

More Hubble trouble

One of three infrared detectors installed on the Hubble Space Telescope during last February's repair mission is out of focus, and all of the devices, which sit inside a chilled vacuum chamber, may function for just half of their expected lifetime.

This time, the problem lies not in Hubble's primary mirror, but in the solid nitrogen system that cools the Near Infrared Camera and Multiobject Spectrograph (NICMOS) down to its operating temperature of 58 kelvins. On the ground, researchers had noticed that as nitrogen ice evaporated, it tended to recondense in the space behind the chamber. Although this condensation pushed NICMOS slightly out of optimum optical alignment, the instrument remained well within the limit of focus. In orbit, however, the recondensing ice pushed the container out about 5 millimeters—enough to defocus camera 3, the detector with the widest field of view and the smallest optical tolerance.

Camera 3 is the only NICMOS detector that has a spectrograph, a device that divides light into its component wavelengths. Stephen E. Strom of the University of Massachusetts at Amherst says that some spectroscopic studies can be approximated by observing through specific color filters on the other two cameras.

A more serious problem, notes NICMOS researcher Marcia J. Rieke of the University of Arizona in Tucson, is that the chamber's new position has placed it in direct contact with its warmer surroundings, causing nitrogen ice to evaporate almost twice as rapidly as before. If the problem continues indefinitely, NICMOS would last for only half of the 5-year intended lifetime. To plan for that worst-case scenario, Hubble administrators are considering putting observations with cameras 1 and 2 on a fast track. —R.C.

A new tail for Comet Hale-Bopp

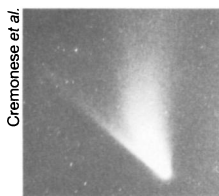
Even as it begins to fade, Comet Hale-Bopp continues to beguile skywatchers. Two weeks ago, astronomers spied a huge tail, of a type never seen before, emanating from the comet's dusty shroud, or coma. Composed of sodium atoms, the tail stretches some 50 million kilometers in length and 60,000 km in width and is distinct from the familiar dust and ion tails that Hale-Bopp and other comets flaunt when they near the sun.

Researchers detected the tail on April 16, using a wide-field camera at La Palma Observatory in the Canary Islands, Spain. Sodium has been detected before in comets, but never in the form of a tail and never this far from the coma. Gabrielle Cremonese of the Astronomical Observatory in Padua, Italy, reported the finding in an April 18 circular of the International Astronomical Union. An image taken by the Polar satellite on March 31, but only recently analyzed, confirms the presence of the tail.

Michael F. A'Hearn of the University of Maryland at College Park says he was surprised by the discovery but suspects "it is a common phenomenon that nobody looked for before." Sodium atoms absorb radiation at wavelengths that coincide with the peak intensity emitted by the sun. As a result, the atoms interact strongly with sunlight and are easily pushed great lengths from the coma by radiation pressure, he suggests.

Michael R. Combi of the University of Michigan in Ann Arbor argues that radiation pressure isn't strong enough. He says that the solar wind, the sun's stream of charged particles,

pushes on sodium-containing material in the inner coma. After leaving the coma, the sodium separates from its parent molecule. —R.C.



The diagonal line is Hale-Bopp's newly discovered tail of sodium atoms. The broad tail pointing up is the dust tail.

Cremonese et al.

Early puberty turns girls into women

Girls in the United States mature sexually earlier than expected, with black girls entering puberty well ahead of white girls, a new study shows.

The study of 17,077 girls indicates that puberty begins, on average, at age 9 for black girls and at age 10 for white girls. For many girls, however, puberty starts much earlier.

Three percent of black girls and 1 percent of white girls begin to develop breasts and pubic hair by age 3. By age 7, more than 27 percent of black girls and 7 percent of white girls have begun to mature. By age 8, 48 percent of black girls and 15 percent of white girls have entered puberty.

"They're still little children," says Marcia E. Herman-Giddens of the University of North Carolina School of Public Health in Chapel Hill. "It's a challenge to prepare them for these sexual changes when they're still so emotionally immature."

Both groups begin menstruating at roughly the same age, which averages 12 years and 2 months for blacks and 12 years and 10 months for whites.

The survey, published in the April *PEDIATRICS*, offers a rare glimpse at differences in the pace of sexual maturation. Data were collected by 225 pediatricians across the United States.

Because these patients visited pediatricians, they do not necessarily reflect the population as a whole. Still, the investigators believe their findings can be used to refine the statistical yardstick for assessing norms of sexual maturation.

About 90 percent of the girls studied are white; most of the rest are black. Hispanic girls were assigned either to the black or white category. Girls of other races together accounted for just 2.8 percent of the study group, too small a sample to ensure statistical accuracy. —S.S.

Psoriasis balm boosts melanoma risk

Most people grow a new skin every 30 days. People with psoriasis, however, grow new layers of skin much more rapidly. In this condition, the new skin is inflamed and abnormal, marred by clumps of immature cells that form red, scaly lesions.

One of the few effective, well-tolerated remedies for severe psoriasis is a plant derivative called psoralen, which slows skin growth when combined with exposure to ultraviolet A light. Several studies have associated long-term use of the therapy—known as PUVA—with squamous cell carcinoma, a usually treatable form of skin cancer.

Now, researchers have also linked PUVA to malignant melanoma, perhaps the deadliest of all skin cancers. The evidence arose in a study of 1,380 people treated regularly with PUVA since 1975, report Robert S. Stern of Harvard Medical School in Boston and his colleagues.

Between the start of PUVA therapy and 1990, these people developed only four melanoma tumors, about the number that might be expected in the overall population. Over the next eleven years, however, seven of them developed eight melanomas. Three of the people have died of melanoma, according to a report in the April 10 *NEW ENGLAND JOURNAL OF MEDICINE*.

On the basis of this and other findings, the researchers calculate that the risk of melanoma rises after 15 years, especially in people who have received 250 or more doses of PUVA. People who receive these treatments often "should be followed carefully" so cancers can be detected and treated early enough to save lives, Stern and his colleagues advise.

Klaus Wolff of the University of Vienna asserts that "we cannot now afford to abandon PUVA," despite the melanoma risk, because "PUVA offers innumerable patients the chance to resume a normal life." Wolff echoes Stern in an editorial asserting that doctors should adhere to treatment guidelines and observe patients for cancer. —S.S.