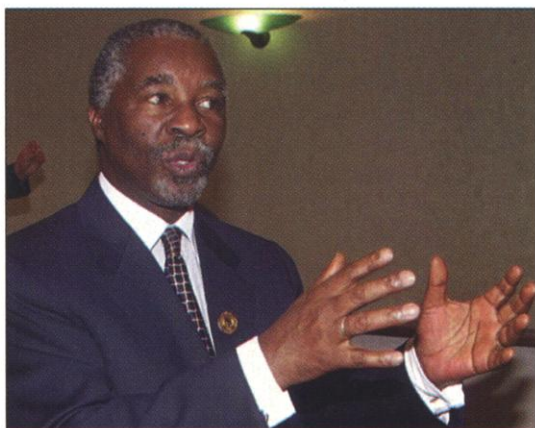


ed," wrote Mbeki in his 3 April letter. "The day may not be far off when we will, once again, see books burnt and their authors immolated by fire by those who believe that they have a duty to conduct a holy crusade against the infidels."



**Drawing flak.** President Mbeki's questioning of the evidence that HIV causes AIDS has provoked an outcry.

"I think the letter was emotional and irrational," says Malegapuru William Makgoba, an Oxford-trained immunologist who in July became the first black head of South Africa's Medical Research Council. "This man will regret this in his later years. He displays things he doesn't understand."

Makgoba says Mbeki told him and others earlier this year that he became intrigued by the dissidents' views after reading about them on the Internet. In January, Makgoba says Mbeki sent him about 1500 pages of documents that question the so-called "HIV/AIDS hypothesis." "It's pure rubbish," says Makgoba. "They never provided any data and, at the same time, they are taking things out of context." He told Mbeki as much in a letter that also offered detailed counterarguments. "His credibility as an African leader may suffer from this," says Makgoba, who recently edited a book called *African Renaissance*, which has an introduction written by Mbeki.

Parks Mankahlana, Mbeki's spokesperson, stresses that Mbeki has never said that he does not believe that HIV causes AIDS. "We've gone through all of his speeches," says Mankahlana, who points out that Mbeki has increased support for AIDS research, encourages the use of condoms, and always wears an AIDS ribbon on his lapel. Mbeki, says Mankahlana, is simply exploring a range of views on the role that HIV plays in the disease. "The problem that the scientific world has is this: It has to do with human arrogance."

The dissidents' views are expected to be included in a panel of about 30 AIDS "experts" that South Africa's Department of Health is convening to discuss how to ad-

dress the country's epidemic. Duesberg says he has been invited and may well attend the panel's meeting next month. "I think after this letter, I have to go," says Duesberg. "It's getting hot again, just like in the old days, thanks to Mbeki. I'm surprised that there's a place left on this planet where you can ask commonsensical questions."

In part because of Mbeki's stance, some AIDS researchers have threatened to boycott the international AIDS conference scheduled to be held in Durban this July. But Salim Abdool Karim, a leading South African AIDS researcher who chairs the scientific committee for the meeting, says he does not expect Mbeki's views to depress attendance. "In fact, it has encouraged some people to say, 'I will attend the conference,'" Karim says. Karim, who conspicuously was not invited to sit on the health department's panel, hopes Mbeki will quickly declare that he believes HIV causes AIDS. "This should be resolved urgently, rather than making it an international issue," says Karim.

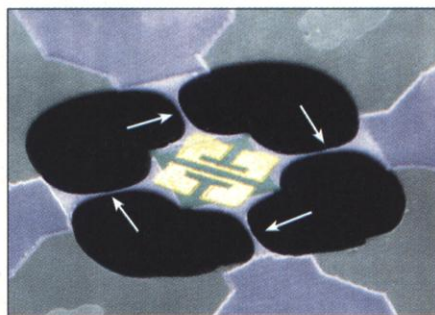
—JON COHEN

## PHYSICS

### Heat Flow Runs Into Quantum Limit

Heat is a symphony of vibrations rippling through a material. But, just like the electrons flowing in an electrical current, the individual vibrations are really quantum mechanical waves. Now a team of physicists has found that they can filter out all but a handful of those vibrations by making them jiggle down a tiny beam only a few billionths of a meter thick. When they do that, the quantum mechanical nature of the vibrations sings out, as the amount of heat the vibrations will carry butts into a fundamental quantum limit.

The findings, reported in the 27 April issue of *Nature*, raise the prospect of observ-



**Quartet.** Four vibrating beams carry heat away from silicon wafer, center.

## ScienceScope

**Ready for Action** With summer just months away, Centers for Disease Control and Prevention (CDC) officials are saying that a "sound public health control plan is now in place" to contain the mosquito-borne West Nile virus (right), which killed seven people in New York last year (*Science*, 24 March, p. 2129). "Last fall, many of our state and local partners were unprepared," CDC West Nile coordinator Stephen Ostroff said at a press conference this week. Now, CDC has spent \$2.7 million to help 19 state and local health departments on the Eastern seaboard and the Gulf of Mexico—where migratory birds are most likely to spread the virus—set up virus surveillance and mosquito-control programs.



Ostroff stressed that the odds of contracting West Nile are very low. An unpublished study by CDC and New York City's department of health found that about 2.5% of over 600 residents of the "Hot Zone"—the area in Queens where most cases occurred—got infected last summer. But the vast majority of those infected suffered mild symptoms or none at all.

**Lobbying for Bargains** AIDS activists are preparing a last-ditch lobbying effort to make cheaper AIDS drugs available to patients in Africa and the Caribbean. A coalition of AIDS groups is backing an effort by Senators Dianne Feinstein (D-CA) and Russ Feingold (D-WI) to amend a pending bill designed to expand trade between the United States, Africa, and Caribbean nations. The amendment would relax patent protections on popular AIDS drugs from major companies, enabling poor nations to import or manufacture them at lower cost. Opponents, including pharmaceutical companies, say the change would open a troubling loophole in international patent law and reduce incentives for R&D. They claim that a lack of doctors, clinics, and planning—not high drug prices—is the major barrier to better AIDS treatment in poorer nations.

The House has already rejected its version of the Feinstein-Feingold measure, leaving proponents to focus on the Senate, which is expected to complete its work on the trade bill early next month. If the AIDS amendment is added, one Republican aide predicts that "it could become very difficult to craft a final bill. It could be a deal killer."

**Contributors:** Eliot Marshall, Wayne Kondro, Martin Enserink, David Malakoff

ing individual vibrations, called phonons. They also provide a warning for scientists and engineers hoping to create wires or machines only a few molecules thick: Such devices may overheat in a hurry.

In 1988, physicists discovered that when electrons flow through a wire only a few nanometers, or billionths of a meter, thick, they move in a handful of quantum channels. So when researchers increase the voltage between the two ends of a tiny wire, the current passing through it climbs in a series of even steps as the channels open one by one. Now Michael Roukes, Keith Schwab, and their colleagues at the California Institute of Technology in Pasadena have overcome daunting technical challenges to catch heat behaving in a similar manner. "It's beautiful work," says Alex Zettl, a physicist at the University of California, Berkeley. "I have nothing but praise for it."

Roukes and colleagues set out to measure the flow of heat in beams of silicon nitride a mere 60 nanometers thick and 200 nanometers wide. They heated each beam at one end with a minuscule electric heater and tracked the temperature difference between the two ends by measuring the temperature-dependent jostling of electrons in gold patches painted on either end. They then monitored the thermal conductance, the ratio of the heat applied divided by the temperature difference, as they cooled the beam toward absolute zero. To keep from melting the delicate device, the researchers kept the heat down to about a femtowatt, or a millionth of a billionth of a watt—roughly the power that would reach your eye from a lightbulb 60 miles away. "You have to control everything well below the femtowatt level," says Schwab. "That's what's terrifying about this experiment."

As the researchers cooled the beam, the thermal conductance fell in proportion to the temperature cubed as the higher frequency vibrations, the flutes and violins of the thermal symphony, faded out. Then, below 1 kelvin, the researchers found that the thermal conductance began to decrease in direct proportion to the temperature. That meant they had winnowed out all but the bass fiddle, the four simplest vibrations, analogous to the lowest energy channel in quantum electrical conductance. The rate of decrease revealed a limit on how much heat these vibrations could carry. Two years earlier, physicists George Kirceznov and Luis Rego of Simon Fraser University in Burnaby, Canada, had predicted just this fundamental limit. "I was obviously hoping that they would see what we predicted," Kirceznov says, "but I'm stunned that the agreement was so good."

The observation may mean extra work for researchers striving to manufacture machines only a few molecules or atoms

across, especially if they must run at low temperatures. Such tiny devices may have to get rid of their heat only through the limited channels, so they may tend to overheat. "When things get very small, these sorts of limits will come in," Roukes says. "So you have to consider how you'll deal with them."

Now that they've struck a quantum chord, researchers would like to observe the individual phonons that are doing the vibrating. Roukes envisions an experiment in which an exquisitely sensitive detector registers a click for each phonon. And Zettl thinks that may be just the beginning: "There are going to be many, many experiments coming out of these results."

—ADRIAN CHO

## ENDANGERED SPECIES

### CITES Puts Off Plan to Hasten Shipments

**NAIROBI, KENYA**—In a setback for scientists, an international trade body has shelved a proposal to simplify research on endangered species. The proposal would have waived an often-cumbersome permitting process for handling samples of everything from hair and DNA to cell lines derived from endangered species. The rules are mandated under the 25-year-old Convention on International Trade in Endangered Species (CITES), which three European countries lobbied to change. But unexpected opposition from the United States and several developing countries at a meeting here last week torpedoed the proposal until at least 2002.

The restrictions are meant to squelch international trafficking in wildlife while granting exemptions for research samples.



**Feathers ruffled.** Treaty negotiators have two more years to hammer out a deal to speed shipments of DNA and other samples from endangered species, such as this St. Vincent's Amazon parrot.

They prevent smugglers of animal parts—say, bear gall bladders used in traditional medicine—from masquerading as scientists by requiring a permit from the originating

and destination countries. Many countries are slow to issue permits, which in some countries is predicated on paying a bribe. Fed up with the status quo, Germany, Switzerland, and the United Kingdom proposed an amendment that would eliminate the need for permits for biomedical research, diagnosing animal diseases, and DNA testing.

Scientists at the meeting shared a few bureaucratic nightmares in hopes of bolstering their argument. For example, it took 7 months for a German group to get a permit from the U.S. Fish and Wildlife Service (FWS) to send blood from a St. Vincent's Amazon parrot to New York City for DNA analysis, says ornithologist Donald Bruning of the Wildlife Conservation Society in New York City. Such delays can be fatal for a sick animal needing a proper diagnosis, says Samuel Wasser of the University of Washington, Seattle, who studies stress hormones in scat in several African countries. By the time the blood sample comes back, Wasser says, "all we know is what the animal died from."

Although sympathetic to the plight of scientists, FWS's Donald Barry says that the European proposal would lead to "a serious erosion of domestic controls." Customs agents can't judge whether someone with wildlife parts is a bona fide scientist, he adds. Instead, Barry suggests that countries issue blanket permits to certain institutions and scientists—a plan that Wasser fears would "create a scientific and institutional elite."

Delegates from several developing nations also went on the attack. "How can we ensure that these samples are not used for bioprospecting?" says Hesiquio Benitez Diaz, a biologist with Mexico's National Commission for the Knowledge and Use of Biodiversity. Permits help to keep track of biological resources that

leave the country. If a drug is developed from an endangered plant, for instance, a country may be able to seek royalties by proving the plant's origin. But right now, says Diaz, "we just don't have a framework yet for controlling access to our own genetic resources on a global level."

In closing the biennial treaty meeting on 20 April, CITES officials instructed several working committees to resolve their differences before the next treaty meeting in October 2002.

—WENDY WILLIAMS

Wendy Williams is a freelance writer in Mashpee, Massachusetts.

CREDIT: MICHAEL DICK