

time. Getting the luminosity was a bit trickier, as ISOCAM was only surveying the regions at 7 micrometers. To deduce an object's total luminosity, they developed a yardstick by looking at a number of stars with known total luminosities and calculating an average ratio of total luminosity to luminosity at 7 micrometers.

Astrophysicist Hans Zinnecker of Germany's Astrophysical Institute in Potsdam says this trove of dwarfs and dim objects will help astronomers understand the process through which molecular clouds fragment and form stars. For example, it might contribute to an understanding of the relationship between the mass of a cloud and the mass and number of the resulting stars. There is also the long-standing question of the unidentified "dark matter" of the universe. "This can help us estimate how many of these [brown dwarfs] form and what their contribution might be to the dark matter," he says.

Watching Dust Grains Form

None of us would be here today if it were not for supernovae. These violent explosions of old, burned-out stars are responsible for scattering the heavy elements such as carbon, oxygen, and silicon created in the star's nuclear furnace. The fireball is also thought to play a role in forming basic chemical compounds and interstellar dust, which condense into new solar systems like our own. Now, ISO is getting a



Dust storm. A ring of debris from supernova Cassiopeia A, where cosmic dust forms.

clearer picture of how and when supernovae create the ingredients of future worlds.

By training ISOCAM, ISO's infrared camera, on Cassiopeia A, the youngest supernova remnant in our galaxy, astronomers have, for the first time, identified the composition of dust grains in the remnants of the supernova. They have also detected a new addition to the list of elements found in supernova remnants: the inert gas neon. By tracing the signatures of dust and elements through the different regions of the exploded star, astrophysicists should be able to fine-tune their understanding of the processes that produce them.

Using a filter specially tuned to pick up the thermal emissions from dust, a group led by Pierre-Olivier Lagage of France's Atomic Energy Commission in Saclay reported a year ago that it had determined that dust was forming in so-called fast-moving knots,

globules of nuclear fusion products blown off from the outer layers of the exploded star. Now, as they reported in Kyoto, Lagage and his colleagues have succeeded in determining the composition of individual knots. They have found that the dusty knots are, as expected, rich in silicate, while others contain traces of argon and sulfur, together with the new addition, neon.

The knots originated in different layers of the star, and they can be distinguished because knots from outer layers move faster than knots from inner layers. Astrophysicists have wondered how much mixing occurs among these layers as the star explodes, because the mixing would affect the processes that generate elements and dust. Lagage's group is now trying to determine whether the composition of the knots varies, which would indicate that the layering of the original star was preserved when it exploded, or whether its layers got churned up, homogenizing the composition of the knots. "We think, at the moment, that there is not a lot of mixing," Lagage says, but he cautions that this is a very preliminary analysis of the rich data returned by ISOCAM.

Eli Dwek, an astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, agrees that the data are a mother lode. "In trying to work backward and see what the composition of the ejecta was at the explosion, the more elements you sample, the more of a picture you get," he says.

—Dennis Normile

AIDS RESEARCH

HIV Suppressed Long After Treatment

BALTIMORE, MARYLAND—"Anecdote" is one of the most damning things you can say about a scientific report. Still, some anecdotes are provocative, and one caused a stir when it was related at an AIDS meeting here last week: An HIV-infected German man drove the virus down to an "undetectable" level with drugs, stopped taking the drugs, and yet, 9 months later, has not had the virus return. This report comes on the heels of a paper published in the 30 August issue of *The Lancet* describing two other patients who similarly have not seen their HIV rebound after being off drugs for 1 year. Those results have drawn some skepticism, however.

The description of the German patient, a man in his 20s who lives in Berlin, came at a meeting put together by Robert Gallo, the head of the Institute of Human Virology in Baltimore. Franco Lori of the Research Institute for Genetic and Human Therapy—which is located in both Pavia, Italy, and at Georgetown University in Washington, D.C.—said that when the patient first sought treatment shortly after becoming infected, the polymerase chain reaction (PCR) assay showed that he had

85,000 copies of HIV RNA per milliliter of blood—a solid infection.

Lori says clinicians in Berlin started the man on three drugs: indinavir, ddI, and hydroxyurea. Indinavir inhibits HIV's protease enzyme; ddI jams the virus's reverse transcriptase enzyme; and hydroxyurea, an anticancer agent, boosts the effects of ddI and also suppresses the immune system. The man's HIV levels quickly dropped to those that the most sensitive PCR assays could not detect. After 27 days, he stopped taking his medication for 3 days, and the virus, as expected, quickly came back. When he restarted the drugs, the HIV again went down to undetectable levels.

Then, 144 days after beginning treatment, the man developed hepatitis A and was so ill that he could not take any drugs for 3 weeks. But before restarting his medications, his physicians checked the amount of virus in his blood. It was still undetectable—and it has remained so for 9 months. "I hate to draw conclusions too early," says Lori. "We think the virus is there. It just doesn't rebound."

Others at the meeting were equally wary. "It doesn't serve any purpose except for the person

who took the drugs," said Jacques Leibowitch of France's Hôpital Raymond Poincaré. Leibowitch and others also criticized the *Lancet* paper, which was written by Jorge Vila of France's AFAVIR and colleagues, noting that the two patients described there, who also were using hydroxyurea as part of their treatment, had such low HIV levels to begin with that they may never have been infected in the first place.

Still, many researchers, Leibowitch included, were intrigued by the possible role played by hydroxyurea, which is not an approved AIDS drug. "There must be something that we need to investigate further," says Anthony Fauci, head of the U.S. National Institute of Allergy and Infectious Diseases (NIAID). Maybe, says Fauci, the hydroxyurea suppresses the immune system cells that HIV targets. Fauci's lab reported in the August *Journal of Infectious Diseases* that a different immune suppressor, cyclosporin A, could lower levels of the AIDS virus in infected monkeys. NIAID's Lawrence Deyton also wonders whether hepatitis A might have stimulated the release of immune system chemicals that kept the HIV in check. "There are many things we have to work out," Lori says.

—Jon Cohen