THE
ATMOSPHERICRESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

A LITTLE BIT ABOUT ORBITS

By Mark D. Schneider

Every 26 months, the Earth passes the planet Mars as both planets move in elliptical orbits around the sun. Because we are closer to the sun than Mars, Earth travels faster and completes approximately two revolutions to Mars' one revolution. Yes, this does mean that you would technically be half your age if you lived on Mars! Sky watchers who are tracking the movement of Mars each night normally observe it moving from west to east. When Mars' orbit gets overtaken by Earth's, however, it appears to actually begin moving the opposite direction – an occurrence called *retrograding*. This retrograde cycle just began in September and ends this month when Mars will resume moving its normal direction in the night sky.

The orbits of planets in our solar system are elliptically shaped and not truly perfect circles. Most planetary orbits (especially Earth's), however, are closer to being circular than the stretched ellipses that are sometimes depicted in illustrations. Comets can have either wide, elliptical orbits (around the sun) or hyperbolic orbits; meaning that they only travel through our solar system once and then get thrown off into space by the gravitational force of the sun. This is why viewing some comets is literally a "once-in-a-lifetime" occurrence. Another reason is that the wide, elliptical orbits of comets around the sun may take many hundreds or thousands of years to complete. This is true of the recent viewing of comet NEOWISE, which won't be visible to Earth again for another 6,766 years. Fortunately, Halley's comet has an orbital period of only 75 years, so some people will be lucky enough to see it twice in their lifetime.

Photo From pxhere.com

When we launch man-made satellites into orbit around Earth, a balance between momentum and gravity must be reached in order for the satellite to remain in constant orbit. If the satellite has too much momentum it will continue to drift out into space. On the other hand, if gravity overcomes momentum, the satellite gets pulled closer and closer to Earth and eventually crashes. Orbital balance is reached by finding the correct orbital velocity for the satellite.

Our moon is rather intriguing because its orbit fluctuates slightly due to the gravitational shift of our ocean tides. Each year our moon moves 1.48 inches farther away from the Earth. This doesn't amount to much distance over our lifespans, but over 4.5 billion years it means that the length of our days would have increased from just five hours to our current twenty four hours. Scientists have studied the daily growth bands of coral reefs and counted the number of days that occurred each year in the recent past. By theorizing that this pattern would continue going back billions of years, there is indication that our days are getting longer too. For now, however humans will just have to measure the lengthening of our days in fractions of a second and this won't be noticeable to anyone wishing for "more time in their day."

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