Monday, January 12, 2009

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $28 Preregistered members; $35 non-members & walk-ups

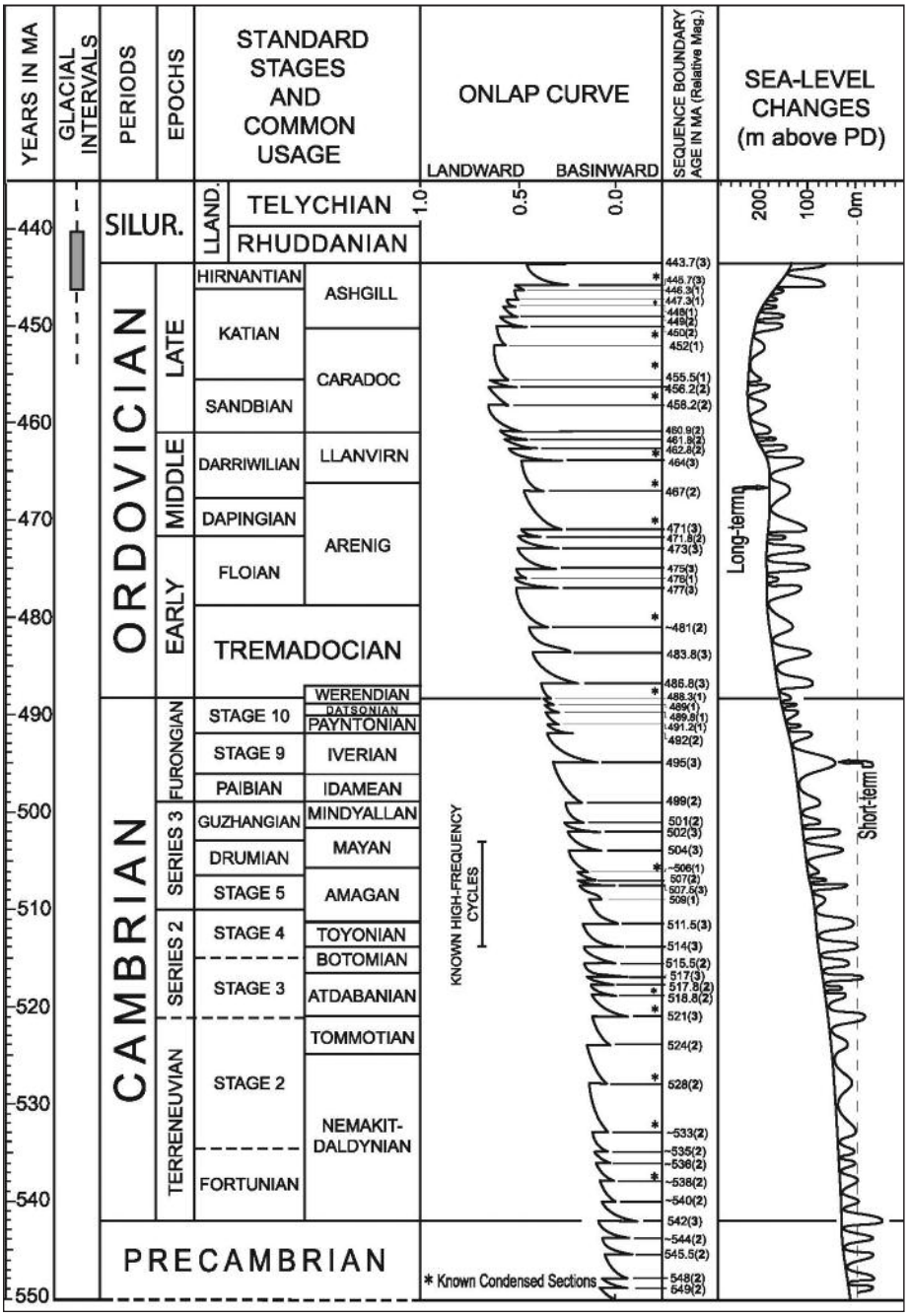
To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

HGS General Dinner Meeting

Dr. Bilal Haq
Director for Marine Geosciences Programs at National Science Foundation (NSF)

A Chronology of Paleozoic Sea-Level Changes

A global synthesis of Paleozoic sequence-stratigraphic data has led to new insights into the nature, amplitude, and causes of base-level changes for this era. A "modal mean" Paleozoic sea-level curve is proposed based on "reference districts" from around the world, corroborated with data from ancillary sections. Estimating the amplitude of sea-level changes in the Paleozoic involves two separate measures: 1) long-term envelope of the sea-level changes driven by long-term tectonic processes, and 2) shorter-term third- and higher-order eustatic sea-level changes driven by glacial and other, unknown, processes that can be widely documented.



Cambrian-Ordovician sea-level changes. The time scale and standard and regional stages are modeled.

Accurate estimates of the magnitude of sea-level changes from stratigraphy remain a challenge.

For the long-term envelope, a consideration of the global continental flooding estimates with epeirogenic corrections, stacked regional sea-level data, and modeling results for mean age of the oceanic crust seem to yield consistent results. For the shorter-term eustatic changes, sea-level rise and fall estimates from "reference districts" for various time slices is considered the best approach. Reference districts are localities where tectonic quiescence prevailed and thus the "modal mean" signal is more likely to be preserved.

Nevertheless, accurate estimates of the magnitude of sea-level changes from

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stratigraphy remain a challenge. As for the causes of short-term sea-level changes, nearly 38% of the Paleozoic experienced some or significant glaciation and thus a glacio-eustatic cause can be invoked for those intervals. For the remaining time, when there is no known evidence of ice accumulation, the trigger for sea-level changes is as yet unknown and remains one of the major mysteries of the earth sciences. ■

Biographical Sketch

Dr. Bilal Haq has served as the director for Marine Geosciences Programs at National Science Foundation (NSF) since 1988. He received his PhD and DSc degrees in marine geology from the University of Stockholm in Sweden. Before coming to the NSF, he carried out research at Woods Hole Oceanographic Institution in Massachusetts and Exxon Research Labs in Houston, Texas in several fields of geosciences. He has participated in four ocean drilling expeditions in the Pacific, Indian, and Southern Oceans, the latter two as co-chief scientist. He has been an American Association of Petroleum Geologists distinguished lecturer and a recipient of the Francis Shepard medal for "excellence in marine geology." He also received the NSF's Antarctic medal and was elected a fellow by the American Association for the Advancement of Science in the year 2000. In 2004, he was awarded American Geophysical Union's Ocean Sciences award for "outstanding and sustained contributions" to marine sciences. He has published extensively on a wide variety of topics, including sequence stratigraphy and global sea-level changes of the past, paleoclimatology, paleobiogeography, paleoceanography, natural gas hydrates, and global warming and its impacts on maritime economies. Dr. Haq has also held assignments with the World Bank and the White House in Washington DC.

Crozon Fieldtrip