

Executive Summary

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Presentation Title

Meteorite Collection on the Lunar Surface

Key Ideas

A key requirement for successfully exploring and understanding the solar system is the availability of material samples for analysis. The best lunar science is occurring today due to advancing laboratory techniques coupled with the lunar samples retrieved during the Apollo missions. It is clear extra-terrestrial samples are valuable – unfortunately using current retrieval technologies the amount retrieved is often negligible and the cost of collection is prohibitive. As part of the 2007 Lunar Ventures competition Kronos Technologies submitted a proposal describing a novel sample retrieval technology to collect larger and more diverse meteorite samples.

Approximately 10 million sizable meteorites have impacted the Earth during the last 200 years and there is significant evidence that the meteorite impact rate on the Moon is much higher. Based on published results a plan is formulated to actively detect and collect meteorites impacting the Earth. With the Earth as the initial focus, our preliminary studies suggest a natural progression to the Moon.

Field trials could begin in the American Southwest by analyzing data from a variety of sources. Candidate impacts can be detected in a variety of ways such as seismic data and satellite imagery. Evidence suggests computer algorithms could successfully discriminate meteorite impacts from human and natural geologic activities to produce candidate sites for retrieval. During the site search other sensors can be used, including active seismic surveys, magnetic detection and visual inspection.

Each successful recovery mission on Earth would provide a specimen and the opportunity to refine the detection and collection techniques for later deployment on the lunar surface.