

Participatory Exploration for Inspiration and Education (12)
Poster Session (P)

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THE DESERT RATS PARTICIPATORY EXPLORATION PROJECT: CITIZEN SCIENCE AND
PUBLIC ENGAGEMENT WITH GIGAPAN**Abstract**

In September 2010, the Desert Research and Technology Studies (Desert RATS) project simulated a future human lunar mission in northern Arizona. To enable the public to actively participate in the mission, we used the GigaPan robot camera to create interactively explorable, high-resolution panoramas of the region. Then, using the GigaPan collaboration web site, we involved students as "citizen scientists" to help develop traverse plans. We also created an on-line voting site that allowed the general public to select a location for the mission astronauts to visit.

GigaPan is a low-cost system for creating gigapixel panoramas using consumer digital cameras. GigaPan consists of a robot camera mount for automatically taking images, custom software for stitching sets of images into panoramas, and a collaboration web site for exploring, snapshotting and commenting on panoramas. Eight months prior to the start of Desert RATS 2010, we created GigaPan panoramas of the Desert RATS 2010 mission locations, including Black Point Lava Flow, SP Crater and Colton Crater.

During Spring 2010, undergraduate students at Arizona State University performed citizen science by studying the GigaPan panoramas. Citizen science is the term used to describe scientific work performed by volunteers, including taking measurements, making observations, and performing analysis. The students combined the panoramas with map data to remotely scout the mission and develop hypotheses about the area's geology. The observations and recommendations made by the students were then integrated into traverse plans by the Desert RATS science team.

To engage the public on a large-scale, we created a website that allowed people worldwide to view GigaPan panoramas and to vote for a place that the Desert RATS astronauts would visit. During a two-week voting period, the website was visited by people from 88 countries and more than 2,500 votes were received. Participants from around the world chose a visually interesting location that appeared to contain multiple overlapping lava flows. This location received a positive vote from two-thirds of voters.

Overall, we found that new forms of interactive media, such as GigaPan, can have a significant positive impact on exploration. In particular, we found that enabling students and the public to directly participate enables the exploration process to occur more rapidly than with traditional methods alone. More importantly, we found that direct participation is a powerful mechanism for raising interest in science and engineering, and for encouraging increased technical literacy.