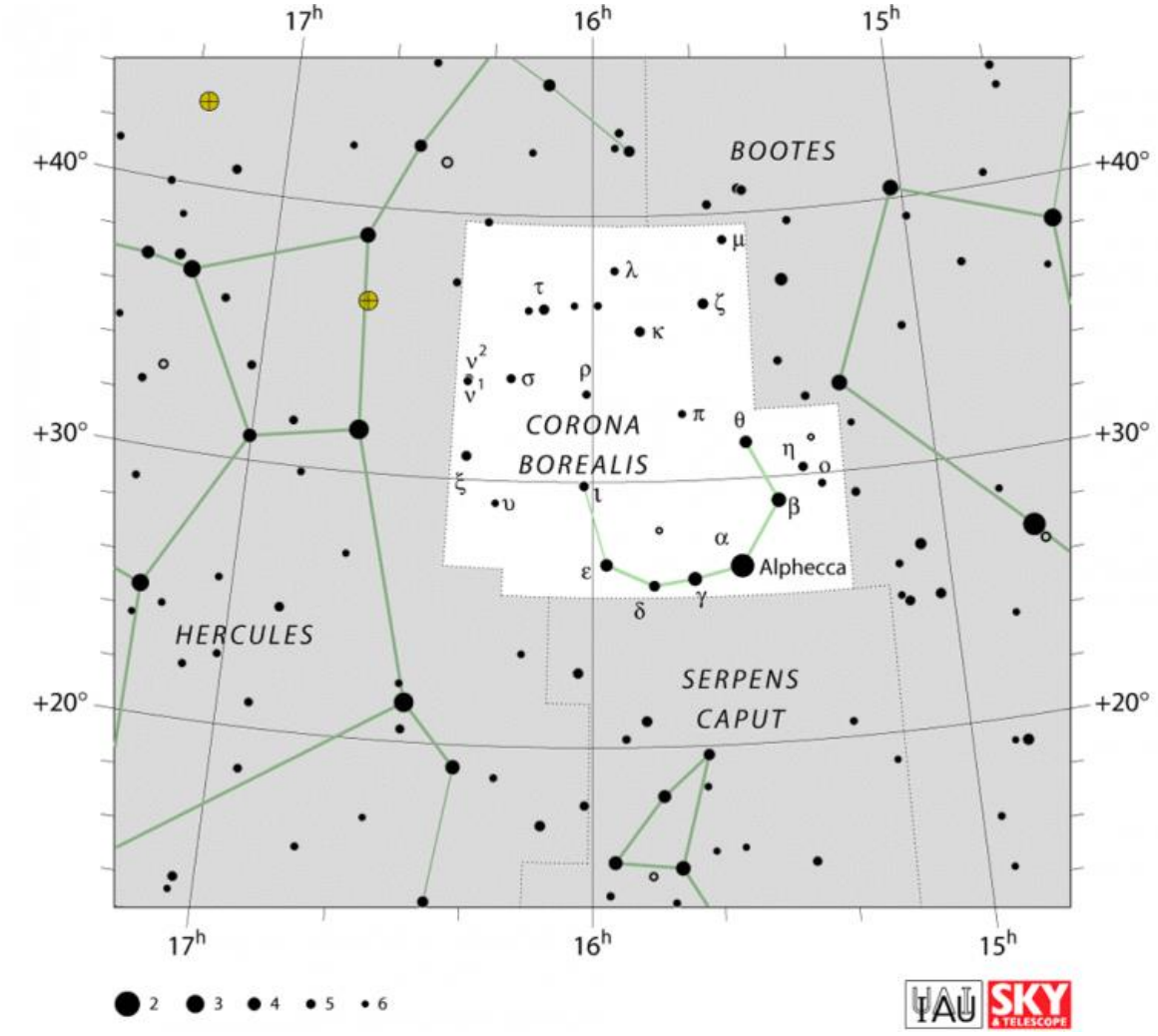
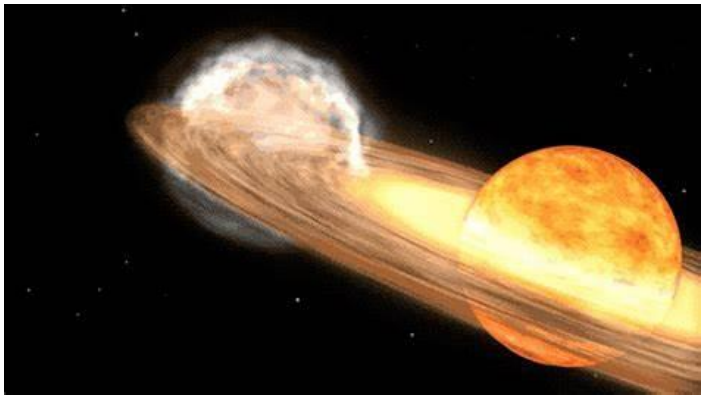
SEE A STELLAR EXPLOSION

Corona Borealis, "The Northern Crown", is one of those rare constellations that actually looks like what it represents. It is a small circlet of stars, looking like a diamond coronet.

To find it, as soon as it is dark, start with the Big Dipper, the brightest part of the constellation Ursa Major. This time of the year it is in the western sky during the evening. Follow the curve of the handle away from the bowl of the "dipper" to the bright, orange star Arcturus. Close by you will see that circlet of stars, low in the western sky.



In that constellation, some 3000 light years away, is a white dwarf, the remnant of a dead star, around the size of the Earth. It rejoices in the name T Coronae Borealis. This star is actually a member of a double star system. When the pair were born, this star had the larger mass, so it aged more quickly, sneezed off its outer layers, leaving the hot core, devoid of fuel, a white dwarf star. Its less-massive partner is now ageing, and has swollen into a red giant star, which is the stage before sneezing off its outer layers and joining its partner as a white dwarf. Like all red giants, its gravitational hold on its outer layers is weak, so its white dwarf partner is stealing material from the red giant and pulling it down onto its surface.



This material is largely unused hydrogen fuel, and as it accumulates, it becomes extremely compressed by that star's strong surface gravity. Eventually the combination of heat, pressure and amount of material becomes critical and there is an enormous nuclear fusion explosion. The result is that for some weeks a star visible only to telescopes and large binoculars will become easily visible to the unaided eye. It is likely to become as bright as the Pole or North Star.

Most stellar couples only experience this process once, because the explosion is big enough to destroy the system, which ends the material stealing forever. However, in some cases the systems survive to repeat the process.

This is the situation for T Coronae Borealis. The pair produces an explosion every 80 years, and the last one happened 80 years ago. Before the explosion there is a dimming of the star. We don't know why this happens, but it is an indication the explosion is imminent. The star is now dimming.

Assuming the system survives this explosion, the next one will be in 80 years, so this will be the last opportunity to see the event for quite a long time.

Since this event will result in the appearance of a new star in the constellation, the best way to see it is to have a look at that constellation every evening or so. In this way you will become familiar with it, so that when the explosion takes place, we will be able to identify that "new star". Imagine the circlet with the opening facing upwards, the new star should appear close to the second star down on the left side (Epsilon Coronae Borealis). If you take astronomical photographs, take regular pictures of the constellation. These will provide a valuable and memorable record of the event.

These explosions are extremely destructive, but they are also creative. The debris they eject into space contains all the known natural elements. These mix with the material in the dust and gas clouds, where they interact and combine to form the ingredients needed to make new planets and living things. In addition, the shock waves from the explosion can destabilize those gas and dust clouds, making them collapse to form new stars and planets. This event will be possibly a once-in-a-lifetime opportunity to see this act of destruction and creation in action.

Venus is extremely low in the sunset glow, and hard to find. At midnight Saturn lies low in the south, with Jupiter and Mars in the northeast. The Moon will reach First Quarter on the 10th .

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