

## Astronomy Online

## Internet Worksheet 8; Moons, Rings and Pluto.

First, we will look at Jupiter's four largest satellites, then we will go out to Saturn and Pluto. Go to [http://www.arcadiastreet.com/cgvistas/jupiter\\_025.htm](http://www.arcadiastreet.com/cgvistas/jupiter_025.htm) . Here we see a size comparison between Jupiter's satellites Io, Europa, Ganymede, Callisto, and the Earth-Moon system. Which of the four Galilean satellites is largest? \_\_\_\_\_(1). Is it larger than our Moon? \_\_\_\_\_(2). Read the "quick facts". "Io is the most \_\_\_\_\_(3) world in the Solar System". Europa is made largely of ice and could have an \_\_\_\_\_(4) of liquid \_\_\_\_\_(5) beneath the crust.

Go to <http://pirlwww.lpl.arizona.edu/HIIPS/Jupsats/> . This is a page titled "Jupiter's Satellites". Scroll down to "Galilean Satellites", where a panel of 12 photos is shown. Under the panel, click on "Figure 2 (Click to Enlarge)" to enlarge the photos. Please be patient as the download may take 1 or 2 minutes. Scroll left, right, up, and down until you see the photo of Io. Answer the questions as you examine the photos. Io is the most geologically active object in the solar system. More than 80 volcanoes have been identified which are constantly re-surfacing the planet. What is the main color of Io? \_\_\_\_\_(6). The surface of Io is covered with volcanic sulfur. Cool sulfur is yellow, and hotter sulfur is orange so that the color of the surface gives us a relative temperature profile.

Now scroll to the right to see the photo of Europa. What is the major feature on the surface of Europa? \_\_\_\_\_(7). Scroll down to the photo immediately below for a close-up view. Europa is covered with a layer of ice several kilometers thick with a 100-kilometer deep ocean of water beneath the ice. The strong gravity of Jupiter flexes and cracks the ice layer, giving the satellite a "ball of string" appearance.

Scroll to the right to see Ganymede, which is an icy body with younger, light patches and darker, older areas on the surface. When meteoroids crash into the surface, the impact sites are colored \_\_\_\_\_(8), because of fresh exposed ice. Scroll to the right to see Callisto, and then look at the photo immediately below to see more detail on Callisto's surface. What is the main feature on Callisto's surface? \_\_\_\_\_(9).

Go to <http://www.eso.org/outreach/press-rel/pr-2002/phot-04a-02-normal.jpg> . This photo of Saturn was taken with an 8-meter (26.2 feet!) diameter telescope using infrared adaptive optics at Paranal Observatory in Northern Chile. It rivals photos from the Hubble space telescope. Here you see the three main rings of Saturn. The outermost tan ring is the A ring. Do you see the tiny gap near the edge of the outer ring? \_\_\_\_\_(10). That 170 mile wide gap is called the Encke Division. Between the A and B rings is a much larger gap called Cassini's Division. The B ring is almost pure white in this view. The C ring is semi-transparent and is close to the planet. Describe what is located exactly at Saturn's south pole.  
\_\_\_\_\_(11).

Go to <http://pegasus.phast.umass.edu/a100/handouts/roche.html> . This page is titled, "Saturn's Rings and the Roche Limit". Read the page. Planetary rings consist of large numbers of small particles, each on their own orbit around the planet. Particles close to each other attract and tend to form larger particles, but the planet's gravity is pulling more on the nearest particle than one further away. "Planetary rings are always found \_\_\_\_\_(12) the Roche Limit". "The borderline distance which separates the region where \_\_\_\_\_(13) form is called the Roche Limit".

Go to <http://www.seasky.org/solarsystem/sky3j.html> . Pluto and its satellite Charon are pictured at the top of this page. What is the temperature on Pluto? \_\_\_\_\_(14). Read under "The Twin Planets". If you were on Pluto, would you see the far side of Charon? Why or why not?  
\_\_\_\_\_(15).

Now return to Earth and e-mail in your answers.