

# THE MOON OUR NEIGHBOUR The Near Side

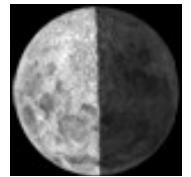
The Moon was formed 4.5 billion years ago, shortly after the formation of Earth. It condensed from the debris of a collision of a small planet with Earth



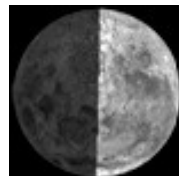
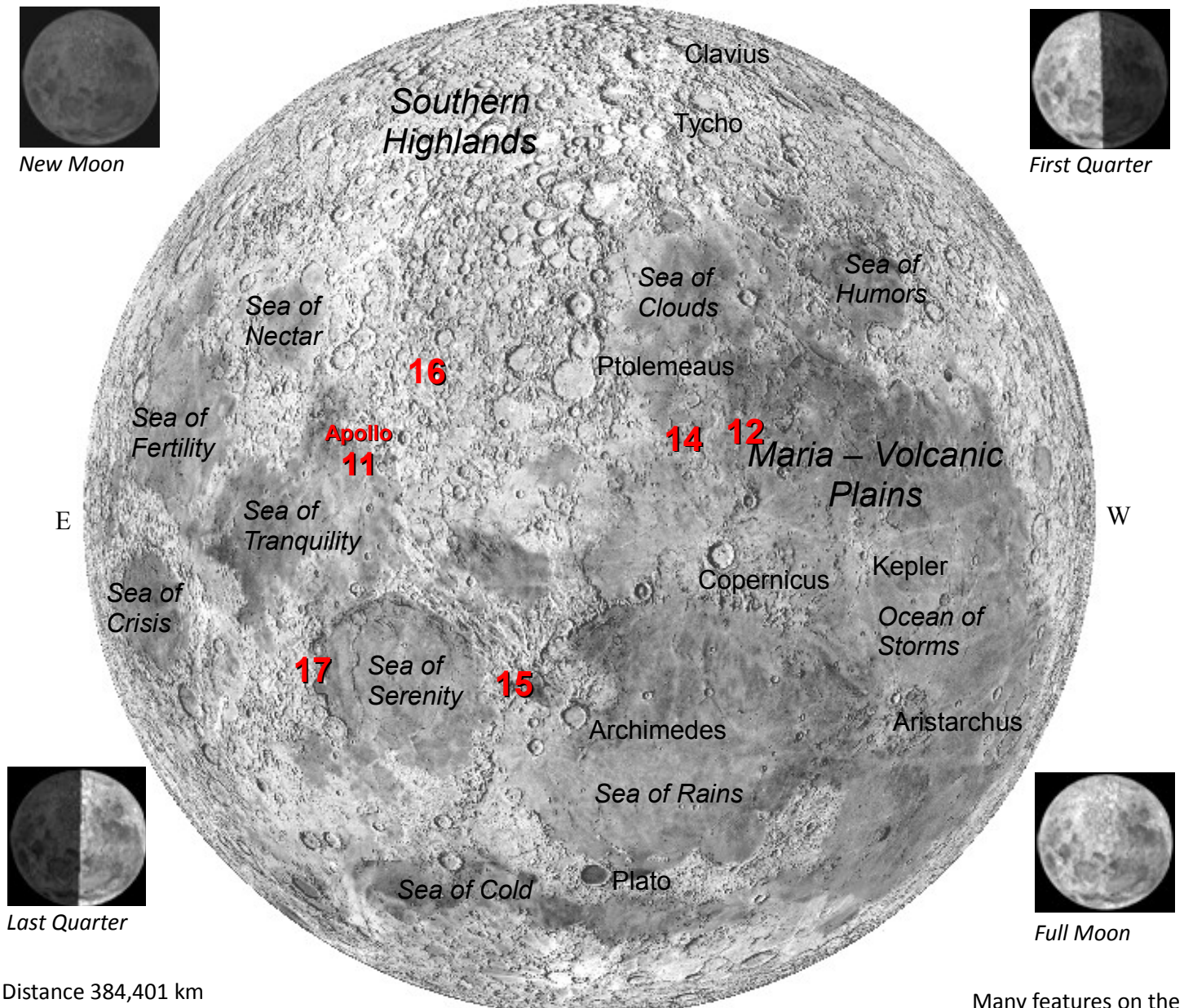
The Moon so far is the only celestial body visited by 12 astronauts 1969 to 1972. Some 380 kg of lunar rock was returned to Earth. Humans are expected to return to the Moon about 2020



New Moon



First Quarter



Last Quarter



Full Moon

Distance 384,401 km  
 Diameter 3,475 km  
 Made of rock with small iron core.  
 No atmosphere. 1/81<sup>th</sup> Earth mass  
 Temperature range day to night is 120°C to -170°C.  
 Rotation period is 27.3 days while the Moon *keeps same side facing Earth*.  
 Complete cycle of phases is 29.5 days.



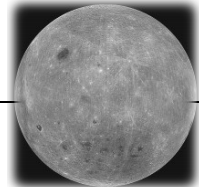
Binocular view of Moon showing craters Clavius, Tycho and many other lunar features

Many features on the Near side of the Moon, like the dark volcanic plains (*Maria*) can be seen with the unaided eye. *Binoculars* will show more detail including dozens of craters. Best time to view the Moon with binoculars and telescopes is in the days near first and last quarters.

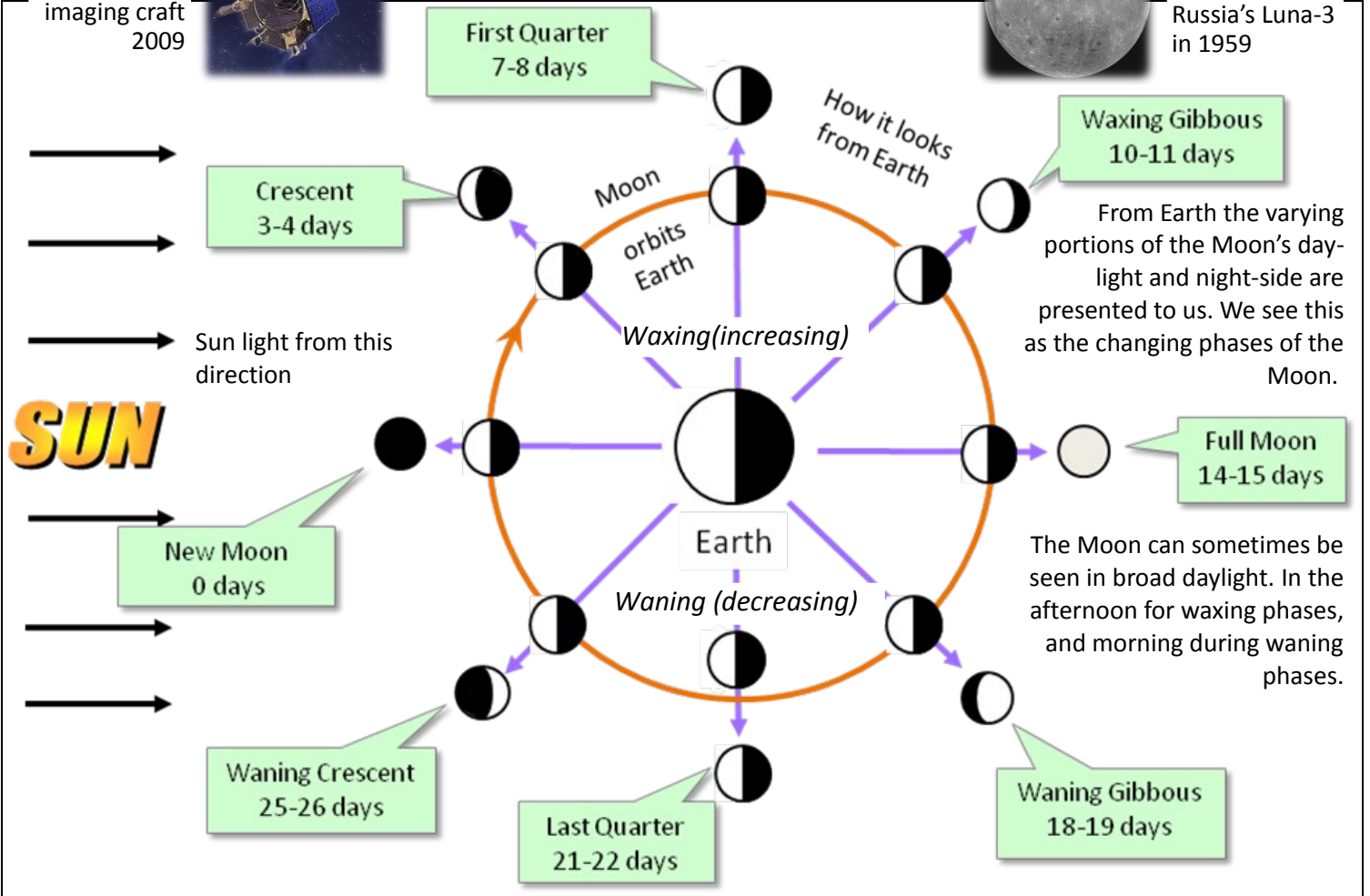
NASA's LCROSS high definition lunar surface imaging craft 2009



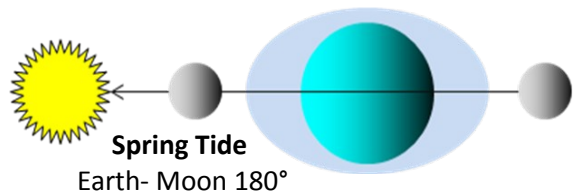
# Phases of the Moon



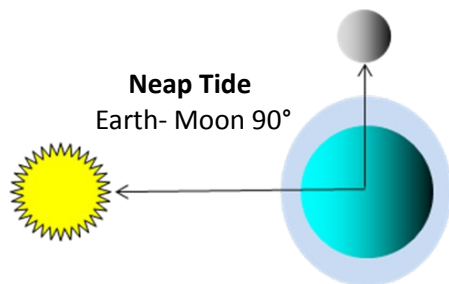
Far side of the moon first imaged by Russia's Luna-3 in 1959



## The Tides



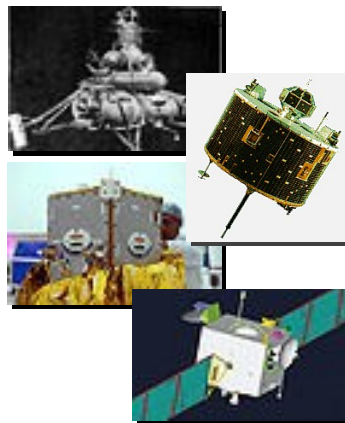
**Spring tide**  
At *new* or *full* Moon the gravitational forces of Sun and Moon combine to raise high tides



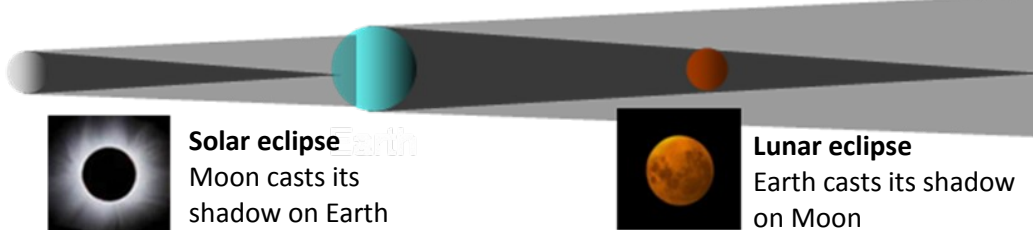
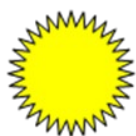
**Neap tide**  
At *first* or *last* Quarter the gravitational forces of Sun and Moon partly cancel and raise smaller *neap* tides. **South Australia** instead gets *dodge* tides that hardly move at all!

## Moon Race

Several other countries have sent robotic space craft to the Moon - Russia, Japan, India and China



## Eclipses



Eclipses occur at new or full Moons when Sun, Moon and Earth align so that one body casts its shadow on to the other. Not all new and full Moons are eclipses. The orbit of the Moon is slightly tilted so that most of the time the shadows just *miss* the Earth or Moon.

Humans may one day colonise the Moon. The Moon can serve as an outpost for astronomical observatories and a step toward exploring the rest of the solar system.