

Pinpointing oil, gas below earth's surface focus of UH prof's research

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To a hydrocarbon-thirsty world, finding an easier way to locate oil and gas prior to drilling is the difference between knowing whether you have a full or an empty glass to consume, says one University of Houston geoscientist.

The next revolution in hydrocarbon exploration and subsurface reflection seismology is being fueled by new algorithms developed by John Castagna, UH Robert and Margaret Sheriff Chair in Applied Geophysics. For his groundbreaking research, Castagna is the 2005 recipient of the prestigious Reginald Fessenden Award from the Society of Exploration Geophysicists (SEG) and was presented with the award at the SEG 75th Annual Exposition and Annual Meeting this week in Houston.

Recognizing those who have made a specific technical contribution to exploration geophysics, the award is named after Reginald Fessenden for his role as the originator of the concept of reflection and refraction surveying in 1917. Castagna joins three other UH geosciences faculty who are also past SEG honorees – Professors Robert Sheriff, Fred Hilterman and Kurt Starck.

Specifically, Castagna is being recognized for his development of an algorithm to predict seismic-wave velocities needed for direct hydrocarbon indicator (DHI) analysis, which is oriented toward directly detecting oil and gas reservoirs using seismic data. Subsurface reflection seismology is like a sophisticated version of the echo sounding used in

submarines, ships and radar systems. The algorithms that Castagna has been developing detect not only fluid but also the type of fluid, such as oil, gas or water, in subsurface reservoirs and are helping to image, explore and identify those subsurface reservoirs that are filled with hydrocarbons in a cost-effective way.

"To imagine that we have advanced the last several years from simply imaging possible subsurface reservoirs or traps that may or may not contain hydrocarbons to actually detecting, in that same seismic record, whether those potential reservoirs contain hydrocarbons is truly amazing," said John F. Casey, chairman of UH's Department of Geosciences. "Utilizing the full seismic record and more advanced ways of collecting and processing the data means that explorers have yet another seismic tool to explore the subsurface. They no longer have to drill costly holes to penetrate the reservoir before there is a much higher probability of a hydrocarbon discovery."

Source: University of Houston

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