

**INTRODUCTION TO LUNAR DRILLING AND SAMPLING.** K. Zacny<sup>1</sup>, G. Paulsen<sup>1</sup>, M. Szczesiak<sup>1</sup>, and J. Craft<sup>1</sup>, <sup>1</sup>Honeybee Robotics Spacecraft Mechanism Corp. (zacny@honeybeerobotics.com)

**Introduction:** There are many reasons for penetrating below the surface of an extraterrestrial body. These include obtaining a core or powder samples that have been preserved for millions of years. Another reason is to provide subsurface access for scientific instruments such as heat flow probe and neutron spectrometer.

There are a number of challenges associated with penetrating extraterrestrial bodies, which include science drivers (depth and size of a sample), mission constraints (mass, power, volume, communication delay) and environmental constraints (temperature, atmospheric pressure or vacuum, dust, geological uncertainty).

This presentation will outline history of lunar drilling with emphasis on Apollo and Luna missions. Challenges associated with drilling on the Moon will be described and a number of available drill systems and new lunar drill developments will be shown. We will also report test results with various drilling systems (sonic, percussive, and rotary) and describe how these two different approaches compare.