

sians finally came up with this year's money for their part of the service module. I don't know if that was the result of my being on their backs or on the backs of our guys. My fear is that every time they're bumping up against a deadline, we will have these problems, because the financial situation in Russia isn't going to improve until

the Russians get a functional tax collection system. So far, neither the money nor the deadlines have lived up to the promises made by President Yeltsin last April. The thing is that of the \$2 billion the [Clinton] Administration claimed we saved by bringing the Russians into the space station partnership, we've already lost \$1 billion

in additional American payments because Russia has not performed on time. Russia is in the consortium because they're in the critical path. I think we're going to pay for them to be in the critical path in dribs and drabs from now until the time the useful life of the international space station runs out 20 years hence.

Peña Breaks Ground at Livermore Laser-Fusion Facility But Construction Awaits Federal Court Ruling on Project

Despite a Federal court action in Washington that would prevent construction of the \$1.2 billion National Ignition Facility (NIF) at Lawrence Livermore National Laboratory, Energy Secretary Federico Peña hoisted a shovelful of soil on 29 May to symbolize the start of the project. NIF is the centerpiece of the Department of Energy's (DOE) science-based stockpile stewardship program, which was conceived to make sure that the US nuclear weapons arsenal remains safe, secure and reliable, without underground testing (see *PHYSICS TODAY*, March, page 63). Under the Comprehensive Test Ban Treaty (CTBT), signed by President Clinton at the United Nations building in December but not yet sent to the Senate for ratification, developing new nukes, remanufacturing existing ones and exploding any nuclear weapons would be unlawful.

At the groundbreaking at the site for NIF, Peña declared: "I am absolutely convinced that [the facility] is required to allow us to enter into the Comprehensive Test Ban Treaty without losing our nuclear deterrent."

NIF is a large project. Construction plans call for it to rise seven stories at its highest point and to stretch the length of two football fields. Though excavation for the facility's storm drains began on 1 July, the foundation was not to be started until the end of July. Actual construction has been put on hold until the US District Court for the District of Columbia rules on a preliminary injunction to stop work on NIF. The legal challenge has been posed by the Natural Resources Defense Council and 28 other environmental groups. They contend that DOE had not considered alternatives to the laser-fusion facility and that the project itself would result in environmental and health hazards in northern California.

Volatile court hearings on the injunction were held on two afternoons in June before Federal Judge Stanley Sporkin. DOE decided to delay con-

struction until 27 June, when Sporkin first said he would decide the case. Then, when the judge did not issue his ruling on that date, Peña told Livermore officials to go ahead.

In his remarks to some 2000 lab employees and their guests, Peña also recognized the 142 protesters who had been invited to attend the event. He told the crowd that he had met with some of NIF's opponents that morning, and they had argued that the facility could be used to design and develop new weapons. Though the protesters argued that the facility would increase the risk of nuclear proliferation and should not be built, Peña recalled that the discussion was peaceful and productive. "There was common ground," he said, "that we all support the goal of nonproliferation." In fact, said Peña, aiming his remark at the project's opponents, "if you support the Compre-

hensive Test Ban Treaty, then you should support NIF." To support his position, he cited statements about the project by three prominent physicists: Hans Bethe of Cornell University (see *PHYSICS TODAY*, July, page 47), Henry Kendall of MIT and Herbert York of the University of California, San Diego, who was Livermore's first director.

It turns out that 34 of the protesters were arrested, according to *Inside Energy*, an authoritative newsletter, when they attempted to block an entry gate of the lab and to distribute "citations" stating that Livermore is "out of compliance" with last year's ruling by the World Court in The Hague that nuclear weapons are illegal. Before Peña spoke, the protesters launched a large helium-filled balloon that read "NIF: Nuclear Insanity Forever." Then, after Peña, Livermore director Bruce Tarter, and Representative Ellen Tauscher, a



ENERGETICALLY FOR NIF: Energy Secretary Federico Peña flanked by Representative Ellen Tauscher and Lawrence Livermore's director, Bruce Tarter, dig up the NIF site.

BRYAN QUINTARD/LAWRENCE LIVERMORE

► **Rejoining UNESCO** After a 12-year absence, Britain rejoined the United Nations Educational, Scientific and Cultural Organization on 1 July, just two weeks after the Labour Party's landslide election. The decision by the new prime minister, Tony Blair, reverses the Conservative government's withdrawal from UNESCO in 1985, six months after President Reagan pulled out the US. "It's good to be back," said Clare Short, Britain's Secretary of State for International Development, at a brief ceremony at UNESCO headquarters in Paris, where the Union Jack was hoisted outside, joining the flags of the 186 other member nations.

For years before the US left UNESCO, the Reagan Administration had accused the agency of arrant mismanagement and alienating partisanship (PHYSICS TODAY, February 1985, page 53). Margaret Thatcher, Britain's prime minister at the time, followed suit. The departure of the two countries depleted UNESCO's budget by 30%. Both countries demanded the exit of Amadou-Mahtar M'Bow, who was serving his second six-year term as director general, and appealed for widespread reforms of the organization. Under M'Bow, the Paris payroll had waxed, eventually accounting for 70% of the budget, while support for science and education waned. UNESCO conferences proliferated in M'Bow's time—and with them, so did calculated polemics. One issue that riled US officials concerned the licensing of journalists as part of a bizarre program called the New World Information Order. Meanwhile, deserving programs to fulfill the organization's original purpose languished.

At the UNESCO headquarters, Short said Britain would support the reforms undertaken by Federico Mayor, the present director general, and would strengthen the agency's programs to promote education, preserve the world's cultural heritage and exchange ideas and information on many subjects, especially science. Mayor, in turn, said he expected the US to return to the organization soon. He reminded his audience that President Clinton had said in 1995 that he knew of no impediments to rejoining except for budgetary restraints by Congress. Britain will contribute 5.32% of UNESCO's budget and already has paid £4.2 million (\$7 million) towards the six months remaining in 1997.

► **Hands Off Internet Data** Amid protests by the National Academies of Sciences and of Engineering and several scientific societies, the US backed off a treaty on Internet commerce being negotiated by the World Intellectual Property Organization (WIPO), at a meeting in Geneva, Switzerland, last December. If the majority of governments belonging to WIPO had their way, severe restrictions would be imposed on the fair and open use of scientific data. Such information would come under the rubric of intellectual property, which is just one of the nettlesome issues covered by the proposed treaty. Others are censorship, encryption, technical standards, privacy and taxation of World Wide Web sites and on-line sales.

Without seeking the views of the science community or conducting hearings on the issues, the Clinton Administration had supported the position of its own Patent and Trademark Office, which sought to impose *sui generis* ("of its own kind") protection of intellectual property. The proposed law was pushed by major publishers, on-line service providers and the Information Industry Association.

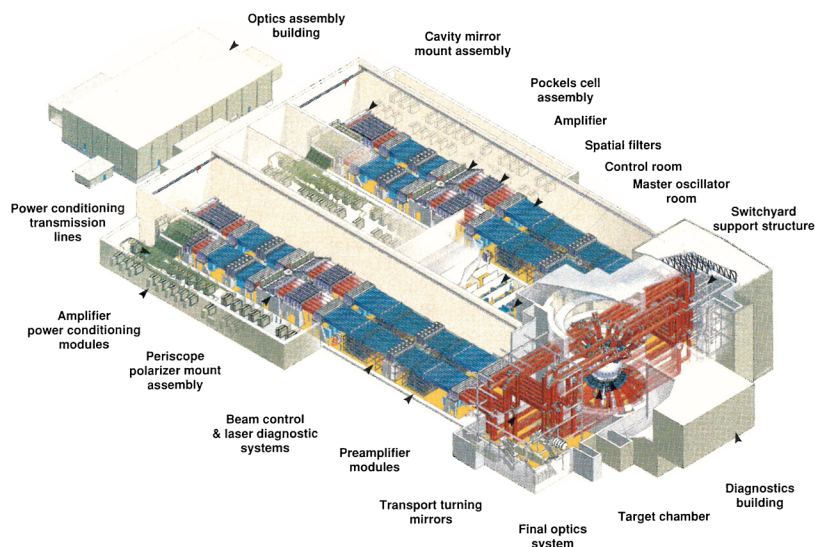
Scientists worry that this would tempt government agencies and commercial interests to control or patrol research information and databases when they seek access to publicly funded research data. It would allow database vendors to charge scientists and scholars for access at commercial rates and even, in some instances, to maintain a monopoly on new or augmented research data. To be sure, such practices could inhibit collaborative research projects that depend on constantly updated information. The Administration appeared vexed by the potential unintended consequences raised by the profusion of perverse transactions available on the Web: fraud, libel, plagiarism, gambling, pornography and sedition, to cite a few.

Not surprisingly, the WIPO negotiations were suspended. Then, on 1 July, President Clinton announced the US policy: hands off the Internet. At a White House gathering packed with high-tech industry executives, the President affirmed the new medium's freedom from regulation and its potential for abetting global electronic commerce, which industry experts say will grow from about \$1 billion last year to as much as \$25 billion by 2000. Clinton called on all governments to follow the US approach by avoiding "unnecessary regulations," including restrictions on content, and endorsed the principle of "self-regulation." Academy officials were pleased with the policy. In April they had issued a report, "Bits of Power: Issues in Global Access to Scientific Data," which recommended that policy makers in all countries should treat the results of publicly funded research as a public good and allow scientific information to flow at little or no cost.

► **Again, 'No' to Powerline Cancers** Another study, this one meticulously designed by scientists at the National Cancer Institute and specialists in childhood leukemia, reported in the *New England Journal of Medicine* that powerline electromagnetic fields (EMFs) "are not a major and probably not even a minor component to the cause of cancer." The team identified 638 children aged 15 or younger with the most common childhood cancer, acute lymphoblastic leukemia, and 620 healthy controls. This cancer strikes about 2000 children per year in the US. Measurements of magnetic fields were made in the homes in which the children spent most of their early life. The results indicated that those whose homes rated at 3 to 4 milligauss had about the same leukemia rate as children anywhere.

Still, there is a troubling uncertainty: In the fewer than 10% of the homes that showed extremely high fields of 4 to 4.9 mG, the risk was three times above normal. "We cannot exclude the possibility of a small increase in risk," the researchers concluded. But the finding was based on such small numbers—14 cases and 5 controls—that it was consistent with chance. This was also consistent with the conclusion of a National Academy of Sciences report last December (see PHYSICS TODAY, January, page 49). The latest finding is the strongest so far, said Charles F. Stevens, chairman of the academy's committee and a neurobiologist at the Salk Institute in La Jolla, California, but it's unlikely to completely dispel public fears of EMFs. An editorial in the *New England Journal* called for an end to powerline cancer research, which has "produced considerable paranoia, but little insight and no prevention."

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INNER WORKINGS OF NIF: A schematic view of the facility.

first-term California Democrat, had turned a few shovelfuls of soil and left the site, a small band of protesters planted sunflower seeds in the holes and watered them, Marylia Kelley, an organizer of Tri-Valley Citizens Against a Radioactive Environment, told *Inside Energy*.

Kelley also reported that the delegation of protesters that met with Peña conveyed the message that the construction of NIF would represent a persistent impediment to worldwide acceptance of the CTBT and that the laser-fusion facility would "lock Livermore into an increasingly narrow nuclear weapons future."

In his remarks, Peña had observed that NIF will not only ensure the reliability and safety of the stockpile, without further explosive testing, but "will advance our fundamental knowledge about basic science and help us learn more about whether fusion can be developed as a new source of energy." The glass laser is designed to fire 192 beams at a peak power of 1.8 million

joules at a tiny fusion target. The deuterium-tritium target would then ignite as a small, controlled, self-sustaining, fusion reaction. This ignition has been the holy grail of fusion researchers for nearly 50 years. Preliminary experiments at NIF are due to start in 2001, but Livermore scientists hold different views on how soon after that they will be able to reach ignition.

Even before it is built, NIF has been a battleground. On 12 May, the US District Court in Washington, the same court deciding on the preliminary injunction, denied a request by DOE regarding an earlier ruling that prevents the agency from making use of a National Research Council report on NIF because it was not done in accordance with the government's sunshine rules put forward in the 1972 Federal Advisory Committee Act. DOE argued that because Livermore is a contractor, it should be allowed to use the report, which supports the operation of NIF in the stockpile stewardship program. The court disagreed.

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National Research Council Studies Operate Under New Openness Rules

Despite the ruling by a Federal court that the National Research Council (NRC) must open its deliberations to public scrutiny, the organization continues to operate within the National Academy complex as if little has happened. It has been able to do so by adopting some new practices that more or less adhere to the rules set out in the 1972 Federal Advisory Com-

mittee Act (FACA) (see *PHYSICS TODAY*, June, page 66). Even so, the research council insists the new ways of conducting its studies will endanger its independence and intends to appeal the court's decision to the Supreme Court in the next few weeks.

Under FACA, research council studies are now proceeding in different ways: One uses a principal investiga-

tor who can call upon individual scientists and NRC staff; another allows a panel of experts to hold public sessions in keeping with FACA requirements; and a third method enables a temporary advisory board or committee to review a final draft report and largely follow the rules for public access. The new rules permit the process leading up to the selection of an investigator or committee to remain the same as always, with the NRC still selecting the experts and controlling the operations. At the end of each study, a final draft must go through the wringer of the report review committee in the traditional manner.

"We have had dialogues with the government agencies about several studies," says William Colglazier, the NRC's executive officer, "and almost every study is going forward." A few agencies have been jittery about supporting studies that use any of the three strategies. The Department of Energy (DOE), for instance, recently canceled an NRC study of the controversial International Thermonuclear Experimental Reactor. DOE claimed the research council's committee, which had already been chosen, would lead foes of the fusion energy program to file another lawsuit. In a report accompanying a bill authorizing DOE defense funding, the House directed the Secretary of Energy to ask the research council to maintain watch over the National Ignition Facility, which is to be built at Lawrence Livermore National Laboratory (see previous story on page 46), to make sure the project is "in full compliance with applicable law." Both DOE and the NRC are wary of such a study. It was just such a review that triggered the lawsuit by the Natural Resources Defense Council and 28 other environmental groups that led to the Federal court decision in May.

Notwithstanding the reservations of Federal agencies in supporting new studies, the research council ended its fiscal year on 30 June having earned \$115 million for studies out of a total budget of \$180 million. "We expect that our income from studies over the next 12 months will be even greater," Colglazier says.

Meanwhile, in a 19 June memo to staff, Bruce Alberts, president of the National Academy of Sciences and chairman of the research council, expressed his confidence that the organization will win its legal battle, but that "a considerable degree of uncertainty is likely to continue for another six to nine months." The uncertainty may have an impact on staff: Alberts warned that pay raises would be modest at best.

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