

DECEMBER 2009 ASTRONOMY

From the Trackman Planetarium at Joliet Junior College

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Happy Solstice! The Winter Solstice - the first day of winter - is on December 21st and it is the astronomical event that led to the other holidays being celebrated at this time of the year. On December 21st, the sun crosses the sky at the lowest point for the year, resulting in the shortest amount of daylight for the year. The ancient cultures in the Northern Hemisphere watched the sun cross lower each day and feared it would sink below the horizon and never return. When it stopped (solstice) and started crossing higher again, they had celebrations. The Christmas holiday was added to the celebrations in approximately 360 AD.

The good news is for those who dislike the early sunsets: the earliest sunset is on December 8th - the sun sets 6 minutes later by Christmas. For those who don't like late sunrises, the news isn't so good. The sun rises later each day until the first week in January.

Jupiter is still the bright object in the southern sky every evening. Our orbit around the sun is moving us farther from Jupiter and by the end of December Jupiter will be 523 million miles from us. Mars will rise at 9:22 PM at the beginning of December and by the end of December it will rise at 7:30 PM. December 20th will be a good day to find the elusive planet, Mercury. Mercury will set one hour and 28 minutes after the sun. Look slightly to the south and above the point on the horizon where the sun set. Venus is too close to the sun for viewing and Saturn is working its way to the evening sky, but we'll have to wait until February for evening viewing.

Orion is now up in the evening skies. Orion is hard to miss with the three stars that make up his belt very easy to find. Use your binoculars to look at the cloud under his belt. That cloud is a nebula where new stars and new solar systems are being formed. As you look at Orion, the star Betelgeuse is the star that marks his left shoulder. Betelgeuse is an old, red star that is dying and about to go super nova - explode. Above Orion and to the left are two bright stars - Pollux and Castor. These stars mark the heads of the Gemini Twins. Below Orion and to his left is Sirius, the brightest star in the sky after our sun. Sirius is part of Canis Major - the Big Dog - and therefore Sirius is sometimes called the "Dog Star". The big "W" of Cassiopeia is overhead in mid-evening. Below Cassiopeia is the Andromeda Galaxy, visible only in very dark skies.

The first full moon in December is on December 2nd. The second full moon of the month, sometimes called the "Blue Moon", is on December 31st. Blue Moons are not that uncommon. There can be a Blue Moon seven times in a 19-year period. The next Blue Moon is in August of 2012.

The full moon on the 31st will be brighter and larger than most full moons because the moon is at its closest approach to the earth (219,000 miles), and the earth and moon are only two days from their closest approach to the sun (91,400,000 miles). The moon reflects sunlight and there is maximum sunlight to reflect from a larger than usual moon. The full moon is high in the sky because it is opposite the sun and the sun is at its lowest (solstice) on December 21st. (However, due to lunar orbital eccentricities, the full moon on December 2nd crosses slightly higher than the moon on the 31st.)

The Geminids Meteor Show peaks on December 13th. The moon will cooperate and the skies should be dark. Go out in the late evening and look toward Orion and you should see a few “shooting stars“.

Our public shows at the planetarium are on: December 1st at 7:30 PM (Seasonal Skies), December 15th at 7:30 PM (Christmas Show), and December 29th at 7:30 PM (Seasonal Skies). Our Sunday afternoon shows are at 2:30 PM on December 13th and 20th (Christmas Show). “The Christmas Show” is about the history of the solstice celebrations in different cultures and how it evolved into our holiday season today. It also researches the “star” of Bethlehem and what it might have been astronomically speaking. (If the Magi saw the “sign” in the east, why did they go west?) “Seasonal Skies” is a tour of the winter skies and what to look for with the naked eye and with binoculars. All of the shows start with a short tour of the skies using the planetarium projector and all shows are offered at no charge as a community service of Joliet Junior College.

Last October, when the LCROSS rocket was propelled into the moon, it almost appeared as if the experiment was a failure. The five-mile plume of dust and dirt that we expected never materialized. But the small amount of moon surface that was propelled from the always-dark bottom of the Cabeus crater proved to be heavy in water content. Water content was what LCROSS was searching for, and now we know there is water available when we build a moon base in the next ten to twenty years.

HAPPY HOLIDAYS FROM THE TRACKMAN PLANETARIUM.

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