SKYWATCH: Our Sky in Perspective

Wayland Bauer, Popular Astronomy Club - Feb 7, 2021

The year 2020 was a disappointment for the Popular Astronomy Club. The club in a normal year would have held two to three dozen public observing sessions. Last year the club held none.

Now in early 2021, with people being vaccinated against COVID 19, the club is eagerly anticipating the opportunity to provide the public with the chance to see the night sky through its telescopes. In addition to the viewing, the club members will describe what you are seeing. Check the club's website (popularastronomyclub.org) to see when public observations will start.

While you wait for public observations to start, you can begin viewing on your own. Smart phones have a great variety of astronomy apps that will show you what is available to be seen. Maps of the night sky are free from many internet sites, like skymaps.com. If you go to this site you will find "The Evening Sky Map." It not only provides a map, but also lists the objects that can be seen with the naked eye, binoculars or telescopes. Find darkest area close to you and use the phone app or map to locate things available that day.

Binoculars are often mentioned as the best way to learn about astronomy. Unlike most telescopes they also offer multiple uses: bird watching, sporting events and scenery. Many of you may have received gift cards for Christmas. Think about applying the gift cards to buying binoculars.

Binoculars come described with two numbers such as 8x32; 10x40. The first number is the magnification power. In the examples 8 and 10 refer to objects being 8 or 10 times closer than seen by your eyes alone. Some astronomers call these first numbers the "frustration factor." The larger number gives greater magnification, but higher magnification means a smaller field of view. The larger the number the harder it is to keep a celestial object steadily in view. If you go 12 or beyond you will need a pair of binoculars that can be placed on a tripod.

The second number refers to the diameter of the front lenses expressed in millimeters. The size of the lens determines the size of the area being viewed. The field of view also determines the amount of light the lenses will gather. For astronomy you like to gather as much light as possible but can still hold the binoculars steady. If you will plan on multiple uses the 10x40 or 10x50 are good options and are available in a range of prices.

When we look up at the stars & Moon, we are actually seeing a tiny, tiny part of the whole universe we live in. Let's try to gain an understanding of the size of the universe by picturing a Russian doll that has several small dolls nested inside one large doll.

We start with the smallest doll in the innermost position. This part is often referred to as the "Inner Solar System" which consists of the Sun and four rocky planets and their moons: Mercury, Venus, Earth, and Mars. The next larger doll going out is called the "Outer Solar System," consists of the gas giants: Jupiter, Saturn, Uranus, and Neptune. (Some astronomers still like to include Pluto (now called a dwarf planet) in this group. These first two sections (dolls) are separated by an asteroid belt. Beyond these planets we find the Kuiper Belt and the

huge Oort Cloud. These two belts and Oort Cloud are home to many of the comets that occasionally travel through the Inner and Outer Solar Systems.

“Local Stars” make up the third section as we think of the universe. This includes stars from 3-4 light years away to around 25 light years away. A light year is a measurement of distance- how far light travels in a year. The speed of light is 671 million mph. You can do the math as to how far that would be for a year! Many of these stars can be seen by simply looking up. The darker the area you are in the more stars you will see.

The fourth section becomes much larger, as it is the “Milky Way Galaxy.” The Milky Way, a spiral type galaxy, is home to our Solar System, several hundred billion stars and is 100,000 light years from side to side. Some astronomers place our Solar System in one of the outer spirals.

For the purpose of this article we now come to an area that contains millions of galaxies. The Andromeda Galaxy is the closest to Earth and can be seen by the unaided eye in areas with dark skies. There is more and more space in each of these sections.

Finally, we reach the outer most of the sections, comparable to the largest Russian Doll, the Universe. All the galaxies are separated by great distances and the Universe is believed to be expanding!

Amateur astronomers have their favorite sections to observe. If you join us for one of our public observing sessions on the third Saturday nights of months March through November, you would have opportunities to observe our Moon, and dependent on the month many of our planets, plus some “Deep Sky Objects” found in the sections three through five. These would include star clusters, both open and globular; galaxies, double stars, and planetary nebula. Every so often there are bonus events like meteor showers, lunar eclipses, and solar eclipses.

Wayland Bauer, member of the Popular Astronomy Club.