

## ASTRONOMY

## Smashup Sends Alien Stars Streaming Near the Sun

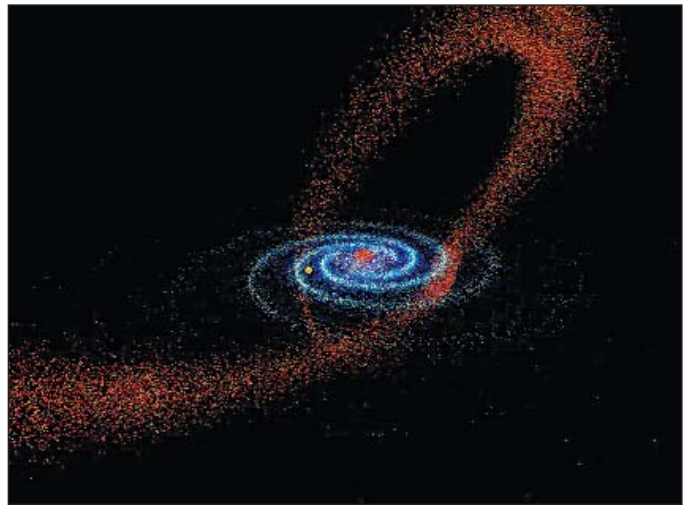
Stars from a foreign galaxy are invading our neighborhood, according to a new analysis of the fate of a small galaxy being shredded by the Milky Way. The discovery promises to give astronomers a rare close-up view of stars born in different physical conditions.

Astronomers spotted the distorted galaxy, called the Sagittarius dwarf, in 1994 on the far side of the Milky Way spiral from our sun. Later observations showed that its stars escape into extended streams from the outskirts of the dwarf as it orbits within the Milky Way's intense gravitational field. A recently finished atlas called the Two Micron All Sky Survey (2MASS) allowed astronomers to trace the full extent of these "tidal tails" for the first time.

Sorting through a half-billion objects in the 2MASS catalog, a team led by astronomer Steven Majewski of the University of Virginia in Charlottesville found several thousand M giants, a distinctive class of red giant stars common in the Sagittarius dwarf but rarely seen above or below the plane of our galaxy. The dwarf's tidal tails popped out dramatically, swooping in arcs more than 100,000 light-years from the Milky Way's center. According to the team's models, so many stars have been ripped from the Sagittarius

dwarf in the last 2 billion years that the little galaxy—just one-10,000th as massive as the Milky Way—is on its last legs. "It's dissolving right before our eyes," says Majewski. The team's report will appear in the 20 December issue of the *Astrophysical Journal*.

By a quirk of timing, stars in one of the dwarf's tidal tails are raining down upon the sun's current position. "That's very important and very surprising," says astronomer Heidi Newberg of the Rensselaer Polytechnic Institute in Troy, New York, because astronomers now can try to identify specific alien stars by scrutinizing their motions and compositions. Indeed, Majewski calculates that there should be at least one such star within 100 light-years of the sun. The proximity of the dwarf's re-



**Stripped.** Stars yanked from a dwarf galaxy (red) loop around the Milky Way and dive near our sun (yellow dot).

mains also ought to be good news for physicists hunting for so-called dark matter, because many astronomers suspect that dwarf galaxies are especially rich in dark matter. But the Sagittarius dwarf may be an exception, Majewski notes: Its disintegration suggests that it contains precious little dark matter to hold it together. —ROBERT IRION

## ECOLOGY

## 'Tragedy of the Commons' Author Dies

Ecologist Garrett Hardin never minced words in presenting his unvarnished view of humanity's impact on the planet. And he was no less direct in planning his death. On 14 September he and his wife committed suicide at their home in Santa Barbara, California. Hardin was 88, and his wife Jane was

81. Both were in very poor health.

Hardin is best known for his 1968 article in *Science*, "The Tragedy of the Commons" (13 December 1968, p. 1243). In it he argued that if everyone had free access to common property, the resource would be lost to all. But Hardin was immensely influential in a host of related causes, including environmentalism, population control, abortion rights, and restrictions on immigration. His hard-headed approach to the competition for resources won him notoriety as well as fame—as when he suggested that if rich people let poor people into their "lifeboat," all will sink. "The human species viewed as a whole has been a disaster for the Earth," he said in a 1996 interview.

He "pushed very hard, was an innovative thinker, and is certainly somebody we're go-

ing to miss," says Stanford University biologist Paul Ehrlich, whose 1968 book, *The Population Bomb*, also stoked the debate over population and the environment. Herman Daly, an economist at the University of Maryland, College Park, says Hardin showed a new breed of "ecological economists" the importance of "giving the welfare of future generations a weight in moral decisions."

Hardin received a Ph.D. in microbiology from Stanford University in 1941 after studying zoology at the University of Chicago. He taught at the University of California, Santa Barbara, until his retirement in 1978. He remained active, however, and in 1986 he and his wife helped found Californians for Population Stabilization. His output totaled 27 books and 350 articles.

Friends say the Hardins practiced what they preached by collecting rainwater to drink, recycling, composting, and eschewing newspapers because they squander newsprint. They were members of the Hemlock Society, and their deaths occurred a week after their 62nd wedding anniversary.

—CONSTANCE HOLDEN



**Double suicide.** Ecologist Garrett Hardin and his wife, Jane, took their own lives last month.

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