Canada's ozone research project launched into space

BY JUSTIN RAY
SPACEFLIGHT NOW
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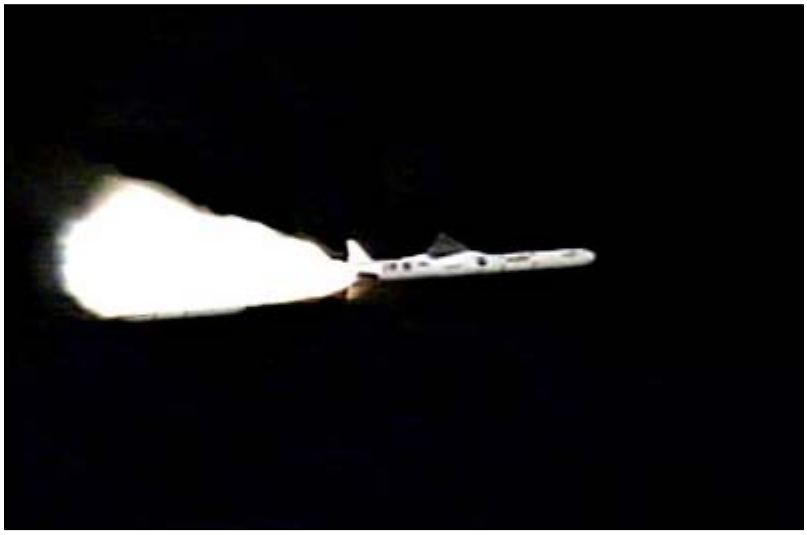
A Canadian endeavor to study the chemistry of Earth's atmosphere and the fragile ozone layer was successfully propelled into space Tuesday night by an air-launched rocket.

The $40 million SciSat 1 spacecraft was lofted by the 35th Orbital Sciences Pegasus booster, which was dropped from the belly of a modified L-1011 carrier jet about 50 miles off Central California's coastline.



The Pegasus rocket ignites to launch SciSat 1 into space. Credit: NASA TV/Spaceflight Now

The three-stage rocket was released over the Pacific Ocean at 7:09 p.m. EDT (10:09 p.m. EDT; 0209 GMT) where it fell 300 feet in five seconds before igniting. About ten-and-a-half minutes later, SciSat 1 was deployed into its planned 400-mile high orbit inclined 73.9 degrees to the Equator.

"It looks like we dropped right on the mark and SciSat is on her way," NASA Launch Manager Chuck Dovale said shortly after the flight from the Mission Directors Center at California's Vandenberg Air Force Base.

The launch -- valued at $21.6 million -- extended Pegasus'

Flight data file

Vehicle: Pegasus XL
Payload: SciSat 1
Launch date: August 12, 2003
Launch window: 10:04-11:01 p.m. EDT (0204-0301 GMT on 13th)
Mission staging site: Vandenberg AFB, Calif.
Satellite broadcast: AMC 9, Transponder 9, C-band

string of consecutive successful flights to 21 dating back to 1997. It was the fourth and final Pegasus of 2003.

Expected to begin science operations in October, the SciSat 1 spacecraft will examine the chemical processes that control the distribution of ozone in the Earth's atmosphere, particularly at high latitudes over the U.S. and Canada. The ozone layer shields the planet from harmful UV rays.

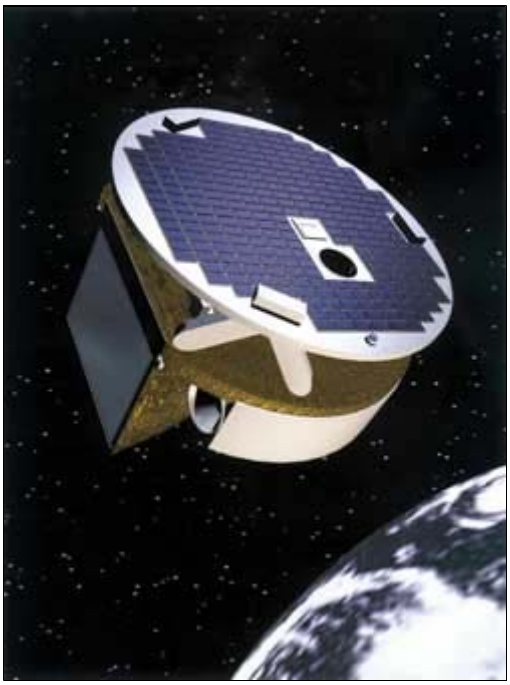
Planned to last two years, the SciSat 1 mission is expected to yield data to complement other international satellites. The combined research will assist world leaders set environmental policies -- such as the Montreal Protocol for the elimination of chlorofluorocarbons.

"The mission's primary goal is to determine whether the ozone layer will recover now that Freons and Halons have been banned," said Peter Bernath, the SciSat mission scientist from the University of Waterloo in Ontario. "These (cholorflorocarbons) have been destroying the ozone layer's ability to protect Earth from the Sun's naturally occurring ultraviolet radiation."

Marc Garneau, former space shuttle astronaut and president of the Canadian Space Agency, said SciSat will have a major impact on all Canadians, including generations to come.

"Our investment in this all-Canadian science satellite is helping Canada become a leader in environmental science and technology, moving us one step closer to improving our understanding of humanity's

interactions on the environment," said Garneau.



An illustration of SciSat 1. Photo: Credit: Canadian Space Agency

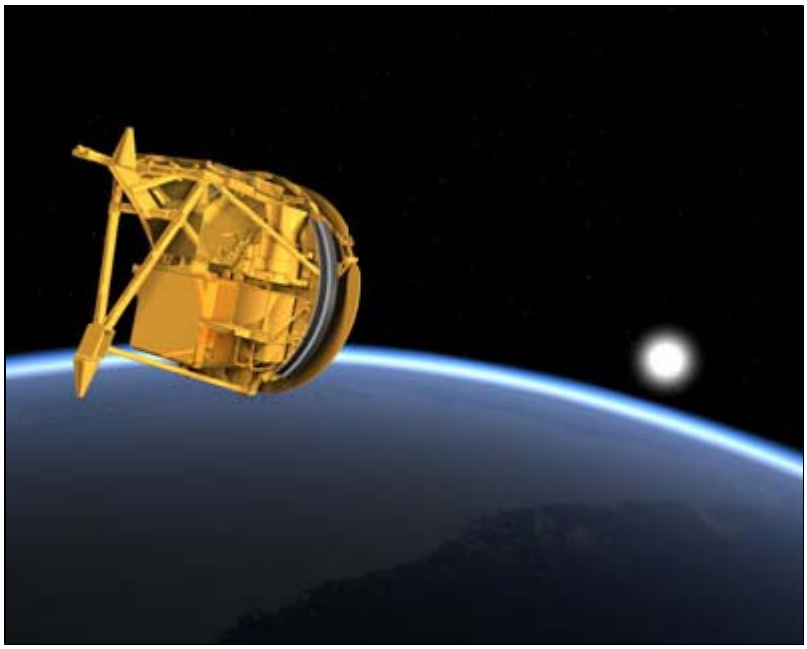
The primary science instrument aboard the 330-pound SciSat 1 is the Fourier Transform Spectrometer, built by ABB of Quebec City.

The device is designed to simultaneously measure the temperature, trace gases, thin clouds and aerosols found in the atmosphere using a "solar occultation" technique.

The satellite will be pointed to the Earth's horizon during orbital sunrises and sunsets, allowing the infrared instrument to observe the whole thickness of the atmosphere. Mission officials say SciSat should make its measurements 30 times per day.

The second instrument is the Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation, or MAESTRO for short. It was built by EMS Technologies of Ottawa.

Scientists will use MAESTRO to gain high-resolution data on the atmosphere and precise profiles of ozone concentration. It will also measure the amounts of organic and inorganic particles under polar ozone holes and near active volcanoes, officials said.



An artist's concept of SciSat 1 operating in space. Credit: Canadian Space Agency

"Although we have certain science goals, the real power of this mission is we are flying spectrometers that will record a tremendous amount of data -- more than a gigabyte per day -- and people can mine this data to make their particular measurements," Bernath said.

"I'm sure, as in all science missions, we don't even know yet what good things entirely will come out of it. We have our own goals and our own hopes but I think in the end SciSat will make a contribution in areas I can't even tell you about today."

The SciSat 1 mission was conceived in cooperation with NASA. The U.S. space agency paid for the satellite's launch in exchange for some of Canada's work with the International Space Station's robotic arm.

"It was an opportunity for Canada to get back into the scientific satellite business. We haven't had our own scientific satellite since the early '70s. We jumped at the opportunity to have our own mission, build our own

instrumentation and get back into developing the industrial base to build small satellites," said Roger Colley, Canadian Space Agency's director general space science.

The SciSat 1 mission emblem is depicted here.
Photo: Credit: Canadian Space Agency

"The launch is a return to Canada for additional work that we did on the space station program several years ago when we prepared the Remote Manipulator System for station. So there has been an exchanged between the two agencies."

The next Pegasus launch is scheduled for early next year with the Air Force's Communication/Navigation Outage Forecasting System satellite, or C/NOFS. The mission will be staged from the Kwajalein Missile Range in the central Pacific Ocean.

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