

A MESSAGE FROM THE PROJECT MANAGER



Long-duration habitation, surface systems and human life support systems will evolve through NASA's capability-driven approach to exploration, but even the most sophisticated designs must include ISRU components when possible. These research and technology development areas will focus on technologies necessary to extract consumables (O₂, H₂O, N₂, He, etc.) for human life-support system replenishment. The technologies can also be used to mine source materials for in-situ fabrication, repair technologies, and source materials (composites, etc.) such as radiation shielding for shelters. Mission capabilities and return on investment multiply when human consumables and spacecraft propellant can be harvested from extraterrestrial environments. As we embark on deep-space missions with

months or longer travel times, ISRU becomes increasingly important because resupply missions are expensive and exclusively relying on them may put crews at risk. Each year university-level teams design and build robots to dig in the simulated basaltic regolith at the Kennedy Space Center to find alternative practices of harnessing resources from off-world exploration sites. Since its inception RMC has hosted over 300 different robots and 3,000 students from across the country including Alaska, Hawaii and the Commonwealth of Puerto Rico.

The Robotic Mining Competition Three Lines of Business Focus

- **Technology - Technology Drives Exploration.** We develop, test and fly transformative capabilities and cutting edge exploration technologies. Our technology development provides the onramp for new ideas, maturing them from early stage through flight and giving wings to the innovation economy. **#NASATech**
- **Mars - We are on a journey to Mars.** Today our robotic scientific explorers are blazing the trail. Together, humans and robotics will pioneer the next giant leap in exploration. **#JourneytoMars**
- **Solar System and Beyond NASA - We're Out There.** NASA's exploration spans the universe. Observing the sun and its effects on Earth. Delving deep into our solar system. Looking beyond to worlds around other stars. Probing the mysterious structures and origins of our universe. Everywhere imaginable, NASA is out there. **#NASABeyond**

The Robotic Mining Competition NASA Education Plan 2015-2017(E3) Jan 2016 Focus

- **NASA Strategic Objective 2.4** Advance the Nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers, and faculty in NASA's missions and unique assets.
- **NASA Education Performance Goals 2.4.4** and Annual Performance Indicator ED-16-4.
- **CoSTEM Strategic Plan** by enhancing the STEM experience of Undergraduate Students and Build and Use Evidence-Based Approaches.

**The Robotic Mining Competition Accreditation Board for Engineering and Technology (ABET)
Focus**

The Accreditation Board for Engineering and Technology is the global standard for programs in applied science, computing, engineering, and engineering technology (<http://www.abet.org>). The Competition rules and rubrics meets most of the requirements for engineering, and engineering technology accreditation.

NASA's resources and personnel provide a unique experience available nowhere else giving students the opportunity to create off-world technologies from this on-world competition.

Good for NASA, Good for America
Good for All of US