hydrogen, of supernova remnants, and of the magnetic properties of the earth's surroundings in the Milky Way are some of the topics of this research. The work is carried out at the Algonquin Radio Observatory, Lake Traverse, Ont., as well as at Richmond Hill and on the University of Toronto campus.

Theoretical Studies.—The advent of electronic computation and the rapid development of this powerful scientific tool in the Institute of Computer Studies at the University of Toronto have thrown new emphasis on theoretical approaches to astronomy by the staff and students at the Observatory. These studies range from computations involving the energy generation in the interior of stars to an analysis of the dynamics of the earth's great galaxy. Theoretical studies like these are of the greatest importance at an observatory, sometimes following from observational discoveries and sometimes pointing the way to new observational tests.

The foregoing outline of the work of the Observatory is intended to indicate only the continuing major fields of activity. To this might be added the many particular research problems involving sun, moon, planets, stars, clusters and galaxies which have been undertaken by members of the staff and by graduate students. An effort is always needed to strike a balance between the production of routine astronomical data—which is regarded as a debt to astronomers of the future—and the encouragement of individual enterprise in the attack upon diversified problems of immediate interest—which is regarded in particular as the due of the increasing number of young graduate students who hold the key to the future of Canadian astronomy.

The Observatory is open to the public by appointment on Wednesday afternoons throughout the year and on Saturday evenings except in winter.

Astronomy at the National Research Council

Solar Radio Astronomy.—In 1946 the Radio and Electrical Engineering Division of the National Research Council commenced investigations of the radio emission from the sun at a site near Ottawa. This grew out of the realization that advances in radio technology due to wartime radar work in the Division could be readily used to obtain fundamental information about astronomical objects. A small paraboloidal reflector, four feet in diameter, was used as a radio telescope together with a sensitive radio receiver to measure the radio emission from the solar disc at a frequency of 2,800 megacycles per second (10.7 cm. wave-length). The emission was monitored from sunrise to sunset for several months and when its variations were compared with optical observations at other observatories three components of the radio emission were recognized as follows: (1) an emission from the undisturbed solar atmosphere; (2) an emission varying slowly from day to day which originates from condensations of electrons above sunspots; and (3) sudden enhancements of radio emission associated with solar flares.

Since its inception in 1946 an uninterrupted series of daily observations has been made. This is now recognized as providing a quantitative measure of solar X-ray and ultraviolet emissions which is of great use in ionospheric research, in studies of the solar component of cosmic rays and in studies of the solar influence on the atmospheric drag on satellites. Because of an increase in radio interference near Ottawa, the program was relocated in 1962 at the Algonquin Radio Observatory, Lake Traverse, Ont. A similar patrol undertaken at the Dominion Radio Astrophysical Observatory in co-operation with the Dominion Observatory will provide increased reliability to the combined program and will increase the daily period of observations by three hours, owing to the difference in longitude of the two observatories.

A new type of antenna based upon the principles of interferometry was developed at Ottawa from 1953 to 1958 to obtain a sharp antenna beam in order to study the emission from small regions above sunspots. The antenna is of the linear type, 600 feet in length,