

1986 paper, had been conducting single-molecule biological research with optical tweezers at UC Berkeley prior to his recent appointment. "The focus [in the 1980s] was on trapping atoms," says Chu, who shared a Nobel Prize with William D. Phillips and Claude Cohen-Tannoudji for that work. "But Art [Ashkin] just continued to play with the single-focus laser beams to move bacteria and his [latex] beads."

Is there another Nobel Prize in store for optical trapping? "I would not be surprised," says Chu. "In the coming decade there could be a truly great dis-

covery using optical tweezers, or some other single-molecule technique."

But JPK application specialist Joost van Mameren says that optical tweezers must be made more broadly available and the benchmark single-molecule experiments with optical tweezers should be successfully repeated with commercial systems to convince researchers to buy them. "Spending two or three years to build a system from scratch was enjoyable," says van Mameren, who worked with optical tweezers for his PhD. "But that does not produce many papers."

Jermev N. A. Matthews

Holdren appointment confirms Obama's climate change focus

President Barack Obama chose a physicist who has specialized in science policy to become his science adviser and director of the White House Office of Science and Technology Policy (OSTP). John Holdren, who has run the science, technology, and public policy program at Harvard University's Belfer Center since 1996, also worked as a theoretical plasma physicist at Lawrence Livermore National Laboratory.

Announcing Holdren's nomination on 20 December during his weekly radio address, Obama fulfilled a campaign pledge to have his science adviser selected by inauguration. Although the science adviser position does not officially require Senate confirmation, the OSTP appointment does, and past nominees have held off science advising until after confirmation to avoid potential objections from senators. Pending his confirmation, Holdren declined through a spokesperson to be interviewed.

Holdren is no stranger to advising the White House. He was a member of the President's Council of Advisors on Science and Technology from 1994 through 2001 and chaired two PCAST subcommittees that addressed energy research. A 1995 PCAST subcommittee review identified fusion energy as an attractive clean energy option and potentially cheaper than photovoltaics. A 1997 report from PCAST called for additional federal R&D funding for a panoply of energy sources, including fission, fusion, and fossil and renewable fuels, and advocated increased spending devoted to reducing the amount of energy used in buildings, in transportation, and in industry.

Holdren has also been active in the

arms control and nuclear nonproliferation policy arenas. He led a PCAST study that addressed US-Russian cooperation to protect nuclear materials from theft. For 10 years he headed up the National Academy of Sciences' Committee on International Security and Arms Control. During that time CISAC produced reports that addressed the disposition of surplus plutonium, future US nuclear weapons policy, and the means for verifying reductions in the world's nuclear weapons arsenals.

Passionate on climate

Holdren would have been considered a leading candidate for the science adviser post had Vice President Al Gore prevailed in the 2000 election. Like Gore, Holdren is, in Obama's words, "one of the most passionate and consistent voices of our time about the growing threat of climate change." He has particular expertise in fusion energy and its environmental impacts, issues he researched while at Lawrence Livermore National Laboratory.

"John Holdren is eminently qualified" for the post, said John Marburger, President Bush's science adviser and

OSTP director for nearly eight years. "His background as a physicist is typical of former science advisers, and his long history of scholarship in energy and environmental policy fits well with President-elect Obama's priorities." Marburger said he has deduced from Holdren's speeches and writings that "he will fit well in the forthcoming administration."

"John Holdren is a terrific pick," said Senator Jeff Bingaman (D-NM), chairman of the Committee on Energy and Natural Resources. Many provisions of the 2005 and 2007 energy acts originated in the Holdren-led PCAST studies, Bingaman noted in a statement. Reaction from academics, with whom Holdren has spent most of his career, was also adulatory. "He has the experience, skills, and broad knowledge of science and technology to help fulfill the president-elect's commitment to science, research, and innovation," said Robert Berdahl, president of the Association of American Universities. Berdahl further praised Obama's decision to restore to the science adviser post the "assistant to the president" title and cabinet-level status.

Holdren's selection brings to three the number of top appointees who will help Obama formulate and implement policies to address the interrelated issues of energy and climate change. The president has appointed Carol Browner, former administrator of the Environmental Protection Agency, to the newly created position of assistant to the president for energy and climate change, and Steven Chu, the Lawrence Berkeley National Laboratory chief, to head the Department of Energy (see *PHYSICS TODAY*, January 2009, page 22). Just how Holdren will interact with Browner and Chu remains to be seen. But Neal Lane, who worked with Holdren when Lane was science adviser to President Clinton, says that each will bring different and complementary expertise to the table: Chu's Nobel Prize-winning science and an understanding of the national labs, Browner's legal and regulatory experience, and Holdren's policy expertise.

David Kramer



Holdren

Spilhaus's long run at AGU helm ends

Fred Spilhaus was executive director of the American Geophysical Union for nearly 40 years. He stepped down at the end of last month, but will stay involved in an emeritus role. Robert van Hook, of Transition Management Con-

sulting Inc, is serving as interim executive director until the post is filled. Says AGU president Tim Grove, a geologist at MIT, "The AGU is indebted to Fred for his excellent service, his leadership, and his dedication. He has really

shaped the union and helped us articulate our values. We are in good shape because of Fred."

Still, the AGU council felt it was time "to move into the future," Grove says. "And the way to do that is with new leadership. With the change in [US] administration, we felt it was an excellent time to seize the opportunity to begin the executive transition here." In particular, Grove adds, the council would like to see more focus on science education, research funding, outreach, and public policy issues. "Fred had a great run as director. Based on his successes, AGU is ready to move to the next phase of its growth."

PHYSICS TODAY spoke with Spilhaus in late December.

PT: How did you come to AGU?

SPILHAUS: I guess it all started when I didn't get the [US] Navy scholarship I wanted to get—to do naval ROTC [Reserve Officers' Training Corps]. I failed the eye test. My father bet me 10 bucks I couldn't get into MIT. So I applied, and I was there for the next 10 years. I got my bachelor's in chemical engineering and then went into geology briefly before ending up in oceanography, which I'd been trying to avoid because it was my father's field.

When I finished, it was Vietnam war time, and I came to Washington to work for the CIA. I was having a terrific time. I learned about the infrastructure of our oceanographic community. One day a letter came to me. It said, would I be interested in the job of associate executive director at AGU. I just threw it in the wastebasket. A couple of weeks later, I mentioned the letter to my dad, and he said, you know, that wasn't too smart, what they're really looking for is someone who can replace their long-term director Waldo Smith when he retires. A few weeks later, I got another letter. And I thought, OK, somebody has their finger in this pie, I better look into it. I suspected my father at first, until I later learned that my thesis adviser was on the search committee. Anyway, I looked into it, and it couldn't have been more than a month later that I had the job. That was 1967.

When I got the job, I thought I'd have a year or two to learn. I was lucky—I got three before Waldo retired. He was a very good tutor.

PT: What is your legacy at AGU?

SPILHAUS: I started *Eos*. It started out

as a monthly magazine and worked that way for 10 years. Then, in 1978—we can credit the gas crunch—I was taking the train with our publishing manager, Judy Holoviak, to look at the printing plant. We started talking to them about *Eos*, and the guy said, make it a weekly and it will get better delivery—the post office had expedited delivery for weeklies. That was late October. We had a proposal at a meeting in December, and the first weekly issue came out in January.

Two other things were really kind of bulwarks. One is the dues. I attended a council meeting in 1968 when they were changed from \$16 to \$20. The dues haven't changed since. I helped convince the leaders not to increase dues above the incremental cost of serving a new member. We have a huge and growing membership—we had maybe 8000 members when I first came in, and the balance sheet was zero. Today, we

have 55 000 members and many tens of millions in the coffers. What I am proud of is the fact that we have one of the top scientific societies—people want to join it, the publications are well respected, the meetings are well attended.

And there is the opening up to the international community. It's really made AGU an example for the whole world in our field. Everything has to be opened up internationally, you just can't work without looking at data from other countries. Geophysics does not respect national boundaries—rivers

cross boundaries, mountains cross them, the ionosphere flies around. . . . About 38% of our membership is now from outside North America.

PT: What challenges await your successor?

SPILHAUS: Scientific societies that have been heavily dependent on publishing revenues have to keep up their guard and make sure they are able to roll with the punches that we are going to get from open access and the fact that technology is going to evolve. We need to begin using the technology more effectively.

Effective public policy has also been difficult for us. We'd like to see the science used in sound policy-making around the world, not just the US.

And in the US, there is the question of travel restrictions. It makes the US less attractive for meetings. We've already talked about not holding some of

our meetings in the US. But moving the San Francisco meeting—this year 16 000 people attended—would be horrendous. [The travel restrictions] could mean that some meetings get canceled or moved.

PT: What areas of geophysics are you most excited about?

SPILHAUS: We are probably going to extend in a lot of ways. One is to work more closely with those trying to make things better for mankind. Geoengineering, for example, is one very exciting area. We have to link together with different disciplines to learn what they need and give them what we have. That's where a lot of the future lies: Take the skills on both sides to attack a societal problem. There might be ways to keep the temperature down on Earth, or new energy solutions, for example.

PT: Your father was also an oceanographer. What was it like working in his shadow?

SPILHAUS: My father was very well known. Less well known was that he was responsible for the Roswell incident [when people believed they'd spotted a UFO]. He was the chief scientist [in a secret military/CIA project] and was looking for a sound channel in the atmosphere for the purpose of detecting bomb tests.

We competed a bit. A turning point came in the late eighties when my father was introduced before a talk at Texas A&M. The host said, "Today's speaker needs no introduction. He's Fred's father." I was not there but I knew the worm had turned when he told me about it.

Toni Feder

DOD launches 'genius' awards

A lot of money over a long time. That's what a trickle of researchers is getting from the Department of Defense's new National Security Science and Engineering Faculty Fellowship (NSSEFF) program, which provides relatively strings-free grants of up to \$3 million.

Last November the 2009 awardees—a half-dozen researchers culled from more than 500 applicants—were announced, bringing the total so far to 14. An earlier first round was for the 2008 awardees. The DOD plans to bestow up to 10 of the five-year grants annually.

"We want to have the best of the best in faculty working in national security," says William Rees, deputy under secretary of defense. By at least partially restoring a relationship between academics and the DOD that has weakened



Spilhaus