

Wednesday, June 13, 2012
TECHNOLOGY AND ENABLING CAPABILITIES:
AERIAL PLATFORMS AND INVESTIGATIONS
8:00 a.m. Lecture Hall

Levine J. S. * Croom M. A. Wright H. S. Killough B. D. Edwards W. C.

[*The Aerial Regional-Scale Environmental Surveyor \(ARES\): New Mars Science to Reduce Human Risk and Prepare for the Human Exploration*](#) [#4086]

ARES is a rocket-powered, robotic airplane, that will fly about a kilometer above the surface while traversing hundreds of kilometers to collect and transmit previously unobtainable, high spatial measurements of the Mars surface and atmosphere.

Thornblom M. N. Lukas J. N. * Lugo R. A.

[*Systematic and Widespread Exploration with Aerocoasting and Reconnaissance of the Martian Sub-Atmosphere \(SWARMS\)*](#) [#4135]

An innovative exploration technology is proposed that utilizes “aerocoasting,” or low-drag aerobraking, with a orbiting vehicle that periodically deploys robotic aerial explorers that “swarm” to measure and characterize the martian atmosphere.

North M. A. * North D. B. Calhoun R.

[*Using Directed Aerial Robot Explorers \(DARE\) to Characterize Martian Atmospheric Methane in the Near-Term*](#) [#4066]

Combining a surface rover and a Directed Aerial Robot Explorers (DARE) is a safe, accurate, and reliable exploration approach that incorporates an innovative exploration approach that is easily fielded in the near-term to explore the planet Mars.

Wolf A. * Beegle L. Raymond C. Plaut J. Pollard B. Gim Y. Wu X. Hall J.

[*Mars Balloon Science*](#) [#4294]

Balloons are uniquely suitable platforms for some observations important for Mars science and future human exploration. They are technologically within reach, and are small enough to be packaged as secondary payloads.

Bar-Cohen Y. * Colozza A. Badescu M. Sherrit S. Bao X.

[*Biomimetic Flying Swarm of Entomopters for Mars Extreme Terrain Science Investigations*](#) [#4075]

Mars investigations using high lift-generating under low Reynolds-number in flying robots would be significantly attractive to the public and could enable unique access to measurable phenomena in extreme terrains to accomplish science objectives.

Singer Cs. *

[*Ultralight Solar Powered Hybrid Research Drone*](#) [#4059]

A planetary research drone is proposed, which is capable for vertical takeoff and landing. A hybrid flight concept utilizing static lift enables the exploration over ground. The static lift is achieved with a lighter than CO₂ gas like air, He, or H₂.

Lemke L. G. * Heldmann J. L. Young L. A. Gonzales A. A. Gulick V. C. Foch R. E. Marinova M. M. Gundlach J. F.

[*Vertical Takeoff and Landing UAVS for Exploration of Recurring Hydrological Events*](#) [#4276]

We describe a semi-autonomous Vertical Take Off & Landing Unpiloted Air Vehicle, capable of flying over surface features on Mars that may be evidence of extant surface water flow and that are located in challenging terrain.

Zubrin R. M. *

[The Mars Gashopper](#) [#4069]

The Mars Gashopper is a flight and surface exploration vehicle that uses heated CO₂ propellant for thrust. It provides a fully controllable aerial reconnaissance vehicle that can repeatedly land and explore numerous widely separated surface sites.

Steinkraus J. M. * Wright M. W. Rheingans B. E. Steinkraus D. E. George W. P. Aljabri A. Hall J. L. Scott D. C.

[Mars Airborne Prospecting Spectrometer](#) [#4307]

One novel approach towards addressing the need for innovative instrumentation and investigation approaches is the integration of a suite of four spectrometer systems to form the Mars Airborne Prospecting Spectrometers (MAPS) for prospecting on Mars.

PANEL DISCUSSION