

# **MORE Science at UTSA**

## **Environmental Science and Engineering**

### **Spring 2007 Seminar Series**

**Where:** Loeffler room (3.03.02) in the BioScience Building

**When:** 4:00 PM – 5:00 PM on April 20, 2007

**Refreshments will be provided**

**Speaker: Dr. Zuoxun Zeng**



**Zuoxun Zeng, PhD**, is currently a visiting Professor of Geology in the Earth and Environmental Science, University of Texas at San Antonio and Professor of Geology in the Faculty of Earth Sciences, China University of Geosciences. His research and teaching focus on (i) Structural Geology, (ii) Rock Rheology and (iii) Physical Modeling and Numerical Modeling. In particular, he uses physical modeling and numerical modeling to answer structural and tectonic problems; estimates rheological parameters from rock deformation, local and regional structures, and structural patterns; and applies his expertise in Structural Geology for petroleum and mineral resources exploration, stability assessment for engineering site selection and regional crust, and planetary studies. He won the honor of outstanding teacher of China University of Geosciences in 2003. He finished over 10 projects funded by the Natural Science Foundation of China, Ministry of Geology and Mineral Resources, Ministry of Land and Resources, and Ministry of Education of China. He published 7 books and more than 80 journal papers. He won 3 second-grade awards from the Ministry of Geology and Mineral Resources of China and from Hubei Province of China.

**Topic: Differential Rotation of Mars Inferred from Uninucleus-Type and Binucleus-type Vortex Structures**

Vortex structures are common structural pattern on Earth. They developed in different scales: from microscope to regional scales. We recently found that both uninucleus-type and binucleus-type vortex structures exist on Mars: the uninucleus-type in the two polar ice caps and the binucleus-type in the Tharsis area of Mars. This suggests a differential rotation of Mars. According to the information from the uninucleus-type vortex structure in the polar ice caps, we suggest that the differential rotation exists between the permanent-frozen core parts of the ice caps and their outer parts, due to an accelerating rotation of Mars. The Tharsis binucleus-type vortex structure is centered at the major center of tectonic activity and volcanic activity of Mars from the equator region expanding to the northern and southern hemispheres. We believe this is resulted from the differential rotation between the northern hemisphere and the southern hemisphere of Mars, due to differences in crust's thickness and elevation of the two hemispheres, i.e., the Martian Dichotomy.