SCIENCESCOPE

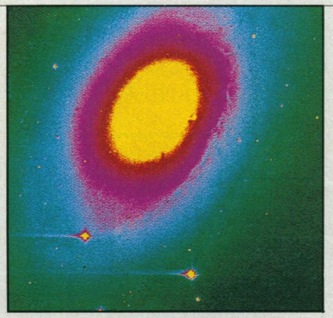
edited by RICHARD STONE

WIPPing Up a Neutrino Observatory

Originally excavated as a repository for radioactive waste, a network of caverns that is part of the $1.3-billion Waste Isolation Pilot Plant (WIPP) may soon stockpile an altogether different cache: neutron detectors for astronomical research.

The Department of Energy (DOE) started building WIPP nearly 20 years ago to store plutonium-laced waste from its weapons labs. Although completed in 1987, the facility near Carlsbad, New Mexico, remains unused. Opposition from environmentalists, state and local officials, and the Environmental Protection Agency has prevented DOE from opening WIPP; a decision on its future as a repository isn't expected until at least 1998.

But WIPP's geological features have caught astronomers' fancy. The caves were dug out of ancient salt deposits in which nearly all the natural radioactive elements have decayed to stable atoms, says physicist David Cline of the University of California, Los Angeles (UCLA). This gives the caves one of the lowest background rates of neutron emission in the United States.



ROYAL GREENWICH OBSERVATORY/PHOTO RESEARCHERS

Novel idea. Waste site could study supernovae such as SN 1993J.

That's why UCLA and several other universities want to build an observatory in WIPP's bowels to detect supernovae. Hundreds of detectors would record neutrons as they are forced out of salt molecules by the burst of neutrinos that accompanies a supernova explosion. From such data, scientists hope to learn more about the genesis of supernovae and the mass of neutrinos.

WIPP officials have not yet agreed to host an observatory, but they have let Cline's team take measurements to confirm the concept's feasibility; Cline is now preparing a proposal to send to DOE and other agencies. And the astronomers may offer an incentive for DOE to share WIPP: They suggest the neutron detectors could serve as a long-term monitor of both stellar and local radioactivity in the caverns, tipping DOE off to waste container leaks. This could satisfy EPA's demand that WIPP install such a monitoring system.

Shrinking the Weapons Labs: No Bargain?

With the threat of nuclear war diminished, the U.S. government is beginning to save money by trimming some defense programs. But retooling the nuclear-safeguard components of three research centers that were cogs in the military machine—the Department of Energy's (DOE's) weapons labs, Los Alamos, Lawrence Livermore, and Sandia—is unlikely to result in much savings, warns a report by the Congressional Budget Office (CBO).

Last spring, Senator Mark Hatfield (R–OR) asked CBO to investigate whether the labs' priorities still make sense, given that the United States is soon likely to approve the global Comprehensive Test Ban Treaty, which would forbid the bomb blasts that are the labs' specialty. Meanwhile, the labs have argued that Administration policy requires them to safeguard the nuclear stockpile.

The report's conclusions, presented in three options for Congress to consider, question the magnitude of rapidly growing programs such as cooperative research and development agreements (CRADAs) and the proposed $1-billion National Ignition Facility (NIF). Even so, CBO estimates that the most radical move it considers—easing Livermore out of stockpile stewardship, cutting CRADA funding by one third, and canceling NIF—would save at most $60 million the first year and $365 million after 5 years.

A high-profile panel on the future of the labs—headed by former Motorola chair Robert Galvin—plans to discuss the CBO report at a meeting on 19 September.

Peer Review for Russian Space Science

For decades, peer review in Soviet science meant vetting research results after they appeared in the scientific journals or in the press. Now, partly because of U.S. pressure, the Russian Space Agency (RSA) has created a council for reviewing and ranking grant proposals.

The RSA's Scientific and Technical Advisory Council (STAC), chaired by physicist Vladimir Utkin, director of the Russian space research agency TsNIIMASH, will review proposals for projects ranging from medical studies on astronauts to analyses of cosmic dust. These are some of the topics to be studied over the next several years during joint U.S.–Russian missions that will precede construction of the international space station. The projects will be funded in part by the U.S. National Aeronautics and Space Administration (NASA), which is committing $20 million for peer-reviewed Russian space research out of $400 million it has earmarked for Russian participation in the station.

NASA stipulated STAC's creation in recent talks with RSA and will have final say about the grants that STAC selects for funding. NASA officials say they'll keep a close eye on the council. "There's always the concern that in a system that doesn't have experience with peer review, the proposals may be accepted for factors other than science," says Robert Clarke, NASA's associate administrator for policy coordination and international relations. "But we feel they're interested in how to do real science," he says. STAC plans to review grants in November.

Congress Does the ITER Two-Step

Yet another flap over the International Thermonuclear Experimental Reactor (ITER)—sponsored by the United States, Japan, the European Union, and Russia—is brewing in Congress. At issue: Should the United States select a candidate site for the $10-billion fusion reactor before the international partners have even decided which country will host the machine?

Last year, the Senate passed a bill requiring the Administration to do just that. Its supporters, led by Senator Bennett Johnston (D–LA), argued that by selecting a candidate site, the United States would demonstrate its commitment to the project. They also pointed out that the United States would have a stronger case for hosting the international project if it had a site already picked out.

Last month, however, the House, with the support of the Department of Energy (DOE), approved legislation that would put off selection of an American site until after the host country has been chosen. "A lot of members don't think there's much chance it will be built in the United States, so why bother to hold a competition?" asks a House staffer.

Ann Davies, head of DOE's fusion program, says DOE supports the House bill because the department simply doesn't want states "to waste their money" preparing for a competition before a host country is chosen.

However, any delay worries people like Steve Jarvis of the California Office of Strategic Technology, who heads the state's ITER site selection committee. "This thing has been dragging along for a year," he says, referring to international talks on a site. "Senator Johnston has lit a fire under DOE to get things moving."

A House-Senate conference committee may decide soon which version of the fusion-research bill will prevail.