

## **Towards Lunar Mining: Bench-scale Demonstration of Aluminum Extraction from Lunar Regolith**

### **Abstract:**

This seminar presents the critical steps required for the production and utilization of aluminum (Al) generated from a lunar highlands' regolith simulant. The main steps that will be presented in this seminar are:

1. The beneficiation of lunar regolith.
2. The leaching of the Al-rich fraction to produce alumina ( $\text{Al}_2\text{O}_3$ ).
3. The construction of an electrochemical reactor.
4. The electrolytic reduction of the produced  $\text{Al}_2\text{O}_3$  to produce metallic Al.
5. The processing of Al into wire feedstock to perform electron beam additive manufacturing (EBAM).
6. The EBAM deposition results.

### **Bio:**

Xavier Walls received his bachelor's and master's degrees in chemical sciences from the National Autonomous University of Mexico (UNAM). He worked as a liaison between the IT department and research laboratories at the National Genomic Medicine Institute (INMEGEN) in Mexico. He has extensive teaching experience, working first as a teacher's assistant and later as a high school teacher for more than 5 years. He is also interested in science dissemination; he has published some articles and news on the subject. His research is oriented towards the space sector, studying chemical reactions outside of planet Earth. He is currently pursuing his doctoral studies in Aerospace Engineering at Carleton University where he is working on the application of chemical reactions for In Situ Resource Utilization (ISRU).