SHENANDOAH ASTRONOMICAL SOCIETY
December 2009

Stars in the Sky

Astronomers tell us that at least half of the stars in the sky are in a binary system. That means that two stars are orbiting around each other. If the Earth were the only planet orbiting the Sun, that would be a binary system. Of course, the Sun is over 300,000 times as massive as the Earth so it would be a bit lop-sided but the Earth would cause the Sun to move slightly. Any two objects in space that are close enough to be gravitationally bound together orbit around their common center. That is, they both orbit the other in a kind of rhythmic dance.

Not only do binary systems exist but in many cases there are three, four, or sometimes more stars that orbit each other. These are called multiple systems. The amateur astronomer can not see all the stars in most multiple systems since at their great distances from us they blend together. Our telescopes cannot resolve them. However, there are many, many double stars that can be resolved with a small telescope. Sky watchers refer to this as "splitting" a double star. Two of the best known doubles are Mizar in the handle of the Big Dipper and Albireo in the constellation Cygnus.

The stars move across the sky, just too slowly for us to notice in a lifetime. Yet precise measurements reveal the movement called proper motion. Small groups of stars that are somewhat bunched together are designated as clusters. There are two kinds of clusters, open and globular. Globular clusters contain thousands of old stars and look like whitish disks in the sky with blurry edges. These mostly surround the Milky Way Galaxy and number around 150 or so. Of course other galaxies contain these clusters, too. Open clusters, or galactic clusters, are more loosely clustered than the globular clusters. They also have fewer stars and the stars are younger than those in the globular clusters. Open clusters number in the tens of thousands.

The best known open cluster is the Pleiades also known as The Seven Sisters. One myth of old says that the beautiful sisters were being targeted by an uncouth fellow and was rescued by the god Jupiter who placed them in the heavens for safety. The group is visible to the naked eye and has been known since ancient times being mentioned in the Bible and the Odyssey. The Pleiades Cluster is located in the constellation of Taurus only about 14 degrees from the bright star Aldebaran near the scattered cluster known as the Hyades, half sisters to The Seven Sisters.

Alcyone, at third magnitude, is the brightest star in the Pleiades followed by Electra, Atlas, Merope and 5 more named stars. With average eyes, at least six stars can be seen without optical aid and many folks can see seven. Especially sharp eyed individuals have seen more. I have seen estimates of from 100 to 400 for the total number of stars in the group. Around 50 stars can be seen with 15 power binoculars or a small rich field telescope. It is a dazzling sight when seen with one of these instruments. The best view is probably obtained with 15 to 20 power binoculars but good in any size.

The Pleiades are already half way up the sky shortly after dark. Look for the bright pair Saturn and Aldebaran close together and the Pleiades only about a hand span farther west easy to spot. It is amazing that these stars can shine so brightly from around 400 light-years away which is over two million billion miles. Can you see six stars or seven stars or more?
(Jim Adkins)

I am hoping every member will come to our December meeting – more info on next page.

(The following quote is from an article by Bill Devlin in the 1999 December newsletter.)

What a great evening we had at Long Branch on October 30! The sky was clear, being slightly breezy there was no dew, it was warm enough to require only a light jacket, lots of visitors, and as if our hearts could stand one more good thing, Matt Orsie arrived with his 24" Dob.

Often I had heard Paul Augsberger speak inspirationally about the Veil Nebula, which of course cannot be seen in my 10" reflector, so I could never truly appreciate why it should be so special, but, oh my! Maybe this is a little touch of how Clyde Tombaugh felt when he finally found Pluto after years of searching. When asked why it had taken so long, he simply answered, "Because it was so hard to find." Equally spectacular were views of the Ring and Crab Nebulas, and everything else that we looked at.

(The next quote is from Galileo.)

But that which will excite the greatest astonishment by far, and which indeed especially moved me to call the attention of all astronomers and philosophers, is this: namely, that I have observed four planets, neither known nor observed by any one of the astronomers before my time, which have their orbits round a certain bright star (Jupiter), one of those previously known, like Venus or Mercury round the sun, and are sometimes in front of it, sometimes behind it, though they never depart from it beyond certain limits. All of which facts were discovered and observed a few days ago by the help of a telescope devised by me, through God's grace first enlightening my mind.

- Galileo Galilei (1564 - 1642)

(From the author of the Heliocentric System of the Solar System – note he starts numbering the planets from the outer one known at the time, Saturn.)

First and above all lies the sphere of the fixed stars, containing itself and all things, for that very reason immovable; in truth, the frame of the universe, to which the motion and position of all other stars are referred. Of the moving bodies first comes Saturn, who completes his circuit in thirty years. After him, Jupiter, moving in a twelve-year revolution. Then Mars, who revolves biennially. Fourth in order an annual cycle takes place, in which we have said is contained the earth, with the lunar orbit as an epicycle. In the fifth place Venus is carried round in nine months. Then Mercury holds the sixth place, circulating in the space of eighty days. In the middle of all dwells the sun.

- Nicholas Copernicus (1473 - 1543)

(Note that Copernicus was writing over two hundred years before Uranus was discovered in 1781.)

SAS Meeting at LFCC
December 9, 7:00 PM

We will meet in Room 318 on the southeast corner of the main Building. Those who wish to do so will be bringing some goodies to share with the group as a holiday month celebration. We have enjoyed these very much in the past. So come on out and share with us.