would have survived nicely," says program manager Scott Borg of the National Science Foundation, co-sponsor of the $4.3 million project. Instead, the 20 drillers and support staff worked around the clock to dismantle the 50-ton drilling platform and haul it to the base camp near shore, an operation completed early on 26 October. "The illusion of man triumphant over nature is ripped away by the winds and cold here," says project scientist John Wrenn of Louisiana State University in Baton Rouge, who studies microfossils. Many scientists who had just reached the camp will now have to return home early.

But the storm-shortened season was not a complete loss: Researchers were able to recover 113 meters of core tentatively dated at 17 million to 22 million years old. Although the sediment is several million years younger than indicated by acoustic studies, it represents a period never before sampled near the Antarctic ice sheet. "I'm delighted with what we have recovered," says Wrenn. Because sediment analyses should help fill a gap in Antarctica's paleoclimactic record, adds Borg, "this core is expected to be very valuable from a scientific perspective."

The premature end to the drilling season, however, casts doubt on the scope of future work. While the project is funded for two field seasons, project scientists acknowledge that there's no way to sample the remaining 1350 meters of valuable sediment layers next season alone. That will leave Barrett and others to sort out over the coming months whether they can squeeze money out of project backers for a third season or whether they must settle for fulfilling only part of their goal. And of course they will keep a wary eye on the weather. Says Askin, "We'll keep our fingers crossed for next year."

–Richard Stone

SPACE TELESCOPE

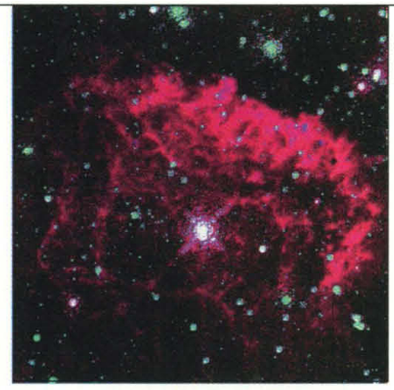
Making the Most of a Short Life

The front-page pictures last month of the "pistol star"—perhaps the brightest star ever seen in our galaxy—was one of a string of striking images this year from the Hubble Space Telescope. But it was among the first from the Hubble's Near Infrared Camera and Multi-Object Spectrometer (NICMOS), one of two new instruments astronauts installed on the telescope in February. For NICMOS scientists, the splash of publicity was a welcome respite from the headaches that the instrument has caused.

Problems with the instrument's cooling system have forced one of its three cameras out of focus and cut its life expectancy by more than half—from 4 1/2 years to less than 2 years. The efforts to complete as much science as possible during NICMOS's shortened lifetime are disrupting observing schedules on other instruments. And NASA is even planning to move the telescope's secondary mirror for a few weeks next January to sharpen some NICMOS observations—an adjustment that astronomers say carries a small, but real, chance of leaving other instruments permanently out of focus.

Soon after NICMOS was installed, NASA engineers discovered that the solid nitrogen coolant, which keeps ambient heat from obliterating the infrared radiation NICMOS is designed to observe, had expanded so that it was touching its casing. The resulting "thermal leak" is heating the nitrogen so quickly that engineers predict it will all sublimate into space by late next year, leaving the instrument's sensors blinded. The expanded ice has also pushed out of focus the detector for the third camera and its multiobject spectrometer, a tool that separates incoming light into a spectrum, revealing an object's speed and what it is made of.

Engineers say they might be able to install a cooling pump in 1999 (*Science*, 23 May, p. 1183), but Hubble managers are not counting on such a save. The Space Telescope Science Institute (STScI) in Baltimore, which controls Hubble operations, has set aside almost half of the telescope's orbits next year for NICMOS observation—double the original allotment. That means some long delays for astronomers who want to use the Space Telescope Imaging Spectrograph (STIS)—the other new instrument installed in February—the Wide Field Planetary Camera 2 (WFPC2), and the Faint Object Camera.



Brightest star in the galaxy. This image was one of the first from NICMOS.

While most of those affected say they understand and even support the shuffling, the delays are frustrating, says astronomer Jeff Linsky of the University of Colorado, Boulder, who hopes to use STIS to probe the anatomy of young stars. "We put in our proposals a long time ago," he says. "[NASA] invested $125 million in STIS, and we have seen very little so far." He estimates that his observations will end up a year behind schedule. Douglas Richstone of the University of Michigan, Ann Arbor, who plans to use STIS to take a census of black holes, estimates that his observations are 6 months behind.

STScI officials acknowledge that the delays will be painful. "There are people who applied for time a year ago and who will have to wait another year for their data," says Andrew Fruchter of STScI, a member of the WFPC2 group. "After that amount of time, a conception can become scientifically stale."

Efforts to sharpen the focus of the multiobject spectrometer camera will also disrupt other observations, at least temporarily. In late January, NASA engineers will send a command for Hubble to move its secondary mirror a fraction of a millimeter to bring the detector into focus. But even that tiny shift is enough to blur the vision of the other instruments, and they would be handicapped if the mirror can't be moved back to its original position. "That scares me," Richstone says. "Suppose the motor fails. It's not astronaut serviceable." But Fred Walter of the State University of New York, Stony Brook, chair of the Space Telescope User Committee that advises STScI, says NASA has made bigger adjustments before. "It's only a small risk that you'll be stuck at a bad focus," he says. "The engineers are confident it will come back."

NICMOS users, on the other hand, are thrilled at the chance to use the third camera to look at the composition of Pluto's moon Charon and of the star-forming regions of the Milky Way and other galaxies. Almost half of the 3-week set of observations will be devoted to taking another look at the Hubble Deep Field, a region of the sky that WFPC2 probed nearly 2 years ago, revealing some of the faintest and most distant objects ever seen. The expansion of the universe stretches the light from distant galaxies into longer—redder—wavelengths, and by viewing the Deep Field in the infrared, NICMOS may be able to probe even deeper into the outer reaches of the universe.

But the coolant troubles will still limit that observation. Scientists had hoped to get deep views of adjacent areas of the sky with WFPC2 and STIS. The mirror shift, however, will render WFPC2 useless, and astronomers are unsure how useful the out-of-focus information from STIS will be.

Nonetheless, STScI director Robert Williams emphasizes that the intense set of observations over the next year should produce a spectacular scientific harvest: "NICMOS works. It can do everything we had hoped." But he admits that the problems have been "a big disappointment." The triage "has required a tremendous amount of work," he says. "We're going to end up recouping most of the science, but it's taken so much more effort to do it."

–Gretchen Vogel