ARMSTRONG UMV CONCEPT FOR LUNAR SURFACE CONSTRUCTION. John W. Suh[1], [1]Hyundai America Technical Center, Inc (4121 Clipper Ct, Fremont, CA 94358, john.suh@hatci.com), and Forrest Meyen[2], [2]Lunar Outpost (17700 S Golden Rd, Unit 102, Golden, CO 80401, forrest@lunaroutpost.com)

Introduction: The Armstrong ultimate mobility vehicle ("Armstrong UMV"), a joint project between Hyundai America Technical Center, Inc (or "HATCI"), and Lunar Outpost. The Armstrong UMV is a vehicle that has an adaptive high range-of-motion suspension (or "ARHOMS") system, which gives the vehicle the ability to travel over a broad set of lunar terrain. With its modular payload support architecture, the goal of the Armstrong UMV is to support a wide variety of scientific, commercial, and construction payloads to accomplish missions nearly anywhere on the lunar surface. HATCI has already begun development of the Armstrong UMV, which has undergone key component validation in a lab environment. The latest results of testing will be presented.

The Armstrong UMV's capabilities will be enhanced by integration with spaceflight-ready technology Lunar Outpost developed for its Mobile Autonomous Prospecting Platform rover. The vision of the joint HATCI and Lunar Outpost team will be to support NASA's plans for building a sustained lunar presence. Optimal places to build lunar infrastructure include areas that are difficult to reach, such as steep slopes around peaks of near eternal light, ejecta fields near rugged crater rims, and deep geologic recesses that may be of use for shielding astronauts from radiation. Lunar construction vehicles must have the mobility capabilities necessary to traverse this extreme terrain. Furthermore, vehicles should have the ability to integrate with a wide variety of payloads. A concept for a vehicle that addresses these requirements will be presented.

In the longer term the Armstrong UMV has the potential to make a significant, dual-use impact on the commercial sector in the new space and current Earth economies. Current customers in the space industry will benefit from the lowered cost and lead times offered by the Armstrong UMV. Additionally, this accessibility increase could open the door for new commercial entities that otherwise would find space applications cost and time prohibitive. On Earth, terrestrial variants of Armstrong have applications in the mining, rangeland management, and construction, and public safety applications such as wildfire fighting, and search and rescue.

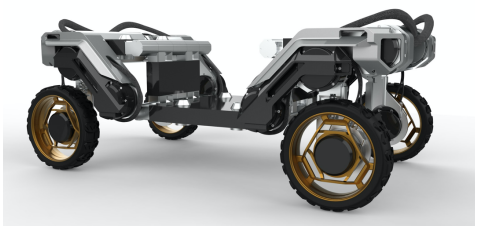

Figure 1. The Armstrong UMV concept with chassis in "tub" configuration.

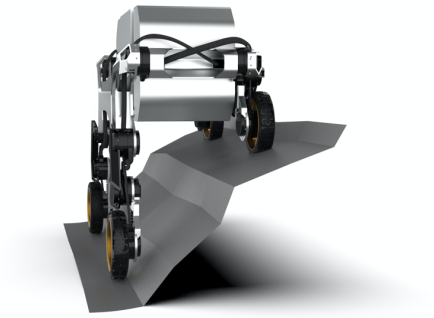

Figure 2. The Armstrong UMV concept show how its AHROMS could provide chassis leveling mobility on steep side slopes.

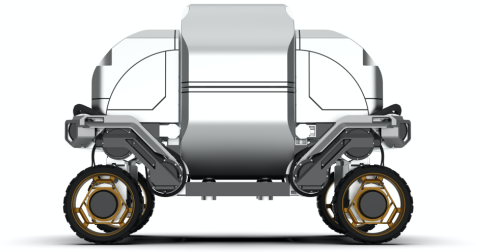

Figure 3. The Armstrong UMV concept with modular payload boxes.

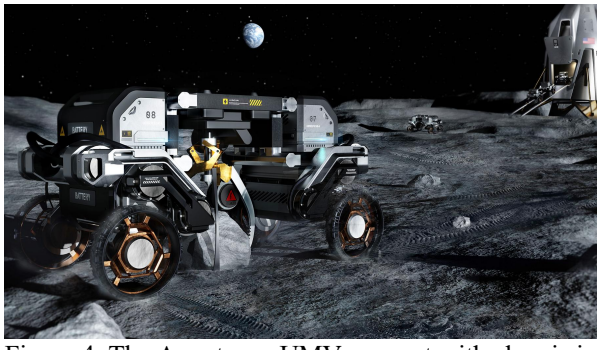

Figure 4. The Armstrong UMV concept with chassis in "arch" configuration and with a gripper tool to clear rocks from the surface.