ASTRONOMY

Some Stars Form Saturn-Like Rings From Spinning Fast

Astronomical Meeting Also Told How Light Absorption Affects Measurement of Stellar Distances

IF MODERN telescopes were powerful enough to show stars as well as they show the planets, some stars of the class known to astronomers as "type B" would appear much like the planet Saturn. Like that body, they would be surrounded by a ring, according to a suggestion made to the American Astronomical Society at its meeting in New Haven, by Dr. Otto Struve, of the Yerkes Observatory.

Dr. Struve pointed out to the astronomers that the bright lines which appear in the spectrum of these B type stars have long been a puzzle. The dark lines, which are seen in the spectrum formed when the star's light is analyzed through the prisms of a spectroscope, "are known to originate in the gaseous atmospheres of the stars," he said.

Origin of Bright Lines

"It is now suggested," he continued, "that the bright lines in the spectra of B-type stars originate in nebulous rings which have been formed around the stars as a result of rapid axial rotation. Such stars resemble in appearance the planet Saturn. Extreme axial rotation, exceeding 250 kilometers (155 miles) per second, at the equator, causes the stars to be very flat at the poles. From the investigations of the British astronomer, Sir James Jeans, it is known that a gaseous body in rapid rotation may, under certain conditions, become lens-shaped. Such an unstable rotating star will eject matter at the sharp edge of the equator, and a nebulous ring will be formed. This ring must revolve around the star, as does the ring of Saturn."

The spectrum of such a star would be different, depending on how we look at it, he stated. If the axis of the star points to the earth, the bright lines from the nebulous ring will be single and sharp. But if the earth is in the plane of the ring, then the lines will be double. This is because part of the ring is moving away from us, and part towards us, causing shifts of the same spectral line in opposite directions. Dr. Struve, in conclusion, declared that "This hypothesis appears to account in a satisfactory way for the results of observation."

The sun, together with the earth and other members of the solar system, is about 10,000 light years, or 60,000,000,000,000,000 miles, closer to the center of the galaxy than previously supposed. This idea was advanced by Dr. Piet van de Kamp, of the McCormick Observatory of the University of Virginia, who told the astronomers how his studies of the absorption of light in interstellar space had led him to this conclusion.

Last spring Dr. R. J. Trumpler, of the Lick Observatory, found good evidence for such an absorption. Later Dr. van de Kamp found still other evidence for it, and since then two German astronomers have also detected it. The result of such absorption would be a rapid falling off in brightness of distant stars, because their brightness would be reduced not only by the distance the light had to travel, but also by the greater amount of absorbing stuff that the rays would have to penetrate.

The Galaxy is the system of stars to which belongs the Milky Way and all the stars that we can see, including the sun. Previous efforts have been made to measure the distance of the solar system from the center, notably by Dr. Harlow Shapley, director of the Harvard College Observatory. Using two different methods, he obtained distance of the center of 16,400 parsecs and 14,400 parsecs. A parsec is the astronomer's unit of distance. It equals 3¼ light years, or nearly 20 million million miles. Dr. Shapley's results depended on measurements of the distance of stars from their brightness, and would therefore be too great if the light was partly absorbed while on its way. Another determination by a Dutch astronomer, using a method not dependent on brightness, gave a value somewhere between 7,000 parsecs and 11,000 parsecs.

Dr. van de Kamp's researches confirm the figure of his countryman, for they indicate that Dr. Shapley's figures are too large.

"At present," he stated, "the conclusion may be drawn that, on the basis of galactic absorbing matter, the distance to the galactic center, as derived from the globular clusters, will have to be reduced, possibly from 16,700 parsecs to 13,700 parsecs, or even to about 10,000 parsecs. A distance to the galactic center of about 12,000 parsecs (roughly 40,000 light years) is probably a fair compromise between the various values."

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