

A Brief Column for the Beginning Stargazer Introducing a New Astronomical Term Each Month

Astronomy is rich with terminology. This column will help beginning stargazers ease into the world of astronomy by *briefly introducing* a new but *basic astronomical term* (word, acronym or abbreviation) each month. This list, which began January 1999 with the letter *a*, is alphabetical but uses successive letters for each month's entry. (We will return to the letter *a* after twenty-six months.)

(The February 2001 column ended with *z* so we are now in the second cycle of twenty-six terms. See the February 2001 issue for a cumulative index.)

Note: For many people, December means Christmas and *Santa Claus*. December's word is *Jovian* and it is most appropriate for this time of year. What is the connection between Santa and Jovian? Read on!

Word of the Month for December 2001

Jovian planet Any of the four giant planets (Jupiter, Saturn, Uranus and Neptune) that lie beyond the *asteroid belt*¹ in a region known as the *Outer Solar System*.

The Jovian planets are also known as the *gas giants* since they are largely composed of hydrogen and helium. They do not have "solid surfaces" like Earth. Instead, their gaseous atmospheres thicken and gradually change to liquid or even a "metallic liquid" under extreme pressure (atoms are stripped of their electrons). Small cores of rock and possibly ice may exist at their centers.

Jovian planets have many other characteristics that help distinguish them from the smaller, rocky *Terrestrial* (or Earthlike) planets. The Jovian planets have large diameters (four to eleven times Earth) and large masses (15 to 318 times Earth) but low mean (average) densities—densities similar to water (from 0.7 to 1.8 times water). Jovian atmospheres are thick but

¹The *asteroid belt* is a region found between Mars and Jupiter where most of the asteroid orbits lie. This belt helps divide the solar system into inner and outer regions.

composed of mostly light gases. In contrast, Terrestrial planets have little or no atmospheres. Those rocky planets that do have some atmospheric gases (Venus, Earth and Mars), have thin envelopes of gases composed of heavier gases such as carbon dioxide, nitrogen or oxygen.

All Jovian planets *rotate* (spin) more rapidly than Earth or the other Terrestrial planets (from about 10 to 17 hours). The gas giants are also very *oblate* (equatorial diameters greater than polar diameters). Therefore, they appear "flattened" at the poles. Although Saturn has conspicuous rings, all Jovian planets also have ring systems whereas the Terrestrial planets have none. In addition, all Jovian planets have many satellites (from 8 to 30 but others are likely to be found) in contrast to the rocky planets that have few or none (Mercury, Venus and Moon²).

Thus, astronomers now realize that Jovian planets have attributes that make them physically more like the Sun than Earth.³

Jovian planets are named for the largest member of the group—Jupiter. The word "Jovian" means relating to or resembling Jupiter. In fact, the word "jovial" derives from Jupiter. The Roman god Jupiter was regarded as a source of "happiness" so jovial means happy or jolly. Note also that Jupiter is a "big planet." In fact, Jupiter is the largest planet in the Solar System. Santa Claus is big too. Thus, Santa (who is big) must also be jolly or "jovial" in nature!

(So, the next time you see Santa, think Jupiter. And the next time you see Jupiter, think happy.) ✨

References. J. Mitton 1991, *Concise Dictionary of Astronomy* (Oxford Univ. Press); I. Ridpath 1997, *A Dictionary of Astronomy* (Oxford Univ. Press); M. Wagman, *Sky & Telescope*, April 1991, pp. 380–381.

²The Moon falls into the Terrestrial category of planets.

³Only a few basic solar characteristics are not Jovian. This includes a small oblateness. This, in turn, results from a very slow rotation period. (The only planets that spin slower are Mercury and Venus.)