journalism Tracker
 - Analysis of science coverage in newspapers and blogs
<http://ksj.mit.edu/tracker>

Takeaways

- Communication is important for funding, recognition and advancements
- There's more opportunity now than ever before to make an impact
- When writing, don't forget to:
 - Consider your audience
 - Avoid jargon
 - Make it personal
 - Keep it simple and short
 - Use analogies from daily life
 - Get to the point
 - Test it out
 - Read what you want to write
 - Have fun!



Thank you!

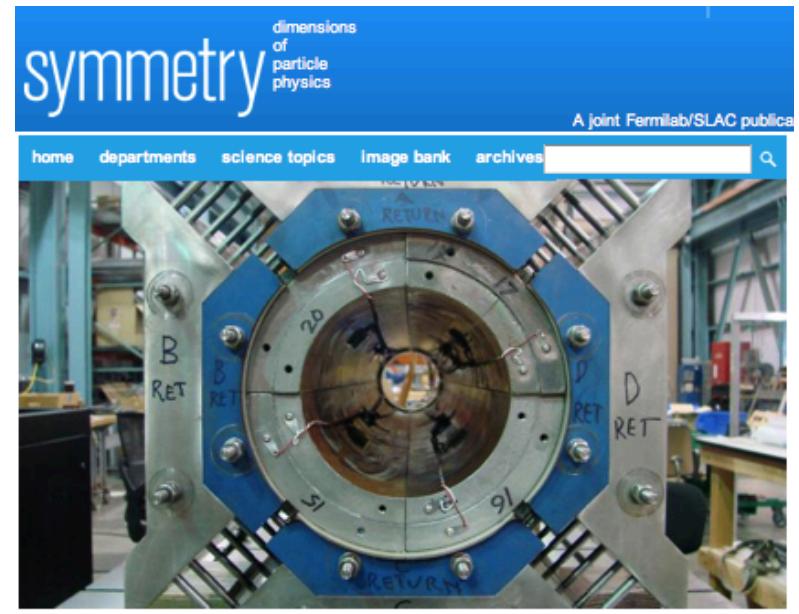
Feel free to contact me with questions or for advice:

Kelen Tuttle

kelen.tuttle@slac.stanford.edu

And I encourage you to read *symmetry*!

www.symmetrymagazine.org



breaking
Future LHC super-magnets pass muster

Scientists in the US LHC Accelerator Research Program have successfully tested superconducting magnets needed to increase LHC collisions tenfold.



day in the life
Detecting opportunity, in particle physics and beyond



feature
Secrets of the early universe
Planck, the space telescope



signal to background
Physics and the birth of the emoticon
Carnegie Mellon University