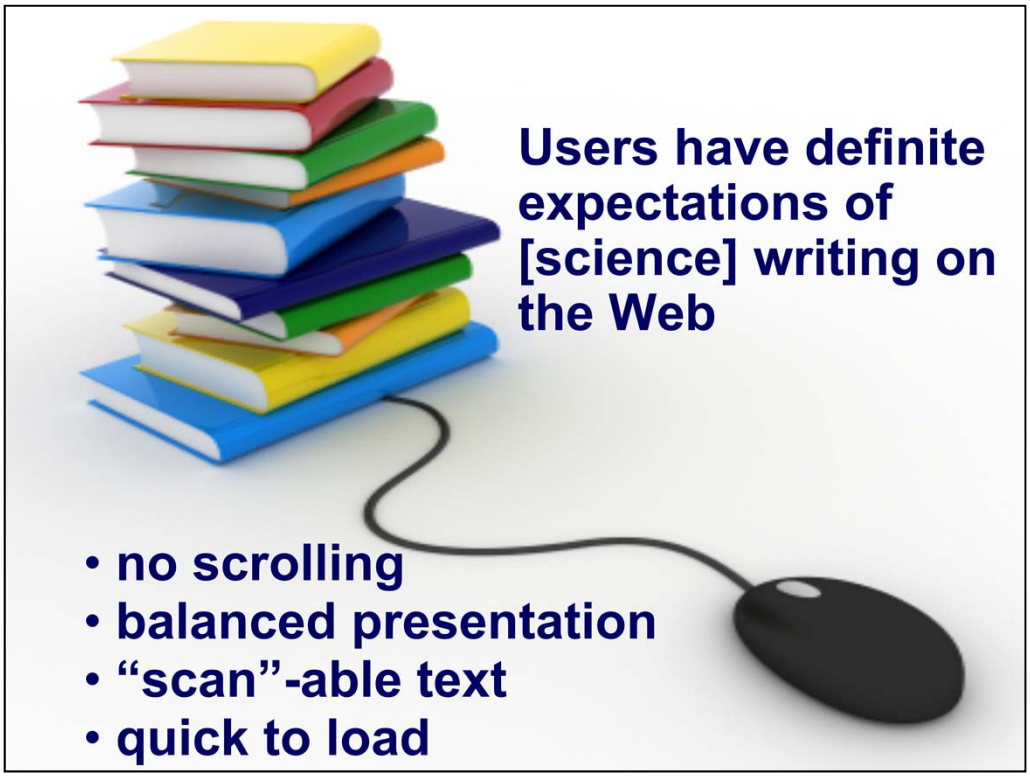
Writing for the Web

Celia M. Elliott
Department of Physics • University of Illinois
cmelliot@illinois.edu

Today, we'll talk about science writing for a non-expert audience in general and writing about science for the Web in particular.

While many of the principles are the same (tailor your message for your audience, use persuasion), writing for online dissemination has particular challenges, compared with writing for print. We'll talk about them today.

We'll also talk about the journalistic writing style, which is quite different from standard scientific or journal-article style, but which is also a useful tool to have in your writing arsenal. In the course of your career, you will need to use this style when interacting with the news media, with the general public, and with funding agencies.



Writing for the Web differs from standard expository writing for journal articles. People have different expectations and different reading styles.

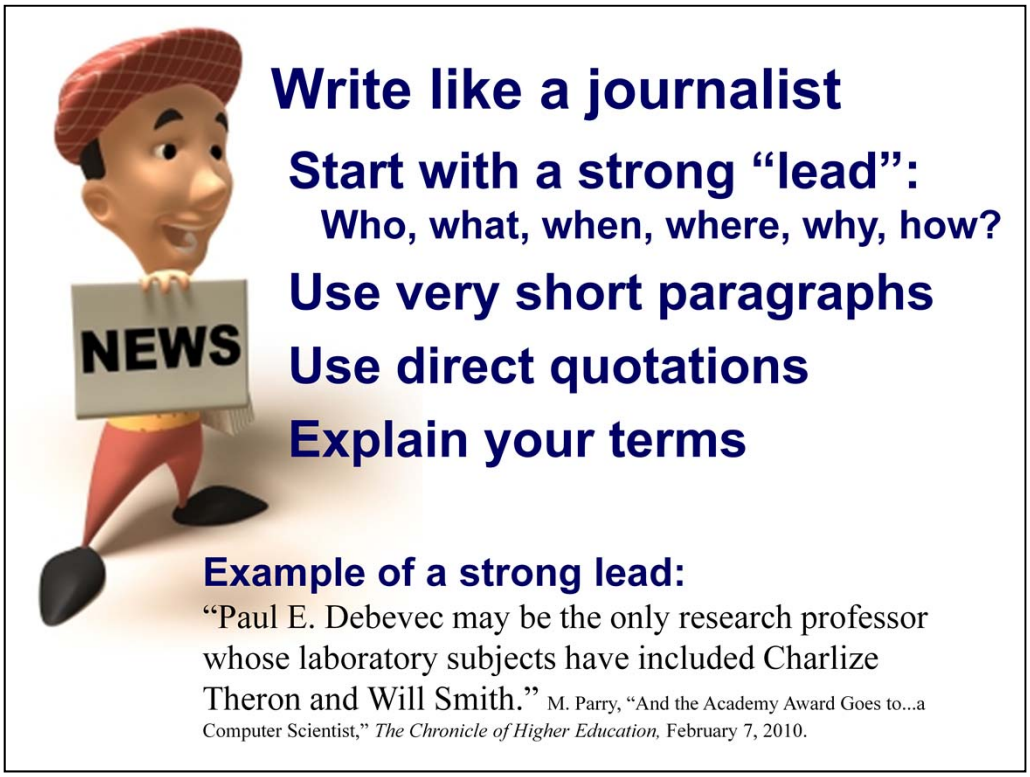
Assume people are going to read through the text one time, beginning to end; they seldom scroll back up to check something they didn’t quite understand the first time through.

Information should be perceived to be trustworthy. References are provided, and hyperlinks go to credible sources. The author of the article should be identified and contact information provided. I also think it is good practice to include the date the article was published, so readers know if they’re looking at information that is current or has been hanging around in cyberspace since 1993.

Tone is straightforward, and treatment is balanced; readers dislike and distrust hyperbole.

Text must be “scannable” so readers can ***immediately*** pick out words of interest.

Graphics must be visually interesting but quick to load (particularly with the number of people that read the Internet through mobile devices).



As in any written work, knowing your audience is essential. Ask yourself:

What will they find interesting or engaging?
What do they already know?
What do I need to explain so that they can understand the significance of the story?
What words are they familiar with?

Start your story with a strong "lead"—an interesting fact or analogy that will grab the reader's attention.

More examples of strong leads:

"Not all bubbles are round. In fact, a new laser-based technique has been developed to make square bubbles, donut bubbles, and V-shaped bubbles." "Bubbles Break Spherical Mold," *Physical Review Focus*, 19 January 2010; http://focus.aps.org/story/v25/st2.

"Two scientists believe they've solved a mystery that's defied explanation for more than 400 years. The phenomenon known as milky seas, once thought to be folklore, may be real." *ScienceDaily*, July 2, 2006; http://www.sciencedaily.com/videos/2006/0707-uncovering_the_mysteries_of_the_seas.htm. (Also has a very cool video...)

Use direct quotations. (N.B. Direct quotations are ***never*** used in journal articles.)

Explain your terms; minimal jargon.

Stories that interest people (think “sell newspapers”) incorporate one or more of the following elements:

Impact—will this discovery affect people’s lives? other work?

Timeliness—is the work new?

Prominence—does the story involve a well-known person or field?

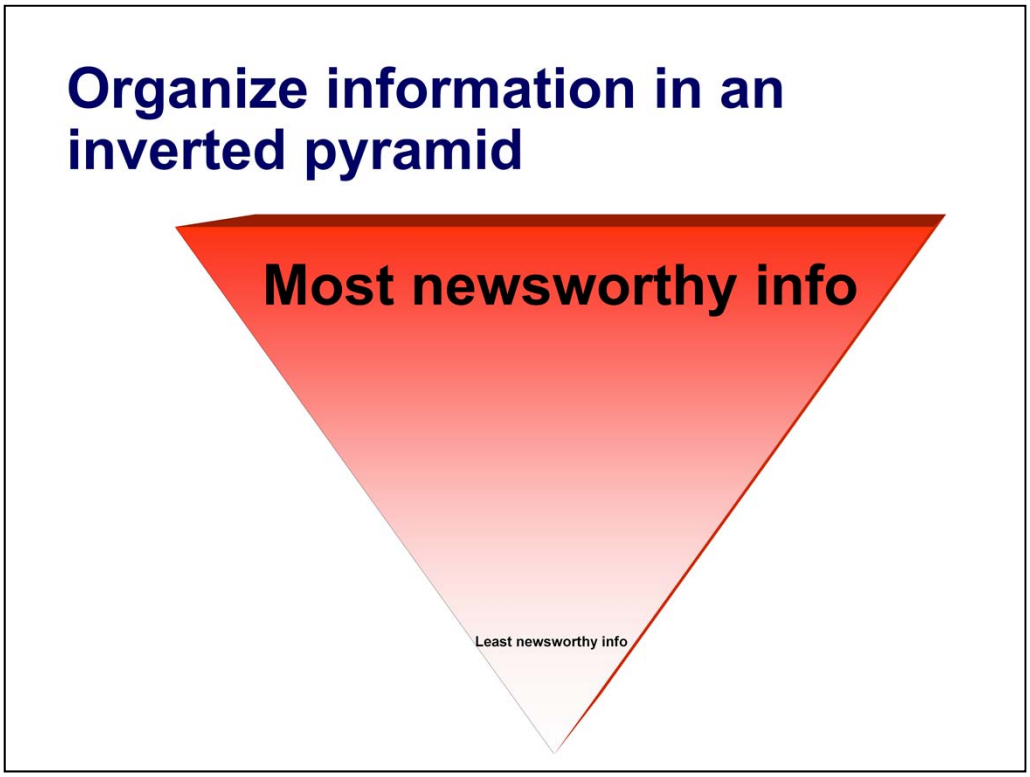
Proximity—will local people care?

Conflict—are the results controversial? do they upset previous beliefs?

Weirdness—are the results unexpected or strange?

Currency—is the report related to some general topic that people are already talking about?

Use one of these elements to set the overall direction of your story.



Present the most important and interesting information (the "lead") in the first sentence of the first paragraph.

Add additional details in subsequent (short) paragraphs.

The inverted pyramid style comes from newspaper reporting, where an editor might have to chop off the last paragraphs of a story to get it to fit on the page.

Assume not everyone (anyone?) will read every word, down to the last period. Can the reader get the basics of your story from the first three paragraphs?

People want to find information on the Web ***immediately***. If they cannot find something interesting and meaningful in <15 s, they'll move on to the next Google link.

Limit text to one "main idea" per paragraph, and make it the first sentence.

Keep paragraphs short (two or three sentences). Restrict to half the words (or fewer) compared with conventional writing.

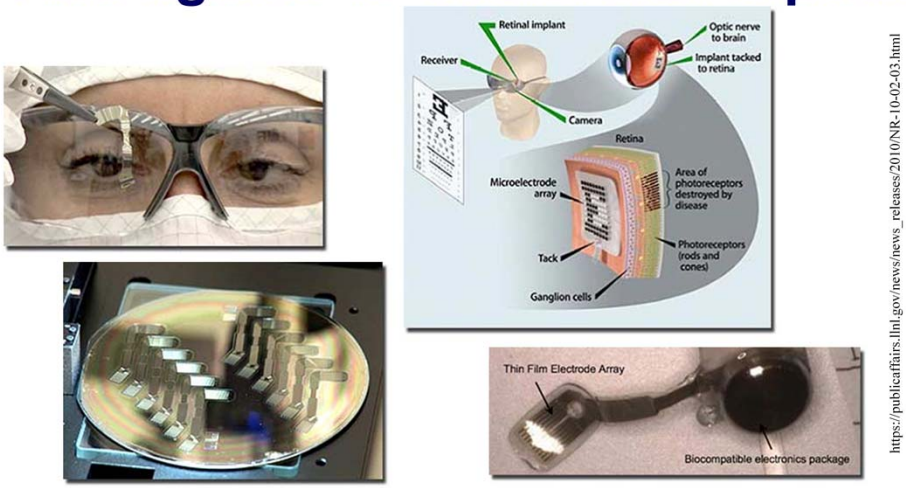
Break up the text with call-out boxes and content-rich (not cute) subheadings—make it scannable.

Use typeface variations, columns, and short paragraphs to break up text into scannable chunks.

Highlight key words to make them visible (bold, italic), but ***don't*** underline text to highlight it. Readers expect underlined words to be hyperlinks..

Underline hypertext links. Don't indicate links with color alone (not accessible).

Add figures to attract and explain



Tip: Different types of figures best convey different types of information; chose the style that presents the most information in the clearest way.

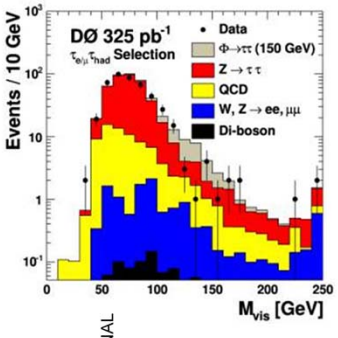
"Graphic excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least ink in the smallest place."—Edward Tufte

Drawings—details, motions, function, cross or cutaway sections.
Diagrams and schematics—processes, symbolic representations, successive steps in time.
Charts/plots—numerical data, comparisons, trends, relationships among variables.
Photographs—actual views of objects; give sense of realism.

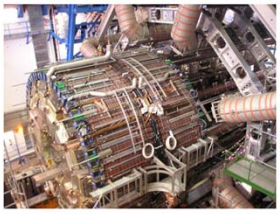
Important to provide a scale for photos and drawings—will your reader know how big something is by looking at it (2 mm or 2 m or 20 m)?

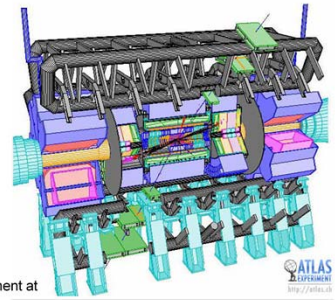
These images all tell the story of the U.S. DOE's artificial retina project. The image at the top left shows a scientist holding a thin-film artificial retina array; it gives an idea of the scale of the device and reinforces what it is used for by positioning the device in front of the woman's eye. The image at the top right provides a schematic overview of how the device works. The image at the bottom left shows one of the artificial retina wafer, which holds a dozen thin-film arrays. The image at the bottom right shows the artificial retina implant including the array and its implantable electronics package. "Lab plays key role in Department of Energy's artificial retina project," Lawrence Livermore National Laboratory, https://publicaffairs.llnl.gov/news/news_releases/2010/NR-10-02-03.html.

Which is the best graphic depict the search for the Higgs boson?

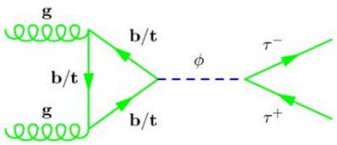


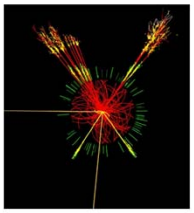
Images courtesy DØ, FNAL





Images courtesy The ATLAS Experiment at CERN, http://atlas.ch





ANSWER: It depends on the story you're trying to tell, what your reader will understand, and what will attract his or her interest.

Critique your figures

Grabs the viewer's attention in <2 s

Overall "message" is understood in <15 s

Caption points out important features

General message is clear to a non-specialist

Is logical, e.g., a flow chart has clear "start" and "stop" points

Conveys something the viewer wants to see or needs to know; no "eye candy"

"Stands alone," i.e., is understandable without reading the text

Tip: Give yourself 1 pt for each "yes"; if <5 pts, get rid of the figure.

An interesting visual image will capture a reader's attention, but the information gets transferred primarily by the caption and any labels. Use them to point out important features and explain what the reader is seeing.

Supplement your story with hyperlinked information

Read more about the LHC

Tip: Have hyperlinks open in a new window so the reader can easily get back to your page.

Add additional details, definitions, references to related work with hyperlinks, not additional text.

Hyperlink to versions of the material at different levels of detail (a press release for a general audience, the journal paper that reported the work, a talk on the subject, higher-resolution graphics).

Make it easy for the viewer to recognize a hyperlink (underline, meta tag).

Use descriptive hyperlinks; avoid generic “click here” or “read more.”

Quality of linked material is more important than quantity; don’t waste a reader’s time.

Increase your credibility and the value of your message

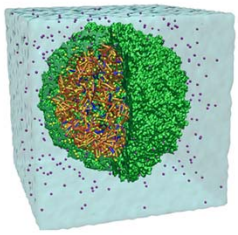
Tip: Be factual and balanced; readers detest hyperbole.

Factual, precise writing—avoid bragging and "marketese." Users detest promotional writing style with boastful, subjective claims; users want the straight facts, no exaggeration. ("Urbana mom earns $7784/wk in her spare time")

Visually interesting, informative graphics.

Use of external hypertext links—links to other high-quality sites show that you can be trusted—you've done your homework and you're not afraid of comparisons with other sites.

First Atom-by-Atom Simulation of a Complete Life Form



Computer simulation of the motion of individual atoms comprising a satellite tobacco mosaic virus in an aqueous solution.
Courtesy Theoretical and Computational Biophysics Group, University of Illinois at Urbana-Champaign

The computing horsepower of one of the world's most powerful supercomputers has been harnessed by Swanlund Professor of Physics Klaus Schulten and his research group to visualize the behavior of a complete life form, the satellite tobacco mosaic virus. "This is just a first glimpse of a moving virus," Schulten said, "but it looks gorgeous."

According to the researchers, their simulation is the first to capture an entire biological organism in atom-by-atom detail. It was carried out at the National Center for Supercomputing Applications at the University of Illinois.

A better understanding of viral structures and mechanisms is an essential step in allowing scientists to develop improved methods of combatting viral infections in plants, animals, and eventually humans.

The researchers visualized the dynamic atomic structure of the virus in a saline solution by calculating, in femtosecond time steps, how each of its »1 million atoms moved. Even though the supercomputer's 500 processors worked in parallel on the problem, the simulation took about 50 days to generate 50 ns of virus activity. "Such a task would take a desktop computer around 35 years," according to Schulten.

This work was funded by the National Science Foundation. and the National Institutes of Health. Conclusions presented are those of the authors and not necessarily those of the funding agencies. Author: Celia M. Elliott, cmelliot@illinois.edu, 6/01/2006.

This example illustrates the use of a strong lead, direct quotations, short paragraphs, and hyperlinks.

Emulate good examples

Physical Review Focus
http://focus.aps.org/

Physics News Update
http://www.aip.org/pnu/

***New York Times* "Science" section**
http://www.nytimes.com/pages/science/index.html

UI News Bureau
http://news.illinois.edu/