Ponder the Portage County Skies with Paul
Sky events for September 2008
03 Saturn in conjunction with the Sun @ 9 p.m.
07 1st Quarter Moon @ 9:04 a.m.
07 Moon @ apogee (251,167 miles from Earth.)
07 Jupiter appears stationary @ 10 p.m.
09 Moon @ Jupiter @ 3 p.m.
10 Mercury at greatest eastern elongation
11 Mercury passes 4 degrees south of Venus
11 Venus passes 0.3 degrees north of Mars
12 Mercury passes 4 degrees south of Mars
12 Uranus at opposition 9 p.m.
12 Uranus at peak visibility
15 Full Moon @ 4:13 p.m.
19 Mercury passes 4 degrees south of Mars
19 Moon @ perigee (229,215 miles from Earth)
19 Moon passes 1 degree north of Pleiades 11 p.m.
22 3rd quarter moon @ 12:04 a.m.
22 Autumnal equinox @ 10:44 a.m.
29 New Moon @ 3:12 a.m.

What are the celestial highlights for September? **As far as planets go Saturn passes behind the sun at the start of the month so becomes a dawn object by midmonth until the end of the year when Saturn rises about 8:20 p.m. Jupiter remains visible all evening this month, going from setting after midnight at the start of September to setting about 11:30 p.m. at the end of September. At sunset, if you follow the curve of the Big Dipper's handle away from the bowl, you can "arc to the star Arcturus" and continue curving away from the bowl to "speed onto Spica" where you will locate three visible planets. In order of brightness Venus (magnitude –3.8), Mercury (magnitude –0.9 to +0.3), Spica (magnitude 0.98), and Mars (magnitude +1.7) go from northwest of Spica at the start of September, to a beehive around Spica midmonth, to Venus southwest of Spica by months end. The problem is you have to catch them all just after sunset as they set within 45 minutes after the sun.**

What about Uranus and Neptune this month? **This will be the best month to catch Uranus as it shines brightest (magnitude +5.7) at opposition (means that Earth lies between the Sun and Uranus on a line connecting them). You can spot it through binoculars, and can even glimpse it with your naked eyes from a dark site! Uranus lies in eastern Aquarius, 3 to 4 degrees northeast of 4th magnitude Phi Aquarii. Either use the internet or a friend that knows the night sky to help you find both Uranus and Neptune.**

What are some autumnal equinox facts? **The autumnal equinox occurs exactly when the sun has fallen from a north declination to a declination of zero degrees, meaning the sun is on the celestial equator (an extension of earths equator to the sky). On the two equinox days (spring and fall) everyone on earth has equal amounts of daylight and darkness (not just the people who live on the equator and enjoy this phenomena year round). Only on the equinoxes does the sun rise due East and set due west, so if you are on an east/west road at these times pull over for just a few minutes to avoid an accident caused by the sun blinding you. The south-pole now enjoys six months of the sun never setting as it parallels the horizon.**

Is there something mathematical that is always present? **Vectors are always present. Take any physics course and you'll soon realize that vectors are everywhere. Examples: Any force is a vector, whether gravitational, electrical, magnetic, strong or weak; forces are everywhere and every force is a vector. A stationary object simply means the net forces acting on the object add up to the zero vector. Displacement, velocity, and acceleration (whether change of velocity or change of direction) are also examples of vectors.**

What is the difference between a vector and a scalar? **A scalar is simply a number (called the magnitude) where a vector is both magnitude and direction. Your speed could be 25 miles per hour as a scalar but your velocity could be 25 miles per hour (magnitude) due north (direction). If you were lost would you rather know that where you need to get to is 99 miles away (distance, a scalar magnitude) or 99 miles going 13 degrees north of due east (displacement, a vector with magnitude and direction).**

On a GPS (global positioning system), what is the difference between a bearing and a heading? **The bearing is the direction that is the shortest path to your destination but a lake/building may be in your way so your heading is the current direction you are traveling while rounding the obstacle. Your goal is to keep your heading matching you're the bearing the best you can. GNATS**