NRC scientists form closer Kinship with the stars

In Canada, the early history of astronomy was associated with requirements in a new land to determine accurate lines of latitude and longitude. Records exist of partial solar eclipses being observed by the Jesuits in Quebec as early as 1670 and also describe several bright comets observed from Quebec City. The first astronomical observatory in this country was founded in Fredericton, New Brunswick, in 1851 for the primary purpose of determining latitude and longitude. Other small observatories were built at Quebec City in 1854, at Kingston in 1875, and at McGill University in 1879.

Participation in astronomy by the government of Canada dates to 1885 when the first modern longitude surveys were undertaken to define lands involved in railway construction in British Columbia. In order to survey the railway belt and link it to prairie sections, latitudes and longitudes of certain points within the area had to be determined astronomically. During the course of this work, the importance of having a fixed observatory for setting up and adjusting instruments was realized. Dr. William Frederick King, astronomer and mathematician, then Chief Inspector of Surveys, persuaded the Department of the Interior (responsible for surveys, mapping and the definition of international and interprovincial boundaries) to erect a small temporary building for this purpose on his own property in Ottawa. His continual urging for a permanent observatory finally paid off in 1900, when \$16,000 in government estimates was set aside for an observatory to be built on the grounds of the Experimental Farm in Ottawa. But costs escalated even then. Total expenditure for the Dominion Observatory, completed in 1905, was \$310,000!

Dr. King, who had succeeded in inaugurating the era of modern astronomical research in Canada, became the first Chief Astronomer. He and his staff not only organized the basic time, meridian circle and positional astronomy programs, but also inaugurated basic research on solar and stellar astrophysical programs that have continued to the present day. The Observatory began work in seismology, and later in gravity and magnetic geophysical research that has become internationally recognized.

So impressed was the Government with the world-wide reputation that Canadian astronomy had received that in 1918 it established the Dominion Astrophysical Observatory near Victoria in British Columbia. At the time of completion, the west coast telescope, 72 inches in aperture, was the largest in the world. Following establishment of this Observatory, most of the work in stellar spectroscopy was transferred to Victoria. The Dominion Observatory continued activity in positional astronomy and solar spectroscopy and expanded the time service.

Entry of the National Research Council of Canada into astronomical research grew out of the realization that the technical knowledge and equipment built up within its laboratories as a result of radar work during the Second World War could be readily used to obtain radio astronomical data. In 1946, NRC's Radio and Electrical Engineering Division began investigation of radio emissions from the sun with a small radio telescope located near Ottawa. Thus began an uninterrupted series of daily observations of solar flux at 10.7 centimetres which has been used throughout the world as a basic index of solar activity.

Realizing the rapid advances being made through the use of radio techniques in furthering astronomical knowledge, the Dominion Observatory established the Dominion Radio Astrophysical Observatory near Penticton, British Columbia in 1960.

Two years later, because of increases in radio interference, NRC's solar program was relocated at the Algonquin Radio Observatory, near Lake Traverse in Ontario's Algonquin Park. Success in solar observations spurred interest within NRC's Radio and Electrical Engineering Division in other aspects of radio astronomy. A parabolic radio telescope, 10 meters (33 feet) in diameter for galactic and extragalactic studies was put into operation at Algonquin Park in 1963, and a new telescope, 46 meters (150 feet) in diameter was brought into operation in 1966. In terms of performance at centimeter wavelengths, this telescope is the finest in the world. (Continued)



NRC's 150-foot radio telescope at Algonquin Park (above), used by the Council and university astronomers to perform advanced astrophysical investigations. Right: the Dominion Radio Astrophysical Observatory's 84-foot telescope at Penticton, B.C., where notable contributions have been made in hydrogen-line and low frequency observations.