

Will the sun explode?

January 6 2014, by Fraser Cain



Artist's impression of a supernova.

All stars die, some more violently than others.

Once our own Sun has consumed all the [hydrogen fuel](#) in its core, it too will reach the end of its life. Astronomers estimate this to be a short 7

billion years from now. For a few million years, it will expand into a red giant, puffing away its outer layers. Then it'll collapse down into a white dwarf and slowly cool down to the background temperature of the Universe.

I'm sure you know that some other [stars](#) explode when they die. They also run out of fuel in their core, but instead of becoming a red giant, they detonate in a fraction of a second as a [supernova](#).

So, what's the big difference between stars like our Sun and the stars that can explode as supernovae?

Mass. That's it.

Supernova progenitors – these stars capable of becoming supernovae – are extremely massive, at least 8 to 12 times the [mass](#) of our Sun. When a star this big runs out of fuel, its core collapses. In a fraction of a second, material falls inward to creating an extremely dense neutron star or even a black hole. This process releases an enormous amount of energy, which we see as a supernova.

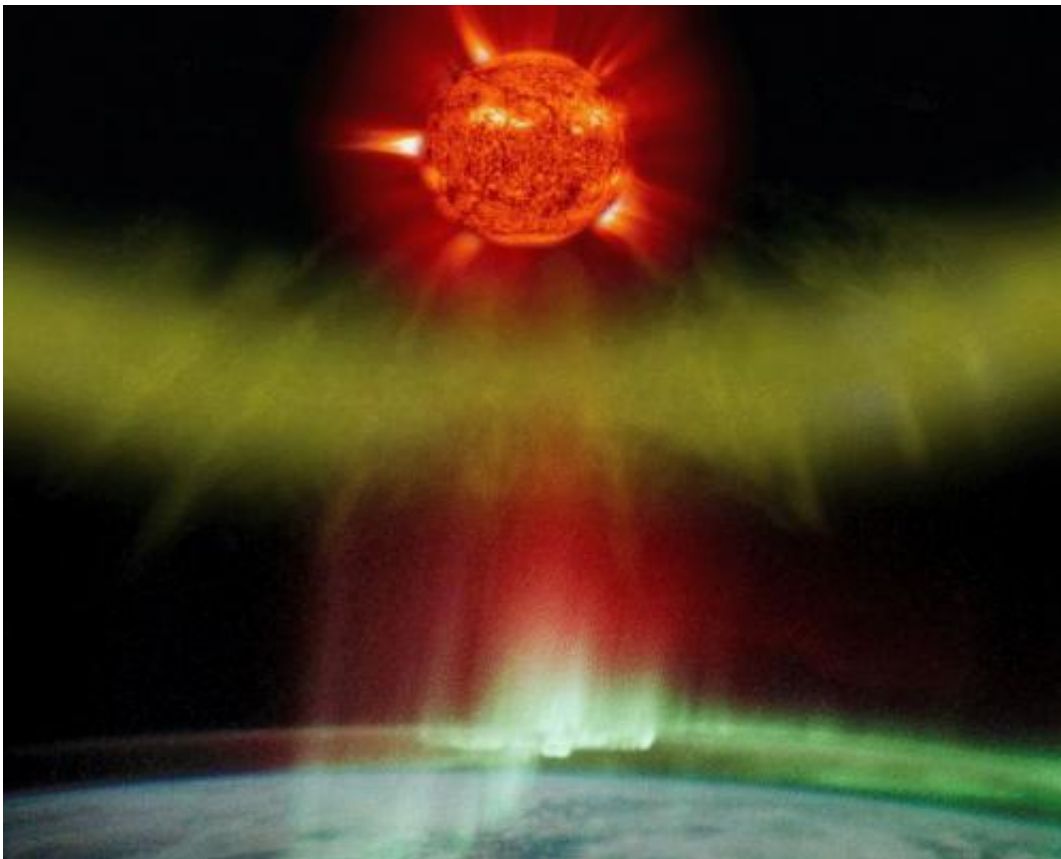
If a star has even more mass, beyond 140 times the mass of the Sun, it explodes completely and nothing remains at all. If these other stars can detonate like this, is it possible for our Sun to explode?

Could there be some chain reaction we could set off, some exotic element a rare comet could introduce on impact, or a science fiction doomsday ray we could fire up to make the Sun explode?

Nope, quite simply, it just doesn't have enough mass. The only way this could ever happen is if it was much, much more massive, bringing it to that lower supernovae limit.

In other words, you would need to crash an equally massive star into our Sun. And then do it again, and again.. and again... another half dozen more times. Then, and only then would you have an object massive enough to detonate as a supernova.

Now, I'm sure you're all resting easy knowing that solar detonation is near the bottom of the planetary annihilation list. I've got even better news. Not only will this never happen to the Sun, but there are no large stars close enough to cause us any damage if they did explode.



We don't have to worry about our sun exploding into a supernova.

A supernova would need to go off within a distance of 100 light-years to

irradiate our planet.

According to Dr. Phil Plait from Bad Astronomy, the closest star that could detonate as a supernova is the 10 solar mass Spica, at a distance of 260 light-years. No where near close enough to cause us any danger.

So don't worry about our Sun exploding or another nearby star going supernova and wiping us out. You can put your feet up and relax, as it's just not going to happen.

Source: [Universe Today](#)

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