DISCOVERER OF NEW NEBULAE

Mrs. Muriel M. Seyfert, young research assistant at Harvard College Observatory, who has just discovered three new ring nebulae in the Milky Way. She is shown inspecting one of the photographic plates taken at Harvard's station in Bloemfontein, South Africa, on which the new star-dust rings were photographed.

ASTRONOMY

Three New Planetary Nebulae Discovered In Milky Way

Rings of Dust, Each Believed Larger Than Our Entire Solar System, Found On Photographs From South Africa

THREE tremendous rings of star-dust, hitherto unknown planetary nebulae, have been found in the Milky Way by Mrs. Muriel M. Seyfert, young research assistant at the Harvard College Observatory.

Each of them is believed to be hundreds of times larger than our entire solar system, yet they are so far distant they can be seen only through a moderately powerful telescope. Even then the rings are not visible to the human eye but can be detected only on sensitive photographic plates, where they appear as luminous rings surrounding brilliant nucleus stars. These center stars would, of course, be visible through large telescopes.

Actually the tremendous nebulae are not rings but spheres or balls of expanding gas and tiny particles, some of them probably as fine as molecules. From their appearance on plates, however, astronomers have named them "ring nebulae." Mrs. Seyfert's discoveries were made through an examination of plates taken at Harvard's station at Bloemfontein, South Africa.

While sufficient data have not yet been assembled to permit accurate calculation of the size and distance of the rings, Harvard observers believe that like most of the approximately 130 known planetary nebulae, those found by Mrs. Seyfert are several hundred light years away from the earth and have a diameter that is expressed in billions of miles.

At present, astronomers express their size in terms of the angle formed by imaginary lines drawn from the observer's eye to the top and bottom of the stellar body. By this calculation two of the nebulae have an angular diameter of about one-fiftieth of a degree. The third nebula is about one-half this size.

Very Light

Astronomers also believe that the rings have a density similar to that of other planetary nebulae—a density 1,000,000,000,000,000,000 times lighter than air. So rare is the atmosphere of the rings that, although only 12.5 cubic feet of air weigh a pound, it takes approximately 100,000 cubic miles of planetary nebular space to give the same 16 ounces.

This density is considerably less than the most perfect vacuum obtainable on earth, yet the ring nebulae are so tremendous, their total mass is measured in millions of millions of millions of millions of tons. This would be a figure followed by at least 24 zeros.

The newly discovered rings are located in the southern constellations of Norma, Carina and Ara. The nebulae of the first two are larger while their center stars have a brightness magnitude of 13.6. The Ara nebula is even more brilliant, having a magnitude of 11.9. An unusually perfect ring shape marks the Norma body.

May Come From Novae

Planetary nebulae, whose origin and place in the scheme of cosmic evolution is one of the unsolved mysteries of astronomy, are comparatively rare. From their appearance astronomers know each is composed of a bright nucleus star enclosed in concentric spheres of expanding gas and small particles which give off light when excited by the center star. This has led scientists to believe that they may be the result of the catastrophic explosion of novae, or new stars like the famed Nova Herculis, which occurred hundreds of years ago.

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