

What is the Centre for Planetary Science and Exploration?

The University of Western Ontario's Centre for Planetary Science and Exploration (CPSX) was formed to address numerous questions of particular relevance to the study of all matters related to planets and space. The CPSX aims to lead Canadian planetary science and exploration by creating a research-intensive learning environment and developing partnerships among Western's faculties. The Centre is establishing the University as a pioneer in space systems design and making it the focus for planetary science research in Canada. The CPSX's members promote the national space program by training Canada's space community and by forming strategic partnerships with industry, the Canadian Space Agency, the National Aeronautics and Space Administration (NASA) and the European Space Agency.



Western planetary science graduate student Simon Auclair at the Flashline Mars Arctic Research Station on Devon Island, Nunavut, during a four-month Mars mission simulation

Research

The CPSX is an interdisciplinary research effort that involves members from the Schulich School of Medicine & Dentistry, the Faculty of Engineering and the departments of Physics and Astronomy, Earth Sciences, Biology, Chemistry, Geography, History and Philosophy. The CPSX is engaged in the following major areas of research:

Astrobiology. Investigating the origin, evolution, distribution and future of life on Earth and on other planets.

Cosmochemistry. Investigating planetary materials such as meteorites to develop a more detailed, quantitative understanding of solar system history and chronology.

Planetary Atmospheres. Interpreting the dynamics, thermodynamics and chemistry of the neutral and ionized components of an atmosphere. This will improve our ability to predict change in our own atmosphere and further our understanding of critical issues for human survival.

Planetary Dynamics/Astronomy. Understanding the dynamic interaction of planets and small bodies and characterizing planetary objects.

Planetary Interiors. Inferring the internal structure of planetary bodies and unraveling their formation and subsequent evolution.

Planetary Surfaces. Studying the features visible on planetary bodies and understanding the underlying physical processes that produce them.

Space Systems. Designing the systems and hardware required to fly instruments and technology in space.

Modular Material Retrieval System. Designing reconfigurable robotic and mechatronic systems for the collection, handling, analysis and containment of pristine samples from terrestrial and extraterrestrial environments. This includes developing systems with redundancy, such as robot swarms with smart sensing and actuation capabilities.

Telerobotics. Investigating the requirements for the teleoperation of robots on Earth and on other planets. This includes designing specialized haptics-enabled robotic systems and algorithms for bilateral teleoperation.

Space History. Examining the history of space and planetary exploration.

The CPSX has submitted a Canada Foundation for Innovation proposal to establish a major astromaterials facility at Western as part of a broader national initiative. This facility will enable the handling and analysis of extraterrestrial samples that have been collected, and will be collected, from the moon, Mars and other planetary bodies.

Notable Achievements

Western has just become the first international affiliate for conducting lunar science activities at NASA's newly established Lunar Science Institute. Western will represent the Canadian lunar science community as part of the newly established Canadian Network for Lunar Science and Exploration. The CPSX will undertake groundbreaking planetary science research with colleagues at the institute and at the Canadian Space Agency, which is a momentous step for building a world-class Canadian lunar science community. NASA's Lunar Science Institute will promote a new generation of collaborative scientific investigations about the moon and will provide technical perspectives to its lunar missions.

For more information, please visit: <http://planetsci.uwo.ca/>