Earth and the Moon

Composite image above from NASA's Terra spacecraft.

1 Earth year =
365.24 Earth days

Earth orbits the Sun once every year, and spins on its axis once every day. We have seasons on Earth because Earth's spin axis (an imaginary line connecting the north and south poles through the center of the Earth) is tilted from the axis of Earth's orbit around the Sun. That tilt makes the days longer and the midday Sun higher in the sky in summer than in winter. The distance from Earth to the Sun has nothing to do with the seasons, because Earth's distance from the Sun varies only slightly during a year. For example, in this scale model, the distance of Earth from the Sun would always place Earth somewhere on this panel.

As of early 2009, humanity's home planet Earth is the only place in any solar system where we know life exists.

Can you locate Toronto in the photo to the right? The photo was taken from the International Space Station in orbit around Earth. Hint: locate Lake Ontario (the central of the three Great Lakes visible in the bottom half of the photo), then tilt your head to the left.
Image courtesy of the Image Science & Analysis Laboratory, NASA Johnson Space Center.

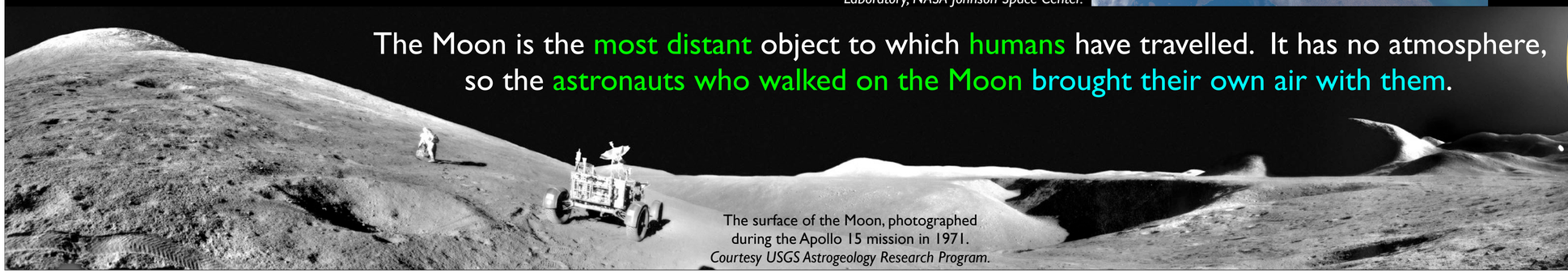
Moon image from NASA's Galileo spacecraft.

The Moon is shown here with its correct size relative to Earth at far left. The above photo shows some areas of the Moon never seen from Earth. The Moon is thought to have formed when a young Earth collided with an object the size of Mars. The collision left approximately 2% of Earth's mass in orbit. Gravity eventually pulled most of that material together to form the Moon.

As an end result of the tides the Moon's gravity raises on Earth's land and oceans, the Moon is moving away from Earth by 4 cm more every year (but will never escape Earth's gravity).

Can you spot the Earth and the Moon below? They are shown with black circles giving their correct sizes in this scale model. The Moon's orbit around Earth would fit inside the Sun.

The Moon is the most distant object to which humans have travelled. It has no atmosphere, so the astronauts who walked on the Moon brought their own air with them.



The surface of the Moon, photographed during the Apollo 15 mission in 1971.
Courtesy USGS Astrogeology Research Program.