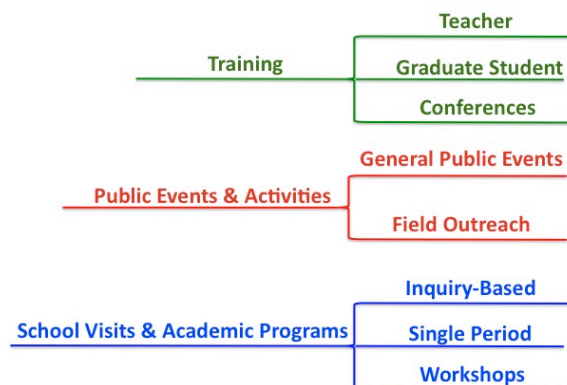


**THE CONTINUED GROWTH OF THE EDUCATION AND OUTREACH PROGRAM AT THE CENTRE FOR PLANETARY SCIENCE AND EXPLORATION.** A. Gilbert<sup>1</sup>, G. R. Osinski<sup>1</sup>, T. August<sup>1</sup>, M. Mader<sup>1</sup>, E. McCullough<sup>1</sup>, A. Pontefract<sup>1</sup>, B. Shankar<sup>1</sup>, and A. Singleton<sup>1</sup>. <sup>1</sup>Centre for Planetary Science and Exploration, The University of Western Ontario, London, ON, N6A 5B7 Canada ([cpsxoutreach@uwo.ca](mailto:cpsxoutreach@uwo.ca))

**Introduction:** The Centre for Planetary Science and Exploration (CPSX) at The University of Western Ontario (Western) continues to develop a comprehensive education and outreach program focusing on planetary science and exploration. With funding from the Canadian Space Agency and Western, the program strives to: 1) use planetary science as a way to raise general interest in science, 2) increase awareness of career opportunities in planetary science and exploration research, 3) offer educational resources to teachers, and 4) train graduate students in education and outreach practices.

**Approach:** Currently, the activities being performed can be divided into three categories: 1) school visits and academic programs, 2) public events and activities, and 3) training. These activities are further divided into subcategories, as seen in Figure 1.



**Figure 1:** Categories and subcategories of CPSX education and outreach activities.

*Academic programs.* These activities are related to the Ontario science curriculum, and are developed with support of the Thames Valley District School Board (TVDSB) and the London District Catholic School Board (LDCSB). Three types of programming are available: 1) multi-period inquiry-based activities, 2) single-period presentations and activities, and 3) workshops.

*Public events.* The focus of the public events is to emphasize the research activities within the CPSX and to increase interest in planetary science and exploration. The CPSX has partnered with organizations such as the London Children's Museum, the Royal Astronomical Society of Canada, and Virtual Researchers on Call (VROC), to offer a wide-range of public outreach events throughout the year.

*Training.* The training activities are among the most critical of the CPSX education and outreach program, and are split into three subcategories: 1) teacher training (providing teachers with resources and ancillary knowledge specific to planetary science), 2) graduate student training (to enable students to communicate their research in effective and interesting ways), and 3) conference attendance (to further the knowledge of CPSX members and to build collaborations with other education and outreach organizations).

**Current activities:** Numerous activities have been developed and carried out in all three major categories.

*Academic programs.* The number of activities available is increasing each year. Two inquiry-based activities (impact cratering and astrobiology) are available and two are in development (Mars mapping and space industrialization). There are currently nine single-period presentations and activities available, with many other topics in development. Material for all activities can be found on the CPSX website (<http://cpsx.uwo.ca/outreach/k-12-student-program>).

There are also two workshops available (Mission Meteorite and Rocks from Space).

*Public events.* The CPSX participates in many public events throughout the year, including International Observe the Moon Night, World Space Week, SLOME, Yuri's Night, and open houses at Western. This year, the CPSX has partnered with the London Children's Museum to participate in the Scientist in Residence program. The CPSX has set up an exhibit (Figure 2), which includes samples of meteorites and impact rocks, hands-on activities, and informational



**Figure 2:** Graduate teaching assistants Emily McCullough and Marianne Mader pose in the CPSX exhibit on display at the London Children's Museum.

posters. Drop-in activities will also be done in association with this program. The CPSX has also partnered with Sport Western to offer a summer camp for the first time in 2012.

*Training.* The CPSX offers an annual teacher training workshop, where teachers are able to view demonstrations of curriculum-based activities, brainstorm ideas for future activities, and to receive resources they can use in the classroom. This year, it is expected that over 60 teachers will participate in this workshop (twice the attendance of the 2011 workshop).

Graduate students receive training via the Canadian Space Agency Speaker Training Program, preparing them to share their knowledge in outreach and educational settings. Graduate students have also attended and presented at conferences such as Science Teachers' Association of Ontario (STAO), the Canadian Astronomical Society (CASCA), and the American Geophysical Union (AGU). Previous conference abstracts can be found on the CPSX webpage (<http://cpsx.uwo.ca/outreach/training-networking>).

**Reach of the program:** The CPSX education and outreach program has grown substantially since its inception. In the first year of the program (2009/2010) 300 participants were reached in five events. In 2010/2011, the program reached 1727 participants in 39 events. During the first half of the 2011/2012 academic year, the program reached just over 1100 participants in 25 events, and there are 40 events scheduled between January and June, 2012. In addition, this year the CPSX has taken part in numerous media interviews, expanding the reach of the program substantially.

**Future activities:** Future activities include developing additional curriculum-based inquiry and single-period activities, designing web-based educational activities, implementing more teacher training workshops, increasing the number of teachers and schools involved with the program, creating more partnerships with education and outreach organizations, and fostering current collaborations.

Two large projects are currently in the early phases of development. The Interactive Mapping of the Planets (IMaPS) program will consist of multiple inquiry-based workshops, a web-based activity using Google Earth, Moon, and Mars, pre-prepared kits to be sent out to teachers in rural and remote areas, and a summer camp. Funding is also being sought for a program that would bring primary- and secondary-school teachers on field research excursions so they may learn first-hand the importance of field-work in planetary and earth sciences.

*Measuring success:* Feedback from teachers, students, and collaborators is important to allow the program to

continue to be successful. Feedback forms are handed out after each event and comments are added to a growing database. Assessment techniques to determine the long-term impact of the program are currently being developed.

**Acknowledgements:** Funding from the Canadian Space Agency's Space Awareness and Learning program and an Interdisciplinary Development Initiative award from Western has made this program possible. Previous students and staff Melissa Battler, Dr. Peter Brown, Anna Chanou, Raymond Francis, Heather Henry, Cassandra Marion, Amanda Papadimos, Laura Thomson, and Troy Unrau are thanked for their participation in the program. We also appreciate input from Jenny Shaw and Terry Brown from Westminster Secondary School in London, Ontario, who have helped develop some of the academic programs.