

The Ottawa Carleton Educational Space Simulation (OCESS)

The OCESS is a forum for its student members to learn about space and space exploration through an elaborate simulation program. The organization also provides educational services to other schools in the form of space science workshops (Elementary Education Program (EEPs)), planetarium presentations (we own a StarLab[®] portable planetarium) for elementary and high school students, and a space science contest open to all grade 9 and 10 students in the region. The sale of these services provides some of our funding.

This organization is entirely run by its student members. The club serves the community in a number of ways. It meets the need for engaging, hands-on instruction in astronomy and space exploration for non-member students and teachers. It provides a focus for students to apply skills in math, physics, chemistry, and biology toward the solution of practical problems. It also provides students with simulated hands-on experience in the activities and planning involved in space exploration. This is an important up-and-coming field of endeavor for Canada, but one that usually is remote to day-to-day lives of most students. Finally, the OCESS provides a forum for students who are less likely to join organized sports teams or to participate in student government. These students have an opportunity within the OCESS to take on leadership roles and to work co-operatively with other students towards a shared goal.

The organization is broken down into teams to address activities such as construction, mission planning, training, and educational outreach.

Our main mission each year consists of a 96 hour procedure in which 6 student astronauts spend the entire time within a mock-up of an interplanetary spacecraft. The only time that they emerge is to explore and collect samples from a mock-up planetary surface at their destination. Other students carry out mission control duties, communicating with the astronauts through radio, closed circuit video, and computer text communication. They assist the astronauts in their duties and help solve emergencies as they arise. A third group of students are the simulators who build the planetary surface, cause various emergencies and malfunctions, and ensure that the other two groups stay within the bounds of our simulated reality. Mission preparation requires research into the intended destination, developing a rationale for the mission, experiments to conduct during the mission, planning supplies that must be taken, upkeep on the spacecraft and related systems, training on the flight, engineering, and environmental simulation software for the spacecraft, mission control, and simulators, and training on mission procedures such as collecting samples while wearing a spacesuit. Students also must plan each phase of the mission profile to ensure that the spacecraft will successfully arrive at the destination and return to Earth. Several smaller training missions are carried out before and after the main mission.

The educational outreach activities require students to manage bookings from other schools, ensure that club members are properly trained to give the presentations and to co-ordinate volunteers from the group members to present for each booking. Adult volunteer supervisors also must be obtained for these events. EEPs require similar preparations as well as making sure that all of the supplies and equipment needed to run the hands-on presentations are present. The Galileo Challenge is offered to science students at all schools in the Ottawa region (both public, catholic, and private). Student members write the contest exam, co-ordinate the advertising and other communication with schools, the distribution of the tests, and obtain prizes from local businesses. Student members also co-ordinate guest speakers such as Canadian astronauts and air force pilots to speak to the student body at large at our home school.