SPG student chapter IIT Roorkee Organizes Guest Lecture by **Mr. N K Khatri**

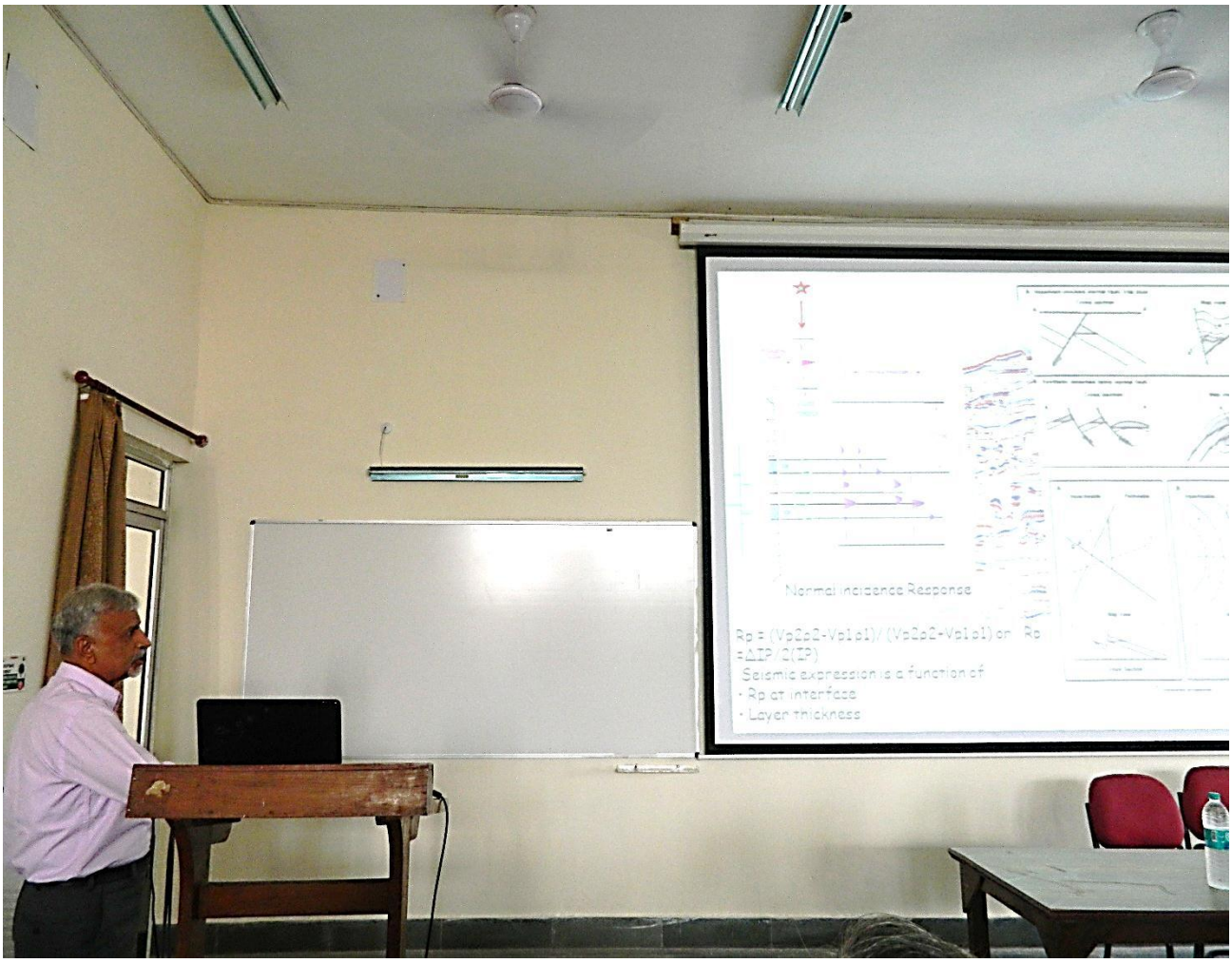
SPG student chapter at the department of Earth Sciences, IIT Roorkee, organized Guest lecture- " Rock Physics and Reservoir Characterization through Surface Measurements" by Mr. N K Khatri, on 22nd of October 2013. Mr. Khatri is a distinguished geophysicist presently working as DGM at Institute of Reservoir studies (IRS), ONGC, Ahmedabad.

Around 80 students from the disciplines of geology and geophysics attended this talk, as the topic was related to industrial application of their curriculum, students actively took part in the discussions. The lecture was graced by the presence of faculty members of the department and found it enlightening.

Mr. Khatri initiated the talk, by introducing the basics of " Rock Physics" and the elastic parameters, their relation with lithology, hydrocarbon and porosity, and the behavior of Vp-Vs curves for water saturated sandstones and limestones respectively. It was illustrated that the water saturated sands showed linearity whereas the limestones gave a non linear relationship between Vp and Vs. The relationship of density and Poisson's ratio with the fluid saturations and the rock parameters (K and μ) respectively was also portrayed. Importance of variation of Vp/Vs ratio with poisson's ratio was also emphasized. The talk later proceeded to the introduction of Gasmann and Woods equations which were used to determine bulk porosity of a rock using parameters like bulk modulus of formation fluids, their saturations and the porosity.

All these parameters and their relationships were used for interpretation of the rock properties using seismic data with the help of case studies. The solution to the Zoepritz equations with the Aki-Richards approximations were analyzed for the two important parameters viz. reflection coefficient (A), given by the relative hardness of the rock across the interface and gradient (B), given dominantly by the relative Poisson ratios of the rock across the interface. The plots of A (intercept) versus B (gradient) were used to infer the type of fluid present for e.g. Brine, gas, oil. The fluid line in these plots becomes non-linear owing to the gas bearing and oil bearing formations. The AVO interpretation fundamentals were confirmed through well seismic tie of resistivity and porosity logs (Neutron log) in a case study. Lesser Vp and higher Vs corresponding to the gas interval illustrated the break in linear trend of Vp and Vs.

The interpretation part of the lecture showcased a number of case studies such as "High amplitude anomaly in Pliocene on seismic data are studied for presence of Hydrocarbon", "Finger printing of high amplitude anomaly for gas sands of Pliocene in the fields of KG offshore where several wells had been drilled" and "Ruling out presence of hydrocarbon in deep waters of Mahanadi Basin".



Mr. N K Khatri, DGM-(Geophysics) ONGC, delivering the lecture

Students and faculty members attending the talk