



Front-line
malaria drug
faltering?

1776



Gorillas caught in
Congo crossfire

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THE TRANSITION

Nobelist Gets Energy Portfolio, Raising Hopes and Expectations

Standing alongside President-elect Barack Obama this week in Chicago, a visibly nervous Steven Chu might have appeared to be a nerdy scientist out of place in the political spotlight. But make no mistake: Chu has a clear vision of where he wants to go and the determination to get there. His commitment to excellence underpinned his work on trapping supercooled atoms that led to the 1997 Nobel Prize in physics. It also drove him to abandon a comfortable academic career and embrace the challenge of reducing the world's carbon footprint as director of Lawrence Berkeley National Laboratory (LBNL). But it may be on the tennis court where the work ethic of the new secretary of energy nominee is most visible.

While colleagues at a 1998 optics conference in Hawaii partook of the luxury accommodations, the slight, trim physicist, then 50, spent hours testing various rackets with the hotel's tennis pro and practicing his serve before his first match. "He was demanding, like 'Get up, Bambi,'" laughs Mark Cardillo, his assigned partner. "Once he goes after something, nothing is going to stop him," says Galina Khitrova of the University of Arizona, Tucson.

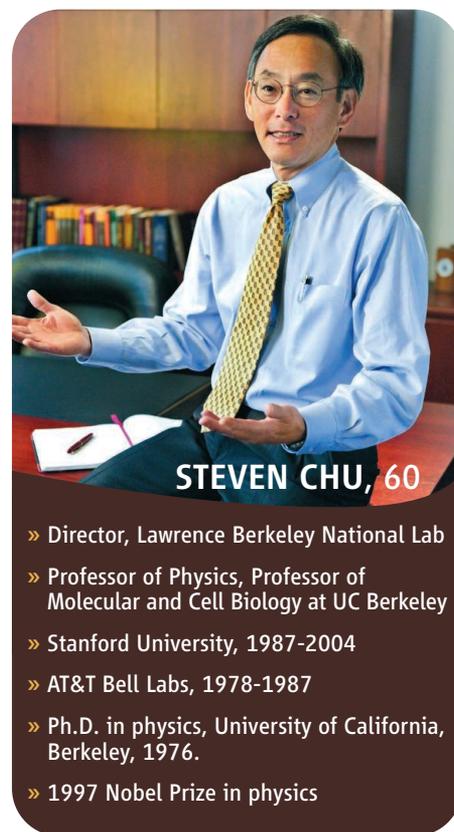
So far, little has. If approved by the Senate, which has given no indication that it would do otherwise, Chu would become the first career scientist to run the \$24 billion agency. He'll be carrying on his back the

hopes of U.S. researchers to jump-start stagnating science budgets at the Department of Energy (DOE) and retain U.S. leadership in the face of rising overseas competition. The curmudgeonly commentator for the American Physical Society, Robert Park, called the choice a "perfect call."

DOE is a mission agency with four distinct portfolios (see graph); Chu has been tapped to beef up its role in science and energy. "In Steve Chu, we have a Nobel Prize-winning scientist who understands that technology and innovation are the cornerstones of our climate solutions," said Vice President-elect Joe Biden when introducing him this week. Obama went even further in explaining the significance of Chu's nomination. "His appointment should send a signal to all that my Administration will value science, we will make decisions based on the facts, and we understand that the facts demand bold action."

It's a challenge commensurate with Chu's demanding standards. The nation desperately needs new low-cost technologies like solar power, better transmission lines for wind power, and successful large-scale demonstration projects for carbon capture from coal combustion or underground CO₂ storage. Although Congress has indicated a willingness to provide basic physical science with double-digit annual funding increases, lawmakers have repeatedly failed to seal the deal when faced with competing budgetary priorities.

Raised by Chinese immigrants in Garden City, New York, Chu says he was more free-thinking than studious until his undergraduate days at the University of Rochester in New York state. In graduate school, he bounced from theoretical astrophysics to whimsical tests to find the frequency sensi-



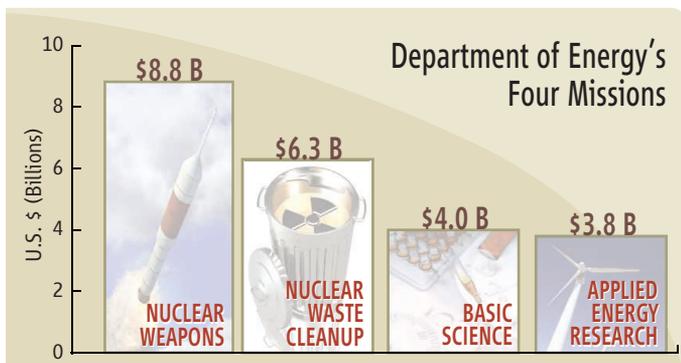
STEVEN CHU, 60

- » Director, Lawrence Berkeley National Lab
- » Professor of Physics, Professor of Molecular and Cell Biology at UC Berkeley
- » Stanford University, 1987-2004
- » AT&T Bell Labs, 1978-1987
- » Ph.D. in physics, University of California, Berkeley, 1976.
- » 1997 Nobel Prize in physics

tivity of the human ear. Once he wedded his creativity with his ambition, however, his career took off, first at AT&T Bell Labs and then at Stanford University.

But being a successful academic scientist wasn't enough. Chu says it was the "sobering" scale of the climate challenge that drew him to accept an offer in 2004 to direct the 4000-person, \$650 million Berkeley lab. There he led efforts to partner with BP on a \$500 million energy biosciences institute (*Science*, 9 February 2007, pp. 747 and 784) and win a competition for an interdisciplinary \$135 million bioenergy research center funded by DOE (*Science*, 25 April 2008, p. 478). Chemist Nathan Lewis of the California Institute of Technology in Pasadena, a partner under Chu's umbrella renewable-energy research program, called Helios, says Chu's ability to understand and cooperate with researchers across a variety of fields will serve him well as he seeks to coordinate research across the sprawling DOE system. "He knows he doesn't have to do it all," says Lewis.

Chu's commitment to interdisciplinary research was underscored at Stanford, where



Out of many, one. One big challenge for Steven Chu will be to unite the disparate activities of the Department of Energy.



he joined three other professors to found the school's Bio-X program, which supports biological research directed at health, energy, and environmental needs. A major challenge for the next energy secretary will be demonstrating to industry that large-scale carbon sequestration facilities can work. Earlier this year, DOE canceled plans to build a \$1.8 billion demonstration facility called FutureGen, opting for an approach that involves smaller test facilities. Obama's team has so far signaled that it likes the more modest approach. Although Chu has not made his preferences clear, he wrote in a report last year by the world's science academies that demonstration projects often get "insufficient attention from those who are or have been engaged in funding the R&D phase."

Obama transition team member Elgie Holstein has said that Obama wants to focus "more activities in the basic sciences on the energy problem." Chu has a track record at LBNL of inspiring scientists to do that; Lewis and chemist Paul Alivisatos are among several top scientists who have followed Chu's lead and shifted their research into areas directly applicable to renewable energy. Chu is also the intellectual father of an idea to make DOE science more innovative and nimble through a miniagency called the Advanced Research Projects Agency–Energy (ARPA-E). Congress authorized spending \$300 million last year on ARPA-E and "such sums as necessary in 2009 and 2010" in legislation championed by Representative Bart Gordon (D–TN), chair of the House science committee. But so far Congress has not appropriated any money for it, and the Bush Administration views the new agency as needless bureaucracy, an issue on which Chu clashed with DOE headquarters behind the scenes. (Indeed, presidential science adviser John Marburger may have had such encounters in mind when he told *Science* that Chu will need to hire assistants with "strong personalities to interact productively with a highly self-confident Nobel laureate.")

Meanwhile, physical scientists are hoping Chu's impeccable scientific pedigree will heal a wounded U.S. physics enterprise, which has fallen behind European colleagues in particle physics and could face thousands of layoffs across DOE's 21 national laboratories unless the budget picture brightens. "Having been a basic researcher for most of his life," says Lewis, Chu knows "you never know where

Obama's Choice to Direct EPA Is Applauded

President-elect Barack Obama's pick to head the Environmental Protection Agency (EPA), Lisa Jackson, has spent 20 years as an environmental officer at the state and national levels. She'll need every bit of that experience to revive an agency demoralized by the actions of Bush Administration appointees, say scientists and environmental activists who welcomed this week's announcement.

A 16-year veteran of EPA's Superfund site remediation program before taking the top environmental job for the state of New Jersey, Jackson holds a master's degree in chemical engineering. "She will be an outstanding administrator, committed to defending the integrity of the science on which EPA regulations must be based," says David Michaels, a research professor of environmental and occupational health at George Washington University (GWU) in Washington, D.C.

That combination of skills and ethics is badly needed at EPA, say Michaels and other scientists. Kathryn Mahaffey, who left EPA this summer for GWU after 15 years of studying the risk to humans from exposure to pollutants, says that she was instructed in 2005 by a political appointee to "go back and recalculate" her results on blood mercury levels among U.S. women. Political interference has grown so serious, she says, that outside scientists "aren't sure what scientific publications coming out of EPA they really should have confidence in."

One issue awaiting the next EPA administrator is whether the agency will regulate carbon emissions under the Clean Air Act. Although the U.S. Supreme Court told EPA in 2007 to reexamine its opposition to doing so, agency Administrator Stephen Johnson said this summer that "the Clean Air Act is the wrong tool for the job" (*Science*, 18 July, p. 324). An aide to Obama said during the campaign that Obama would instruct EPA to regulate carbon under the act if Congress didn't adopt a cap-and-trade system in the next 18 months. Another Bush Administration policy opposed by many environmentalists—to deny California and other states a waiver to tighten auto emission standards—could be reversed by the new EPA administrator.

As head of New Jersey's EPA, Jackson developed a plan to slash the state's carbon emissions and worked with other Northeast states on a regional program to do the same. Dena Mottola Jaborska, executive director of Environment New Jersey, an advocacy group, credits Jackson with making the state "a leader on global warming." At the same time, some groups have criticized Jackson for making inadequate progress on cleaning up toxic waste sites. This month, she became chief of staff to Governor Jon Corzine. If confirmed by the Senate, Jackson, 46, would become the first African-American to lead EPA.

—LILA GUTERMAN

Lila Guterman is a science writer in Washington, D.C.



Familiar environment. Lisa Jackson has been nominated to lead EPA, an agency where she spent 16 years as a regulator.

the big discoveries are going to come from."

But with money tight in Washington, Chu will need to show considerable political prowess to revitalize DOE. Although a regular visitor to Washington over the past 4 years, he lacks the vast network and insider knowledge possessed by Carol Browner, a former head of the Environmental Protection

Agency under President Clinton, whom Obama has named as his White House czar for energy, climate, and the environment. Her relationship with Chu and influence over DOE research has yet to be explained.

This time, it seems, it's going to take guile as well as sweat for Chu to walk off the court a champion.

—ELI KINTISCH

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Eli Kintisch

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