

WHAT'S UP?

Hi. I hope you've had a chance to enjoy some summer star-gazing and have been noticing how the arc-to-Arcturus changes its position and orientation in the sky as the hours go by. Have you been able to notice the reddish color of Arcturus? In this installment of *What's Up?* I want to give you some advanced notice of an event that *could* happen any time between now and the autumn. You many have already heard or read about it. It's a *nova*. Unlike a *supernova* which is a cataclysmic event in the life of a dying star, these events happen again and again (for a long while, anyway). These events occur in binary (two-star) systems where one star is a *white dwarf* star and the other is a *red giant* star. A white dwarf is a phase in a star's life when it has lost most of its mass and has condensed into a star with a mass similar to our Sun but is only the size of the Earth. It has all the gravitational pull of our Sun, but is very small. The gravitational pull of the white dwarf strips off the outer layers of gas from its red giant neighbor. This gas accumulates on the surface of the smaller star. Over time, this layer of gas causes increased temperatures and pressures at the base of the gas that – when conditions reach a tipping point – triggers a thermonuclear explosion that blasts away the piled-up gases. Then, the cycle starts all over again. When the explosion occurs, the star's brightness increases enormously, often making it temporarily bright enough for us to see easily here on Earth. It's just such an event that is due to happen any time now! Where should we be looking for this star? Well, let's just say that it's a good thing that we know to "arc-to-Arcturus". Arcturus, as we know, is located in the constellation *Boötes*. The star we're now interested in is found in the constellation just to the east of Boötes. The constellation is called *Corona Borealis, the Northern Crown*. Corona Borealis is a semi-circle of six stars ranging from easily visible (2nd magnitude) to faintly visible (5th magnitude). Fortunately, at this time of the year, these stars are high in the sky and out of the glare of horizon lights and haze. The diagram here shows where to find Corona Borealis. I've marked an X where the nova will appear when it happens. How do we figure out what star is the new one? The key to this is

to go outside now, and on every clear night (around 9:00 or 9:30 will do), locate the stars of Corona Borealis, and get to know them. Making a sketch is definitely the way to go. Then, when the nova appears, it will be "that really bright star that wasn't there before"! If you are familiar with the keystone shape of the constellation *Hercules*, you can also use that to find Corona Borealis. Corona Borealis will be just to the west of Hercules. The star we're talking about is known as *T Coronae Borealis* or, *T CrB*, for short. As I said, it is a binary star and most of the time appears to us as a dim,

10th magnitude star, visible in a telescope but not to our unaided eyes. It is about 3,000 lightyears away from us, so the nova we are about to see actually occurred around 970 BCE. Close by astronomical standards, we have a front-row seat for this. The cycle of explosions is, on average, 80 years long. Just how bright the nova will be is uncertain, but should be easily visible without binoculars or a telescope. The outburst may only last at visible levels for a week or so, so get out there and watch!!!!

Planet Roundup: Venus and Mercury have sped their ways around the far side of the Sun and are now in our skies just before sunset. However, they're still too close to the Sun for us to pick them out very easily. By mid-July, you may be able to pick out Mercury with binoculars just after the Sun is below the horizon. For Venus, we'll need to wait until the very end of July before we can start to see it easily. The outer planets, while still

making for a nice lineup just before dawn, are starting to work their way into our nighttime skies. Saturn rises around 11:00 p.m. now, with Neptune following a half-hour later. Mars peaks its disk up in the east just before 1:30 a.m. Uranus and Jupiter rise after Mars at half-hour intervals. By the time the eastern sky starts to brighten, all five will be found in an arc across the sky from east to southeast and on towards the south. The Moon, in its monthly circuit of the Earth passes through its New Moon phase on July 5th. The 1Q Moon is on the 13th, the Full Moon occurs on the 21st, and the 3Q Moon is on the 27th.

You can email me at astroblog@comcast.net with any questions and comments. This is *What's Up?* installment #86.

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