# RANDOM SAMPLES

edited by CONSTANCE HOLDEN

## Protest Spreads Against French Nukes

France's nuclear testing in the South Pacific began last week, sparking riots in Tahiti and strong condemnation from many governments. On the home front, French scientists opposed to the tests continue to press their case on the Internet. A petition by physicists at the Orsay campus of the University of Paris, originally published in July (*Science*, 21 July, p. 307), was subsequently translated into English and published on the Net. It has since been signed by scientists from 29 nations, and the number of signatures has grown from 400 to more than 2600—including about 1200 in France.

The French government has argued that the tests are needed to provide raw data to plug into computer simulations of blasts after a comprehensive test ban treaty is signed next year. But this is a canard, says Orsay physicist Harry Bernas, one of the authors of the petition: "The major reason for doing simulations is to keep together a collection of scientists and engineers capable of building weapons if we need them."

For similar reasons, Bernas and others criticize U.S. and French plans to conduct lab experiments on thermonuclear explosions, another component of the computer simulations. Two powerful lasers currently under construction—the Mégajoule near Bordeaux and the National Ignition Facility at the Lawrence Livermore National Laboratory in California—will be capable of producing small-scale nuclear fusion reactions when they come on-line sometime after 2002.

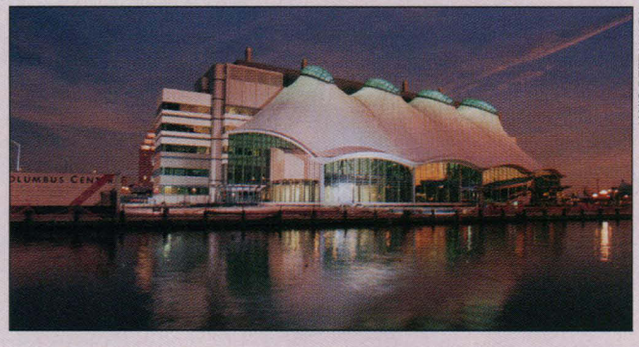
## Plastic Chips

Silicon is the workhorse material of computer chip design. But it's stiff, brittle, and expensive to forge into transistors, the basic units of chips. Researchers have therefore begun making organic-based transistors with cheap and flexible semiconducting polymers. It is widely hoped that these can be used in new "smart cards" and other plastic electronic devices.

So far, however, they've only been able to make simple devices that conduct only one kind of charge—either positive or negative—but not both, a drawback that prevents the devices from being used to construct complex low-power memory circuits. Now on page 1560 of this issue, a group of researchers from AT&T Bell Laboratories in Murray Hill, New Jersey, reports building an organic-based transistor that, they say, can do the job.

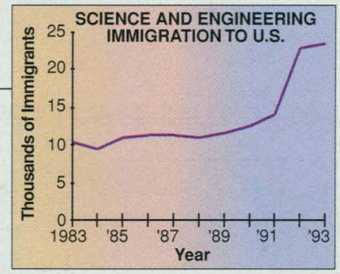
To make such circuits in silicon, researchers deposit on a substrate layers of silicon that have been "doped" so that they conduct either positive or negative charges. Patterns are then etched in the silicon to create negatively and positively charged transistors next to each other. Because organics are difficult to pattern with such precision, researchers have been unable to duplicate such devices in plastic. To get around the problem, the researchers, led by Ananth Dodabalapur, made their organic transistors pull double duty. By layering an organic electron conductor made of carbon-60 atop a positive charge conductor known as α-hexathienylene, they were able to make a transistor that can transport either charge.

"It's an interesting development," says organic transistor developer Francis Garnier of the Centre National de la Recherche Scientifique in Thiasis, France. But, he notes, like other plastic electronic devices, they still face problems. One is a short life-span, as carbon-60 is notoriously unstable. But the researchers have already had preliminary success with a more stable electron-conducting material—and if all goes well, plastic may soon be used to store not only products but information as well.



JANIS RETTALIATA

**Water world.** High hopes abound for the nearly completed Columbus Center, a $160 million complex built on the harbor in Baltimore, Maryland, which will combine marine biotechnology research with science education and public enlightenment on marine matters. The center, first proposed by Baltimore magazine editor Stan Heuisler to celebrate the 300th anniversary of 1492, was taken up as a cause by Maryland Senator Barbara Mikulski (D), who snared a $54 million appropriation 2 years ago for its construction. The University of Maryland's Center of Marine Biotechnology moved to the center this spring, and this month saw the opening of the education component—classrooms, labs, and a lecture hall. Next spring the center, next to the National Aquarium on Baltimore's heavily touristed harbor, will open a public exhibition hall on marine biotechnology. Neuroscientist Solomon Snyder of Johns Hopkins University says, "I think the center will have an important national impact." He observes that it not only represents a unique combination of research and public outreach but that putting a research institute in the middle of a tourist hot spot "was really a very audacious idea."




SOURCE: NSF

## Scientific Immigration

Even as overall immigration into the United States declined, the flow of foreign scientists and engineers continued to increase in 1993, according to a National Science Foundation (NSF) report to be released next month (1993 is the most recent year for which these statistics are available).

The report, "Immigrant Scientists, Engineers, and Technicians," says the number of scientific immigrants increased 3.1% from 1992 to 1993 to a total of 23,534. At the same time, overall immigration decreased by 7.2%.

Of the total number of scientific immigrants, engineers made up 61.6%; about half the rest were mathematicians and computer specialists. China and India accounted for 37.9% of the total. Many (1403) of these were Chinese students accorded permanent resident status under the Chinese Student Protection Act of 1992. And there are more women scientists immigrating—from 15% to 21.3% of the total between fiscal years 1988 and 1993.

Carlos Kruytbosch of NSF's Division of Science Resources Studies attributes the overall increase in scientific immigrants to changes in the immigration rules that became effective in 1992, a year when scientific immigration leapt by 62%. But many observers believe that the wave may now have peaked. Richard Herman, dean of the college of computer, mathematical, and physical sciences at the University of Maryland, College Park, says the influx was partly caused by senior scientists escaping failing economies abroad. But now, he says, foreign job markets are improving. William Destler, dean of the college of engineering at the University of Maryland, adds that for the same reason more students who come to the United States for training are returning to their home countries.