closer to the epicenter, many seismographs to the south were overloaded by the quake and unable to provide accurate magnitude measurements.

At press time, U.S. researchers had yet to receive seismographic data from Mexico. When the detailed data sets do become available, seismologists plan to scrutinize them for possible precursory signs — such as a period of quiescence, which has been observed before a number of other earthquakes on that plate boundary — to help make predictions for the future. *—S. Weisburd*

ASAT target was working research satellite

It is not just that the Air Force satellite deliberately destroyed by an Air Force missile on Sept. 13 was still transmitting at the time. That much was a requirement in the test of the U.S. antisatellite (ASAT) system, says a Pentagon spokesperson, "so that we could verify impact." What has outraged some scientists is that the chosen satellite was instrumented for studies of the sun, and had been operating until the instant of its destruction as what one solar physicist calls "the backbone of coronal research through the last seven years."

Known as P78-1, the satellite had been launched on Feb. 24, 1979, carrying seven scientific instruments. Only two were in use at the time of the ASAT test, due, the Pentagon says, to "continuing battery degradation." But one of them was a "white-light coronagraph" that had been photographing the sun's outer atmosphere on the way to what scientists hoped would be the first record, made from outside earth's own atmosphere, of the corona's behavior over a full, 11-year cycle of solar activity. (A coronagraph aboard NASA's Solar Maximum Mission satellite had become useless when "Solar Max" blew three fuses 10 months after its 1980 launching, and was not restored to duty until space shuttle astronauts repaired the satellite last year [SN: 4/14/84, p. 228].)

"I can't believe that they couldn't find a piece of space junk, really, instead of a working laboratory," says David Rust of the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md. "This was a working observatory, so I'm just a little taken aback [by] the SDI [Strategic Defense Initiative, sometimes dubbed 'Star Wars'] people. ... They particularly made a pitch to the university community, to the scientists, in saying this is a 'Manhattan Project' sort of thing, and it's good science and so forth — and then they turn around and blow up a laboratory."

Rust, a supervisor of the APL solar physics program, was also coordinator of satellite observations during the 1980-81 Solar Maximum Year. P78-1 "played a major role in that," he says, and its researchers "have made major strides in explaining how coronal changes affect interplanetary space. They found the first evidence of a comet falling into the sun [SN: 10/17/81, p. 244], and you could expect that they'd continue to show some good results, particularly with the solar cycle changing the characteristics of the corona. . . ." As for APL, he says, "our chief reaction here, among several of us who have used the data, was really one of shock."

The ASAT test was originally to have been aimed at an instrumented, balloon-like vehicle launched into space just for that purpose. But according to the Sept. 2 Aviation Week & Space Technology, problems with the target caused delays until "the decision was finally made to use an older, no longer functional satellite already in space. . . ." P78-1 had a "planned, on-orbit lifetime" of only one year when it was launched, and a "maximum design lifetime" of three. And, said one Pentagon spokesperson after the test, it had "outlived its useful life and fit the requirements of the test."

But "useful life" and "design lifetime" are not always synonymous. Design lifetime is a technical specification, used for such purposes as determining the reliability requirements for microcircuits and other components (those tested to higher reliability standards cost more), or scheduling subsequent satellites. Researchers working with scientific satellites and interplanetary spacecraft, however, often plan for the possibility of longer periods of operation.

The Voyager 2 spacecraft, for example, exceeded its official design lifetime when it passed Saturn in August 1981, yet even before its 1977 launching scientists had been planning for the possibility of encounters with Uranus in 1986 (Voyager 2 will get there in January) and Neptune in 1989. Similarly, the Viking 1 landing craft, which reached the surface of Mars on July 20, 1976, collected data about the planet for more than six years, yet its formal "spec" had called for only 90 days. "Design lifetime," says an engineer who has worked on some of NASA's interplanetary missions, "is not what I'd fall back on if I were trying to rationalize turning off a working spacecraft."

Even so, the Pentagon spokesperson says that, "based on cost and return-on-investment, P78-1 would have been turned off in early 1987, when ground systems are scheduled to be upgraded." For the ASAT test, he says, "the Air Force made a conscious decision . . . [which] considered the loss of the continuing useful scientific data being provided by the two operating experiments."

"If you want to say that I called it 'a travesty,'" Rust told Science News, "why you can say that. I think that's a perfectly correct characterization." *—J. Eberhart*

A hot vent find in the Atlantic

This summer, a team of oceanographers on its way to track down the exact sites of the low-temperature hydrothermal vents, or undersea geysers, it had found on the Mid-Atlantic Ridge last year (SN: 10/20/84, p. 246) made an even steamier discovery. While retrieving some current meters at another hydrothermal field along the ridge, the scientific party aboard the National Oceanic and Atmospheric Administration (NOAA) ship *Researcher* found the telltale signs of enhanced hydrothermal activity in water samples. They decided to abandon their original plan to cruise farther south, and three weeks later zeroed in on a cluster of at least 11 high-temperature vents — "black smokers" that were vigorously spewing out blackened, mineral-laden water just like their counterparts along the East Pacific Rise.

The find is remarkable not only because it adds to the number of vents found in the Atlantic but also because it is the first example of high-temperature venting along a slow-spreading ridge. Traditionally scientists have hunted for undersea geysers along ridges where seafloor is being created rapidly; the East Pacific Rise, for example, churns out new ocean floor about 10 times faster than the Mid-Atlantic Ridge. But since 1972, when the first evidence of low-temperature venting was found along the Mid-Atlantic Ridge, oceanographers have come to understand that fast-spreading ridges don't have a monopoly on venting.

Finding high-temperature vents fortifies the view that slow-spreading ridges — which account for half of the world's ridge network — may contribute much more to the oceans' chemical and thermal budgets than previously thought. In addition, the recent find demonstrates that there is enough heat available under slow-spreading ridges to drive black smokers — an idea that was in question before the cruise, says *Researcher* chief scientist Peter Rona at NOAA in Miami. Rona also reports that the group dredged polymetallic sulfides from the floor, a find suggesting that the Atlantic may house more economically important resources than had been assumed.

Rona's group, which includes researchers from the University of Cambridge in England and the Florida Institute of Technology in Melbourne, has yet to analyze in detail the water and sediment samples collected during the July 9 to Aug. 7 cruise. Preliminary results will be presented at the December meeting in San Francisco of the American Geophysical Union. The researchers would like to return to the vents with a submersible to examine them in detail and to collect samples of the hot, bubbly fluids from the mouths of the vents. *—S. Weisburd*