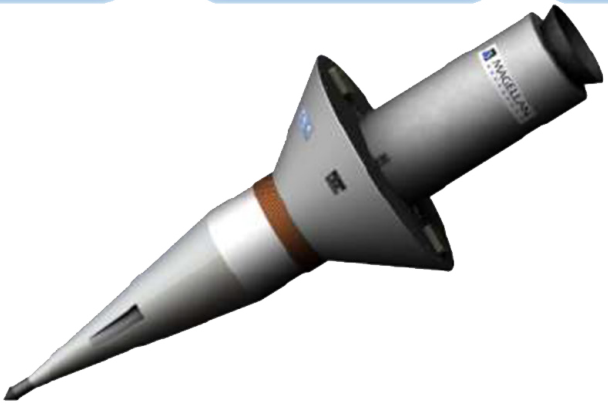
MULTIPURPOSE AUTONOMOUS IMPACT PROBE FOR LUNAR EXPLORATION

The Multipurpose Autonomous impact Probe for Lunar Exploration (MAPLE) represents a game-changer for lunar surface and sub-surface exploration due to its low cost and versatility. Vast regions of the Moon, including the permanently shadowed regions, could be explored using penetrator deployments at a fraction of the cost of soft-landers or rovers.

- In Situ Resource Characterization and Measurement
- Landing Site Surveys
- Reconnaissance of Inaccessible Terrain
- Sample Drilling
- Gravity Mapping
- Seismic Event Generation / Detection for Geophysical Measurement
- Surface Navigation and Communication
- Volatile Detection and Measurement (e.g., water ice)



MAPLE

MULTIPURPOSE • RUGGEDIZED • LOW COST EXPLORATION

The MAPLE probe allows the end user to conduct low cost localized science and resource exploration activities on the lunar surface. It provides the perfect means to scout a location prior to deploying a soft lander. The MAPLE probe contains a customizable payload bay suitable for a variety of missions on any celestial body. Each MAPLE probe is provided with a baseline Reconnaissance Suite which can be used to offset the science gathered by the primary payload.

KEY FEATURES

- Total mass: 20 kg (1 kg payload mass, 10 kg optional de-orbit propulsion subsystem)
- Payload bay usable space = 10 x 10 x 6 cm
- Provides Impact Shock mitigation up to 13000 Gs
- Provides dedicated payload thermal control
- Provides dedicated payload power interfaces

Technology Readiness: TRL 4

OVERVIEW

- Game-changer for lunar surface and sub-surface explorations
- High-velocity impactor probe (up to 180 m/s), reaching beneath the surface (30-70 cm)
- Low-cost and versatile approach to conduct localized science and resource exploration activities on lunar surface
- Adaptable payload bay to host multiple payloads, suitable for a variety of missions on any celestial body
- Aimed at utilizing the Moon's resources in support of human exploration, including surface excavation, manufacturing and construction duties on lunar surface
- Supports building machinery and electronics to work in extreme environments

MAPLE RECONAISSANCE SUITE

Instrument	Projected Performance	Potential Science
Accelerometer	- Up to 30,000 Gs - Sample Rate: 10,000 Hz	- Density of Lunar Regolith - Yield Strength of Lunar Regolith
Magnetometer	- 3-axis magnetometers - ±0.4 mT, ±0.8 mT, ±1.2 mT, ±1.6 mT	- Lunar magnetic field properties
Thermistor / Thermocouples	- Range: -270 to 1260°C - Resolution: +/- 3°C - Sample Rate: 10 Hz	- Lunar regolith thermal properties - Presence of ice - Mechanical properties of lunar regolith
Rate Sensors	- 3-axis - Dynamic Rage ±75°/s to ±900°/s	- Mechanical properties of lunar regolith
External Camera	- Optical Width: 15 km @ 10 km altitude - Resolution: 25 m @ 20 km	- Proximity of permanently lit area to landing site
Low-Cost LIDAR	- Range Knowledge: 1 m - Range: 20 km - Resolution: 0.1 %	- Lunar surface properties

ABOUT MAGELLAN AEROSPACE

Magellan Aerospace is a global aerospace company that provides complex assemblies and systems solutions to aircraft and engine manufacturers, and defence and space agencies worldwide. Magellan designs and manufactures aeroengine and aerostructure assemblies and components for aerospace markets, advanced proprietary products for military and space markets, and provides engine and component repair and overhaul services worldwide. Magellan is a public company whose shares trade on the Toronto Stock Exchange (TSX: MAL), with operating units throughout North America, Europe, and India.

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