

Canada has developed a thriving remote-sensing industry, essentially a collection of more than 30 smaller companies who are among the world leaders in developing and manufacturing equipment for gathering and interpreting remote-sensing data. In 1985, some 1,400 Canadians were employed in these companies, producing and marketing remote-sensing services in Canada and in export markets. The value of these services in 1985 was approximately \$120 million, of which some 60% was exported.

In 1969, Canada was invited by the United States to participate in the U.S. Space Transportation System (STS) program — the space shuttle. The National Research Council and NASA signed a formal agreement for a cooperative program to develop a Remote Manipulation System (RMS), a remotely-controlled space arm for the shuttle, now familiarly known as the CANADARM. The RMS has been used for a variety of manipulations in space, including the recovery and deployment of satellites. The prime contractor for the \$100 million CANADARM project was Spar Aerospace Limited backed by an industrial team that included CAE Electronics, and more than 40 Canadian suppliers and subcontractors from Quebec to Alberta. The CANADARM was successfully tested in 1981 and 1982 on the space shuttle Columbia, and has added to Canada's reputation as a leader in space.

Following the decline of space-science activities in the late 1970s, the Federal Government decided in 1980 to increase the space-science budget to allow Canadian scientists to participate in international cooperative space projects. The National Research Council was named the lead agency for space science and the Canada Centre for Space Science (now part of NRC's Space Division) was set up to manage the Space Science Program and to provide facilities for scientists in both university and government laboratories. As a result of the increased funding a number of major space-science projects were initiated with the U.S., Sweden, France and Japan.

Most of the projects have relatively long lead times and some have been delayed by the Challenger disaster. However, the instrumentation for a number of the projects has been completed and they are now making a substantial contribution to space science. One of these instruments is an ultra-violet auroral imager which was launched in 1986 on the Swedish satellite VIKING and has produced some of the best and most interesting auroral images yet received from space. Another result of the increased funding for space science was that a number of Canadian companies became involved in the construction of space instrumentation for the first time.

At the same time that funding was being increased for some parts of the Space Science Program, the general budget reductions announced in November 1984 resulted in the cancellation of NRC's rocket and balloon program. This has had a significant effect on the Space Science Program because it removed the only component of the program that had a relatively short time-frame between project initiation and launch, a feature that is necessary when graduate students are involved or when new instruments are being tested.

The Canadian Astronaut Program was started in 1983 in response to an invitation from NASA, and is managed by NRC's Space Division. Initial plans called for three flights by Canadian astronauts aboard the space shuttle. By the end of 1983 six astronauts had been selected and, in October 1984, Marc Garneau became the first Canadian in space. He carried out a number of experiments aboard shuttle flight 41-G and acted as proxy