

20th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)
Late breaking abstracts (LBA)

Author: Mr. Neil McHenry
Texas A&M University, United States, neilmchenry@gmail.com

MOONRAKER - A BEEHIVE INSPIRED ROBOTIC LUNAR CONSTRUCTION ARCHITECTURE

Abstract

The MOONRAKER, or Multiple Objective, Optimized, Nature-inspired, Robust Architecture for Knowledgeable Extraterrestrial Robot Architecture, is a beehive inspired architecture focused on utilizing a swarm of worker robots, namely a Queen Bee and group of worker bees, for construction of a Lunar regolith shield around an inflatable habitat structure. The Queen Bee robot acts as a deliberative layer, commanding the worker bee robots to perform certain tasks collaboratively in order to excavate, transport, and inject a binding agent into lunar regolith material. This also involves a human in the loop sending high level objectives to the Queen Bee; this teleoperation can take place either from a Mission Control Center (MCC) on Earth or in the orbiting Deep Space Gateway.