ROCK MECHANICS AND EXPLOSIVES RESEARCH CENTER (RMERC)

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The Rock Mechanics and Explosives Research Center (RMERC) brings together leading investigators from different disciplines to research static and dynamic rock mechanics, rock fragmentation and excavation, and explosives technology. A particular emphasis is to foster innovative and responsive research in rock physics and all fields of science and engineering that deal with rock, including energy production, mining, geology, geophysics, petroleum, nuclear and related fields. The High Pressure Waterjet Laboratory of the RMERC has developed a world-renowned team of waterjet technology specialists. The RMERC has a linear rock cutting machine, compressive testing load frame, and also an array of rotary rock cutting machines, an electronics shop, and a comprehensive machine shop for its students and investigators.

Areas of current research include:

- Reagent design for mineral pressing applications, froth flotation, ionic liquids;
- Engineering geophysics, ground penetrating radar, electrical resistivity tomography;
- Modeling, simulation, and optimization for sustainable mining systems;
- Enhanced oil recovery and water management, particle-gels, hydrogel, and nano-fluidics;
- Numerical geomechanics, petroleum related geomechanics modeling;
- Waterjet technology, communication, mineral processing;
- Geophysical exploration of the Earth’s interior, geophysics, seismology, rock physics;
- Rock mechanics, acoustic emissions, mine hazard prevention and controls, seismic based void detection;
- Space mining, rock excavation, mining method development, mine design;
- Mining health and safety, ground control, underground communications;
- Explosives engineering and technology, explosive taggants, shock physics;
- Geophysical subsurface imaging, seismic interpretation, seismic anisotropy;
- Lidar scanning, landslides, autonomous navigation;
- Energetics, rock dynamics, ground control, coal dust explosion suppression.

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