

Department of Mathematical Sciences
Colloquium

DR. MARK BAKER
Geomedia R&D

*Gravity Prospecting:
Applied Mathematics in Diagnostic Reasoning*

The study of the earth's gravity field has motivated developments in mathematics and physics for centuries, establishing potential theory as a mature, almost moldering discipline. Unfortunately, gravity interpretations in environmental, mineral, and oil investigations are still severely hampered by the handicap that the inverse problem is ill-posed: an infinite number of density distributions map to the same gravity field. I'll give a quick survey of ways geophysicists parameterize computation of gravity from a density distribution, and how these approximations influence attempts to interpret the density distribution from the potential field. I'll then discuss how we've attempted to quantify the nonuniqueness in a framework of hypothesis testing in our consulting business. Finally I'll present a tentative, intriguing approach to quantifying the uncertainty that mixes elements of Kalman Filtering and interval methods. The absence of a mathematical underpinning is offset by computational advantages and intuitively satisfactory results in early tests of small well-defined problems.

Friday, January 25, 2008 at 3 pm in Bell Hall 143
The University of Texas at El Paso

Refreshments will be served in front of the colloquium room, 15 minutes before the start of the colloquium.

For further information, please contact Dr. Pavel Solin, Bell Hall 220. Phone: (915) 747-6770, email: solin@utep.edu.