

29:52 Exploration of the Solar System

Homework Assignment # 7

Quiz must be completed on ICON by 8 AM, Monday, March 29

1. The celestial coordinates of Mars at the present are Right Ascension = 8h20m, Declination=23 degrees. In what part of the sky is Mars?
 - (a) the constellation of Scorpius
 - (b) between the constellations of Virgo and Libra
 - (c) the constellation of Capricornus
 - (d) between the constellations of Gemini and Cancer
 - (e) the constellation of Aries

2. Imagine that astronomers discover a terrestrial planet around another Sun-like star. This will probably happen in your lifetime. What would you expect to be the dominant gas in its atmosphere?
 - (a) carbon dioxide
 - (b) nitrogen
 - (c) hydrogen
 - (d) oxygen
 - (e) methane

3. In class I stated that one of the main discoveries of the spacecraft exploration of Mars was that of the *north-south asymmetry*. What does this mean?
 - (a) Mars is non-spherical, and the southern hemisphere tapers to a rounded peak
 - (b) the southern hemisphere of Mars is covered by carbon dioxide ice, while the northern hemisphere consists of dust and rock exposed to space
 - (c) the northern hemisphere of Mars is low and relatively smooth, the southern one is higher and heavily cratered
 - (d) the northern and southern hemispheres have different reflectivity of light, and have significantly different colors.

4. There are two types of water flow channels on Mars. Which kind are similar to channels of large rivers here on Earth?
 - (a) Valley networks
 - (b) outflow channels
 - (c) Valles Marineris
 - (d) Olympus Mons
 - (e) Aphrodite Terra

5. Pictures of the surface of Mars taken from orbit show channels that were clearly formed by flowing water. Measurements of the pressure and temperature of the Martian atmosphere show that liquid water cannot exist on the surface of Mars. What is the resolution of this apparent paradox?
 - (a) the high gravitational field of Mars keeps the water from evaporating
 - (b) Mars is far from the Sun, and it is too cold for water to evaporate
 - (c) the channels were formed by flowing lava, not water
 - (d) the channels were formed by water flowing billions of years ago

6. How many times further away is Mars at the present time than the Moon? That is, by what number would you have to multiply the Earth-Moon distance to get the present distance to Mars. Again, the right number below is approximate.
 - (a) 47 times
 - (b) 7,493,000
 - (c) 8 times
 - (d) 375 times
 - (e) 9340 times

7. How high above the surface of the Earth would you have to go to have the atmospheric pressure be the same as on the surface of Mars?
 - (a) 250-300 kilometers
 - (b) 30-40 kilometers
 - (c) 5-10 kilometers
 - (d) 400-700 meters
 - (e) 13-20 meters

8. Gusev crater, the landing spot of the spacecraft Spirit, has the following Martian coordinates; Latitude, 14.6 degrees south, longitude, 175 degrees east. What type of Martian terrain is the crater located in?
 - (a) on the boundary between heavily cratered and smooth terrain
 - (b) completely on the heavily cratered terrain
 - (c) completely on the smooth, lightly cratered area
 - (d) on the north polar cap