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`Killer' asteroid scary, but don't sweat supernovas

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THE UNIVERSE

Today, the cosmic threat we seem to hear the most about is the "killer" asteroid, the still uncharted mountain-sized chunk of celestial debris that could clobber Earth without warning.

But nasty asteroid encounters weren't always the outer-space threat du jour.

A generation ago, supernovas were thought to be the scariest menace in the universe. A supernova is the total annihilation of a star several times bigger than our sun.

It happens when such a star runs low on its internal supply of nuclear fuel.

The star's fusion furnace sputters, then explodes in a doomsday chain reaction.

As the star's temperature skyrockets, it becomes a self-annihilating fireball of such intensity that for a few days it becomes bright enough to be visible across the universe.

Anything nearby gets incinerated. Anything a bit farther away gets a really bad sunburn.

Calculations suggested that the blast wave from a supernova up to 50 or 60 light-years away from Earth could destroy our atmosphere's protective ozone layer and cause significant extinctions.

That's scary, at least in the long term, because supernovas at that distance occur about once in 50 million to 100 million years. The dinosaurs became extinct 65 million years ago, which fits the time scale.

But we haven't heard much lately about the supernova threat. And for good reason.

Scientists have been quietly reworking the old calculations with better data and today's far more powerful computers.

The new conclusions suggest that a supernova would have to be much closer than previously thought to do any serious damage to our planet.

NASA scientists have determined that the supernova would need to be within 26 light-years from Earth to significantly damage the ozone layer and allow cancer-causing ultraviolet radiation to saturate the planet's surface.

An encounter with a supernova that close happens only at a rate of about once in 700 million years, according to astronomer Neil Gehrels of NASA's Goddard Space Flight Center in Greenbelt, Md.

Gehrels presented his findings last week at the American Astronomical Society's major

meeting in Seattle.

"The possibility for mass extinction is indeed real, yet the risk seems much lower than we thought," he said.

"Perhaps a nearby supernova has bombarded Earth only once with its punishing gamma rays and cosmic rays during the history of multi-cellular life."

The new calculations are based on advances in atmospheric modelling, analysis of gamma rays produced by a well-documented supernova in 1987 and a better understanding of galactic supernova locations and rates.

Working with data from the 1970s, scientists predicted that supernovas as far as 55 light-years from Earth could wipe out up to 90 per cent of the atmosphere for hundreds of years.

The 26 light-year limit is now considered a much more realistic estimate, which greatly lowers the chances that Earth will get zapped.

Says Gehrels: "Once in 700 million years is pretty good odds."

Terence Dickinson *is the editor of SkyNews magazine and the author of several guidebooks for backyard astronomers.*

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