



Abstract #800

English

Free-Flying Unmanned Robotic Spacecraft for Asteroid Resource Prospecting and Characterization

In Situ Resource Utilization (ISRU), a new space concept, facilitates planetary exploration by drawing needed resources, such as water, from the local environment. However, the extreme nature of these environments requires the development of advanced unmanned and autonomous space systems integrated with sample-capture devices to achieve the ultimate goal of prospecting these resources. These systems must have the capability to access terrains that would be inaccessible to traditional systems. NASA Kennedy Space Center Swamp Works, with support from Embry-Riddle Aeronautical University and Honeybee Robotics have been developing innovative resource prospecting mission concepts based on autonomous small marsupial free-flyer prospector spacecrafts. The recent NASA STTR funded project, supported Embry-Riddle Aeronautical University in the evaluation of concepts and technologies for safe, reliable, and scalable control of an unmanned free-flying robotic system, and autonomous control with minimal human intervention in complex, unstructured environments. Honeybee Robotics effort, on the other hand, focused on developing sampling acquisition approaches that included low reaction force Micro Coring Drill and Pneumatic Soil Sapling system. Terrestrial applications of this technology include autonomous exploration of geological features and mining sites using aerial vehicles with sampling capabilities.

French

No abstract title in French

No French resume

Author(s) and Co-Author(s)

Dr. Kris Zacny
(UnknownTitle)
Honeybee Robotics

Mr. Rob Mueller
(UnknownTitle)
NASA Kennedy Space Center

Mr. Tom Ebert
(UnknownTitle)
NASA Kennedy Space Center

Prof. Hever Moncayo
(UnknownTitle)
Embry Riddle Aeronautical University - Daytona

Prof. Richard Prazenica
(UnknownTitle)
Embry Riddle Aeronautical University - Daytona