Astronomy From Å to ZZ — Howard L. Cohen

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.)

Word of the Month for October 1999

Julian Date (JD) A system of recording dates and times that simply counts the number of days and fractions elapsed since mean noon at Greenwich or 12h *Universal Time* (UT) on 1 January 4713 B.C. (*Julian proleptic calendar*—the calendric system using Julian calendar rules but extended to dates preceding its introduction). Since Julian dates avoid complexities of the civilian calendar, it provides unambiguous dates and times of events. In fact, subtraction of two Julian dates immediately gives the time difference between the two events.

(This is useful for periodically recurring events such as when observing variable stars or eclipsing binaries.)

The JD system was devised in 1582 by the French scholar, Joseph Justus Scaliger (1540–1609), who named the system for his father, Julius Caesar Scaliger (1484–1558). Scaliger originally intended the system to count years but nineteenth century astronomers adopted his system to count days.

The starting date (4713 B.C.) is far enough in the past to predate all known astronomical events thus avoiding negative numbers. Although a starting date is arbitrary, Scaliger chose 4713 B.C. because three calendrical cycles began at this time: the 28-year solar cycle, the nineteen year lunar cycle, and the fifteen-year indiction cycle. This cycle repeats every 7980 (= 28 x 19 x 15) *years*, an interval Scalger called the *Julian Period*.

Note: The *solar cycle* is the period after which weekdays and calendar days repeat in the Julian calendar. The *lunar cycle* is the period after which moon phases repeat on approximately the same calendar date. The *indiction cycle* is not astronomical cycle but an ancient Roman tax cycle.

Example: 19:00h (7:00 p.m EST) on 31 December 1999 = 00:00h UT 1 January 2000 = JD 2451544.5.

(The *FirstLight* calendar printed in each issue lists the JD for the first day of the month at 0h UT.)

Julian Day Number The integral part of the Julian date. It represents the number of elapsed days since 12h UT on January 1, 4713 B.C. (or by astronomical reckoning -4712). The fractional part is the UT expressed as a decimal of a day.

Modified Julian Date The Julian date minus 2,400,000.5 days—used to make the Julian date more convenient. (Zero point is thus 1858 November 17.0.)

Some people count days in other ways and *erroneously call them Julian days,* as in counting days (1–365) from the beginning of the year. Although sometimes a useful tool for record-keeping, designating this count as a Julian date causes confusion with Julian day numbers.

References. J. Mitton 1991, *Concise Dictionary of Astronomy* (Oxford Univ. Press); I. Ridpath 1997, *A Dictionary of Astronomy* (Oxford Univ. Press); *Explanatory Supplement to the Astronomical Almanac* (University Science Books); ed. P.K. Seidelmann 1992. ☼