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Abstract for Lunar Conference 2003

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Title: The Lunar Robotic Dowsler

In 1998, the Lunar Prospector found an excess of hydrogen at the lunar north and south poles. There is no guarantee that the hydrogen is bound with oxygen, but given the abundance of oxygen, it's likely. If this hydrogen were H₂O, it would be about 2.6 billion gallons (minimum suggested by data). Since the neutron spectrometer measures neutrons down to only 0.5 meter, this water (which would be frozen in permanently shadowed craters) is near the surface.

The obvious next step is to send a robot to the south (or north) pole and take some samples (by drilling into the soil). These samples would be analyzed on-site and the data sent back to Earth. We could therefore get an exact answer as to whether there is water at the south (or north) pole.

The Lunar Prospector was unique in its simplicity, which was largely why it was a success. The Lunar Robotic Dowsler project would be unique in a new way. It would be based on the ideas of *multiple-hierarchical-redundancy and miniature systems*. There would be at least 2 launches of identical hardware. There would be several small robots and communications relays in each package. It would take full advantage of our capabilities for miniature systems. These capabilities (powerful computing, large memory and fast communications in a small package) are already much better than they were in 1989 when the Lunar Prospector was designed. It is even possible that we could use micro-machines (MEMS) for soil sampling, instead of large mechanical core samplers. Doing the project this way would increase its chance of success and since we have powerful hardware in small packages, it does not necessarily increase cost. It might even be less expensive. This paper will be a conceptual design for such a project.

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