The 2013 American Association for the Advancement of Science Annual Meeting: Some Visual and Verbal Highlights for Science Editors

Mary Beth Schaefer, Christina Wilcox, Jessica Scarfuto, Kathryn Saucier, and Barbara Gastel

Titled “The Beauty and Benefits of Science”, the 2013 American Association for the Advancement of Science (AAAS) annual meeting, held 14–18 February in Boston, contained much of visual and other interest. Attendees viewed a wide array of images in sessions and in the corridors and even listened to music in addition to hearing about advances and issues in many fields of science. The following are some highlights of potential appeal to science editors.

The Beauty and Utility of Scientific Images

Mary Beth Schaefer

They say that a picture is worth 1000 words—but what if a picture were to invoke a much greater response? Photographs, illustrations, and models can inspire innovative scientific research. They can even ignite or fuel global movements, according to presenters at the symposium “The Beauty and Utility of Scientific Images”.

Moderator Kartik Sheth, of the National Radio Astronomy Observatory, gave the example of astronaut William Anders’s photo “Earthrise”, thought to have prompted the modern environmental movement. Sheth also mentioned Life magazine’s 1965 photo essay “Drama of Life Before Birth”, by Lennart Nilsson. Both anti-abortion and pro-choice organizations have used images from this photo spread.

Stefi Baum, of the Rochester Institute of Technology, described the history and implications of astronomical images. Drawings and photographs of space enabled by telescopes and satellites have caused humans to repeatedly redefine “our place in the universe”. Baum’s favorite image, “Pale Blue Dot”, is a photograph of Earth taken from 4 billion miles away.

Harvard Medical School’s Tom Kirchhausen studies a self-assembling cellular protein, called clathrin, which forms basket-like vesicles to help to transport molecules between cells. Kirchhausen used high-resolution molecular snapshots, microscopic movies, and simulations to demonstrate this basket-making process.

David Yousem, of Johns Hopkins Medicine, encouraged attendees to consider the brain as a work of art. He showed images of art pieces representing the brain. Yousem also conveyed the art and beauty of brain scans.

The University of Arizona’s Alfred McEwen took the discussion back to outer space. He focused on the imaging of planetary surfaces, which has evolved greatly...
over the last 50 years. He took the audience through a tour of our solar system, from the Disney crater on Mercury to the polar caps of Triton, Neptune’s largest moon. McEwen also shared images of comets and near-Earth asteroids to underscore the beauty of extra-terrestrial planetary surfaces.

Claudia Ford’s research was inspired by an image quite different than those showcased by the other presenters. Ford, of Antioch University New England, described how the image of a model could serve as a metaphor for complex systems. The model of the ecological resilience adaptive cycle, shaped like the numeral 8 turned on its side, has inspired research in multiple disciplines.

An image can make us understand, wonder, and question. The presenters of this symposium illustrated how we can draw inspiration from an abstract model, the starriest corners of space, or deep inside ourselves.

Artful Science
Christina Wilcox

Two worlds—art and science—have collided to produce advances in both. Speakers at the session “Artful Science” presented examples of this productive convergence and discussed implications.

Maura Flannery, of St John’s University, discussed how art and science have long converged in herbaria, which she defined as collections of pressed plants. Botanists, she noted, use herbaria to categorize and identify plant species. Flannery explained how Mark Catesby, an English naturalist, recorded plant species by producing illustrations and herbaria. Works of art, such as Catesby’s illustrations, are essential for preserving the discoveries of science, Flannery said.

Robert J Krawczyk, of the Illinois Institute of Technology, described how he uses mathematical equations to create unorthodox artwork in the form of graphs. In his art, sweeping red lines intertwine, loop, swirl, and fill the screen—tricking our eyes into perceiving a three-dimensional image.

Jo Ellis-Monaghan, of Saint Michael’s College, said that she uses mathematical modeling to reconstruct seashells in the hope of learning why seashells have evolved to form their beautiful shapes. She stated that mathematical models are a creative language: equations in the models can be used to recreate a physical reality.

George W Hart, an independent sculptor, uses a repeating geometric pattern called a hyperbolic tessellation to construct a variety of artworks. From an artificially enhanced sand dollar to massive comets suspended in a museum, Hart has wedded art and science.

The line between art and science is becoming blurred, said moderator John R Jungck, of Beloit College. He argued that in the education system, the artistic side must receive attention in addition to the scientific. Accordingly, in his classroom, art students and biology students work together in teams. Research in science is changing, so we need a new kind of education, Jungck concluded.

Writing About Science for the Public
Jessica Scarfuto

How do you explain psychology and neuroscience to a class of 700 undergraduate students? Sound like a challenge? Daniel Levitin, of McGill University, faced this challenge when he began teaching.

Levitin quickly recognized that the things that he had learned in years of research were not as obvious to his students as he had assumed. He had to find another way to connect with them. Levitin turned to music as an extended analogy to brain science . . . and it worked. His analogy was so successful that Levitin was later asked to extend it into a book, which he titled This Is Your Brain on Music.

Levitin’s talk and others in the session “Writing About Science for the Public” focused on one central theme: Science belongs in the public interest. Speakers agreed that whether they like it or not, it is scientists’ responsibility to communicate with the public. However, although the speakers agreed on the need to communicate science to the public, their reasons for and methods of doing so differed. Levitin said that it is taxpayers’ right to know how their money is being spent. Lisa Randall, of Harvard University, said that people should have the opportunity to learn and understand what they want to. Michael Gazzaniga, of the University of California, Santa Barbara, addressed the importance of finding common ground when talking about topics, such as cloning and stem-cell research, that pose ethical issues.

The last speaker was television comedy writer Eric Kaplan (contributing writer for Futurama, The Simpsons, and Zombie College and a co-executive producer of The Big Bang Theory). Kaplan discussed the use of logic and paradox in making science understandable and approachable for all. Introducing Kaplan, Levitin noted that by integrating real-life elements—such as petty jealousies, insecurities, and romantic relationships—with concepts about the multi-universe theory and particle physics, “The Big Bang Theory brings science to more people each week than all of the rest of us combined.”

The session concluded with a discussion facilitated by Livingston Taylor, of the Berklee College of Music, who engaged animatedly with the audience about the importance of being a successful performer. The standing-room-only lecture hall hung on to his every word about loving and connecting with your audience—and applauded enthusiastically when he ended the session with a song played on his guitar.

Wild Weather, Climate Change, and Media: Communicating Science, Uncertainty, and Impact
Kathryn Saucier

Hurricane Sandy may have dissipated in late October 2012, but she took center stage in this session, which focused on communicating extreme weather events in an era of climate change. Speakers included
Chris Field, director of the Department of Global Ecology of the Carnegie Institution for Science; Andrew Freedman, senior science writer for Climate Central; and Seth Borenstein, science writer with the Associated Press.

Moderator Cristine Russell, of Harvard University, began the session by saying that the speakers would focus on the extreme weather phenomenon of Hurricane Sandy. Suspecting that the audience was varied, Russell asked members to identify themselves as communicators, scientists, members of the public, or government representatives. All groups were present in force.

Field said that because of their increased vulnerability, developing nations are more severely affected by extreme climatic events than other countries are. “In vulnerable communities”, he stated, “even nonextreme events can have extreme impacts.” Need exists, he said, to communicate the interconnectedness of adaptation, disaster risk management, and sustainable development.

Freedman noted that Sandy “brought climate impact and risk into the conversation as never before”. Now, he observed, the public seems to be attributing more to climate change than scientists are. “The public is making conclusions,” he said. His message to journalists was simple: Don’t cry wolf with every extreme event, and ask informed questions.

Borenstein identified differences between mass media and science and then provided tips for connecting the two. To communicate to the public, Borenstein recommended using analogies. He also said that journalists should explain what they know and let the public make up their minds.


Barbara Gastel

“Edit!” exclaimed Felice Frankel as the word appeared in large type on the screen. “In fact, I shall repeat it,” she said, citing as her main take-home point the need to edit visual depictions.

Self-described “science photographic journalist” Frankel, of the Massachusetts Institute of Technology, delivered her lecture remotely, by Skype, because a bout of sciatica had immobilized her. Nevertheless, “More Than Pretty Pictures: How the Process of Making Science Images and Graphics Clarifies Understanding” seemed to engage the audience well. Frankel—whose images have appeared on covers of many periodicals, including Science Editor—organized her lecture around three main themes: “Make me look,” “Make me understand,” and “Collaborate.” She noted the need to remember that representations are representations, not the objects themselves. She also emphasized the point that developing and refining representations can yield insight.

Regarding “Make me look,” Frankel discussed the ability of images to engage viewers and lead them to ask questions. She showed how choices, such as lighting and background, can influence effectiveness. She also discussed deciding which enhancements are permissible.

With regard to “Make me understand,” Frankel said to simplify as much as possible. To illustrate, she showed a colored image that communicated more effectively when put in black and white. Frankel also projected before-and-after versions of other images revised to convey the intended points more clearly. In addition, she noted the power of visual metaphors, such as using a jar containing mainly black jellybeans to show that the universe consists almost entirely of dark energy and dark matter.

Finally, with regard to “Collaborate,” Frankel encouraged having scientists work with others to create representations. She mentioned a program in which graphics students and science students worked together.

In closing, moderator Sharon Dunwoody, of the University of Wisconsin, observed that viewing Frankel by video alongside her slides had proved quite effective—perhaps some inadvertent visual editing.

Other sessions with content of science-editorial interest included those on scientists’ understanding of the public, on Rachel Carson’s legacy, and on producing and marketing printed and electronic field guides. Audio recordings of many sessions can be ordered at www.dcprovidersonline.com/aaas/event_id=AAAS101.

The next AAAS annual meeting, titled “Meeting Global Challenges: Discovery and Innovation”, will take place 13–17 February 2014 in Chicago.
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