The FLIGHT DECK

The Official Newsletter of the Fleet Flagship
U.S.S. HALSEY

New Series Number 12-07 December 2011

FROM THE BRIDGE:

Greetings and welcome to the unusually warm month of December. Missing the Halsey CPT. Hope everyone had a good time at Starbase Indy. I was working this year.

The annual Halsey Christmas Party is Dec 17, 6 PM at the Bishoff's. Bring a dish and a present. Ho Ho Ho. . .

LL&P,

Janet Dailey, Ed
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Important Upcoming Dates:

December 17	Halsey Christmas Party – Bishoff's 6 PM
December 30	Eve of NYE party – Bishoff's 6 PM
January 21	Jan 2012 Meeting
February 25	Feb Meeting
March 31	March Meeting

Ed note: My sister's F-i-L passed away and one of my employee's granddaughter passed away under strange circumstances (and her sister dies Oct 2010). Had to move all my stuff on my computer desk, lost my notes on our meeting dates. Will reconstitute them for the Jan 2012 Newsletter. jld

Science News:

December 22 is a Solstice Day in 2011

The December solstice will occur at 05:30 (or 5:30am) Coordinated Universal Time (UTC) on December 22, 2011. It is also known as the winter solstice in the northern hemisphere and the summer solstice in the southern hemisphere due to the seasonal differences.

The date varies from December 20 to December 23 depending on the year in the Gregorian calendar. The 2012 December solstice will be on December 21, 2012, which is a speculated date for **"the end of the world"**.

Use the Seasons Calculator to find December solstice date in other time zones or other years.

The December Solstice Explained

The December solstice occurs when the sun reaches its most southerly declination of -23.5 degrees. In other words, it is when the North Pole is tilted 23.5 degrees away from the sun. Depending on the Gregorian calendar, the December solstice occurs annually on a day between December 20 and December 23. On this date, all places above a latitude of 66.5 degrees north are now in darkness, while locations below a latitude of 66.5 degrees south receive 24 hours of daylight.

The sun is directly overhead on the Tropic of Capricorn in the southern hemisphere during the December solstice. It also marks the longest day of the year in terms of daylight hours for those living south of the Tropic of Capricorn. Those living or travelling south from the Antarctic Circle towards the South Pole will see the midnight sun during this time of the year.

On the contrary, for an observer in the northern hemisphere, the December solstice marks the day of the year with the least hours of daylight for those living north of the Tropic of Cancer. Those living or traveling north of the Arctic Circle towards the North Pole will not be able to see the sun during this time of the year.

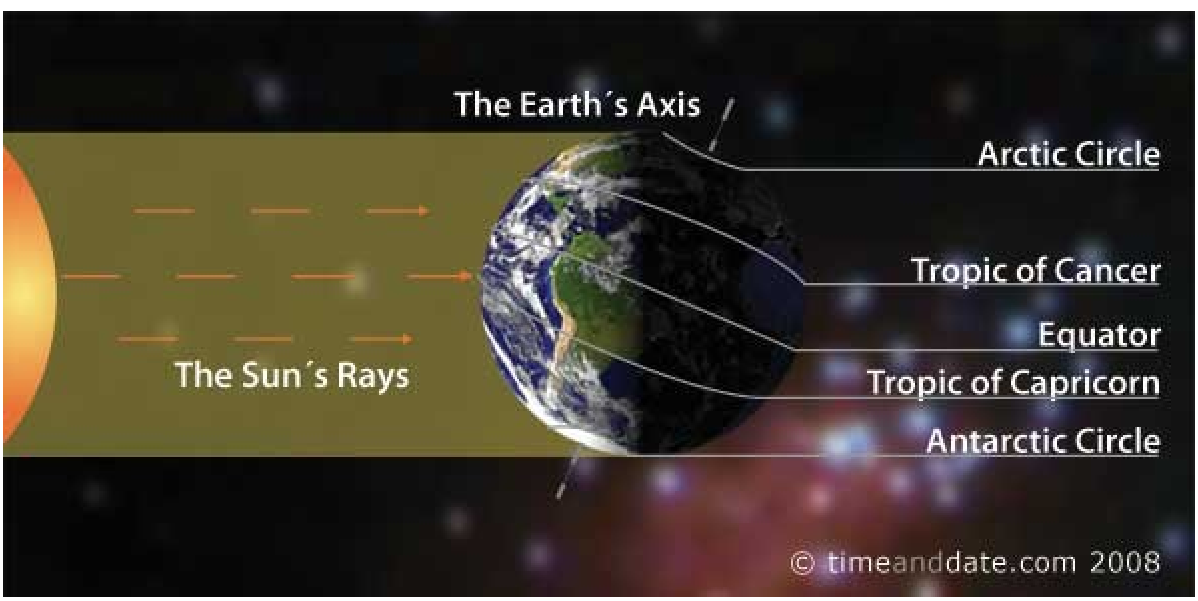

Illustration is not to scale

The December solstice in the calendar

December 20 and December 23 solstices occur less frequently than December 21 or December 22 solstices in the Gregorian calendar. The last December 23 solstice occurred in 1903 and will not occur again until the year 2303. A December 20 solstice has occurred very rarely, with the next one occurring in the year 2080.

Seasons, Equinoxes and Solstices

- Seasons Calculator – When seasons start
- March Equinox Explained
- –traditions around March Equinox
- June Solstice Explained
- –traditions around June Solstice
- September Equinox Explained
- –traditions around September Equinox
- **December Solstice Explained**
- –traditions around December Solstice
- Equinox day is not exactly 12 hours long

As with the June solstice, the December solstice's varying dates are mainly due to the calendar system. The Gregorian calendar, which is used in most western countries, has 365 days in a year and 366 days in a leap year. However, the tropical year, which is the length of time the sun takes to return to the same position in the seasons cycle (as seen from earth), is different to the calendar year. The tropical year is approximately 365.242199 days but varies from year to year because of the influence of other planets. The exact orbital and daily rotational motion of the earth, such as the "wobble" in the earth's axis (precession), also contributes to the changing solstice dates.

Over the course of history, many different schemes have been devised to determine the start of the year. Some are astronomical, beginning at the September or March equinox, or at the June or December solstice. Solstices are more readily observable either by observing when the midday shadow of a gnomon is longest (winter solstice in the northern hemisphere) or shortest (summer solstice in the northern hemisphere). The solstices can also be observed by noting the point of time when the sun rises or sets as far south as it does during the course of the year (winter in the northern hemisphere) or maximally north (summer in the northern hemisphere).

December solstice in relation to seasons

It is important to note that earth does not move at a constant speed in its elliptical orbit. Therefore the seasons are not of equal length: the times taken for the sun to move from the vernal equinox to the summer solstice, to the autumnal equinox, to the winter solstice, and back to the vernal equinox are roughly 92.8, 93.6, 89.8 and 89.0 days respectively. The consolation in the northern hemisphere is that spring and summer last longer than autumn and winter (when the December solstice occurs).

The relative position of the earth's axis to the sun changes during the cycle of seasons. This phenomenon is the reason why the sun's height above the horizon changes throughout the year. It is also responsible for the seasons through controlling the intensity and duration of sunlight received at various locations around the planet.

Useful Tools

To calculate the approximate time and date (according to Coordinated Universal Time) of the March equinox, as well as the June and December solstices and the September equinox, click on the Seasons Calculator. These dates mark the beginning of the four seasons of the year, which are spring, summer, autumn (or fall) and winter. It is important to note that the seasons in the northern hemisphere are opposite to those in the southern hemisphere. Find out more about the Seasons Calculator and links to useful tools, such as the Day and Night World Map, Moon Calculator, Moon Phase Calculator, and Sunrise Calculator.

The World Clock can also be used to find sunrise and sunset times, as well as the current position of the sun in major cities around the world. Simply select any location that is available from the World Clock and the calculator will adjust the local time in that particular city.

Solstice's influence on cultures

The December solstice has played an important role the lives of many people in ancient times. To this day, the world is still influenced by various traditions linked to the observance of the December solstice.

For those of us with time and money:

http://alumni.georgetown.edu/newsevents/newsevents_168.html

Faster than light drive?

http://www.bbc.co.uk/news/science-environment-15471118

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An international team of astronomers has identified a candidate for the smallest-known black hole using data from NASA's Rossi X-ray Timing Explorer (RXTE). The evidence comes from a specific type of X-ray pattern, nicknamed a "heartbeat" because of its resemblance to an electrocardiogram. The pattern until now has been recorded in only one other black hole system.

Named IGR J17091-3624 after the astronomical coordinates of its sky position, the binary system combines a normal star with a black hole that may weigh less than three times the sun's mass. That is near the theoretical mass boundary where black holes become possible.

Gas from the normal star streams toward the black hole and forms a disk around it. Friction within the disk heats the gas to millions of degrees, which is hot enough to emit X-rays. Cyclical variations in the intensity of the X-rays observed reflect processes taking place within the gas disk. Scientists think that the most rapid changes occur near the black hole's event horizon, the point beyond which nothing, not even light, can escape.

Astronomers first became aware of the binary system during an outburst in 2003. Archival data from various space missions show it becomes active every few years. Its most recent outburst started in February and is ongoing. The system is located in the direction of the constellation Scorpius, but its distance is not well established. It could be as close as 16,000 light-years or more than 65,000 light-years away.

The record-holder for wide-ranging X-ray variability is another black hole binary system named GRS 1915+105. This system is unique in displaying more than a dozen highly structured patterns, typically lasting between seconds and hours.

"We think that most of these patterns represent cycles of accumulation and ejection in an unstable disk, and we now see seven of them in IGR J17091," said Tomaso Belloni at Brera Observatory in Merate, Italy. "Identifying these signatures in a second black hole system is very exciting."

In GRS 1915, strong magnetic fields near the black hole's event horizon eject some of the gas into dual, oppositely directed jets that blast outward at about 98 percent the speed of light. The peak of its heartbeat emission corresponds to the emergence of the jet.

Changes in the X-ray spectrum observed by RXTE during each beat reveal that the innermost region of the disk emits enough radiation to push back the gas, creating a strong outward wind that stops the inward flow, briefly starving the black hole and shutting down the jet. This corresponds to the faintest emission. Eventually, the inner disk gets so bright and hot it essentially disintegrates and plunges toward the black hole, re-establishing the jet and beginning the cycle anew. This entire process happens in as little as 40 seconds.

While there is no direct evidence IGR J17091 possesses a particle jet, its heartbeat signature suggests that similar processes are at work. Researchers say that this system's heartbeat emission can be 20 times fainter than GRS 1915 and can cycle some eight times faster, in as little as five seconds.

Astronomers estimate that GRS 1915 is about 14 times the sun's mass, placing it among the most-massive-known black holes that have formed because of the collapse of a single star. The research team analyzed six months of RXTE observations to compare the two systems, concluding that IGR J17091 must possess a minuscule black hole.

"Just as the heart rate of a mouse is faster than an elephant's, the heartbeat signals from these black holes scale according to their masses," said Diego Altamirano, an astrophysicist at the University of Amsterdam in The Netherlands and lead author of a paper describing the findings in the Nov. 4 issue of The Astrophysical Journal Letters.

The researchers say this analysis is just the start of a larger program to compare both of these black holes in detail using data from RXTE, NASA's Swift satellite and the European XMM-Newton observatory.

"Until this study, GRS 1915 was essentially a one-off, and there's only so much we can understand from a single example," said Tod Strohmayer, the project scientist for RXTE at NASA's Goddard Space Flight Center in Greenbelt, Md. "Now, with a second system exhibiting similar types of variability, we really can begin to test how well we understand what happens at the brink of a black hole."

Launched in late 1995, RXTE is second only to Hubble as the longest serving of NASA's operating astrophysics missions. RXTE provides a unique observing window into the extreme environments of neutron stars and black holes.

http://www.nasa.gov/topics/universe/features/black-hole-heartbeat.html

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Merry Christmas to all, and to all a good night!

END OF TRANSMISSION. *CDR J Dailey*