



**American Society of Civil Engineers (ASCE)  
Aerospace Division (ASD)**

**Earth & Space 2024 Conference  
Greater Miami, FL; April 15-18, 2024**

The 19th Biennial ASCE ASD International Conference on Engineering, Science, Construction and Operations in Challenging Environments  
(Earth & Space 2024)

**PRE-CONFERENCE SHORT COURSE**

Course Title	LUNAR GEOTECHNICS AND FOUNDATION DESIGN
<b>Organized By</b>	<ul style="list-style-type: none"> <li>• Pooneh Maghoul, Ph.D., PEng, M. ASCE, Associate Professor, Polytechnique Montréal, Montreal, QC, Canada</li> <li>• Roberto de Moraes, PEng, M. ASCE, Geotechnical and Underground Excavation Senior Advisor, AECOM, Oakland, CA, USA</li> </ul>
<b>Sponsored By</b>	Aerospace Division (ASD), American Society of Civil Engineers (ASCE)
<b>Location</b>	<i>Venue of the ASCE ASD Earth &amp; Space 2024 Conference:</i> Roz and Cal Kovens Conference Center, Florida International University Biscayne Bay Campus, 3000 N.E. 151st Street, North Miami, FL 33181-3000
<b>Date and Time</b>	Monday, April 15, 2023; 9 AM – 5 PM (U.S. Eastern time)
<b>Duration</b>	Net 6.5 hours (8:45 AM – 4:45 PM, including 1 hour lunch break and two 15-minute breaks)
<b>Professional Development Credit</b>	6.5 PDHs by ASCE

**Brief Description:** This short course is designed for engineers and researchers who work on and have interest in, various aspects of construction, and structural and geotechnical design of infrastructure on the Moon. The morning session of the short course focuses on the basics of soil mechanics and foundation design in low gravity conditions. We will overview the theories and discuss the more important aspects to be considered in the foundation design of lunar infrastructure such as launching/landing pads, roads, lunar habitat, and lunar solar power towers. In the afternoon session, we will teach the practical aspects for the geotechnical design such as site investigation, field testing using geophysics and geology rover equipped with geotechnical investigation tools, slope stability, excavation, and geotechnical seismic design. Several case studies based on our state-of-the-art knowledge will be discussed.



**PRE-CONFERENCE SHORT COURSE (cont'd...)**  
**ASCE Earth & Space 2024 Conference**

Short Course Program Schedule (Subject to Change)		
Time (EST)	Topic	Instructor
8:45 am	<b>Welcome and Short Course Introduction</b>	<ul style="list-style-type: none"> <li>Ramesh B. Malla, Ph.D., F. ASCE, F. EMI, A.F. AIAA; Professor, University of Connecticut, Storrs, CT, USA (<i>Honorary Chair, ASCE Earth &amp; Space 2024 Conference and Chair, Space Engineering and Construction Technical Committee, ASCE Aerospace Division</i>)</li> </ul>
9:00 am – 10:00 am	<b>Introduction to Foundation Design on the Moon</b>	<ul style="list-style-type: none"> <li>Pooneh Maghoul, Ph.D., P.Eng., Associate Professor, Polytechnique Montréal, Montreal, QC, Canada</li> <li>Randy States, P.E., M. ASCE, Geotechnical Consultant, CT, USA</li> </ul>
10:00 am – 10:15 am	Break	
10:15 am – 11:15 am	<b>Excavation and Regolith Work on the Moon</b>	<ul style="list-style-type: none"> <li>Nathan Gelino, Principal Investigator, NASA, Kennedy Space Center, Merritt Island, FL, USA</li> <li>Rob Mueller, Senior Technologist, NASA, Kennedy Space Center, Merritt Island, FL, USA</li> </ul>
11:15 am – 12:15 pm	<b>Site Investigations &amp; Site Preparation for First Lunar Base Camps</b>	<ul style="list-style-type: none"> <li>Christopher Dreyer, Ph.D., Professor of Practice, Colorado School of Mine, Golden, CO, USA</li> <li>Matthew Waterman, Manager of Engineering Geology, Bechtel Corp., Reston, VA, USA</li> </ul>
12:15 pm – 1:15 pm	Lunch break	
1:15 pm – 2:15 pm	<b>Techniques and Equipment for Geotechnical Developments on the Moon</b>	<ul style="list-style-type: none"> <li>Robert C. Anderson, Ph.D., Group Supervisor &amp; Research Scientist, NASA JPL, Pasadena, CA, USA</li> <li>David Slack, Chief Operating Officer, ConeTec, Burnaby, BC, Canada</li> </ul>
2:15 pm – 3:15 pm	<b>Geotechnical Aspects of Seismicity on the Moon</b>	<ul style="list-style-type: none"> <li>Alexander M. Jablonski Ph.D., P. Eng., Project Manager, DFL, Canadian Space Agency, Adjunct Professor (Carleton University), Ottawa, Canada</li> <li>Pooneh Maghoul, Ph.D., P.Eng., Associate Professor, Polytechnique Montréal, Montreal, QC, Canada</li> </ul>
3:15 pm – 3:30 pm	Break	
3:30 pm – 4:40 pm	<b>Geotechnical and Extreme Surface/Subsurface Temperature Considerations for Lunar Construction</b>	<ul style="list-style-type: none"> <li>Roberto de Moraes, PEng, Geotechnical and Underground Excavation Senior Advisor, AECOM, Oakland, CA, USA</li> <li>Ramesh B. Malla, Ph.D., F. ASCE, F. EMI, A.F. AIAA; Professor, University of Connecticut, Storrs, CT, USA</li> </ul>
4:40 pm – 4:45 pm	<b>Concluding Remarks</b>  <b>Vote of Thanks &amp; Course Closure</b>	<ul style="list-style-type: none"> <li>Pooneh Maghoul, Ph.D., P.Eng. and Roberto de Moraes, PEng, (<i>Short Course Organizers</i>)</li> <li>Ramesh B. Malla, Ph.D., F. ASCE, F. EMI, A.F. AIAA; (<i>Honorary Chair, ASCE Earth &amp; Space 2024 Conference and Chair, ASCE ASD Space Engineering and Construction Technical Committee</i>)</li> </ul>