

Giant star Mira leaves gifts

Astronomers see building blocks of systems in its wake

By Felicia Mello, Boston Globe Correspondent | August 16, 2007



The speeding star called Mira is shown shedding material that will be recycled into new stars, planets, and possibly even life as it hurls through our galaxy. (NASA via REUTERS)

As a nearby giant star hurtles through space, it is leaving behind a glittering wake that contains the seeds of future heavenly bodies, scientists from the National Aeronautics and Space Administration reported yesterday.

Astronomers discovered the tail by looking at ultraviolet images from the Galaxy Evolution Explorer telescope, orbiting the Earth. The pictures show the red giant star known as Mira, which has the same mass as our sun but is 400 times as large, dragging a comet-like collection of glowing dust that goes back 13 light-years.

Scientists yesterday described Mira as a kind of "Johnny Appleseed of the Cosmos," skipping through the Milky Way at 80 miles per second while strewing atoms of carbon, nitrogen, and oxygen -- elements that are the building blocks of new solar systems.

"All of the carbon in our muscles and all of the oxygen that we breathe every time we take a breath comes from red giant stars," Michael Shara, a professor of astronomy at Columbia University, said in a teleconference discussing the finding. "So this is the source of some of the material that's essential for life, and we're seeing it implanted across the galaxy right now."

Stars often swell and cool as they age, becoming red giants before exploding or collapsing.

As Mira moves, it apparently heats the gas in front of it, which mixes with a cooler wind coming off the star to create a turbulent wake similar to that which forms behind a boat, the scientists said. The process has been going on for at least 30,000 years, they said.

"If Neanderthal man had had ultraviolet eyes and could look above the atmosphere, he could have seen the beginning of this tail forming," said Christopher Martin of the California Institute of Technology, the principal investigator on the telescope project.

Although this is the first time astronomers have seen such a tail on a red giant, they suspect other such stars may carry similar appendages, including, one day, the sun, which will evolve into a red giant in about 4 billion years. Researchers plan to use radio waves and infrared to see whether more red giants have these tails, and will study the images of Mira to better understand what the star's atmosphere was like tens of thousands of years ago.

Scientists have known about Mira, whose name means wonderful in Latin, since the 16th century. The star is 400 light-years from Earth. But it was only with the highly sensitive telescope, which orbits the Earth and has a large field of view, that astronomers were able to catch sight of its tail.