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Author: Mr. Madhu Thangavelu
University of Southern California, United States

THE USC ADAM PROJECT: ADVANCED DEVELOPMENTAL ARCHITECTURES FOR OUR MOON

Abstract

The US administration has laid out, in the clearest terms yet in many years, what the nation expects NASA to do in the immediate term: Return people to the Moon asap(2020s timeframe) with the goal of building the technological and operational infrastructure to conduct a safe human Mars expedition within the next two decades(2030s).

How to jumpstart a self-sustainable cislunar economy that does not wither and fade with each administration cycle and be victim yet again to the on-again off-again visions for human space activity ?

Robotic precursor missions to both Moon and Mars have been underway for some years now, with the aim of gauging in-situ resources for extended human activities, eventually leading to permanent settlements. Following the Apollo missions nearly half a century ago, several reports have presented the case that the Moon is the most proximal celestial body where much of the hard engineering data and experience needed for more ambitious missions may be tested, evolved and certified.

Commerce is the lifeblood of modern civilization.Open-ended government funded space exploration, by itself, is not sustainable for future long duration missions. Hence the role of commerce and international partners in human space activity. An effort to expand the International Space Station model to include more partners on a global scale is also proceeding in parallel.

The goal to develop and field the next generation of human occupied space station, one that can safely keep her crew and reliably operate beyond the protective cocoon of the Earth's magnetic field is logically the next step along the critical path for evolving a Mars expedition vehicle, one that has to withstand the interplanetary environment, before crew can be delivered to the surface of Mars.

What projects can we do with existing human spaceflight assets that are aligned with administration space policy directives ? The ADAM Project attempts to explore options available in the immediate term, to satisfy the national space policy goals set forth by the current administration, while encouraging new visions for human space activity, utilizing existing space technology to accelerate real space commerce for the immediate benefit of all society.

The 2018 ADAM project concept architectures and earlier works of the USC ASTE527 Space Concepts Studio may be accessed at :

https://sites.google.com/a/usc.edu/aste527/home

White House directives, ISS Transition Report and National Space Exploration Campaign Report were helpful in shaping the Adam Project that is presented.