

# Communicating Science in 21st-Century Contexts: Some Highlights of the 2017 AAAS Annual Meeting

**Christina B Sumners, Leah Poffenberger, and Barbara Gastel**

The 2017 annual meeting of the American Association for the Advancement of Science (AAAS), held 16–20 February in Boston, Massachusetts, included many sessions that addressed, at least in part, communicating science. The following are highlights of sessions that may especially interest science editors and those in related realms.

## Communicating Science Seminar Christina B Sumners

The 2017 AAAS meeting included a 3-part seminar on communicating science.

### Who's Your Audience?

For the session “Who's Your Audience?”, moderated by Bruce Lewenstein of Cornell University, speakers shared their experiences communicating science to diverse audiences. Kishore Hari of the University of California, San Francisco, suggested sitting down with stakeholders and really listening to them—and then being prepared to act on what you learn. He said science engagement often involves taking two usually separate communities—perhaps scientists and leaders of a Native American nation—and having them interact, leading to deeper connections. Still, it all begins with listening to each other.

Kirstin Dow of the University of South Carolina works on climate change with the National Oceanic and Atmospheric Administration (NOAA) Regional Integrated Sciences and



Assessments (RISA) Program. To her, one problem with communicating science is that scientists and policy makers often talk past each other. Science has to “match” the decision that needs to be made to give policy makers the information they need.

Matt Leighninger, a vice president at Public Agenda, pointed out that in modern Western culture people have little time but considerable resources (such as education, information, and access to each other and to community leaders) available to them when they do make it to the table. Because they have so much information at their fingertips, “people are simply not going to defer to expertise,” he said. Leighninger broke down engagement into “thick” (mapping webs of connections in the community) and “thin,” which is much more superficial. Although thin engagement certainly has its place, Leighninger suggested that thick engagement is far more powerful—and the best form of recruitment is when someone you know and trust asks you to do something or attend an event.

At the end of the session, Lewenstein pointed out that all of the presenters told stories to convey their messages, and suggested science communicators do the same in order to be successful.

## Scientist Motivations, Support, and Challenges for Public Engagement

In this session about public engagement, Ezra Markowitz of the University of Massachusetts, Amherst, spoke about how the engagement environment matters. By *environment*, he meant both the institutional infrastructure (support, norms, and expectations) and structural disincentives (for example,

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the perception that one's career might suffer if one pursues science engagement). His suggestions? The academic and scientific communities need to normalize engagement and protect those who do choose to engage. Markowitz said it's also important to celebrate the impact when engagement activities succeed.

Tracey Holloway of the Center for Sustainability and the Global Environment at the University of Wisconsin–Madison observed that public engagement can actually benefit the research itself, with two-way dialogue potentially leading to new research directions. If scientists do go this route, though, users must be engaged at the beginning, middle, and end (so they do not feel as if they are left hanging). “It is absolutely not enough to publish a journal article and hope that they read it,” she said. Instead, scientists need to recognize that the deliverables different audiences need—whether a booklet, a video, or a presentation—can work hand-in-hand with the peer-reviewed journal article. “Look for the win-win,” she advised.

Sriram Sundararajan of Iowa State University spoke about how broader-impacts work—an important section of National Science Foundation grant proposals—is built into the structure of his institution to help faculty members “develop their broader-impacts identity.” When writing such statements, he commented, “don't say you're talking to the public, but say you're talking *with* the public.”

### **The Online Scientist: Social Media and Public Engagement**

“The Online Scientist: Social Media and Public Engagement” addressed how scientists and professional science communicators can meet strategic communication goals through social media.

Raychelle Burks of St. Edward's University initially became involved in social media because she wanted to network and create social connections. “There were various points in my academic career where I felt incredibly isolated,” she said. “The networks I found online with my peers have given me the strength to be here, and I have reaped a bounty of good.” However, she acknowledged that not everyone is as lucky, and institutions differ on whether public engagement is seen as good or bad when considering faculty for promotion and tenure. Still, she explained, “To me, being online is essential to my career.”

Sara Yeo of the University of Utah said that research shows scientists' own perceptions of self-efficacy determine how likely they are to engage, so training them how to communicate well is very important. “As scientists, we want to talk about all the nuances, but sometimes being reductionist is the best way to communicate,” she said, adding it can take practice to learn how to do so while still sharing the necessary information.

Nsikan Akpan, a producer and reporter for PBS NewsHour, acknowledged that developing “science video is very hard.” Still, he thinks people do want to engage with science via this medium, and the site chosen for video content can be key. It is not necessary to be on every platform: Find one that works and then stick to it. For people trying to figure out if a video would work better on Facebook or YouTube, he offered the following advice: Both sites perform but in different ways. On Facebook, audience retention, especially for a longer video, isn't great. “I tend to think of Facebook as advertising,” he said. It might work to interest people, but videos on that platform are unlikely to drive long-term engagement. YouTube, on the other hand, is better for building a community and stronger for building a brand.

To watch a video of any of the sessions, visit the AAAS 2017 Annual Meeting Communicating Science Seminar web page (<https://www.aaas.org/page/2017-annual-meeting-communicating-science-seminar>).

### **Fake News and Social Media: Impacts on Science Communication and Education** **Leah Poffenberger**

“Fake news” has always existed, but it has recently become a cultural phenomenon. At this session, the panel sought to provide insight into how fake news is propagated, why it has become an issue, and how science communication and education are affected. “There are real effects,” stated moderator Seth Borenstein from the Associated Press.

According to Dan Kahan, a professor at Yale Law School, “we need studies that study fake news directly” to measure its effects. Lacking concrete information on fake news, Kahan presented theoretical models to describe how fake news might be propagated. He believes the most accurate model is the motivated-public model, which involves a culturally motivated public demanding misinformation that matches their viewpoints, which opportunistic misinformers supply.

Kahan described, “culturally toxic memes” (widely circulated self-propagating ideas that fuse positions on politically charged issues to individual identities) as increasing polarization among motivated public groups. Kahan worries that Donald Trump's often misinformed tweets on topics such as childhood vaccinations and comments accusing illegal immigrants of spreading Zika virus make Trump a “toxic-meme propagator of unparalleled influence.” Science communication is in danger of being polluted when noncontroversial science is “pulled across the polarizing line” in the current political climate, Kahan commented.

Dominique Brossard, a communication professor at the University of Wisconsin, Madison, said “fake news about science has always existed,” but social media have allowed it to spread much faster. *Narrowcasting*, or the ability to quickly

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share “iffy” news, allows fake news, or just bad science reporting, to spread. However, Brossard observed, “social media isn’t the issue—human psychology is the issue.” Social media just make it easier for users to “cherry-pick” information that supports a viewpoint they already hold.

To combat fake science news or just simply incorrect science information, Brossard suggested higher-quality coverage of peer-reviewed research and more training of scientists to communicate science with the public. Brossard cautioned, “Let’s make sure not to oversimplify the science-media environment by dichotomizing. It’s not [scientists] versus [the public].”

Julie Cairo from the University of Rhode Island shared data from five studies demonstrating the challenges students face when analyzing online information. “Eighty percent of middle schoolers believed ads were real news,” Cairo said, “and 30% to 70% of college students could not differentiate between mainstream and fringe sources.” Cairo offered the following four ways to enhance students’ abilities to critically evaluate what they see on the internet.

First, educators should discuss multiple dimensions of critical evaluation, such as analyzing content for relevance and accuracy and examining sources for reliability and perspective. Second, students should be encouraged to use multiple quality indicators to evaluate information, applying the SCAM framework: identify sources, claims, and arguments, and then make a decision. Third, realize the validity of differing perspectives. “Something can be biased without being bogus,” she remarked. Lastly, Cairo encouraged, “teach[ing] students to be critical consumers and critical producers of online information.”

## Bringing Scholarly Communication into the 21st Century

### Barbara Gastel

Organized by the Royal Society—which published the first English-language scientific journal, *Philosophical Transactions*, in the 17th century—this session addressed moving beyond the traditional journal model to serve 21st-century scientific communication.

Speaker Wendy Hall, professor of computer science at the University of Southampton, United Kingdom, said the scientific community was “paying publishers three times over” by writing the articles for journals, providing peer review, and then buying the journals. She called for not only making papers openly accessible but also taking full advantage of web capabilities; “It’s all about linking,” she commented. Objecting to the jargon *gold open access* (for items openly accessible in a journal) and *green open access* (for items openly accessible elsewhere, such as in a

repository), she stated, “We just want open and fair.” She also advocated what she termed a micropayment method, with users buying individual papers. In addition, she objected to what she described as domination by metrics: “This is not what it’s all about. It skews what we’re doing.”

Next, Neal Young, senior investigator at the National Heart, Lung, and Blood Institute, spoke largely about “the winner’s curse,” an analogy he used in a 2008 paper in *PLoS Medicine* to show how “current publication practices may distort science.” In that paper, he observed, much as the top bidder at an auction tends to pay more than an item is worth, findings in top journals tend to be those that are most striking, thus providing a distorted view of what researchers overall have found. While noting the paper was “definitely the most popular thing” he had published—gaining thousands of hits online, a cover story in *The Economist*, and coverage on National Public Radio (NPR)—he cautioned the auction image was only an analogy. He indicated an economics approach can aid but not suffice in analyzing the complicated interactions of science and publishing.

The final speaker was Jessica Polka, director of Accelerating Science in Publication in Biology (ASAPbio), an initiative to promote the use of preprints in the life sciences. Characterizing preprints as a system complementary to journals, she likened posting a preprint to presenting at a conference, thereby allowing feedback before journal submission. She said the use of preprints (which has long been common in physics) is gaining popularity in biology; some funders accept preprints as documentation of research, and some journal editors read preprints and then invite authors to submit. She also noted some universities consider preprints when recruiting candidates and when evaluating individuals for advancement. Regarding the fear that a preprint culture would result in a deluge of poor papers, Polka offered a solution: the use of technological tools to highlight good ones. Similarly, addressing the concern that releasing preprints would let others scoop one’s work, she believed the visibility of preprints would be a deterrent. A problem, she said, was that multiple preprint sources exist in biology, and she called for community-governed policies for aggregating preprints.

In concluding the open discussion that followed, moderator Philip Campbell, editor in chief of *Nature*, posed the following question: Would you be willing to decrease funding for science to support the items proposed for scientific communication? A respondent noted costs would actually be saved and so funding for science could increase.

The next AAAS annual meeting (meetings.aaas.org/) will take place 15–19 February 2018 in Austin, Texas.