

## ***The 46<sup>th</sup> US Rock Mechanics/Geomechanics Symposium (Chicago, 22-28 June, 2012)***

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The 46<sup>th</sup> US Rock Mechanics/Geomechanics Symposium took place in Chicago on 22-28 June 2012, at the Westin Michigan Avenue Hotel. The focus of the Symposium was on new and exciting advances in rock mechanics and geomechanics, and it encompassed all aspects of rock mechanics, rock engineering and geomechanics. It attracted more than 600 participants from more than 30 different countries.

The Symposium offered many opportunities to learn about recent advances in rock mechanics and geomechanics and share new knowledge and new methodologies. The meeting started with two excellent workshops. The first one, *2<sup>nd</sup> Unconventional Resources Geomechanics Workshop: Geomechanics Solutions for Environmental and Technical Challenges in Unconventional Resources*, organized by Azra Tutuncu and sponsored by Unconventional Natural Gas and Oil Institute (UNGI) and ARMA. It brought together more than 70 national and international researchers from the energy industry, academia and federal and state government organizations to explore technical and environmental challenges and to showcase the findings from ongoing field studies on unconventional reservoirs. (Editor's note: A more detailed report on the workshop follows this article.) The second workshop, *1<sup>st</sup> ISRM-ARMA Workshop on Petroleum Geomechanics Testing*, was organized by Tony Addis, Russ Ewy, Axel Makurat and Maurice Dusseault and was sponsored by ISRM and ARMA. More than 100 participants discussed how to efficiently obtain quality rock properties relevant to field development planning and for design issues.

The symposium comprised 44 technical sessions and two poster sessions, with a total of more than 350 papers. The symposium has become, following a growing pattern from past events, multinational, with just over 50% of the papers from countries outside the US.

All papers were peer reviewed, and a special issue of *Rock Mechanics and Rock Engineering Journal* will include a representative sample of the contributions made at the symposium. The presentations at the meeting were loosely grouped into four tracks: petroleum, mining, civil, and interdisciplinary. It is interesting to note that the majority of the sessions were truly multidisciplinary, with presentations and participation of professionals from different industries. This follows a trend observed in the last ARMA symposia where the problems, and many times the approaches taken and the solutions proposed, cut across disciplines. The range of topics covered was very broad, including "classical problems" such as rock mass characterization or stability and support of caverns and tunnels, to name a few, to more recent challenges such as carbon sequestration and geothermal energy. Another trend is the greater involvement of rock

mechanics/geomechanics in addressing new societal demands for water, energy, and sustainability. The search for new sources of energy is turning towards geothermal energy and unconventional resources, where mechanics, temperature, fluid flow, and chemistry issues all fall into the realm of our profession.

The symposium also included five plenary lectures. The lectures were intended to cover topics from theory and fundamentals to applications, from micro to planetary scales, thus mirroring the great diversity in rock mechanics/geomechanics. Fundamental and theoretical issues were addressed by Paul Young in his lecture, "Rock Fracture Dynamics and Induced Seismicity," where he shared his experience at the University of Toronto on experimental rock deformation and geophysical imaging, and by John Rudnicki with his lecture, "Formation and Extension of Localized Compaction in Porous Sandstones," where he proposed theoretical considerations for the formation and extension of compaction bands as observed in the laboratory and in the field. Applied rock mechanics was the focus of the lectures by Luis Alfaro, "The Panama Canal Expansion," where he described the project for the widening of the Panama Canal -- one of the most iconic projects in geomechanics, and by Paul La Pointe in his lecture, "It's the Cracks that Matter: DFN Modeling of Everything Rock," an exploration of the wide range of applications of discrete fracture network approaches and synthetic rock mass models. Jay Melosh, the MTS lecturer, took rock mechanics to planetary scale with his lecture, "Dynamic Fragmentation, Asteroid Impacts and Meteorites from Mars," where he discussed the formation of meteorite craters and the possibility of transfer of life across planets. (Editor's note: These lectures and more can be found on the ARMA website at [www.armorocks.org](http://www.armorocks.org) under the "resources" page.)

Two short courses complemented the symposium: "Floor Stability in Underground Coal Mines: The Illinois Basin Experience," given by Murali Gadde, and "Monitoring and Modelling Seismic Rock Mass Response to Mining," taught by Richard Lynch from the Institute of Mine Seismology. Three technical tours were available: Urban Underground Limestone Mine, Fermilab, and Chicago's Tunnel and Reservoir Project (TARP).

The success of the 46<sup>th</sup> ARMA Symposium was the result of the efforts and dedication of a number of individuals. They include the organizing committee chaired by Antonio Bobet and members Steve Brandon, Bill Dershowitz, Chuck Dowding, Russ Ewy, Murali Gadde, Giovanni Grasselli, Bezalel Haimson, Haiying Huang, Joe Labuz and Peter Smeallie. Peter A. Dickson, MWH Global, was instrumental in putting together the technical tours, and Kathryn Greco, Hill Montague, Katharine Smeallie, and Wayne Gibson provided the technical support for the symposium. The sponsors, Agapito Associates, Inc., Chevron, ConocoPhillips, Golder Associates, Inc., Haley & Aldrich, Inc., Itasca International Inc., MTS Systems Corp., MWH Global, and TerraTek contributed to the economic success of the symposium.

The 46<sup>th</sup> Symposium reflects the continuous growth of the US Rock Mechanics/Geomechanics symposia over the past few years. While we look back at its success as a testimony of the increasing interest in rock mechanics/geomechanics in the US and around the world, we also need to look forward for the new and exciting things to come in June 2013, in San Francisco, with the 47<sup>th</sup> US Rock Mechanics/Geomechanics Symposium.