

Polar Gateways Arctic Circle Sunrise 2008 Conference
Barrow, Alaska, January 23-29, 2008
<http://polargateways2008.org/>

Abstract

Environment Challenges for Exploration of the Moon

Joseph I. Minow¹, William C. Blackwell, Jr.², Victoria N. Coffey¹, William J. Cooke¹, James W. Howard, Jr.², Linda N. Parker², John R. Sharp¹, Richard G. Schunck¹, Robert M. Suggs¹, and Joseph J. Wang³

¹NASA, Marshall Space Flight Center, Huntsville, AL

²Jacobs Engineering, ESTS Group, MSFC, Huntsville, AL

³Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA

NASA's Constellation Program is designing a new generation of human rated launch and space transportation vehicles to first replace the Space Shuttle fleet, then support development of a permanent human habitat on the Moon, and ultimately prepare for human exploration of Mars. The ambitious first step beyond low Earth orbit is to develop the infrastructure required for conducting missions to a variety of locations on the lunar surface for periods up to a week and establishment of a permanent settlement at one of the lunar poles where crews will serve for periods on the order of ~200 days. We present an overview of the challenging aspects of the lunar environment that will need to be addressed when developing transport and habitat infrastructure for long term human presence on the Moon including low temperatures and dusty regolith surfaces, radiation environments due to galactic cosmic rays and solar energetic particles, charging of lunar infrastructure when exposed to lunar plasma environments, and secondary meteor environments generated by primary impacts on the lunar surface.

Primary Contact: Joseph Minow
EV44/Natural Environments Branch
Marshall Space Flight Center
Huntsville, AL 35812
(256) 544-2850
joseph.i.minow@nasa.gov