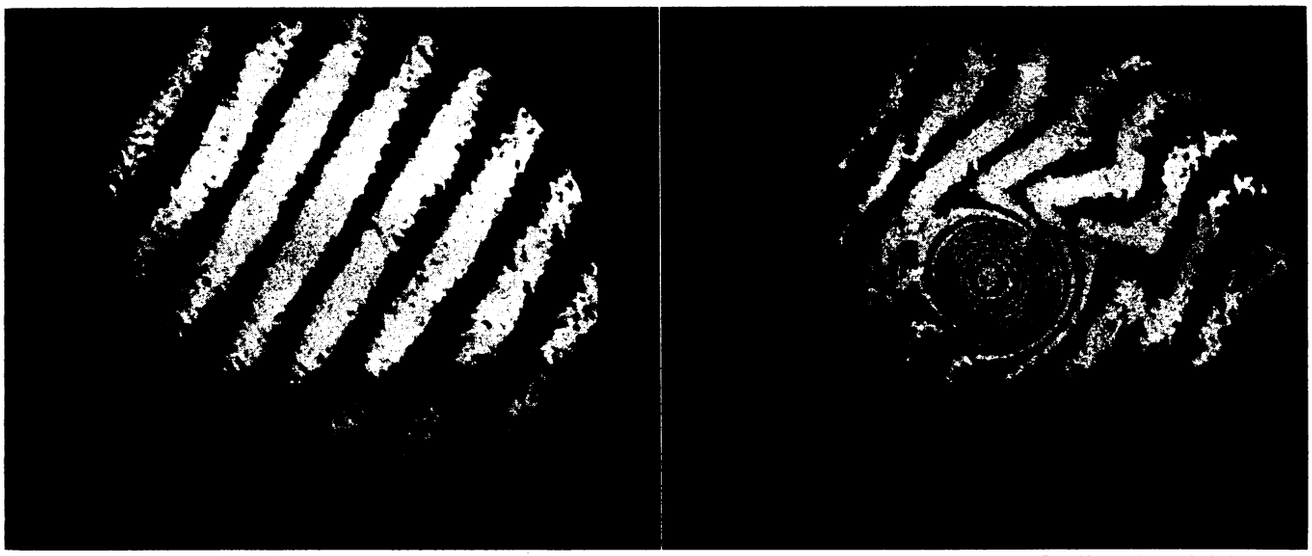

Los Alamos Scientific Laboratory

LASER PHOTOS—When a laser beam is sent into an interferometer, the light is split into two paths with lengths differing by exactly one-half wavelength. This produces the fringe pattern at left. In research under Project Sherwood to study the stucture of a fireball, the laser beam is directed into a tube containing deuterium gas compressed by a strong magnetic field. The path of the laser light beam is shifted by the hot plasma to form the concentric circles in the photograph at right, thus producing what amounts to a contour map of the density.

ASTRONOMY

Galactic Center Probed

Hydroxyl molecules near the center of the Milky Way galaxy have been found to occur in large numbers, 100 times more than expected.

➤ A SURPRISINGLY STRONG source of combined oxygen and hydrogen atoms—hydroxyl molecules, the raw materials of water—has been discovered near the center of the Milky Way galaxy in the constellation Sagittarius.

Astronomers consider this discovery outstanding because the source is 100 times stronger than expected.

The observations of the Sagittarius source were made by Drs. B. J. Robinson, F. F. Gardner, K. J. van Damme and J. G. Bolton, all of the Commonwealth Scientific and Industrial Research Organization Radiophysics Laboratory, Sydney, Australia.

These observations were confirmed by scientists at Harvard College Observatory, Cambridge, Mass. In their observations they found weaker hydroxyl sources surrounding the galactic center.

Compared to atomic hydrogen, the most abundant form of matter in interstellar space, the number of hydroxyl molecules in any part of Sagittarius-A is extremely small. However, regions of the Sagittarius source closer to the galactic center were found to have higher concentrations of hydroxyl molecules than those farther away. The highest ratio measured by astronomers was one hydroxyl molecule per 10,000 hydrogen atoms.

The Sagittarius source was discovered using a radio telescope operating at frequencies of 1,665.40 and 1,667.36 megacycles per second, or 18 centimeters wavelength. To locate the hydroxyl molecules, the scientists translated radio signals they received after interstellar clouds had absorbed radiation from the hydroxyl molecules.

The Australian group and others are investigating hydroxyl sources that emit waves not absorbed by interstellar clouds. However, no results have been reported from these observations, although announcement of discovery of such a source is expected soon.

Hydroxyl molecules were discovered in interstellar space by a team of scientists from Massachusetts Institute of Technology, Cambridge, in 1963, from a source in the constellation Cassiopeia.

• Science News Letter, 86:66 August 1, 1964

PHYSICS

Photographs Taken of Sun-Like Reactions

➤ SCIENTISTS are taking pictures of fiery reactions like those occurring in the sun.

The scientists are from the Los Alamos Scientific Laboratory, N. Mex., and are working on Project Sherwood—an effort to produce a controlled sun-like reaction. These scientists hope that photographing such a reaction will aid them in its control.

Since a regular photograph would show only a white flash where the reaction occurred, a new kind of camera had to be found. This camera uses the laser—a device that emits a beam of light brighter than the sun itself.

The actual picture is taken by passing the laser beam through a "magnetic bottle" containing a highly compressed and heated gas called plasma. This plasma is heated 10 million degrees in about three-millionths of a second, and is under a pressure of 14 tons per square inch.

After the beam has traveled through the bottle, its light pattern is recorded. Thus, by seeing how much the plasma particles shifted from the original path of light taken by the laser beam, scientists have a photograph of the reaction.

Project Sherwood is being pursued at five different laboratories dealing with various aspects of controlling thermonuclear reactions.

• Science News Letter, 86:66 August 1, 1964

PHYSICS

Combination Telescope Measures Radiation

➤ ONE OF THE LARGEST missile tracking telescopes ever built operates in combination with a spectograph to measure radiation from bodies reentering the atmosphere.

Called the Tele-Spectrograph, the instrument has a 36-inch telescope mirror, an increase of at least 50% over previous types. The wide-range spectrograph will enable the device to detect the weak radiation emitted by objects before they are heated to incandescence by the atmosphere.

J. W. Fecker division of American Optical Co., Pittsburgh, designed the Tele-Spectrograph for the National Aeronautics and Space Administration's Langley Research Center.

• Science News Letter, 86:66 August 1, 1964