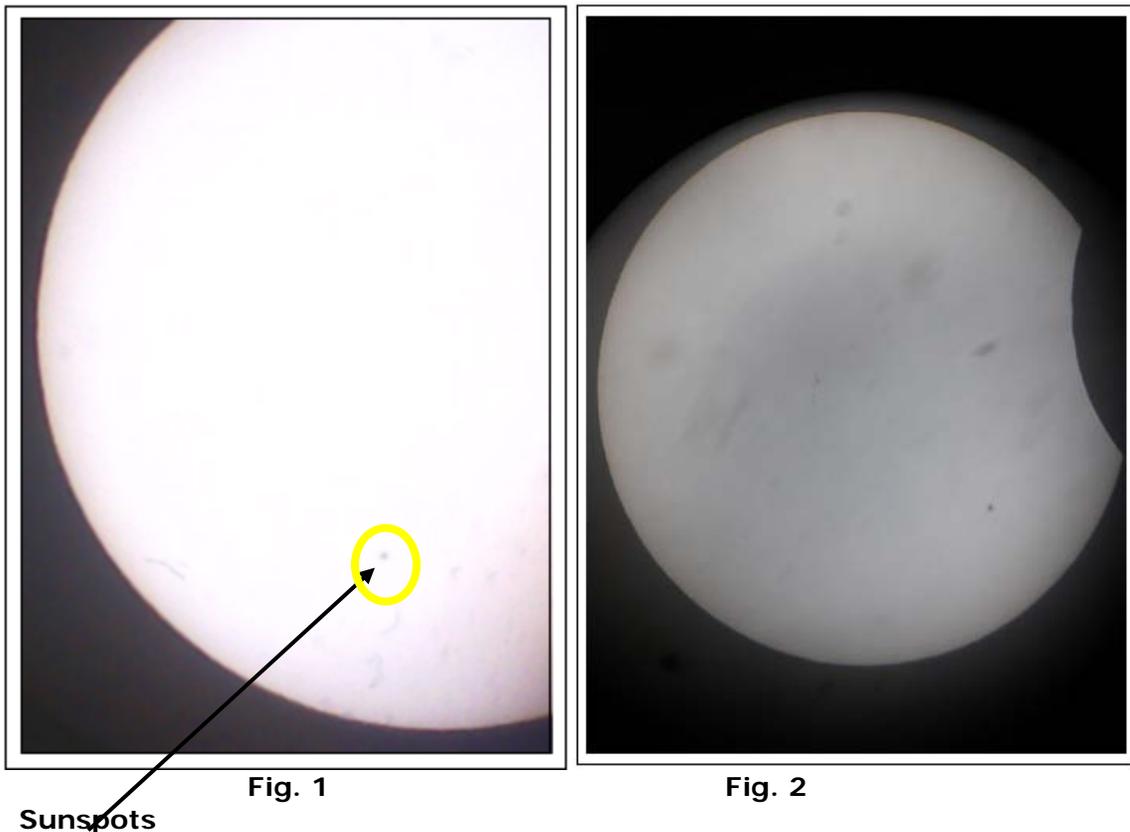


# Solar, Lunar and Binary stars Observation

## Sun

The Sun (our local star) is just about 100 billion stars in our galaxy, the Milky Way and about 4.5 billion years old. The Sun is about 93 million miles from the Earth. It takes 8 min 20 sec for light to travel from the sun to Earth.

Monitoring sun and spots on its surface is a global activity. Sunspots are the cooler region of sun thus darker having intense magnetic field. Every 11 years the Sun undergoes a period of activity called "solar maximum", followed by a period of quiet called the "solar minimum". During the solar maximum there are many sunspots, solar flares, and coronal mass ejections all of which can affect communications and weather here on Earth.



The Sun; sunspots (Fig.1) visible at lower right in both pictures while Fig 4 showing eclipsed Sun of 4<sup>th</sup> Jan 2011

## Moon

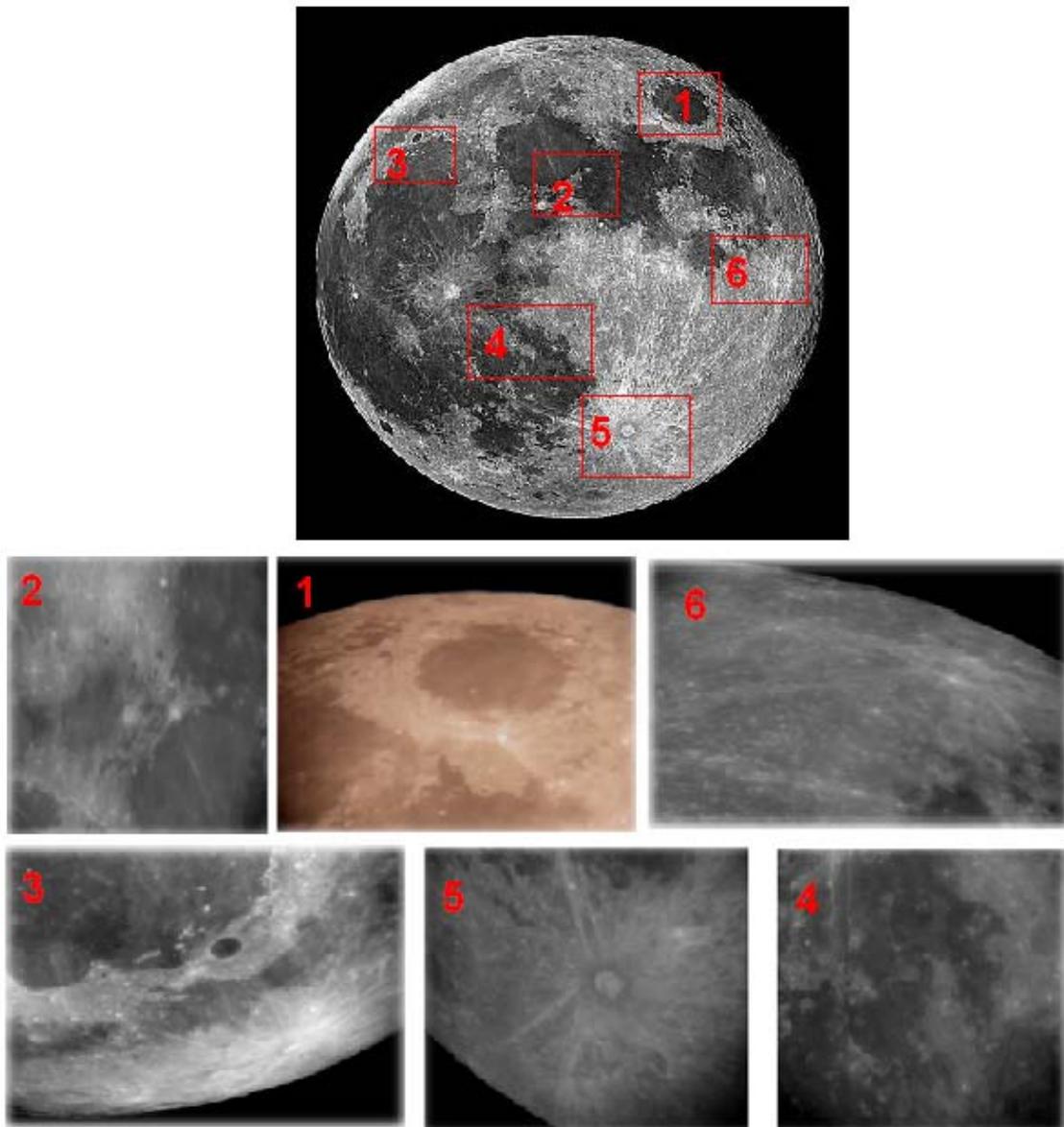
The moon (nearest object to Earth) is currently the focus of an international program of scientific investigation. Current missions will lead to the future use of the moon for science and commercial development. Lunar exploration programs have both scientific and commercial objectives some of them are as follows,

Potential availability of water on the moon

Use of lunar solar power

Use of moon as a natural laboratory due to lack of atmosphere

During observation many features of Earth's moon which include plain (darker) areas known as maria and highlands (brighter) with lots of craters its surface were observed.



**Fig 3: Photographs taken by *Nikon Coolpix p6000*; Image processed with *Registx* on 19<sup>th</sup> Jan 2011 at SUPARCO, Karachi (Lat 24 ° 51 ' , Long 67° 01 ' )**

## Binary Stars

Binary stars consist of two stars orbiting around their common center of mass. The brighter star is called the primary and the other is its companion star, comes, or secondary. Binary star systems are very important in astrophysics because calculations of their orbits allow the masses of their component stars to be directly determined, which in turn allows other stellar parameters, such as radius and density, to be indirectly estimated. This also determines an empirical mass-luminosity relationship (MLR) from which the masses of single stars can be estimated.

The Big Dipper is one of the most distinctive asterisms in the sky. Big Dipper is composed of bright stars that are easily visible; it is part of the constellation of Ursa Major. The most interesting star in the Big Dipper is Mizar. Usually these stars can be distinguished through telescope, however some of the binary stars like Alcor and Mizar can be observed with naked eye in Big Dipper which is a part of a huge constellation *Great Bear*. The components of the Mizar multiple star system are Mizar I (Zeta 1 Ursa Majoris at magnitude 2.27) and Mizar II (Zeta 2 Ursa Majoris at magnitude 3.95), located 14.4 arc seconds away.



**Figure 1: Binary Stars (Upper Right); Alcor (lower left) & Mizar I II (Upper Right) photograph taken on 19<sup>th</sup> Jan 2011 at 23:43 hrs PST. By Nikon Coolpix p6000; Image processed with Registx , background is simulation picture of North-East sky.**

