## January Skies over the Pinnacles

January 2021
January's four principal phases of the moon

| January 6 | Last Quarter |  |
| :---: | :---: | :---: |
| January 13 | New Moon |  |
| January 20 | First Quarter |  |
| January 28 | Full Moon |  |

## He's Baaaaack!

One of the greatest things I'm looking forward to when this pandemic is over is the opportunity to again be able to see friends again-and not through a computer screen. But in January, one old friend always returns no matter what! He's bright, adventurous, and, oh, what stories he can tell! Here's his picture.


In this picture, taken from my back yard, Orion seems to have one leg over and is about to hoist himself above the eastern horizon.


This is an illustration of the mythical Orion, the hunter as he is rising.

As winter goes on, the turning night sky will place Orion upright.


I'd better get something straight before I go on. The stars of the night sky are very far away and the ones we see are scattered across that great pinwheel we call the Milky Way. They are more-or-less randomly scattered within the spiral arms of our galaxy


The image at left was taken at just the right moment when three flying birds happened to synchronize their locations and wing positions. What does it look like to you? This image was made at just the right moment.

What does this have to do with my friend, Orion? All the stars that make up the figure we call "Orion" happen to be arranged, just for a moment, in a way that we recognize. Compared with the age of the Cosmos, that "moment" is really short - lasting just a few thousands of years. Compared to a lazy summer afternoon, a "moment" is shorter - a tiny fraction of a second.

All conscious beings, including humans, have developed the ability to recognize patterns as a matter of survival. Think of an unfamiliar dog displays an aggressive stance to you with bared teeth, ears back and is growling, so you know to back away. We can't just 'turn-off' our hardwired pattern recognition 'software' when we look at the night sky. So we invent our own patterns among the stars to fit our stories. Or is it the other way around?


Who decided which constellations were which? Today, the constellations we recognize are mostly from Greek or Roman mythology based on the classical philosopher Ptolemy. These became standardized when printing became available by lawyer and amateur astronomer, named Johann Bayer (1572-1625). Julius Schiller (1580-1627) later decided that the constellations should follow a Christian theme. So at about the time of the invention of the telescope he published his own catalogue of the constellations. Thus, Orion (above) became St. Joseph. Schiller often used the same classical star groupings.

I wrote before that Orion tells us stories. One story is that stars don't always shine at the same brightness. In the picture below, I've labeled some of the stars and interesting parts of Orion. In Orion's right armpit is the star Betelgeuse. 640 light years from Earth, Betelgeuse is nearing the end of it's short life (compared with most stars) and has been blowing off parts of itself for, maybe, thousands of years. It also grows and shrinks. Below is a new image made with advanced technology that shows this star has an irregular shape. Think of a monster soap bubble. In the illustration below left you can see that at its largest, it would billow out past the orbit of Jupiter if it were placed where the sun is.


An even bigger story Orion tells us is of the creation of entire solar systems. If your eyes are good you might notice some small fuzziness below the left belt star, Alnitak. This is often called Orion's sword. Astronomers long thought that stars were being born in this fuzzy blob. This is the location of the Great Orion Nebula.


In this collection of images from the Hubble Space Telescope we see many future "solar systems" still surrounded by their embryonic dust clouds and all deep in the Great Orion Nebula.

Thinking back to December, did you get to see the Great Conjunction? Saturn and Jupiter appeared from our perspective to get very close to each other in the sky, much closer together than the apparent size of the full moon.

The Great Jupiter-Saturn Conjunction


The images above were taken through a telescope. Pictured below is how they appeared without a telescope in the next evening toward the southwest as it was just getting dark.


The planets had separated a bit more in the above picture but still made a beautiful sight. Jupiter is the bright "star" at left and Saturn is on the right.

I must credit the dedicated writers of Sky and Telescope magazine for much of the content in this article.

## Attractions in January

If you have them, keep your binoculars handy and catch the planets Jupiter and Saturn slowly separate from each other low in the southwest after dark. As you do so, keep in mind that the increasing distance between them is mostly due to the Earth's motion on its orbit. As Saturn seems to be moving to the right from Jupiter remember that's because the ringed planet is further away from us than Jupiter. Mars continues to be a bright orange object as it passes into the western sky but it appears much smaller in the telescope, compared to last summer.

January 2 Our spaceship Earth reaches the point in its elliptical orbit where we are closest to the sun than at any other time in the year. This point is called perihelion ('peri', for close and 'helion' for Helios, the ancient Greek word for the Sun.) Not feeling the 'burn'? Well, it's northern hemisphere winter and we're only 3\% closer than in July.

January 3 For you "polar bears", the annual Quadradid meteor shower reaches its peak. The moon will be in the waning gibbous phase and will probably blot out all but the brightest "shooting stars".

January 10 Just after dark, Jupiter, Saturn and Mercury will appear ro make a pretty little triangle low in the southwest.

January 11 Get up early and catch a beautiful pairing of the thin crescent Moon and Venus as close as 3 finger-widths

January 20 Just after dark, look for orange Mars close to the first-quarter Moon. Here's the bonus: if skies are very clear you might just glimpse pale blue Uranus about 2 finger-widths to the lower left of Mars.

