

# Solstice and Equinox Dates and Times

**Why do the times and sometimes the dates differ for a particular equinox or solstice each year?**

- The Earth makes one orbit around the sun in 365.2422 days
- 0.2422 days = 5 hours 48 minutes and 46 seconds
- So each solstice or equinox occurs approximately 5 hours and 49 minutes later than the previous years solstice or equinox.
- There are small year-to-year variations in the dates and times due to the effect of the Moon on the motion of the Earth. These variations are known and monitored by the U.S. Naval Observatory in Washington D.C.
- Every 4 years (leap year) 24 hours must be subtracted from the previous years solstice or equinox before adding the 5 hours and 49 minutes.
- It is interesting to note that since a year is not an even 365.25 days that occasionally a leap year is skipped. A leap day occurs in any year that is divisible by 4 but not divisible by 100 except when the year is divisible by 400. Thus the years 1600 and 2000 had a leap day but the upcoming 2100 will not.
- This time system, known as the Gregorian calendar, makes our calendar year differ from the solar year by only 0.00031, which amounts to only one days error every 4000 years.

## Sample Calculations