Engaging in science communication is crucial, but it the pitfalls it presents can be intimidating. In May 2013, the Astrobites organization at Harvard organized a conference called ComSciCon, which brought together graduate students from all over the country to learn the tricks of the trade from expert science communicators. Here are some tips culled from the conference's seven panel sessions.

1. Sharing science with scientists
2. The world of non-academic publishing
3. Engaging non-scientific audiences
4. Science writing for a cause
5. Interacting with the media
6. Communicating with multimedia & the web
7. Communicating science through fiction
1. Sharing Science with Scientists

Panelists:

Thalia Rubio, lecturer in the MIT Writing and Communication Center

Bethany Halford, senior editor at Chemical & Engineering News, the weekly magazine of the American Chemical Society

Alyssa Goodman, professor of Astronomy at Harvard University, Research Associate of the Smithsonian Institution

Points to keep in mind:

Communication within science should be similar to public communication. Even research papers are better when they emphasize stories, use clear language, etc.

Papers are not the only way to share ideas with other scientists. Many fields have a variety of trade publications other than conventional academic journals, such as American Chemical Society’s weekly newsletter.

Scientists frame research differently from the public. Scientists often focus on placing work in the broader context of the field, whereas public audiences want to hear what new thing you’re contributing.

Practical tips:

- Counter pressure to conform on form by providing great substance. You may experience pushback against more accessible academic writing. You can get away with more if you have great content. You may need to produce good results/progress to gain credibility and gratitude before you try some departures from norms.

A few ideas to make math-heavy papers readable:

- Keep the text unbelievably clear.
- Keep some of the text very conceptual, leaving the math to a few more mathematical sections.
- Put the detailed math in an appendix.
- Turn the math into a story by adding introduction/conclusion bookends around it.
- Break down equations into the relationships they express in words. For every equation, give an explanation that abstracts away from the details.

When giving a talk:

- Find a friend in the audience and pretend to converse with them. You’ll sound more personal and natural.
- Aim talks at an intelligent grad student.
- Your audience may not give you clear feedback on their understanding, especially in some ESL audiences, where the culture may dictate a polite appearance of apprehension. You may need to resort to non-overt questions to gauge understanding.
2. The World of Non-Academic Publishing

Panelists:

Marcia Bartusiak, executive director of MIT Graduate Program in Science Writing

Eugenie Samuel Reich, Cambridge-based science writer at Slate, The Boston Globe, New Scientist, among others

Daniel Engber, science writer at Slate, New York Times Magazine, Wired, among others

Points to keep in mind:

There are multiple ways to get into the world of non-academic writing/publishing.

One way is to enroll in a formal program like MIT’s Graduate Program in Science Writing. The advantages of taking the formal path are access to networks and contacts, and opportunities for jobs and internships.

The other way is more independent – the proactive, do-it-yourself method. As some of the panelists proved, writing and submitting articles and finding internships and jobs on your own can get you equally far in the world of non-academic publishing.

Practical Tips:

Go beyond transmitting information: include meaning, emotion, and narrative.

- Engage and critically analyze the science.
- Don’t be afraid to give your opinion; as a graduate student/scientist, there is value in your “expert” perspective.

In a pitch to an editor (before writing an article), include the following:

- A paragraph of introduction describing your experience and credentials.
- A paragraph summarizing the point of the piece, perhaps with a sample introduction.
3. Engaging Non-Scientific Audiences

Panelists:
Emily Lakdawalla, senior editor and blogger for The Planetary Society
Courtney Humphries, freelance journalist and author specializing in science, health, and nature

Points to keep in mind:
Not much portfolio is needed to transition from academic research to science writing.
Science is often seen as passionless. Hook people with passion!

Practical tips for scientists:
- Science communication is not just about explaining science accessibly. A good feature has controversies, background, personal stories, politics, etc. In addition to simplifying the scientific component, enrich the human component to make people care.
- Don’t overexplain. Don’t underestimate the intelligence of your reader.
- Don’t overestimate the complexity of your topic. Usually, the big ideas can be explained in under 10 minutes.
- Use unscientific questions as a springboard to discuss real science. If someone asks a question from a non-scientific perspective, acknowledge where they’re coming from, but “bridge” (as politicians do) into the science.
- Put research in the context of the broader field, or at least provide contacts who can. Reporting often parrots press releases, which naturally try to put the best foot of their institutions forward, leading to inflated accounts of certainty or promise.

General practical tips for science writing:
- Put the science in its social/big-picture context first.
- Simplify not only jargon, but syntax, especially for ESL readers. When possible, stick to subject-verb-object form.
- Target a specific audience. If you have a mixed audience, try picking a primary one but providing something for everyone.
- For widely covered stories, find a small piece that not many others will focus on.

Always answer the “why should I care” question. NASA grant reviewers say even grant proposals don’t sufficiently explain their big-picture purpose.
- Use common hooks: audience self-interest, medical significance, the “wow” factor, and current hot topics.
- Turn your content into a story. It helps people care, and clarifies the important points in your mind.

Don’t dismiss stories you think people won’t want to hear. A few ways to cover them:
- For a null result, tell a scientist-as-a-tragic-hero story.
- Take an empathetic, personal angle rather than focusing on the research itself.
- Find a surprising or unintuitive angle – people like to be surprised.
- Put it on a blog or Twitter instead of a mainstream outlet.

Beware of scientists talking to you like you’re an expert. If you’re trying to get good quotes from a scientist and you know the field:
- Act like you don’t know the field.
- Remind them to speak not to you, but to the audience.
- Don’t use many quotes from them.
4. Science writing for a cause

Panelists:

Michael D. Lemonick, senior writer at Climate Central

Amanda R. Martinez, science writer for The Atlantic, Scientific American, Seed magazine, among other publications


Practical tips:

- Offer a sophisticated argument that allows reader to make their own judgment.
- Include drama, excitement, and beauty in the science.
- Use strong narrative.
- Give the audience something to relate to.

Points to keep in mind:

The values of science are not necessarily the same as the values of journalism. Journalism values the new, while science first and foremost values the accurate. Considering the slow-moving pace of scientific research, the new in science is often not yet accurate science, and only becomes the accurate through longer periods of time.

The intersection between science and advocacy is often challenging to the scientist. There is greater difficulty in being considered a trustworthy source to journalists if you are an advocate with your science.
5. Interacting with the Media

Panelists:


Richard Eckel, senior director of Communications at Microsoft


Points to keep in mind:

Differing expectations have led many scientists to feel burned by interactions with reporters. Journalistic style differs from scientific writing. A journalist can’t cite all collaborators, but will talk about personality and appearance.

Science journalism is mainly driven by news releases, journal articles, and conferences – little gets written about the scientific process. This perpetuates the view of science as a series of discovery events, rather than a process of understanding. Sometimes magazines or other long-form venues can include process.

The number of dedicated science journalists is declining. So your press release should make sense to a reporter who typically covers sports. This shift may not be entirely bad as it leads to more scientists becoming more involved.

Journalists are always interested to hear how you got into something. It makes their storytelling job easier.

Practical tips:

• Don’t worry about your persona. For a scientist to get press coverage, articulateness, passion, and good storytelling matter more than being a colorful character.

• Write in an “inverted pyramid” structure. Put your most important conclusions first.

• Be clear about your objectives before sitting down with any journalist.

• Focus on “why” questions. What/when/etc. should be in service of the “why.”

• “Owned” is easier than “earned.” It’s easier to get into media outlets you control (e.g., blogs and YouTube channels) than outlets that need to be convinced to include your content (e.g., newspapers and magazines).

To get your work in front of a reporter:

• Get to know your institution’s PIO (Press and Information Officer).

• Create an online presence by publishing content online. Some reporters actually go out looking for stories or for people to talk to about a topic.
6. Communicating with Multimedia & the Web

Panelists:

Robert A. Lue, Department of Molecular and Cellular Biology, Harvard University

Richard L. Menschel, faculty director of the Derek Bok Center for Teaching and Learning, Harvard University

Thomas Levenson, director of MIT Graduate Program in Science Writing

Kelle Cruz, Physics and Astronomy Department, Hunter College. Research associate of American Museum of Natural History

Points to keep in mind:

No matter the medium, always think in terms of a story. Always use storytelling elements in your product.

Kelle Cruz’s AstroBetter blog offers a practical Blogging opportunity. Follow along if you are also interested in branching off to start an analogous “Chemistry-Better,” “Ecology-Better,” etc.

Practical Tips:

When designing animations, think about:

- The animation’s goal.

- The difference between representation and high-accuracy simulation. Which you favor depends on your goal.

- The framework. Pay attention to the animation’s structure and the path through which you’d like to lead your audience. Cognitively, we retain information better when there is a clear path to follow and future steps to expect (without removing all elements of surprise).
7. Communicating Science through Fiction

Panelists:

- Alan Brody, professor of Theater, MIT
- Joe Haldeman, science fiction writer
- Sneha Veeragoudar Harrell, learning scientist and educational technology consultant. Serves on the Social Sciences Advisory Board for the National Center for Women in Information Technology

Points to keep in mind:

Fiction uses science dramatically, not to communicate scientific information per se. Science serves to further the action and inform the characters’ emotional and intellectual lives.

For playwrights, science is the new religion. Like religion, science tells us why things are how they are, which drives many plays.

Constructing imaginative works can be a vehicle for STEM learning. Building stories and technological artifacts in a virtual world can engage students otherwise turned off to STEM topics.

Practical tips:

- Socialize with fiction creators. Scientists can be of use to creators mainly by talking with them. Aim only to fertilize; you can’t plan what’ll come out.

- Include all the details, then rewrite and cut extensively to get the right balance of science and plot movement.

- Don’t stand for pseudo-collaboration. Neither artist nor scientist should try to make the other a servant to their ideas.