*The **May 2024*** **Chippewa Valley Astronomy Update**

Caption: The small constellation "Corona Borealis" is located between constellations Bootes and Hercules, on a line between the stars Arcturus and Vega. The circle in this image shows where a "new star" is expected to temporarily appear when the currently invisible star system undergoes a nova explosion.

Sky Watch: A Star Explosion Last Witnessed in 1946
May Happen Again This Year

By Benjamin Ashley

In 1946, a pair of distant stars across our galaxy, that are regularly far too dim to be seen with unaided eyes, flashed so brightly from a great explosion that they became visible like a new star in the night sky. The event known as a nova (from the Latin for "new") could be seen for only a week before it faded away and disappeared. That nova was named T Coronae Borealis (T CrB) and is a rare recurring type - one that repeats around every eighty years, with the first recorded sighting being as early as the year 1217. Seventy-eight years since its last explosion, the nova stars have been increasingly active, with significant swings in brightness reminiscent of the pattern that preceded the 1946 outburst. This has fueled speculation from astronomers that T CrB may be nearing its next light show soon in 2024.

When it happens, the nova will be visible in our local skies in the C-shaped constellation Corona Borealis, the Northern Crown. The constellation is currently located high in the South-East sky after sunset and will move across the Southern sky towards the South-West through the Summer, disappearing in mid-October. Look to an imaginary line between the very-bright stars Vega and Arcturus. The nova may reach magnitude 2 like the brightness of the North star Polaris, so it would be best viewed from a darker site outside of city lights. It will fade quickly and within a week be visible only with a telescope.

The T CrB nova is caused by two old stars late in their lives. One is a large red giant that is spiraling around a comparatively tiny white dwarf star and transferring material from its outer layers to the white dwarf. The white dwarf was once a star like our Sun, but when it had no more hydrogen and helium in its core to fuel it, the star collapsed and compressed the mass of 450,000 Earths into a space the size of one Earth. Because of this great density, it compresses the matter (mostly hydrogen and helium) that was transferred from the red giant. The temperature on the surface of the white dwarf rises. For years, the star remains stable by radiating the new heat away into space, but eventually as more and more of the red giant is drawn to it, the temperature becomes too high, and a runaway thermonuclear explosion spreads across the surface of the star and ejects the gathered matter out into space in one quick and violent bang. With recurrent nova like T Coronae Borealis, both stars survive the explosion, and the whole cycle can start again.

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