

Mysterious Rings Surround Supernova

Supernova 1987A has intrigued astronomers ever since they witnessed the debut of this exploded star in a nearby galaxy 7 years ago. The latest finding — two rings that resemble giant hula hoops — has left scientists awhirl.

From Earth, the twin rings appear fuzzy. But the Hubble Space Telescope has now revealed the objects, one of which lies in front of the supernova, the other behind, in full detail. Astronomers have not found the features around any other exploded star. "This is an unprecedented and bizarre object," says codiscoverer Christopher Burrows of the Space Telescope Science Institute in Baltimore.

The Hubble image, which Burrows presented last week at a press conference in Washington, D.C., actually shows three rings — the two newly discovered objects and a smaller, previously known inner ring. Scientists believe they know how the inner ring formed, and depending upon which astronomer is doing the speculating, the two outer rings may or may not have the same origin.

The inner ring stems from material ejected by the supernova's parent star. Perhaps 30,000 years before it exploded, the parent had evolved into a bloated star called a red giant, which blew a low-speed, high-density wind into space.

A few thousand years before the supernova explosion, the red giant became a more compact blue giant and expelled a higher-speed but lower-density wind. When the blue-giant wind caught up with the red-giant wind, it apparently compressed the material into an hourglass

shape. The waist of the hourglass, the densest part of the compressed wind, became visible as a ring when the supernova heated it.

Robert P. Kirshner of Harvard University suggests that the two outer rings represent the ends of the hourglass, which the supernova explosion may also have illuminated. However, the thinness of these rings and their off-center location from the supernova may require some modification of this simple model, he adds. In contrast, Burrows favors an entirely different explanation for how the two rings got painted on the sky.

He speculates that another compact object — a black hole or neutron star — lies near 1987A, along with a less dense companion. Material from the companion star falling onto the compact object would create equal but oppositely directed jets of radiation. Like the wobble of a top as it slows, each jet would trace a giant circle, generating the bright rings observed by Hubble, Burrows suggests. A

possible source for the jets lies about one-third of a light-year from 1987A.

Kirshner says he objects to the complexity of Burrows' model. Two observations may settle the debate. Burrows says the purported jets would flop around like a garden hose and in time would trace rings at a different angle. In addition, if a compact body lies near the supernova, it would be hit by debris from the exploded star, generating radio wave emissions, perhaps as early as 1997. — R. Cowen

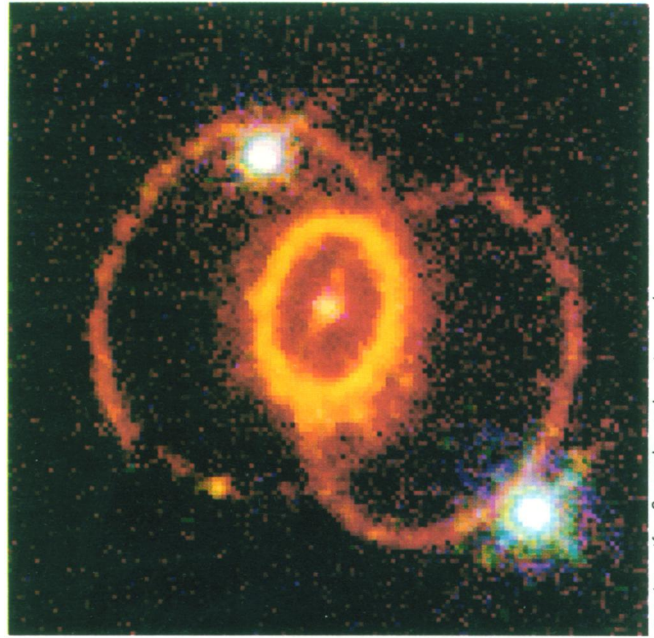


Image of rings around supernova 1987A.

Burrows/Solidus, European Space Agency, STS-I, NASA

Does testosterone fight artery disease?

The primary male sex hormone testosterone has traditionally been considered a major contributor to heart disease in men. Surprising new findings suggest that this hormone may actually protect men from the clogged arteries that can lead to a heart attack.

What tipped researchers off was evidence that didn't fit the testosterone theory of male heart disease. For example, previous studies showed that men who had suffered a heart attack tended to have abnormally low concentrations of testosterone circulating in their bloodstream. Gerald B. Phillips and his colleagues at Columbia University's College of Physicians and Surgeons in New York City wondered whether high concentrations of the hormone might actually shield men from heart disease.

To test that theory, the team studied 55 men who had chest pain or other

symptoms of atherosclerosis, a condition in which fatty debris coats the walls of the arteries. None of the recruits had suffered a heart attack, but all had undergone angiography, a procedure that yields X-ray pictures of the vessels supplying the heart with blood.

The researchers found that men who had low concentrations of testosterone in their blood were significantly more likely to exhibit more serious coronary clogging than their peers with high concentrations of the hormone.

Even when the team excluded men who were sick from other causes or had unusual hormone readings that might skew the results, the correlation remained statistically strong.

"I couldn't believe it when I saw it," Phillips says, noting that the possibility of the link's occurring by chance is less than 1 in 1,000.

The study is the first to find a relationship between testosterone and the degree of atherosclerosis, the team states in the *MAY ARTERIOSCLEROSIS AND THROMBOSIS*, published by the American Heart Association.

A relationship between testosterone and atherosclerosis doesn't necessarily mean that low concentrations of the hormone lead directly to the disease. Yet the correlation is so strong that Phillips believes there's more to the testosterone and heart disease story than previously suspected.

It may be that testosterone helps men ward off heart disease, while estrogen, the primary female sex hormone, plays the same role for women, Phillips speculates. Both men and women produce testosterone and estrogen but in varying amounts.

The new findings are preliminary, however. "This has to be confirmed," Phillips cautions. — K.A. Fackelmann