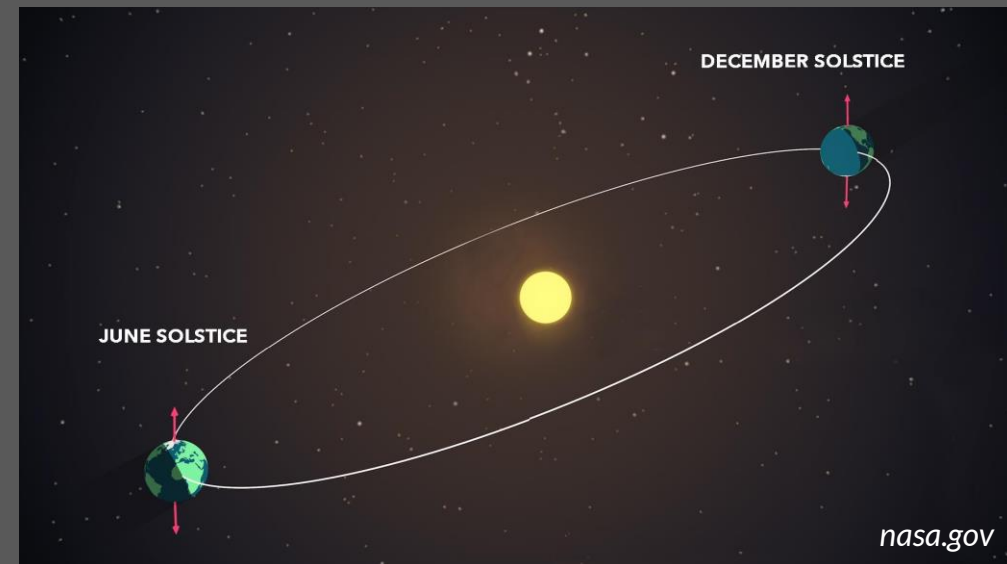
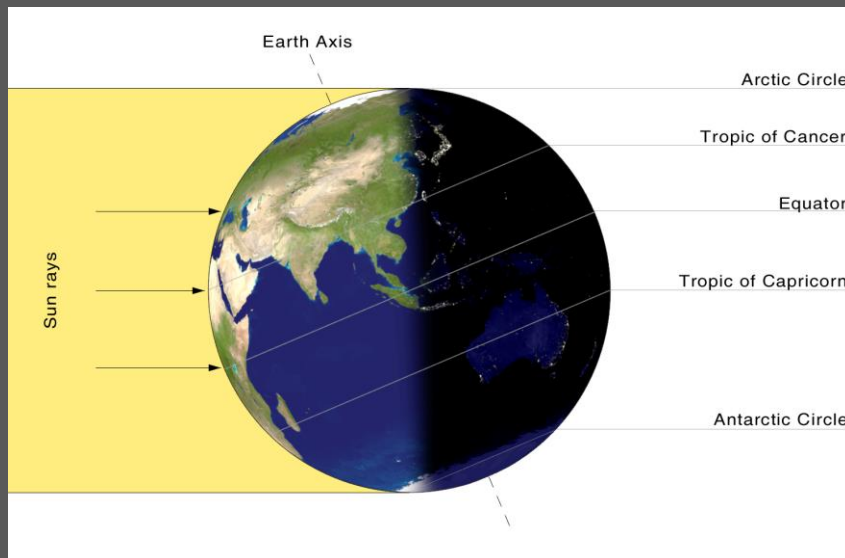




Summer Solstice June 21, 2023 8:57 am MDT

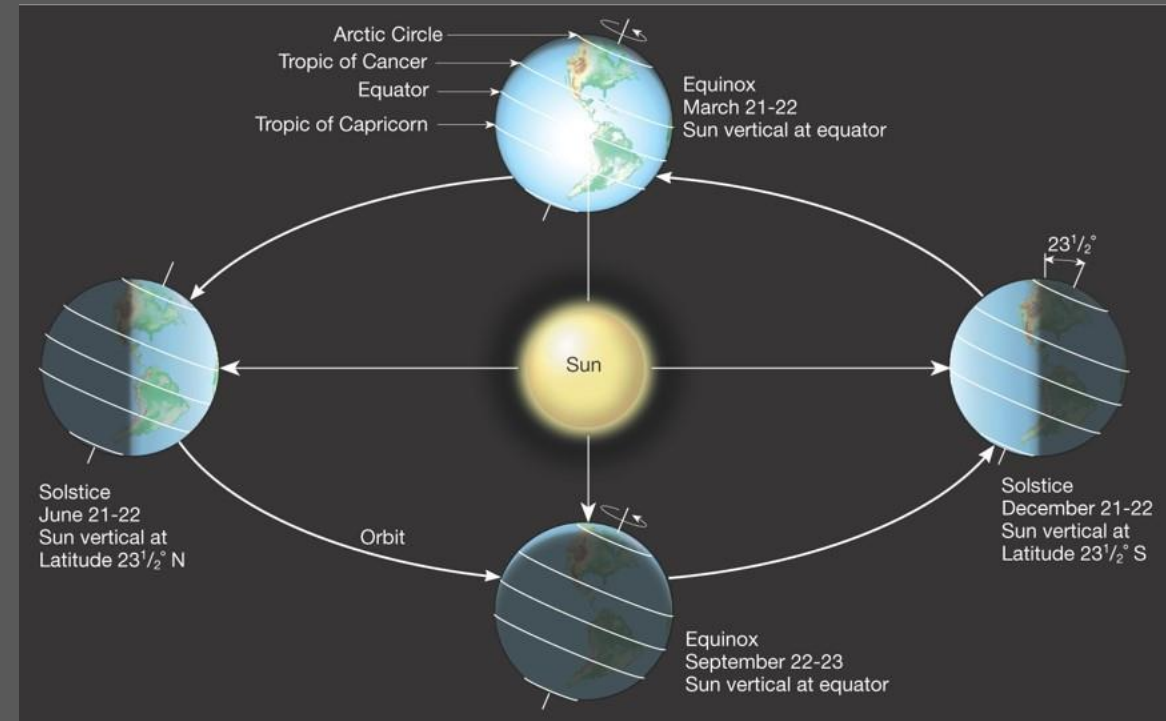
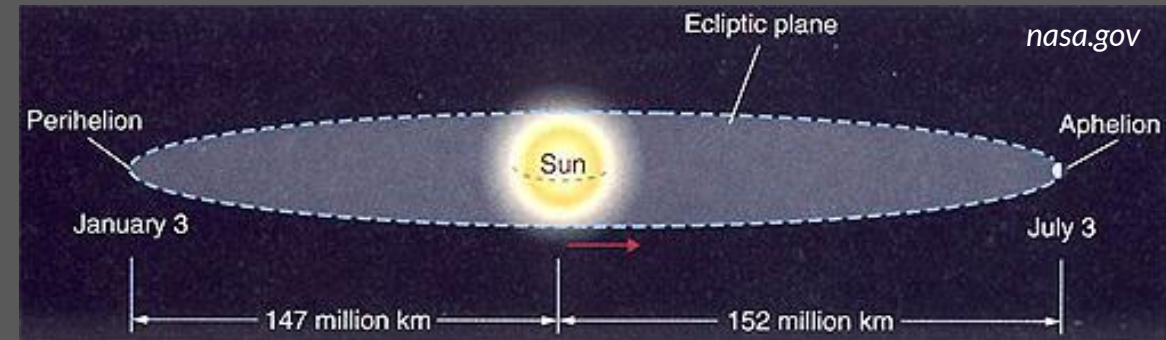


The Northern Hemisphere summer solstice will occur at 8:57 AM MDT on June 21, 2023. This date marks the official beginning of summer in the Northern Hemisphere, occurring when Earth arrives at the point in its orbit where the North Pole is at its maximum tilt (about 23.5 degrees) toward the Sun, resulting in the longest day and shortest night of the calendar year. (By longest “day,” we mean the longest period of sunlight hours.) On the day of the June solstice, the Northern Hemisphere receives sunlight at the most direct angle of the year (see the images below).





We all know that the Earth makes a complete revolution around the sun once every 365 days, following an orbit that is elliptical in shape. This means that the distance between the Earth and Sun, which is 93 million miles on average, varies throughout the year. The top figure on the right illustrates that during the first week in January, the Earth is about 1.6 million miles closer to the sun. This is referred to as the perihelion. The aphelion, or the point at which the Earth is about 1.6 million miles farther away from the sun, occurs during the first week in July. This fact may sound counter to what we know about seasons in the Northern Hemisphere, but actually the difference is not significant in terms of climate and is NOT the reason why we have seasons. **Seasons are caused by the fact that the Earth is tilted on its axis by 23.5°.** The tilt's orientation with respect to space does not change during the year; thus, the Northern Hemisphere is tilted toward the sun in June and away from the sun in December, as illustrated in the bottom graphic on the right. The combination of the earth's elliptical orbit and its axial tilt contribute to the uneven changes in the times of sunrise and sunset throughout the year.





A pinhole camera (no lens and a single small aperture) can be effectively used to document the change in elevation of the sun during the year. The image below is a solargraph made with a pinhole camera, in which the path of the sun as it crosses the sky is captured for an extended period. It was made in Tijeras, and depicts the period from the summer solstice (highest streaks) to the winter solstice (lowest streaks) in 2009.

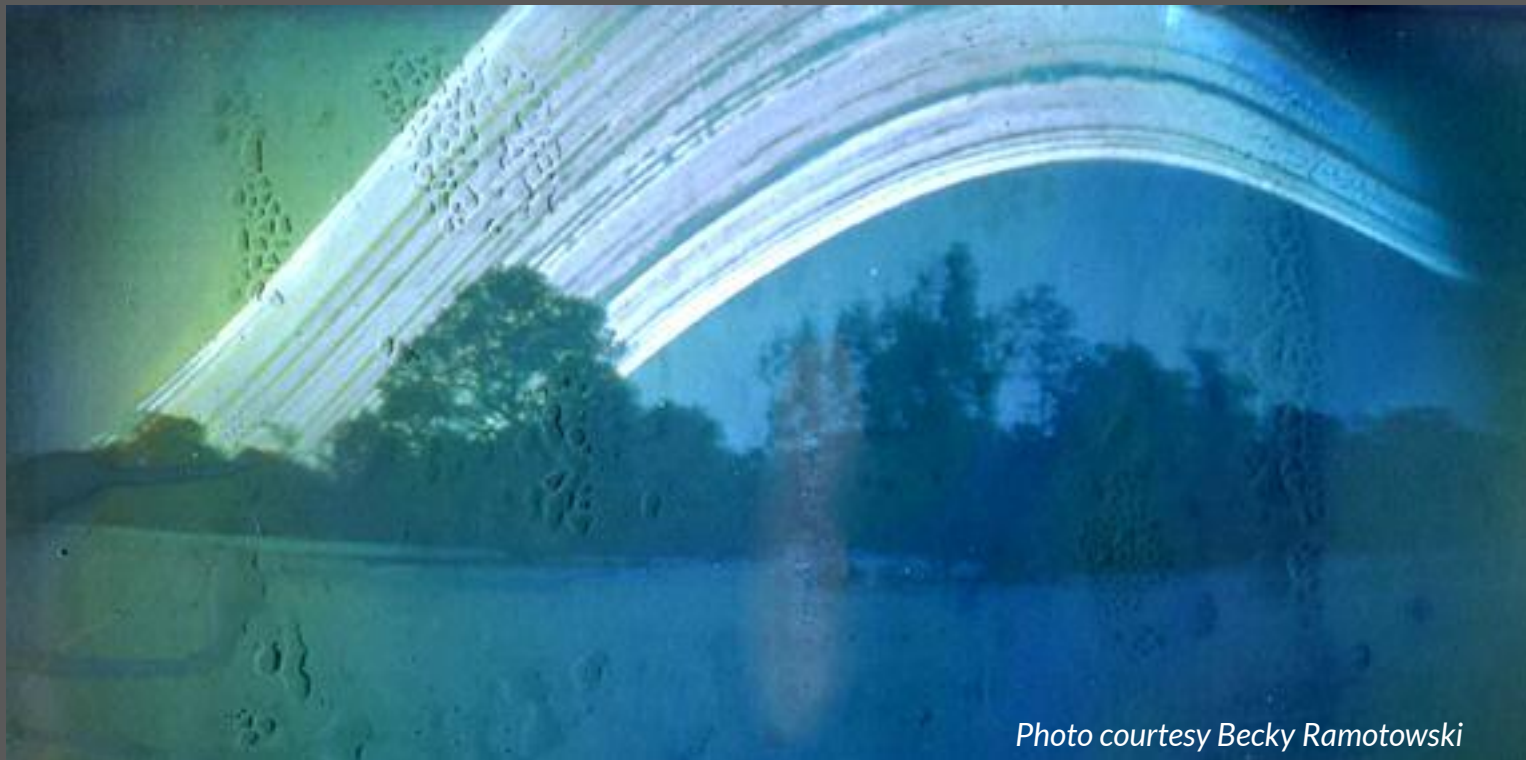
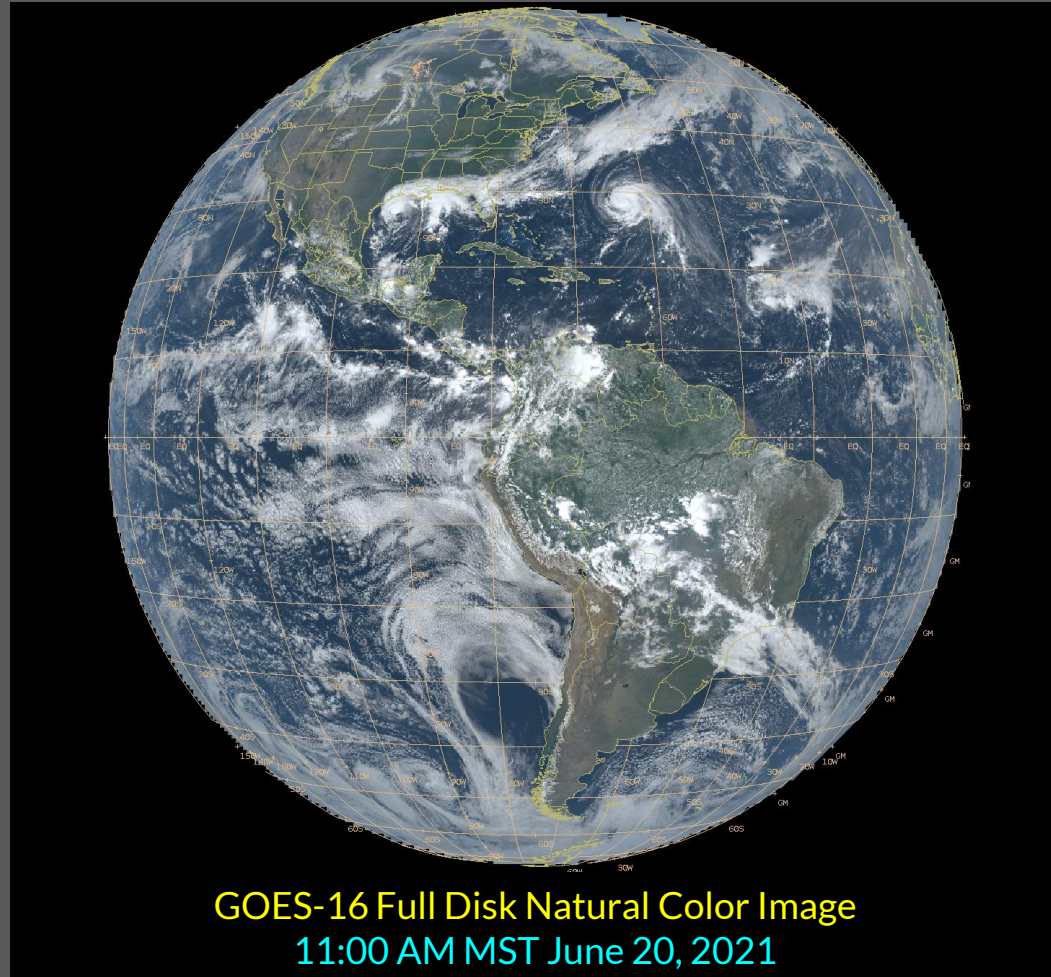


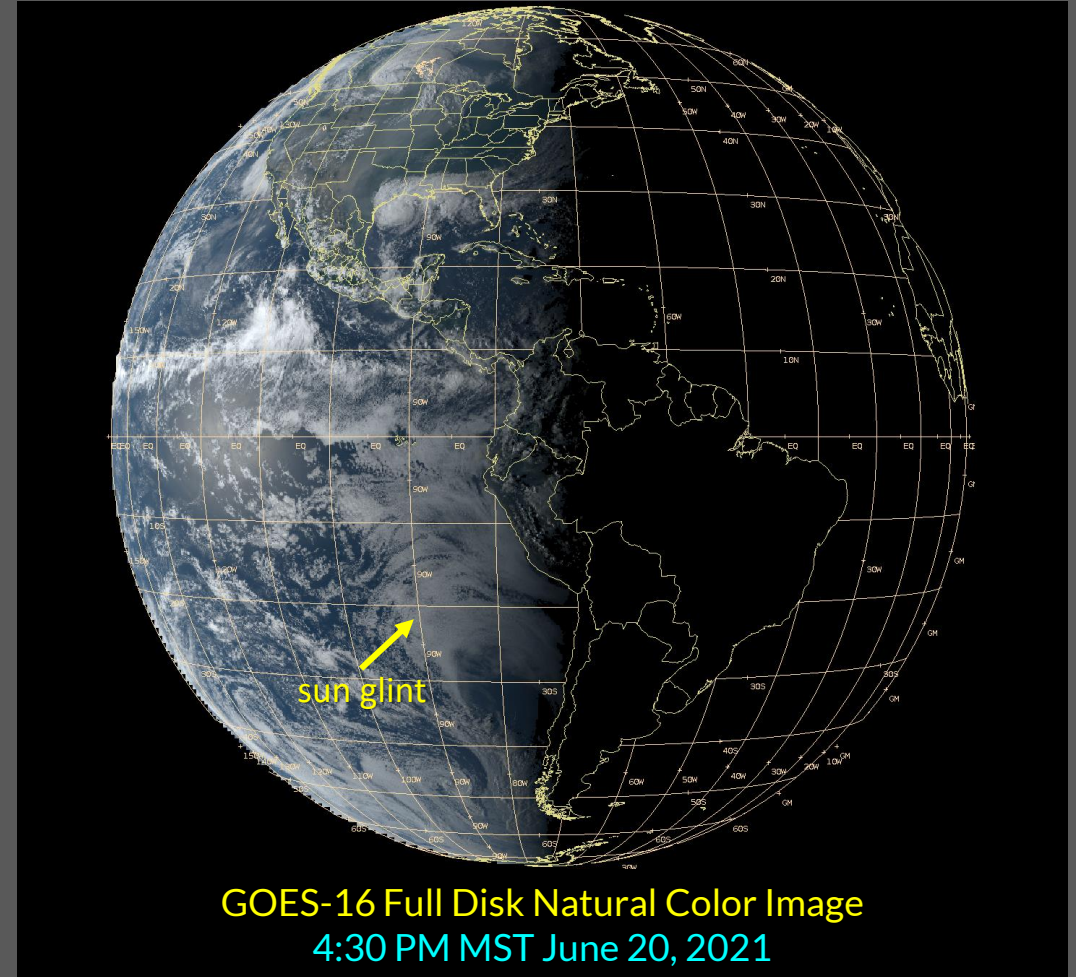
Photo courtesy Becky Ramotowski



The GOES-16 full disk images from June 20, 2021 show the tilted distribution of day and night between the north and south poles as we approached the summer solstice on June 21, 2021. There is near total daylight at the north pole and total darkness at the south pole. The location of maximum sun glint can be seen directly over the Tropic of Cancer where sunlight is reflected back to the satellite on the summer solstice. Earth will orbit the sun for the winter solstice on December 21, 2023 at 8:28 PM MDT.



GOES-16 Full Disk Natural Color Image
11:00 AM MST June 20, 2021



GOES-16 Full Disk Natural Color Image
4:30 PM MST June 20, 2021