ASTRONOMY

Milky Way Thicker

Our wheel-shaped galaxy is surrounded by a fatter spherical haze of stars than astronomers formerly thought, research at Harvard Observatory shows.

➤ WE LIVE in a much fatter and solider galaxy of stars than previously supposed, Dr. Harlow Shapley, director of the Harvard College Observatory, announced in delivering the 22d annual Sigma Xi lecture at the University of Chicago.

The enormous thickness of the Milky Way, the galaxy or "universe" of stars in which the sun and earth are located, is established definitely through a general revision, which has just been completed at Harvard, of the distances of the globular star clusters. No large alterations are found necessary in the diameters of the galaxies, but Dr. Shapley confirms his earlier evidence that our own wheel-shaped galaxy is surrounded by an extensive haze of stars that is approximately spherical in shape.

The overall thickness of the surrounding star haze is found by Dr. Shapley to exceed 100,000 light years; that is, it would take light 100,000 years to cross the galaxy, traveling at its speed of 186,000 miles per second. This is 580,000,000,000,000,000 miles.

We are still located about 30,000 light years from the center of the Milky Way, as the distance calculations made possible by the new researches caused little revision.

"The original determination of distance and distribution of globular clusters led to the abandonment of the heliocentric hypothesis of the sidereal universe since it pointed to the star clouds in Sagittarius as a region around which the globular clusters are aggregated," Dr. Shapley said. "That region was assumed to be the center also for all stars of the Milky Way. The clue given by clusters was later verified by studies of motions of stars around that center, again demonstrating that the sun and earth are in the outer part of the wheel.

"Cosmic dust and gas clouds between Milky Way stars have hindered our direct exploration of the home galaxy and especially prevented measurements of accurate distances for remote objects that are in low galactic latitudes, that is, near the Milky Way circle. But in higher latitudes far from the Milky Way band we escape much of the space-absorption and when more than 20 degrees from the galactic circle we can see through the dust. In those latitudes from 20 degrees to the poles at 90 degrees on both sides of the Milky Way, we can now safely measure positions of globular clusters.

"One test for transparency of space is through measuring colors of remote objects. If there is reddening or color excess over normal for average stars we suspect presence of absorbing dust and gas in interstellar space. A better test is now provided by external galaxies. If they are present and numerous in the field of globular clusters, space is clear. If absent, they have been blocked out by space absorption. If present but scarce, the transparency is partial."

The determinations of the distances in the Milky Way were made with the help of the Harvard Observatory's extensive surveys of faint and distant galaxies, through the use of the new studies of the magnitudes of variables and giant stars in globular clusters and with new measurements for nearly all globular clusters in latitudes higher than 20 degrees. These researches were reported for the first time by Dr. Shapley.

"The globular star clusters average more than 100,000 times the brightness of the sun," Dr. Shapley said. "When compared with clusters in the neighboring galaxy in Andromeda they appear to be systematically brighter, or more probably they indicate that the distance of the Andromeda nebula is now considerably underestimated."

Science News Letter, December 11, 1943

CHEMISTRY

Rainbow Colors Obtained In Electroplating

➤ RAINBOW plating is a new term applied to a new process by which a brilliant multi-colored electroplate is obtained from molybdate solutions. The metallic coating of molybdenum, a metal which occurs in nature only in combination, reflects light in brilliant colors much in the same way as a soap bubble. Pure molybdenum itself is silvery white.

The process of obtaining the multi-colored electroplate was explained at the recent meeting of the Electrochemical Society in New York City by Oliver P. Watts of the University of Wisconsin. In his experiments he used an electroplating solution of ammonium molybdate with a little sodium cyanide added. Highly polished surfaces of copper, brass or nickel may be successfully plated.

The same speaker described experiments in electroplating with monel metal as a substitute for nickel. The results were encouraging when a sulfate-citrate-cyanide bath was used.

Science News Letter, December 11, 1943

SCIENCE NEWS LETTER

Vol. 44 **DECEMBER 11, 1943** *No. 24*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices, Indexed in Readers' Guide to Perodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation, Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

***Board of Trustees**—Nominated by the American Association for the Advancement of Science:* Henry B. Ward, University of Illinois; Edwin G. Conklin, American Philosophical Society; J. McKeen Cattell, Editor, Science. *Nominated by the National Academy of Sciences:* R. A. Millikan, California Institute of Technology; Harlow Shapley, Harvard College Observatory; W. H. Lewis, Wistar Institute. *Nominated by the National Research Council:* Ross G. Harrison, Yale University; C. G. Abbot, Secretary, Smithsonian Institution; Hugh S. Taylor, Princeton University. *Nominated by the Journalistic Profession:* O. W. Riegel, Washington and Lee School of Journalism; A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers. *Nominated by the E. W. Scripps Estate:* Frank R. Ford, Evansville Press; Warren S. Thompson, Miami University, Oxford, Ohio; Harry L. Smithton, Cincinnati, Ohio.

***Officers**—Honorary President:* William E. Ritter. *President:* Edwin G. Conklin. *Vice President and Chairman of Executive Committee:* Harlow Shapley. *Treasurer:* O. W. Riegel. *Secretary:* Watson Davis.

***Staff**—Director:* Watson Davis. *Writers:* Frank Thone, Jane Stafford, Marjorie Van de Water, Morton Mott-Smith, A. C. Monahan, Martha G. Morrow. *Librarian:* Jerome Harris. *Science Clubs of America:* Joseph H. Kraus, Margaret E. Patterson. *Photography:* Fremont Davis. *Sales and Advertising:* Hallie Jenkins. *Business Manager:* Columbus S. Barber.