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Celestial Time Table for September

Sept. EST			mences in Northern Hemisphere.
8 12:00 noon	Moon farthest, distance 252,000 miles.	2:18 p.m.	New moon.
11:55 p.m.	Full moon (Harvest Moon).	25 2:00 p.m.	Mercury farthest west of sun; visible for a few days around this date low in east before sunrise.
16 11:02 p.m.	Moon in last quarter.	26 1:12 p.m.	Moon passes Venus.
21 10:00 a.m.	Sun and Mars in line with earth.	28 8:56 a.m.	Moon passes Saturn.
22 Midnight	Moon nearest, distance 222,300 miles.	30 12:49 p.m.	Moon in first quarter.
23 2:27 a.m.	Sun over equator, autumn com-		Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, August 24, 1957

ASTRONOMY

Early Stars Were Brighter

A study of the atmospheres of the B stars leads astronomers to believe that billions of years ago the stars were much brighter than they now are.

THE SKIES were adorned with much brighter stars billions of years ago than they are now and the rate of star creation then was much faster than now.

So conclude Drs. L. H. Aller and Jun Jugaku of the University of Michigan Observatory from a study of the atmospheres of the very young, hot and bright objects known as B stars. The astronomers reported results of their study, supported by the National Science Foundation, to the American Astronomical Society meeting in Urbana, Ill.

B stars are only a few million years old, very young on the astronomical time scale that dates the sun's formation as five billion years ago. They are believed formed from interstellar gas in the spiral arms of the Milky Way galaxy in which the earth and sun are found.

Since B stars consume their nuclear fuel, hydrogen, at a rate hundreds of times faster than does the sun, their lifetimes must be relatively short. By comparing the sun's composition with that of a young B star, Drs. Aller and Jugaku hoped to find the amount of element building occurring in the last four billion years.

According to the present ideas of stellar evolution, the heavier elements are produced in the dense, hot cores of massive stars, which subsequently spew these materials into interstellar space. The interstellar material is again collected into stars and the

same process is repeated in the more massive objects.

The sun is thus, since it was formed so many millenia ago, believed to have a smaller fraction of heavier elements than has a star made only "recently" from interstellar gas.

Although the problem of comparing the sun's atmosphere with that of a young B star is very complex and not very accurate, Drs. Aller and Jugaku found that some elements, such as silicon and oxygen, do not seem to be substantially greater in the young stars than in the sun.

Therefore, they conclude, the rate of element building, and of star formation as well, must have proceeded at a much slower pace since the sun was formed than it did in the early stages of the Milky Way galaxy.

The interstellar gas from which stars are formed is being continuously renewed by an outward flow of gas from the galactic center, or nucleus, Dr. Sidney van den Bergh of Perkins Observatory, Delaware, Ohio, reported to the meeting. The present rate of gas lost from the nucleus about equals the rate at which gas is lost from the spiral arms by star formation, he has calculated.

Dr. van den Bergh based his conclusion on the recent findings that the Milky Way galaxy, as well as the Andromeda nebula, contain "surprisingly" small amounts of interstellar gas.

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ASTRONOMY

Minor Planet Named NORC for Giant "Brain"

ONE OF the hundreds of minor planets, or asteroids, circling the sun between the orbits of Mars and Jupiter, is now officially named NORC, in honor of the giant electronic "brain" used to calculate the orbits of these small, star-like bodies.

The asteroid NORC was discovered by Dr. S. Arend of the Royal Observatory, Uccle, Belgium, on Sept. 1, 1953. By international agreement, the discoverer names a new minor planet, but Dr. Arend has granted this right to Dr. Paul Herget, director of the Cincinnati Observatory in Cincinnati, Ohio.

NORC is short for the Naval Ordnance Research Calculator at Dahlgren, Va., one of the most powerful electronic computers in existence. It was developed at the Watson Scientific Computation Laboratory under the direction of Dr. W. J. Eckert.

Dr. Herget reports that the computer has already provided a "vast amount of computations" on minor planet orbits, with more expected in the future. Use of NORC for this time-consuming chore was made possible through the assistance and cooperation of the Naval Proving Grounds, the Office of Naval Research and the National Science Foundation.

Science News Letter, August 24, 1957



COMET MRKOS—This year's second naked-eye comet is shown here in a photograph taken on Aug. 12 at the University of Michigan's observatory at Portage Lake. Prof. Freeman D. Miller of the University took the photograph at a 15-minute exposure. Its tail is estimated at 2,000,000 miles long. Comet Mrkos was about 100,000,000 miles from the earth as seen here. Seen in the northeast, it is now receding from both the earth and the sun. (See SNL, Aug. 17, p. 103.)

