

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.

Dinner Meeting

David Rajmon
Rock Characterization and
Modeling Research Team
Shell International E&P
Houston, Texas

Hydrocarbon Accumulations and Exploration Considerations Associated with Impact Structures

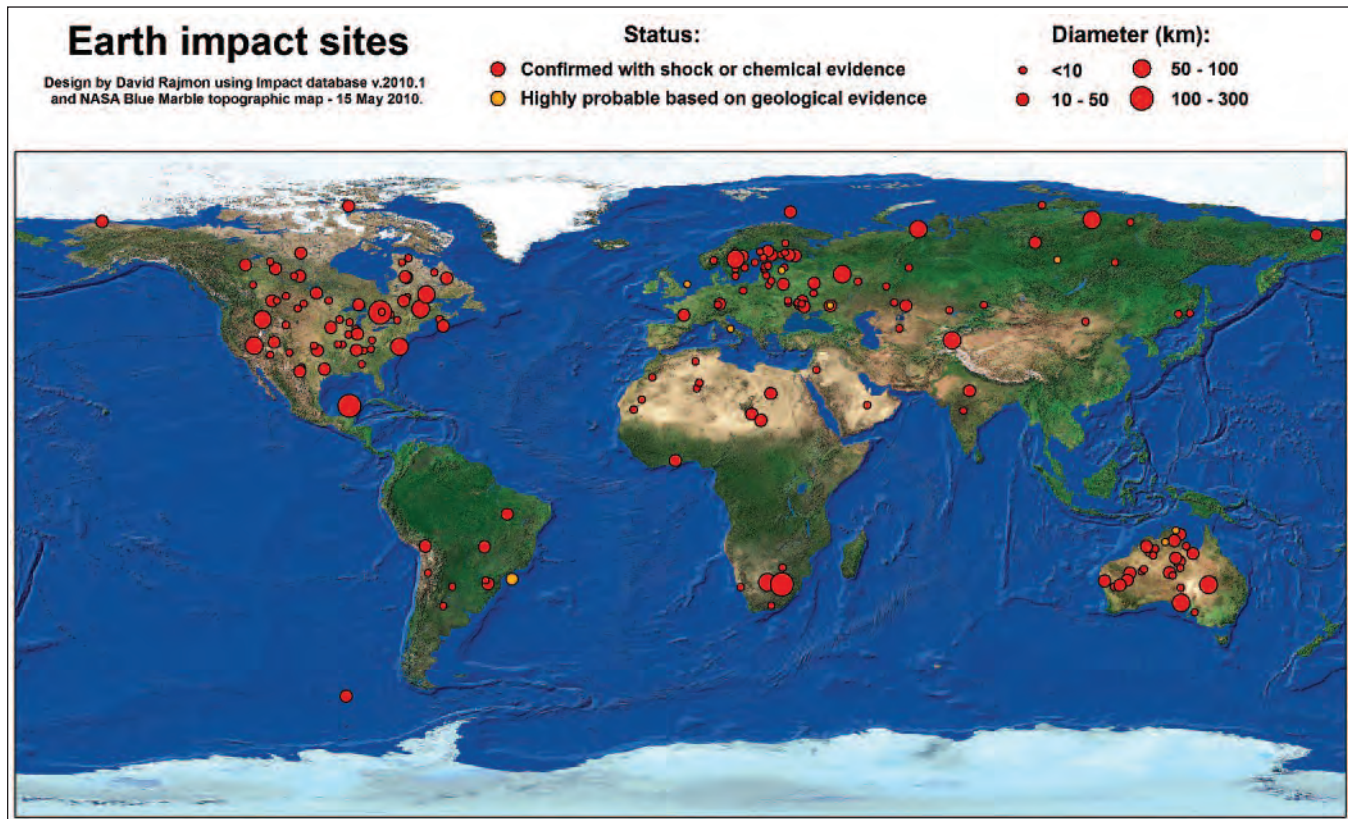
High-velocity impacts of solid bodies on planetary surfaces trigger an explosion-like process resulting in characteristic circular structures called “impact craters or structures”. Approximately 180 impact structures have been recognized on Earth, representing about a quarter of the estimated preserved structures in the geological record. The impact events are an integral part of the Earth’s geological history and some of them have presented significant economic opportunities.

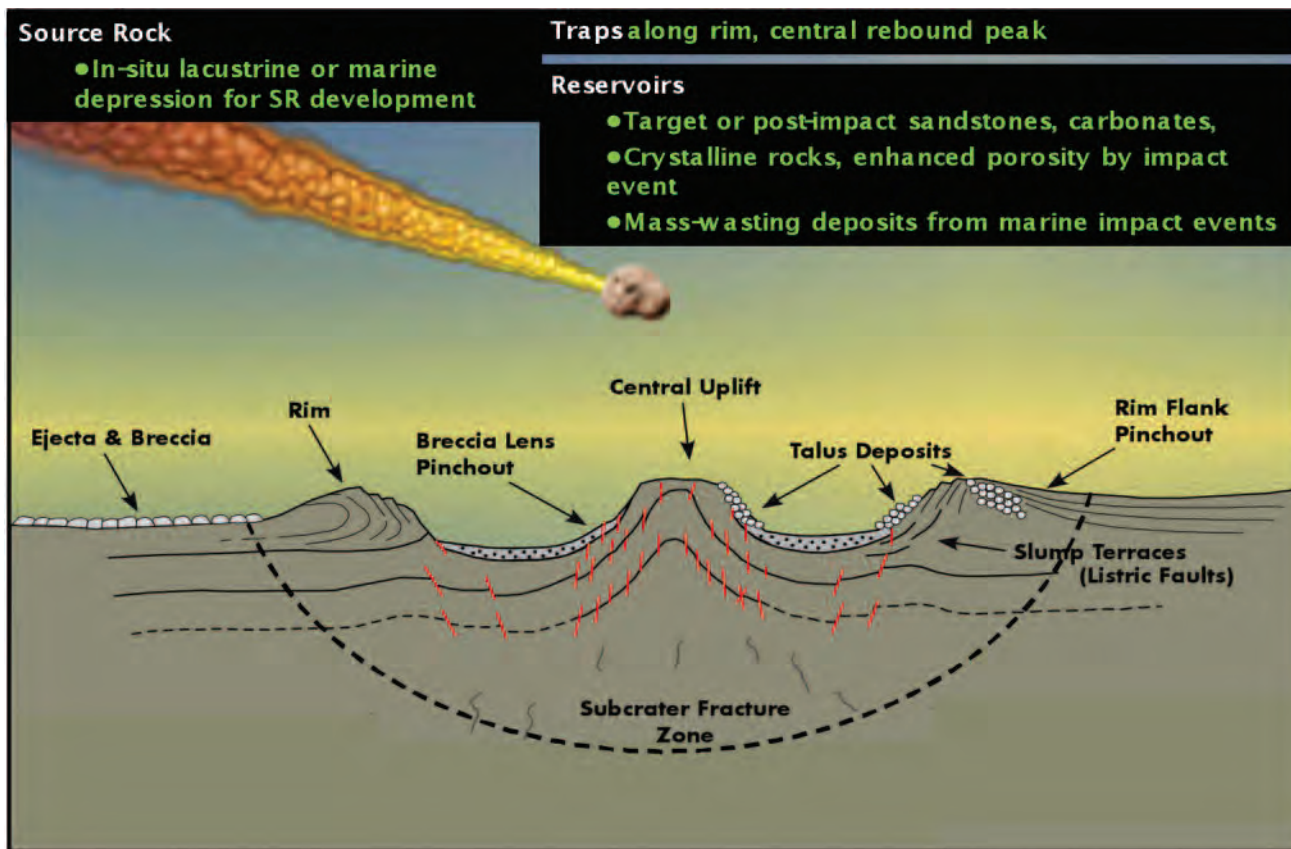
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circumstances. Drilling success rates in an impact setting are comparable to those in any other play. The recoverable hydrocarbon reserves in the following structures owe their origin in part to the impact process: Ames (Oklahoma; 53 mil. boe), Avak (Alaska; 9 mil. boe), Cloud Creek (Wyoming; 3-30 mil. boe), Eagle Butte (Alberta, Canada; 8 mil. boe), Newporte (North Dakota; 15 mil. boe), Red Wing (North Dakota; 43-73 mil. boe), Steen River (Alberta, Canada; 0.3-1 mil. boe), collapse breccias of the Chicxulub structure (Mexico; 57 bil. boe), and possibly one accumulation at Tookoonooka (Australia; 0.3 mil. boe). The same

The impact process can facilitate or hinder any critical element of a working hydrocarbon system, depending on the geological

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appears to be true for the accumulations at the probable impact structures Bee Bluff (Texas; 0.3 mil boe), Calvin (Michigan; 3 mil boe), and Viewfield (Saskatchewan, Canada; 12-14 mil. boe). Additionally, immature post-impact source rocks have been mined at Boltysk and Rotmistrovka (Ukraine), and also documented at the Obolon (Ukraine), Flynn Creek (Tennessee), and Ries (Germany) structures.

Contrary to previous work, this study documents that: 1) the accumulations at the Marquez (Texas) and Sierra Madera (Texas) structures are not related to the impact process, 2) the heat generated during an impact event does not contribute to the maturation of the pre- or post-impact source rocks, and 3) there are no spatial or temporal trends in the distribution of impact structures that could be used to guide exploration for undiscovered structures. However, the probability of finding an impact structure of a particular size in a particular sedimentary basin can be estimated from the known cratering rates, the time span, and the area of the basin. Deep ocean floor areas must be excluded because the thick water column prevents formation of most impact structures. Aerially extensive data sets (i.e. seismic, potential fields, and imagery) can also be used to scan for circular structures. ■

Biographical Sketch

DAVID RAJMON is a geologist in the Rock Characterization and Modeling Research Team in Shell. Joining Shell in 2003, he

initially worked in reservoir modeling research but soon settled his interest on basin modeling, mainly issues related to rock properties integration with petrology and wider geologic context, thermal modeling, diagenesis, and pore pressure. His exploration projects covered most of offshore Brazil and his research projects used models of GoM and offshore NW Borneo.



Dr. Rajmon received B.S. and M.S. degrees in geology/geochemistry at the Charles University in Prague, Czech Republic, and a Ph.D. in geology at the University of Houston. During his school years, he worked on various aspects of impact cratering involving ⁴⁰Ar/³⁹Ar thermochronology, petrology, paleomagnetism, lunar geology, and remote sensing. He was active in science popularization (associate staff at the Štefánik Observatory, 1992-1998, and vice-chairman and TV program chief editor at the Astropolis Society, Prague, 1997-1998) and he taught at the Charles University and the University of Houston (1998-2003).

Mr. Rajmon runs basin-modeling and impact-cratering groups on LinkedIn and is developing an on-line impact database which has become the reference work in the field.