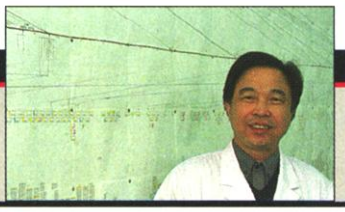

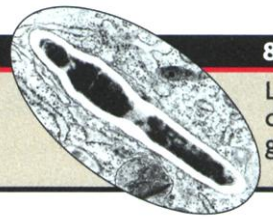

for 17 May at Livermore. In the meantime, the black humor surrounding NIF is getting a bit darker. Noting that the laser is often described as a "stadium-sized" project, some DOE employees have proposed that a more fitting benchmark might be the *Titanic*.

–DAVID MALAKOFF

MILITARY ASSETS

Scientists Gain Access To Sharper GPS Signal

Rarely can the government make thousands of scientists happy by simply flipping a switch. This week, however, U.S. President Bill Clinton did so by ordering his military commanders to turn off a scrambling device on Air Force positioning satellites. The change, effective at midnight on 2 May, provides researchers and commercial users with a 10-fold improvement in their ability to pinpoint the location of receivers on Earth.

Until now, only the U.S. military has had regular access to the high level of precision possible with the constellation of 24 Global Positioning Satellites (GPS). Civilian researchers have had to make do with the scrambled version of the signals, which are based on atomic clocks onboard each spacecraft. "This really opens up the field for scientists," says Charles Challstrom, director of the National Geodetic Survey.

Combining the more exact GPS data with existing maps, for example, will allow scientists in remote territory to plot immediately their locations to within 10 meters, says James Baker, National Oceanic and Atmospheric Administration chief, eliminating time-consuming calculations. Glenda Humiston, Agriculture Department deputy undersecretary of national resources and environment, says that the greater accuracy will allow researchers to probe environmental effects at a much more fine-tuned level; for example, to understand the effects of roads on watersheds.

National security agencies have long resisted any move to improve the precision for civilian and commercial users, arguing that terrorists could make use of GPS signals. And the few civilian researchers temporarily given the codes to receive the more exact signals had to face a process that one Commerce Department official says was "costly and cumbersome." Time-consuming data processing by civilian scientists helped improve the accuracy of scrambled signals, but the quality remained less than that enjoyed by the military.

Eager for benefits ranging from improved car and boat navigation to tracking freight, however, commercial concerns kept up pressure to unscramble the signals. The Administration in 1996 agreed to stop the scrambling within a decade and moved up that timetable after the Defense Department found a way to rescramble the signals in a particular region in case of war, military officials said at a 1 May White House briefing. Now anyone with a GPS receiver anywhere will have access to signals nearly as accurate as those used by the military services.

Keeping track. GPS receivers help Carnegie Mellon University researchers track their NASA-funded robot in Chile's bleak Atacama Desert.

The Administration plans to make GPS even more accurate by adding a second frequency in 2003 that will compensate for disturbances in the ionosphere that interfere with the GPS signals. A third frequency for even greater accuracy is slated for 2006. The government also hopes to improve its ability to estimate the position of each satellite, giving scientists an even better sense of where they are.

–ANDREW LAWLER

ARCHAEOLOGY

Hints of Frequent Pre-Columbian Contacts

Last week's opening of the Smithsonian Institution's exhibition, "Vikings: The North Atlantic Saga," was a glittering black-tie affair, with Scandinavian royals rubbing shoulders with an international scientific crowd. The pomp and ceremony served to popularize the scientific evidence that the first contact between Europeans and Americans was not Columbus's voyage but Viking landfall in Newfoundland, thought to have occurred about A.D. 1000. And at a 2-day symposium, Canadian archaeologist Patricia Sutherland took the Viking story a big step further, presenting stunning new traces of the Norse on northern Baffin Island in the Canadian Arctic, at least 200 years before Columbus. Although not all her colleagues are convinced, Sutherland argues that the evidence shows that in the Arctic, unlike in Newfoundland, the Norse had frequent and prolonged contact with aboriginal peoples—the first sustained close encounter of the Old World with the New. "There was more than just in-and-out trading and 'Goodbye, we won't be back,' " says Sutherland, who suspects that the Norse actually established shore stations on Baffin Island.

The Norse artifacts, including spun and plied yarn, characteristic woodworking, and even carvings with European-like faces, come from sites of arctic hunter-gatherers known as the Dorset. Although archaeologists had suspected that the Norse had traveled the eastern arctic coasts, until recently no one had searched Dorset sites for clues. Researchers had thought that the Dorset had vanished from most of the Arctic by the time the Vikings crossed the Atlantic, although a fragment of a Norse pot did turn up in a Dorset site in Greenland a few years ago. "But that was just a single find," says Bjarne Grønnow, an archaeologist and director of The Greenland Research Centre in Copenhagen, who heard Sutherland present her work at a recent conference in Denmark. "When Pat presented her finds, we all said, 'Wow, it's not just a coincidence. It's really something.' "

Sutherland, who works at the Canadian Museum of Civilization in Hull, first came across the Norse objects while examining the museum's artifacts from Nunguvik, a Dorset site on northern Baffin Island excavated in the 1970s and 1980s. Among trays of distinctive Dorset harpoons and carvings, she pulled out two strands of soft yarn, one 3 meters in length. Neither the Dorset nor other native northern groups were

Face to face. Dorset carving shows Norse and Dorset faces.

CREDITS: (TOP) CARNEGIE MELLON UNIVERSITY; (BOTTOM) CANADIAN MUSEUM OF CIVILIZATION