



Rush D. Holt, Ph.D., took the helm at AAAS in February 2015.

## Rush Holt wants everyone to think like a scientist

We live in a science-centric nation, even if not everyone appreciates it, says AAAS's new CEO

By **Kathy Wren**

**R**ush Holt is, by all accounts, an unfailingly nice guy. He is so considerate of others that during an interview at a restaurant he will interrupt himself to wonder how one of the servers can carry his huge load of dishes. But, Holt also likes to argue and doesn't mind debating about climate change, as he told AAAS staff after becoming the Association's chief executive officer and the executive publisher of the *Science* family of journals.

Science lies at the heart of the paradox between Holt's kindly demeanor and the feistiness required in Congress, where he represented New Jersey's 12th district for 16 years. That's because arguing, Rush Holt-style, is not so much quarreling as it is marshaling the evidence. In fact, the principles of doing science—making evidence-based decisions, keeping an open mind, and inviting others to check your work—are also essential to making sound public policy and good decisions in general, according to Holt.

The physicist, educator, policy-maker, and leader of AAAS speaks often about how thinking like a scientist can help all people become better problem-solvers. Scientific thinkers can separate ideology from evidence, and they are more aware of the mental blind spots that we are prone to, such as a tendency to prioritize short-term benefits, when evaluating possible courses of action.

"I think it's great to study science even if you don't become a scientist," Holt said,

Embracing scientific thinking and encouraging more people to do so will remain a top priority for AAAS, according to Holt. "If you study the American way of thinking over the centuries, we've been a scientific nation even among the people not doing science professionally" and have long celebrated people such as Benjamin Franklin for their scientific and technological accomplishments, Holt said. AAAS must continue to cultivate the public's appreciation and support for science, which is largely "unhealthy" today, he said.

As a congressman, Holt took strong stances on many science- and technology-related issues, including climate change, civil liberties, environmental protection, and support for R&D and science education.

Rep. Bill Foster (D-IL), who is the lone physicist now serving in Congress, said that he and Holt shared a belief in the importance of "a quantitative approach to policy decisions." Foster praised Holt's work on national security and digital privacy issues and said that when parts of the Patriot Act come up for reauthorization in June, "his counsel and voice will be missed by many members of Congress, myself included."

Holt has shifted between academia and politics several times in his career: As a professor at Swarthmore College, he also completed a AAAS Science and Technology Policy Fellowship in the office of U.S. Representative Bob Edgar. He left Swarthmore to lead the Nuclear and Scientific Division of the Office of Strategic Forces at the U.S. Department of State for 2 years and then became the assistant director of the Princeton Plasma Physics Laboratory, where he served for 9 years before becoming a congressman.

This comfort with navigating both worlds developed early in Holt's life. "In the 7th grade, I had my own subscriptions to *Scientific American*, *Science News*, and the *Washington Post*," he said. "Even then I saw no incompatibility between science and politics."

Holt's parents also blazed their own trail to Washington. Rush Holt Sr. served as a U.S. senator from West Virginia and was the youngest person to be popularly elected to the Senate.

"I would run into complete strangers who would tell me how much my father meant to them, how much he had helped them," Holt said. "That's one of the things that made it easy for me to go into politics."

Holt Jr. was 6 years old when his father passed away while serving in the West Virginia House of Delegates. Holt's mother, then a college biology teacher, filled Holt Sr.'s seat for the rest of his term and then became secretary of state and the first woman to hold statewide office in West Virginia. Later, Helen Holt was appointed by President Eisenhower to head a program to improve the country's nursing homes, and she worked for the Federal Housing Administration, later the Department of Housing and Urban Development, until the 1980s. She was reappointed by six U.S. presidents and is active today at age 101.

When his mother, who had a masters degree in zoology, was teaching at a local women's college, Holt would play in the laboratory stockroom after school. With a laugh, he recalled "taking some phosphorous out of the bottle, taking out some mercury and chasing the droplets around the floor, and any number of other things I shouldn't have been doing."

Holt continued, more soberly: "She was also raising three kids as a single mother," after her husband died. "She was more remarkable than I appreciated at the time."

Perhaps an early sign of Holt's willingness to try new things in front of a wide audience was when, as a graduate student at New York University, he tried out for the game show *Jeopardy!* and won five televised contests. Three decades later, while in Congress, Holt accepted an invitation to compete in a *Jeopardy!* match against IBM's computer Watson, in order to highlight the importance of R&D.

With a knack for remembering facts, including that "hipphobia" is a fear of horses, Holt was the only congressional contestant to outscore Watson in his round.

"I really wanted to draw attention to the kind of innovation that was contained in the Watson system," Holt said. "I thought we should be talking about R&D in corporations, and about the possibilities that come through research."

At AAAS, Holt has a new platform for encouraging all people to appreciate and engage with science. "We should be looking at the health of science in America in all its aspects, in some cases because nobody else is," he said.

## AAAS Annual Meeting celebrates new ways to visualize science

By Becky Ham

With a light-activated protein and an optical fiber, Stanford bioengineer Karl Deisseroth can temporarily turn a fearful rat into a bold one. He and his colleagues can then trace the neural circuitry of this transformation with a technique that renders brain tissue as clear as glass. These imaging techniques have provided an unprecedented glimpse of the biology behind addiction, anxiety, and social behavior.

It's a cliché to say that new discoveries shed light on a scientific question, but the methods pioneered by Deisseroth and others are helping researchers actually see the brain in new ways. At the 181st AAAS Annual Meeting, researchers demonstrated the powerful potential of some of these visualization techniques in fields from psychology to astronomy. Some scientists at the meeting showed how 3D imaging can be used to guide facial reconstructive surgery. Other researchers demonstrated the potential of remote sensing technology to monitor Earth's atmosphere and oceans, and the use of adaptive optics to discover new planets with ground-based telescopes. In education-themed symposia, attendees learned about integrating mapping and graphical literacy into science classrooms. And, in public policy sessions, presenters discussed how neuroimaging could affect the use of memories in legal proceedings.

Researchers can now use these advances to work across fields and to engage nonscientists in their work. In his plenary address at the meeting, for instance, University of Washington biochemist David Baker discussed how his research on predicting 3D protein structures has led to citizen science offshoots that ask the public to solve protein-folding puzzles or to donate computing power to identify new structures for medicines and new materials.

University of Chicago paleontologist and plenary speaker Neil Shubin also praised the potential of new imaging techniques to open up science to the broadest possible audience. His lab is preparing digital blueprints of *Tiktaalik*, his research team's famous "fins to limbs" fossil discovery, so that more people can print out a 3D copy. "We're entering an age where you don't have to rely on a gatekeeper to study that fossil, you can use the Internet to study that fossil yourself," he said.

The imaging revolution "lets us visualize a world we never knew existed," said MIT geneticist and outgoing AAAS President Gerald Fink in his plenary address. "That vision changes the basis of our science, and changes the textbooks, and changes our view of the universe."

More than 9800 scientists, journalists, educators, and students attended the 12 to 16 February meeting, held for the first time in San Jose, California. AAAS's Family Science Days, a free public event with hands-on activities and demonstrations aimed at K-12 children, drew more than 5000 people.



Karl Deisseroth's sons ask Neil Shubin questions about the *Tiktaalik* fossil.

# Science

## AAAS news and notes

*Science* **347** (6229), 1430-1431.  
DOI: 10.1126/science.347.6229.1430

**ARTICLE TOOLS** <http://science.sciencemag.org/content/347/6229/1430>

**PERMISSIONS** <http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

---

*Science* (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.