

## Mars mapping postponed

A damaged solar panel will delay until March 1999 a mission to map the surface composition and atmosphere of Mars. The 1-year delay might also shorten the study, initially planned to last 2 years.

Mars Global Surveyor arrived at the Red Planet in September and was scheduled to settle into its final orbit in January 1998. According to that plan, mapping would have begun in March of that year.

Trouble arose in early October, a few weeks after the start of aerobraking, the fuel-saving technique that Surveyor relies on to reshape its orbit. In the aerobraking maneuver, the craft dips down into Mars' denser upper atmosphere to trim its elliptical orbit into the circular path designed for mapping (SN: 10/18/97, p. 246).

Aerobraking had been going according to plan until part of the upper atmosphere unexpectedly grew thicker. The extra pressure exerted on the craft during its maneuvers caused the panel to flap back and forth. Flight controllers feared it would snap off or suffer irrevocable damage, so they suspended aerobraking for 3 weeks.

Studies revealed that the solar panel could continue to function if aerobraking were slower. With this strategy, which NASA adopted on Nov. 7, the craft does not dip as deeply into the upper atmosphere and so is exposed to lower pressures.

The duration of these maneuvers, as well as a 6-month hiatus in the spring of 1988 while Mars moves into an optimal alignment with the sun, adds a calendar year—half a Mars year—to the time required for Surveyor to attain its mapping orbit, says mission manager Glenn E. Cunningham of NASA's Jet Propulsion Laboratory in Pasadena, Calif.

From the point of view of Surveyor, the orbital modifications will mean that the side of Mars that would have been dark will be sunlit and vice versa. That will make no difference in data gathering if Surveyor orbits the Red Planet for an entire Martian year, as planned. However, the mission may be shortened to ensure adequate funding for the next craft, the Mars '98 orbiter, scheduled to arrive in September 1999. —R.C.

## Two more moons for Uranus

Large telescopes are often reserved for examining distant reaches of the heavens, but they can do wonders exploring Earth's own backyard. Using the 5-meter Hale Telescope atop Palomar Mountain near Escondido, Calif., astronomers have discovered two additional moons orbiting Uranus, bringing to 17 the number of known satellites of this distant planet.

The two satellites, the faintest moons ever detected from the ground, were first observed in early September by Brett J. Gladman of the University of Toronto and his colleagues. Other researchers, using telescopes in New Mexico and Hawaii, confirmed the finding, scientists reported in an Oct. 31 circular of the International Astronomical Union.

One of the moons has a diameter of about 80 kilometers and lies about 6 million km from Uranus; the other is roughly twice that size and lies about 8 million km away. Both are classified as irregular because they have highly elliptical paths and orbit at an angle to the plane in which most other moons orbit their planets. The other two giant planets in our solar system, Jupiter and Saturn, also possess irregular moons, but these are the first discovered around Uranus.

The size and angle of their orbits suggest that these moons did not arise from the same cloud of material that condensed to form Uranus, says codiscoverer Joseph A. Burns of Cornell University. He speculates that the moons may have been chunks of solar system debris that slammed into Uranus' atmosphere when the planet was still very young and its atmosphere bloated. In the process, the debris lost energy and became bound by gravity. —R.C.

## HIV not eradicated by drug cocktail

HIV, the virus responsible for AIDS, isn't eliminated entirely by combinations of medications—even when doctors catch it early. Although drugs kept the virus at bay in many patients for up to 30 months, HIV was still present and potentially active, according to three new studies.

Scientists warn that people getting today's most effective anti-HIV cocktails of expensive drugs may be destined to take them indefinitely. Side effects include vomiting and diarrhea.

The virus was present in all patients tested, reported two teams—one led by researchers at Johns Hopkins Medical Institutions in Baltimore and the other by scientists at the University of California, San Diego School of Medicine in La Jolla—in the Nov. 14 *SCIENCE*.

"The bad news is we still found the virus present; the good news is, in the patients we looked at, it was still sensitive [to the drugs] and not resistant," says Diana Finzi of Johns Hopkins.

The third study indicates that HIV may be doing more than merely clinging to life in T cells, the immune cells that the virus invades. A team led by researchers at the National Institute of Allergy and Infectious Diseases (NIAID) examined 13 HIV-positive patients who were taking a triple-drug combination. It detected viral DNA that was not integrated into chromosomes in the infected cells, an indication that the virus might be slowly replicating. "If viral replication is shut off, that [form of DNA] would have disappeared," says coauthor Anthony S. Fauci, NIAID director. "It's not absolutely slam-dunk, but it's likely that replication is going on." The study appears in the Nov. 25 *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*.

All three research teams used the most sensitive measures available to detect HIV. Long-term studies extending months or years into the future may show whether the drug onslaught causes the virus to dissipate, Fauci says. —N.S.

## Some needle sticks worse than others

On average, only about 3 people in 1,000 who are exposed to HIV by being stuck with a contaminated needle or similar sharp object become infected with the virus, research has shown.

Now, a study of health care workers in four countries reveals that deep punctures or cuts, combined with infected blood containing high concentrations of the virus, increase the likelihood that HIV will spread in such accidents, researchers report in the Nov. 20 *NEW ENGLAND JOURNAL OF MEDICINE*.

The nature of the contaminant proved significant. Risk of infection was highest when a worker was jabbed with an instrument carrying blood in visible quantities or received undiluted blood from a vein or artery of an infected person.

Researchers in France, Italy, the United Kingdom, and the United States collected information from 33 people who became HIV-positive through such accidents—30 of which involved needles—and 679 people who didn't. All but six people in the infected group contracted HIV from the highly virulent blood of AIDS patients who died less than 2 months later.

The data were collected between 1988 and 1994 as part of the Needlestick Study of the federal Centers for Disease Control and Prevention (CDC) in Atlanta. Although taking an immediate course of AZT, or zidovudine, seems to lower AIDS risk, only 9 of the 33 infected workers received the drug. Today, CDC recommends an immediate course of AZT and two other drugs for anyone stuck by a needle that may carry HIV, says CDC medical epidemiologist and study coauthor Denise M. Cardo.

In the United States, of a total of 52 health care workers known to have contracted HIV from patients, 46 were infected via cuts or punctures, Cardo says. Although fewer than 1 percent of such accidents result in HIV infection, Cardo says, the new findings show that specific characteristics of the transmission can intensify the risk. —N.S.