**Cosmic Graveyard: Looking For Life in an Unlikely Place**

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NASA / European Space Agency

This Hubble Space Telescope image shows the "last hurrah" of a star like our sun, the outer layers of gas being cast off and leaving behind the burned out white dwarf, the white dot in the center.

When a star dies, it leaves a tiny, glowing corpse known as a white dwarf; it’s an ember that retains the mass of a star but crunched down into a  volume the size of the Earth. As the name suggests, white dwarfs start out white hot, then cool over tens of billions of years. Since the universe is only 13.8 billion years old, however, all existing white dwarfs have barely begun losing their heat.

That makes them a possible, though seemingly improbable, place to [look for habitable planets](http://science.time.com/2013/03/06/could-tiny-stars-be-home-to-mirror-earths/): a rocky, Earthlike world sufficiently near a white dwarf could actually be balmy and hospitable. And while nobody’s come close to finding a planet around a white dwarf yet, a team of astronomers has taken a big step by finding some telltale rocks — or their remnants, anyway.

Using the [Hubble](http://topics.time.com/hubble/) [Space Telescope](http://topics.time.com/space-telescope/), the scientists report in *Monthly Notices of the Royal Astronomical Society* that they’ve teased out evidence of silicon in the upper layers of two white dwarfs in the Hyades star cluster, in the constellation Taurus. Silicon, explains Jay Farihi, of the University of Cambridge, in England, lead author of the study, is a major component of the rocks that make up Earth, Mars and Venus.

The best explanation, he says: small asteroids falling in toward the white dwarf and breaking up, then plunging into the body of the star itself. “If you threw a rock at the Sun,” he says, “it would just vaporize and mix in. You’d never know it had happened.” If an asteroid fell toward a white dwarf, by contrast, tidal forces generated by the dwarf’s high surface gravity would tear it apart by the time it got within a million miles or so. “It would form a ring, like Saturn’s,” says Farihi.

Over the next million years or so, the ring of pulverized asteroid would gradually rain down onto the star and vaporize, contaminating the white dwarf’s spectrum with an extra soupçon of silicon. But the silicon atoms would sink to the core of the white dwarf relatively quickly, vanishing from spectral sight. “The fact that we can see it,” says Farihi, “means that it’s being continually replenished.”

Astronomers have had hints of such disks around white dwarfs before, and even hints that they were made of rocky material. These observations, made with the Hubble’s Cosmic Origins Spectrograph, were the first to detect carbon as well. By calculating the carbon-to-oxygen ratio in the new asteroid debris, Farihi and his colleagues were able to determine that the mixture was pretty much the same as that found in Earthly minerals — more evidence that the bits of rubble orbiting these white dwarfs are plain old rocks.

That doesn’t prove [planets](http://topics.time.com/planets/) are out there as well, but, says Farihi, “I’d bet a lot of money that there are. I’d bet *all* my money that these stars built planets — the only question is how many they would retain at this point in their lifetimes.” With the gravity of the star itself pulverizing its own worlds, there may not be many at all. But a planet that found a sweet spot in a stable orbit just far enough away to survive the white dwarf’s gravity hammer but close enough to feel its warmth could be a special and even biology-friendly place.