

**December 25, 2017**



**Explanation:**

Something very bright suddenly lit up the arctic -- what was it? The original idea was to take a series of aurora images that could be made into a time-lapse video. But when night suddenly turned into day, the astrophotographer quickly realized that he was seeing something even more spectacular. Moving through the sky -- in front of the Big Dipper no less -- was a Geminid meteor so bright it could be called a fireball. The meteor brightened and flashed for several seconds as it went. By a stroke of good fortune, the aurora camera was able to capture the whole track. Taken the night after the Geminids Meteor Shower peaked, the astrophotographer's location was near Lovozero Lake in Murmansk, Russia, just north of the Arctic Circle.

**December 26, 2017**



**Explanation:**

Galaxies are fascinating not only for what is visible, but for what is invisible. Grand spiral galaxy NGC 1232, captured in detail by one of the Very Large Telescopes, is a good example. The visible is dominated by millions of bright stars and dark dust, caught up in a gravitational swirl of spiral arms revolving about the center. Open clusters containing bright blue stars can be seen sprinkled along these spiral arms, while dark lanes of dense interstellar dust can be seen sprinkled between them. Less visible, but detectable, are billions of dim normal stars and vast tracts of interstellar gas, together wielding such high mass that they dominate the dynamics of the inner galaxy. Leading theories indicate that even greater amounts of matter are invisible, in a form we don't yet know. This pervasive dark matter is postulated, in part, to explain the motions of the visible matter in the outer regions of galaxies.

**December 27, 2017**



**Explanation:**

One of the most identifiable nebulae in the sky, the Horsehead Nebula in Orion, is part of a large, dark, molecular cloud. Also known as Barnard 33, the unusual shape was first discovered on a photographic plate in the late 1800s. The red glow originates from hydrogen gas predominantly behind the nebula, ionized by the nearby bright star Sigma Orionis. The darkness of the Horsehead is caused mostly by thick dust, although the lower part of the Horsehead's neck casts a shadow to the left. Streams of gas leaving the nebula are funneled by a strong magnetic field. Bright spots in the Horsehead Nebula's base are young stars just in the process of forming. Light takes about 1,500 years to reach us from the Horsehead Nebula. The featured image was taken with the large 3.6-m Canada-France-Hawaii Telescope in Hawaii, USA.

**December 28, 2017**



**Explanation:**

Massive stars in our Milky Way Galaxy live spectacular lives. Collapsing from vast cosmic clouds, their nuclear furnaces ignite and create heavy elements in their cores. After a few million years, the enriched material is blasted back into interstellar space where star formation can begin anew. The expanding debris cloud known as Cassiopeia A is an example of this final phase of the stellar life cycle. Light from the explosion which created this supernova remnant would have been first seen in planet Earth's sky about 350 years ago, although it took that light about 11,000 years to reach us. This false-color Chandra X-ray Observatory image shows the still hot filaments and knots in the Cassiopeia A remnant. High-energy emission from specific elements has been color coded, silicon in red, sulfur in yellow, calcium in green and iron in purple, to help astronomers explore the recycling of our galaxy's star stuff - Still expanding, the blast wave is seen as the blue outer ring. The sharp X-ray image, spans about 30 light-years at the estimated distance of Cassiopeia A. The bright speck near the center is a neutron star, the incredibly dense, collapsed remains of the massive stellar core.

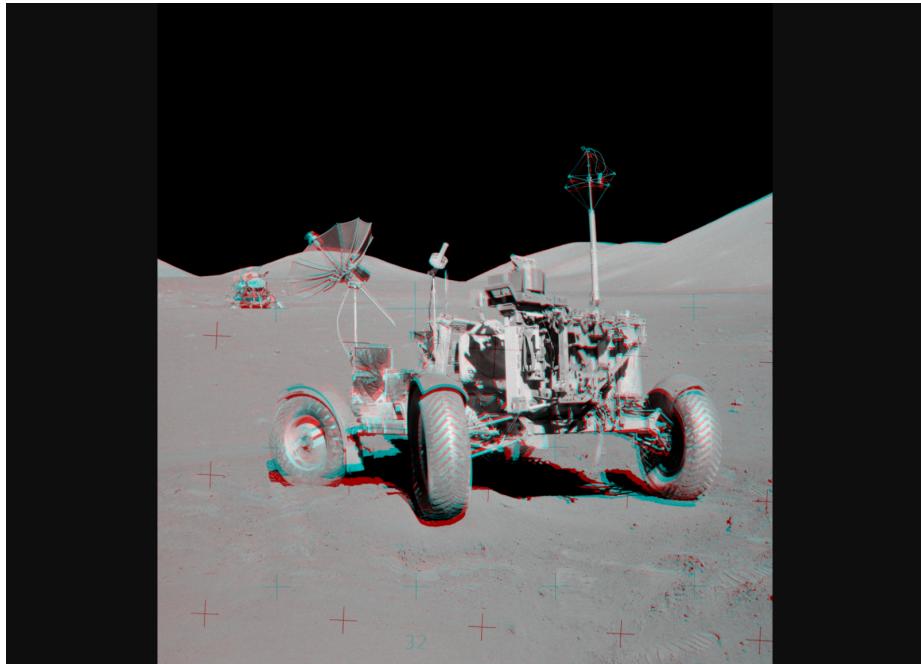
**December 29, 2017**



**Explanation:**

Interstellar dust clouds and glowing nebulae abound in the fertile constellation of Orion. One of the brightest, M78, is centered in this colorful, wide field view, covering an area north of Orion's belt. At a distance of about 1,500 light-years, the bluish reflection nebula is around 5 light-years across. Its tint is due to dust preferentially reflecting the blue light of hot, young stars. Reflection nebula NGC 2071 is just to the left of M78. To the right, and much more compact in appearance, the intriguing McNeil's Nebula is a recently recognized variable nebula associated with a young sun-like star. Deeper red flecks of emission from Herbig-Haro objects, energetic jets from stars in the process of formation, stand out against the dark dust lanes. The exposure also brings out the region's fainter pervasive glow of atomic hydrogen gas.

**December 30, 2017**



**Explanation:**

Get out your red/blue glasses and check out this stereo scene from Taurus-Littrow valley on the Moon! The color anaglyph features a detailed 3D view of Apollo 17's Lunar Rover in the foreground -- behind it lies the Lunar Module and distant lunar hills. Because the world was going to be able to watch the Lunar Module's ascent stage liftoff via the rover's TV camera, this parking place was also known as the VIP Site. In December of 1972, Apollo 17 astronauts Eugene Cernan and Harrison Schmitt spent about 75 hours on the Moon, while colleague Ronald Evans orbited overhead. The crew returned with 110 kilograms of rock and soil samples, more than from any of the other lunar landing sites. Cernan and Schmitt are still the last to walk (or drive) on the Moon.