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, 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, 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 explosive dust experimentation; propane dispersion and ignition; mining systems simulation; environmental aspects of mining; geostatistics; polymer aids for coal recovery by flotation; integrating nanotechnology in mineral processing; high pressure waterjet cutting; high pressure waterjet mining; sustainable supply chains for small modular reactors; optimal room and pillar mine sequencing; structural development of fractured anticline formations; heavy equipment vibrations and impact on miner safety; formation excavation; single molecule imaging system and nano-fluid chips use to understand fluid flow in shale gas formations; advanced particle gels use in water management in oil fields; aggregate materials, sizing and characterization; use of booster fans to increase safety in mining; LIDAR scanning; use of LIDAR, EO systems, and ground-penetrating radar in rock cuts, discontinuities, interior spaces, and autonomous vehicles; drill string vibrations; monitoring of CO₂ injection and storage and sealing materials; wellbore strengthening; rock mechanics and rock cutting; planetary and near-earth objects and space resources; mining methods in microgravity; ancient and modern sedimentology and depositional systems; stratigraphy.

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