Ontario Centres of Excellence

Where Next Happens

Tiny Satellites Explore Space

"Our students are leading the way in designing, building, testing and deploying tiny-scale satellites to explore space while we've been able to establish a viable space laboratory. The Ontario Centres of Excellence assistance with funding and in developing proposals to further our program was invaluable."

Dr. Robert Zee, Institute for Aerospace Studies, University of Toronto

For some students at the University of Toronto's Institute for Aerospace Studies, getting a Master's degree is a lot more than classrooms and a thesis. For some, it is spending two years building a tiny satellite and launching it into space.

With assistance from the Ontario Centres of Excellence's Centre for Earth and Environmental Technologies, the UTIAS Space Flight Laboratories are not only training a new generation of space specialists, they are breaking ground in the field of small and ultra-small satellites that explore the solar system.

Bringing together the people and institutions that create the ideas with those who help move them to reality is the essence of Ontario's competitiveness and innovation, and the partnerships behind UTIAS are a tribute to that spirit.

It was OCE support, in conjunction with the Ontario Challenge Fund, that helped build the Space Flight Laboratories five years ago. The first Canadian Advanced Nanospace experiment (CanX) program was established in 2001, and the first CanX-1 satellite was launched in 2003.

"We have had assistance from OCE with more than funding," says Dr. Zee. "They have helped with developing new proposals, and with ideas and expertise in marketing our facility."

Ontario Centres of Excellence is one of the few publicly funded institutions that make connections from university research to marketplace. It helps make sure that innovative science and technology can have what is needed to become profitable new businesses. In the case of the Space Flight Laboratories, OCE helps to foster the relationships among university research, the innovation of new technologies and the training of a new generation of specialists who will move Ontario forward as a competitive entity in businesses that serve space exploration, space technology and earth observation.

CanX-1 helped demonstrate technologies in imaging of the earth, moon and stars, conducted experiments in star horizon tracking, and demonstrated global positioning satellites from space. It was built by a student-led team with mentoring from staff. The next generations of CanX are allowing rapid access to space and carrying science payloads from research being conducted at the University of Calgary, York University, the University of Toronto and Carleton University.

The latest success for UTIAS came in November of 2005 when it launched its custom nanosatellite ejection system called the T-POD v1.7 that deployed three 10-centimetre cube satellites from the Student Space Exploration and Technology Initiative (SSETI) Express microsatellite. SSETI Express is an educational satellite built by over 100 students across Europe under the mentoring of the European Space Agency.

Dr. Zee says it was the UTIAS experience with nanosatellites that led them to think of using one ejection system per satellite – an innovation based on the years of work at the Ontario laboratory.

Ontario companies are benefiting from the research as well, feeding work at Dynacon Inc., MacDonald, Dettwiler and Associates Inc. (MDA) and ComDev Ltd.

With the vision of Dr. Zee, the engagement of graduate students, assistance with the dream by OCE and partnerships with public and private agencies, the UTIAS Space Flight Laboratory is feeding innovation both on earth and with the stars.

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