

24th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)  
Small Spacecraft for Deep-Space Exploration (8)

Author: Dr. Christopher Moore

National Aeronautics and Space Administration (NASA), United States, christopher.moore@nasa.gov

Ms. Nicole Herrmann

Valador, Inc., United States, nicole.b.herrmann@nasa.gov

Dr. Jitendra Joshi

National Aeronautics and Space Administration (NASA), United States, jitendra.a.joshi@nasa.gov

“DEEP-SPACE CUBESATS ON EXPLORATION MISSION ONE”

**Abstract**

Thirteen deep-space CubeSats will be deployed from NASA’s Space Launch System rocket on its first flight in November 2018. This armada of miniature spacecraft on Exploration Mission One (EM-1) is being developed by NASA and its industry, university, and international partners. The EM-1 CubeSats will be the first to ever visit the Moon and cislunar space, heliocentric orbit, and a near-Earth asteroid. The objectives of the various CubeSat missions include prospecting for lunar volatiles, demonstrating deep space communications, measuring the space radiation environment and studying its effects on yeast DNA, and enabling low-cost capabilities to scout potential destinations for human missions. Many innovative CubeSat technologies will be tested including a common deep-space transponder and optical communications, electric and solar sail propulsion, laser reflectance spectrometry, biological radiation sensors, and lunar impactors. Each of the CubeSat missions and their new technologies will be described.