Ponder the Portage County Skies with Paul

Sky events for April 2008

01 Sunrise 06:38 a.m. & sets 07:26 p.m.
03 Jules Verne ATV docks with ISS
04 Moon passes 5^{o} north of Venus @ 8 p.m.
05 New Moon @ 10:55 p. m.
07-09 24th National Space Symposium
08 Crescent Moon occults Pleiades cluster
11 Moon passes within 1^{o} of Mars 11:30 p.m.
12 1st Q. Moon @ 1:32 p.m.
15 @3:30 a.m. Moon, Regulus, Saturn close
16 Mercury superior conjunction 2 a.m.
17 Apollo 13 crew returns to Earth alive
20 Full Moon occurs @ 5:25 a.m.
21 (1997) first space funeral.
22 Lyrid meteor shower peaks (but washed out)
27 Moon passes 2^{o} south of Jupiter.
28 Last Quarter Moon at 9:12 a.m.
30 Sunrise 05:49 a.m. & sets 20:01 p.m.

What's special in April '08? The most beautiful scene this season happens as the moon passes in front of the sky's best star cluster, the Pleiades. To watch this occultation just watch the crescent moon from about 8 p.m. until 10 p.m. In this latest in a series of Pleiades occultation's over the past two years, the three day old crescent moon's light doesn't overpower the stars light as the moon blocks out each star for an hour at a time. Also note that you can see the outline of the dark section, of the side of the moon that is always facing us, because of Earthshine. The Earth reflects over 600 times more light than the moon (especially in the spring) and thus light from the sun is reflecting off the Earth to the Moon and back to your eyes.

Anything else one should catch in the sky before it is gone? Yes, catch Saturn's rings while you still can! Saturn is high in the east at sunset and passes just south of directly overhead at 10:45 p.m. early in April and at 9 p.m. at the end of April. Saturn lies just east of the brightest star in Leo the Lion, Regulus (at the base of the backward question mark). If you still have difficulty finding Saturn look just west of the moon on the evening of 15th as the moon has past this dual while you were having breakfast and is now East of them. Nothing matches Saturn's astonishing beauty and this spring is our last chance until November of 2010 to see the rings this wide open again. The rings are tipped 8.6^{o} this month, 10^{o} early next month before becoming razor-thin by years end at 1^{o}. Next spring the rings will open to a maximum of 4^{o} again only to collapse to zero degrees in Sept. 2009 when behind the sun.

Can you explain the Leap Year rules to me and why the rules exist? Leap year rules need to exist because the time it takes the Earth to orbit the sun is 365.24219 years instead of 365.25 as everyone thinks. You wouldn't think .00781 years would make a difference but in 1582 A.D. Pope Gregory's Astronomers figured the calendar was off by ten days because of the .00781 years difference. To correct the calendar, the Pope declared that the day following Oct. 4th, 1582 would be Oct. 15th. (Thus, Oct. 5th through the 14th never existed in the history of our calendar!) The Pope kept the old rule of a leap year every four years but added two more rules so the calendar would not have to be corrected again. Note that 100 times .24219 is only 24.219 which rounds to 24 days every 100 years instead of 25 days, so *every 100 years we skip the leap year* (1800, 1900, 2100, 2200,). But 400 times .24219 is 96.876 days which rounds to 97 days where 4 times 24 days every 100 years gives 96 days so *every 400 years we need to have the leap year* (1600, 2000, 2400, 2800…).

I hear that you tell your students that this third 400 year leap rule makes us all very special, explain? Think about it, this third rule was used for just the second time in history **during your lifetime**. Galileo was alive the first time this rule was used in 1600 and it will not be until 2400 when this third rule is used again!

What role do decimals play in mathematics? Wow, this is like asking what role do people play in the human race. You see fractions, percents, trigonometric functions, logarithmic functions, other transcendental numbers (like pi, and e), complex numbers, vectors, and matrix elements can all be written as decimals that never end. Even ½ can be written as .50000… with zeros forever. Using this property of decimals the famous mathematician Georg Cantor (1845-1918) proved not only is the irrational number infinity a larger infinity than the rational number infinity but that there exists an infinite amount of infinities. My stab at explaining this proof of Cantor's will appear in July. So, in math when we shop, we just don't go to any mall, we go to the deci-mall. GNATS!