



Diagram of Voyager 2's path through possible "filaments" of Jupiter's magnetic tail.

ently flew through the tail. "The way we tell we're in the tail," says principal investigator Frederick L. Scarf of TRW Inc., "is that we see noise in a certain range of frequencies that is characteristic of Jupiter. [In the Voyager data], we saw exactly the same characteristics we last saw as we were leaving Jupiter a year and a half ago. We are convinced that we were experiencing Jupiter's magnetosphere again." The "noise," according to Scarf, probably represents radio waves trapped (and possibly even generated) within the tail.

But the readings were not continuous. They showed up on Feb. 18 and 19 and again in early April, as if the tail, weakened so far downstream from Jupiter, was split into separate "filaments."

How far the filaments extend remains to

be determined (though the Pioneer 10 data suggest that the distances could be vast), as does whether Saturn will be in the middle of one of them when Voyager 2 flies by. Neither of the two probes that have already visited Saturn—Pioneer 11 and Voyager 1—did so when Jupiter's tail was anywhere near them, so the results of such an interaction are so far unknown. The now-familiar "bow shock" formed where the supersonic solar wind strikes a planet's magnetosphere could even be missing completely if the incoming flow is the much more leisurely one of particles flowing down the Jovian tail.

"I think it's extremely likely that the Saturn encounter will be different this time," says Scarf. "I think it'll be a field day for the theoreticians." □

## Beware the supplies of arts and crafts

The male, middle-aged professor had taught various lithography courses in a large university's art department since 1972. By the spring of 1976 he was extremely ill, experiencing weakness, blackouts, headaches, dizziness and shortness of breath. A blood profile revealed that this artist had aplastic anemia—a disease with a 65 to 75 percent mortality rate. An investigation of his professional routine revealed that the acquired (as opposed to congenital or inherited) disease may have resulted from long-term exposure to the benzene used in photolithography.

This artist's case history is outlined in the recently published *Health Hazards in the Arts and Crafts*—the proceedings of a Society for Occupational and Environmental Health conference conducted to promote awareness of the health risks involved in prolonged exposure to the chemicals in paints, solvents and other substances used by artists. More recently, one of the book's editors—Michael McCann, an industrial hygienist at the Art Hazards Project of the Center for Occupational Hazards in New York—reported a study whose results bore the same message: Artists beware.

McCann, along with Barry A. Miller and Aaron Blair of the National Cancer Institute Environmental Epidemiology Branch, used a statistical method called Proportionate Mortality Ratio (PMR) to analyze the deaths of 1,598 white male and female artists listed in *Who's Who in American Art* between 1940 and 1969. A

PRM compares the observed number of deaths from a specific cause in a sample population with the expected number of deaths from that same cause in the general population. Using this technique, McCann and colleagues found an apparent increased incidence of cancer deaths among professional artists. Specifically, the researchers found an increased incidence of leukemia and bladder, prostate and colon cancers among male artists and an increased incidence of cancers of the rectum, lung and breast among white female artists in the study. But the study, presented at the Health Risks in the Arts, Crafts and Trades meeting last month in Chicago, is only preliminary, warns Miller, and efforts now are under way to locate other suitable arts and crafts populations to study.

Studies also are under way to investigate industrial settings where workers are exposed to the same chemicals found in the artists' studios. For example, Charles Billings and colleagues of Johns Hopkins University in Baltimore, Md., have been awarded a contract by the National Institute of Occupational Safety and Health to study the health hazards of the painting trade. In the first phase of this study, a walk-through of 50 plants and a check through the NIOSH *Registry of Toxic Effects of Chemical Substances*, the researchers found that there are more than 300 potentially toxic materials and 150 potential carcinogens present in paints. Phase two of the Johns Hopkins study, currently

under negotiation, will include an epidemiological analysis of workers exposed to these substances.

The Johns Hopkins and NCI investigations occur amidst a dynamic controversy concerning stricter labeling of the raw materials used in arts and crafts and certain industrial settings. At the request of the Chemical Manufacturers Association and as a part of its general reduction in regulation, the Reagan administration put aside an OSHA proposal that would require such stricter labeling. Still, a similar measure now pends in Congress.

The bill's main champion is Rep. Frederick W. Richmond (D-N.Y.). "I first became aware of the desperate need for comprehensive warning labels on toxic art supplies after receiving letters from several artists who suffered chronic illnesses as a result of using improperly labeled art material," Richmond says. "The type of symptoms they described are all too common among artists and hobbyists who have not been warned of the potentially chronic health hazards associated with art supplies."

Richmond's proposed piece of legislation—the Arts Hazards Bill—would require artist product labels to list such items as the common names of the chemicals contained in the product and precautions to take to avoid its misuse. □

## The VA: Curious orange

The Veterans Administration recently took a long-anticipated step toward resolving the Agent Orange issue when it contracted a University of California at Los Angeles research team to design a study to determine whether that herbicide has caused health problems in soldiers exposed to it.

Agent Orange—composed of the dioxin-contaminated 2,4,5-T (SN: 4/18/81, p. 247) and 2,4-D—was used in Vietnam to destroy crops in an attempt to reveal enemy jungle hiding places. Since that time, thousands of veterans have blamed exposure to the herbicide for a multitude of ills—ranging from acne and headaches to birth defects in their children and cancer. Now, the UCLA team—headed by Gary Spivey and Roger Detels—has been awarded a \$114,288 contract to design an epidemiological study that will investigate these claims.

The UCLA study design will be evaluated by members of various institutions, including the National Academy of Sciences' National Research Council. The VA then will consider bids from groups interested in conducting the proposed study.

The VA planned to embark on this Agent Orange strategy about a year ago, but the National Veterans Task Force on Agent Orange sued to block it, complaining that the plan was too restrictive and lowest-price bid oriented. Eventually, a federal court gave the VA the go-ahead. □