

## AWARDS

### **The Efficient Use of Communications Power Award**

Awarded to the team for using the lowest average data utilization bandwidth per regolith points earned in both the timed and NASA monitored portion of the competition. Teams MUST collect the minimum amount of regolith to qualify for this award.

### **The Regolith Mechanics Award**

Awarded to the team with the best example of a real granular innovation that identified a specific regolith mechanics problem (like the way the soil flows around the grousers, or angle of repose too high in their dump bucket, etc.) and intentionally improved their design to deal with it. Courtesy of the Center for Lunar and Asteroid Surface Science (CLASS), part of NASA's Solar System Exploration Research Virtual Institute (SSERVI) Network.

### **The Caterpillar Autonomy Award**

Awarded to the teams with the first, second and third most autonomous points averaged from both mining attempts, even if no regolith is deposited. In the event of a tie, the team that deposits the most regolith will win. If no regolith is deposited, the Mining Judges will choose the winner.

### **The Judge's Innovation Award**

Awarded to the team that demonstrates the most innovative design.

### **Social Media and Public Engagement**

Awarded to the teams that uses various social media platforms to engage the public in their participation with MC and engages with NASA and other robotic teams.

### **Slide Presentation and Demonstration**

Awarded to the team that best presents their project at the competition in front of an audience including NASA and private industry judges.

### **Outreach Project Report**

Awarded to the teams with the best educational outreach project in their local community to engage students in STEM (Science, Technology, Engineering and Math). Outreach activities should capitalize on the excitement of NASA's discoveries to spark student (K-12) interest and involvement in STEM.

### **Systems Engineering Paper**

Awarded to the team that best discusses the Systems Engineering methods used to design and build their mining robot. The paper is peer reviewed by support and operations personnel from across the Administration.

### **Robotic On-Site Mining**

Awarded to the team that: passes robot and communication inspections, mines more than 10 kg of regolith, most efficient use in bandwidth, minimizes robot mass, reports energy consumed, has a dust tolerant design & performs dust free operations, performs tele-robotic and / or autonomously and mines the most resources.

**... and finally**

## **THE JOE KOSMO AWARD FOR EXCELLENCE**

Awarded to the team that scores the most points in both the mandatory and optional competition events.

## Summary

Category	Award	Maximum Points for Joe Kosmo Award
On-Site Mining in the Caterpillar Mining Arena (required)	1st place \$3,000 team scholarship 2nd place \$2,000 team scholarship 3rd place \$1,000 team scholarship  Teams not placing 1 <sup>st</sup> , 2 <sup>nd</sup> , or 3 <sup>rd</sup> will receive one point per kilogram of BP-1 and/or icy regolith simulant (gravel) mined and deposited up to 10 points	25 20 15  Up to 10
Systems Engineering Paper (required)	\$500 team scholarship	Up to 25
Outreach Project Report (required)	\$500 team scholarship	Up to 20
Slide Presentation and Demonstration (optional)	\$500 team scholarship	Up to 20
Social Media and Public Engagement (optional)	\$500 team scholarship	Up to 10
The Judges' Innovation Award	Trophy	NA
Caterpillar Autonomy Award	1 <sup>st</sup> place \$1,500 team scholarship 2 <sup>nd</sup> place \$750 team scholarship 3 <sup>rd</sup> place \$250 team scholarship	NA
The Regolith Mechanics Award	Trophy	NA
Efficient Use of Communications Power Award	Trophy	NA
Joe Kosmo Award for Excellence (Grand Prize)	Trophy and \$5,000 team scholarship	