Vadodara Chapter of SPG (Society of Petroleum Geophysicists) and APG (Association of Petroleum Geologists) organized a series of technical webinars on 10th & 12th September 2020. The objective of the lecture series was aimed towards knowledge sharing amongst the geo-scientific community with an active industry-academia collaboration. The sessions were chaired by Patron, SPG & APG, Vadodara Chapter, ED-Basin Manager Shri H. Madhavan and active participation from members of SPG and APG Vadodara, students from MS University and Kutch University. The first technical talk on “Principles of Gravity in Petroleum Exploration” was delivered by the guest speaker Sh. J N Prabhakarudu, an Ex-ONGCian, a Domain Expert in the field of Gravity & Magnetic and other non-seismic methods, having rich experience of more than three and a half decades. He has authored three technical books and to his credit has a patent on Microgravity Method for Petroleum Identification in his name. The session commenced with a brief address by the SPG Patron Shri H. Madhavan, wherein he welcomed the guest speaker and exhorted the young executives for a proactive and a research oriented approach.

The technical talk by Sh. Prabhakarudu, dealt with different case studies pertaining to gravity anomalies in Cambay, Saurashtra and Vindhyan basins, and their utilities in hydrocarbon prospecting. He also elucidated various advanced techniques in gravity anomaly surveys, viz. Micro-gravity, Borehole gravity, 4D gravity and Full tensor gravity gradiometry.

Glimpses: Talk on Principles of Gravity in Petroleum Exploration

Two technical talks were delivered by distinguished guest speakers from Academia on 12th September 2020, Prof. M. G. Thakkar, HOD, Dept. of Earth and Environmental Science, KSKV Kutch University, and Prof. Dhananjay Sant, MS University Baroda. The online sessions commenced with a brief welcome address by Shri H. Madhavan.
The first technical talk was on the “Geology of Kutch Basin” by Prof. M.G. Thakkar. Having vast experience and deep understanding of geology of Kutch area, he began with explaining the physiographic divisions of Kachchh region. The area is an excellent example of a tectonically controlled landscape, whose physiographic features are a manifestation of the earth movements along the tectonic lineaments of the Pre-Mesozoic basin configuration, which was produced by the primordial fault pattern in the Precambrian basement. Physical features of Kachchh are characterized by the contrasting occurrences of extensive plains and highlands with rugged topography.

Kachchh can be divided into four main physiographic units from north to south, viz,

1. The Rams
2. The low lying Banni plain
3. The Hilly region
4. The southern coastal plains

Prof. Thakkar also elaborated extensively about the general stratigraphy of the region, and then delving into the tectonic settings of the Kachchh Basin.
The second technical talk was on the topic, “Microtremor Study (HVSR) in Kutch Basin” by Prof. Dhananjay Sant. He elucidated his research work on Microtremor - Horizontal to Vertical Spectral Ratio (HVSR) technique, as a tool to map the extension of rock outcrop/features in subsurface, and to demarcate distinct rheological contrasts up to shallow depth of 2000 m. Microtremor surveys use ambient noise as the signal. Their ability to generate rapid single station records at a required resolution, and the cost effective operations, are some of the incentives of using a microtremor survey.

Prof. Sant then presented his research work in Kachchh region, a maiden attempt to map shallow subsurface rheological interfaces laterally across the Banni Plains and to decode geometry of the antecedent faults associated with the Kachchh Mainland Fault using the microtremor method.

Prof. Sant further clarified that the ambient noise encapsulates fundamental resonant frequency of the sediment layers. These resonant frequencies derived from the microtremors show strong correlation with the velocity of the Rayleigh waves and the thickness of the sediments. For a given fundamental resonant frequency, there exists an empirical relationship between the depth of an interface and the velocity of seismic waves (Vs) for the given interface.

The event culminated with the concluding remarks from SPG Patron Sh. H. Madhavan, who thanked the guest speakers for such insightful talks and emphasized in more such Industry Academia collaborations. The event was a grand success attended by more than 130 participants.

President SPG Shri Rajesh Madan, GGM (GP) and Vice President Shri G Ganeshan CGM (Geol) and the Basin Office were instrumental in making the event successful. The vote of thanks was given by Sh. Sanjay Kumar, Secretary, SPG Vadodara Chapter. The event was ably compered by Mr. Vipul Chawla, Jt. Secretary, SPG Vadodara.