

Ring up another light echo

Although supernova 1987A, located in the Large Magellanic Cloud about 160,000 light-years from Earth, has been fading since the spring of 1987, astronomers are still seeing traces of light from its brightest period. That light reaches the Earth after reflecting off interstellar dust, taking a somewhat longer time to complete its journey than visible light coming directly from the supernova. Such a feature is known as a light echo.

Last year, astronomers reported observing two glowing light-echo rings approximately centered on the supernova (SN: 6/18/88, p.388). Now, Howard E. Bond and his colleagues at the Space Telescope Science Institute in Baltimore report discovery of a third ring inside the other two.

Whereas the previously discovered rings appear to correspond to two separate sheets of dust about 1,000 light-years and 400 light-years in front of the supernova as seen from the Earth, the newly observed ring suggests the presence of dust lying only 20 light-years from the supernova. Because there was no sign of the third ring in earlier observations, the researchers conclude there is apparently a cavity or bubble in the material surrounding the supernova, at least in the direction of the Earth.

Other astronomers have already confirmed the presence of this new light-echo feature and continue to monitor changes in the other two rings. Because the echoes have retained their near-circular shapes, astronomers suspect the interstellar dust must be highly concentrated into two thin layers. Furthermore, the very small deviations from a circular form impose tight constraints on the curvature and inclination of these dust sheets.

The Milky Way's third population

The Milky Way galaxy consists of a thin disk of stars with a central bulge surrounded by a halo of stars in globular clusters. The stars in the disk are mostly young stars rich in heavy elements, mainly metals. The globular clusters in the halo contain old stars with low concentrations of heavy elements.

Several years ago, a number of astronomers suggested our galaxy may contain a third distinctive population of stars. A team of astronomers has now collected evidence supporting the idea. They suggest this third population may have resulted from a merger of separate bodies of stars early in the galaxy's history.

Data gathered by Bruce W. Carney of the University of North Carolina in Chapel Hill and his collaborators show stars that in their sample appear to fall into three categories, characterized by differences in their heavy-element content. The concentration of heavy elements in the third population falls between the high concentration in thin-disk stars and the low concentration in halo stars. The researchers contend that stars in this newly identified third population, which they call the "thick disk," are old and formed over a short period of time.

Such thick-disk stars could have resulted from the merger of our galaxy with another large clump of matter shortly after the thin disk formed. The heating of the galactic disk resulting from the merger could have driven both stars and gas to greater heights above the disk's plane, resulting in the formation of stars with peculiar characteristics. The stars driven out of the thin disk by the collision and those formed from gas at such heights would remain there and would make up the stellar component now termed the thick disk.

"If this is the cause of our galaxy's thick disk, and if other galaxies . . . show signs of such components . . . , it is conceivable that mergers play a major role in galaxy formation, and perhaps help determine the type of galaxy that eventually results," the researchers conclude in the February *ASTRONOMICAL JOURNAL*.

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To save the wild chimps

The U.S. Fish and Wildlife Service has proposed revising the status of African chimpanzees — now estimated to number about 175,000 — from threatened to endangered. Due to go into effect within 60 days, this rule would make illegal the U.S. importation of any chimp from Africa — even one supplied from captive breeding programs. This "closed a major loophole" that would have allowed the "laundering" of wild animals through captive programs by unscrupulous suppliers, explains Curtis Bohlen, senior vice president of the World Wildlife Fund in Washington, D.C. The value of chimps to biomedical research — now about \$25,000 each — has continued to foster their poaching, despite an international treaty banning trade in chimps from the wild.

U.S.-held chimps, especially the 1,300 or so in biomedical research facilities, would remain "threatened" — and subject to federal-reporting rules. Had the Fish and Wildlife Service also declared these animals endangered, "that would have been a very serious impediment to biomedical research," says Frederick King, director of the Yerkes Primate Research Center at Emory University in Atlanta. As written, the new rule should have no effect on U.S. research. King says the federally sponsored National Chimpanzee Breeding Program, in which Yerkes participates, should be able to produce enough chimps that U.S. biomedical researchers need never look to Africa again.

Daminozide: Now you see it . . .

Since EPA first proposed banning daminozide in 1985 (SN: 9/7/85, p.149), farmers have been encouraged to abandon use of this popular plant-growth regulator. The chemical, known to cause cancers in animals, keeps apples from prematurely falling from trees and can nearly double the shelf life of fresh apples (SN: 9/14/85, p.169). Many apple juice manufacturers recently announced they would use only daminozide-free fruit. Consumers Union, the Mt. Vernon, N.Y.-based independent product-research organization, decided to see how well the manufacturers followed through on that promise. Its just-completed survey of 32 apple juices — all from manufacturers who had taken the daminozide-free pledge — found residues of the chemical in more than 70 percent of the tested juices. A detailed report, including brand names, is scheduled to appear in the May *CONSUMER REPORTS*.

The Washington, D.C.-based National Food Processors Association (NFPA), a technical arm of the food-processing industry, also surveyed for daminozide in apple juice, apple sauce and other packaged apple products. Last week it reported that only one sample in 2,449 showed any traces.

Why the big difference? The newer Conditt method used by Consumers Union is sensitive to 0.02 parts per million (ppm). Levels in the 23 juices Consumers Union found to contain daminozide were 0.53 ppm or lower. In fact, only five contained 0.3 ppm or more. According to Roger Coleman at NFPA, the PAM II technique his group used is sensitive only down to 1 ppm, but has been the standard test for daminozide.

Last month EPA announced it would accelerate cancellation of daminozide's "pesticide" registration on the basis of new estimates it calculated showing that daminozide residues on apples in the marketplace — in the 0.5-ppm-and-under range — constitute a potential lifetime cancer risk 45 times higher than the one-in-a-million risk it considers unacceptable. Asks Consumers Union spokeswoman Marnie Goodman, "Why would anyone use a method that's only sensitive to 1 ppm [as NFPA has]? They're apparently hoping the public will believe that anything below 1 ppm is not a significant risk." But based on EPA's new risk assessment, she says, "it doesn't look like you can be calm about a level like that anymore."

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