

# IITR Earth Sciences Research Talk

Wednesday Sept 11, 2019

4:00 PM

Mittal Hall



## **Study of basement faults in the Ganga plain: A geomorphological and geophysical approach**

**Narendra Kumar Patel**



### **Abstract**

Basement faults in the Ganga plain always remain as nightmare for geoscientist community, as these are under thick sedimentary cover. As direct study of these fault are not possible; uncertainties always remain about the nature and attitude of faults, width of fault zone, last spatial and temporal activity and recurrence period. However, their temporal reactivations due to the Himalayan collisional tectonics have triggered many large earthquakes in the foreland region in Holocene. In response to fault activities fluvial geomorphology around the fault zones have been readjusted which possess the spatial and temporal imprint of seismicity along the faults and the tentative width of the subsurface fault zone. In the present study, an attempt has been made to address these uncertainties particularly using tectonic geomorphology along surface expression along faults. As these faults are directly linking the Himalayan front to the peninsula, the degree of tectonic instability along the Himalaya is reciprocated through the activities of these faults. Those basement faults show wide fault zones, more number of earthquakes and frequent shift of river systems with larger values of tectono-geomorphic parameters too correspond to the segments of the Himalaya record high degree of uplift at present. Geological and geophysical parameter shows tectonics activity along basement fault of the Ganga plain.

### **About the Speaker**

I am working in neotectonics and geomorphological evolution in the Ganga plain and the adjacent Himalayan terrain. I completed Master of Technology (MTech) degree in Geosciences in June-2014 from the Indian Institute of Technology, Kharagpur.

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## Applications and Limitations of Digital Rock Physics in Geosciences

**Shruti Malik**



### **Abstract**

Core samples have always been used to determine the properties of a reservoir using typical laboratory methods. But, these measurements render the cores unusable. While access to cores and the luxury of running multiple experiments fast is becoming rarity, digital methods of image processing and delineation of pore network are becoming increasingly approachable. Digital Rock Physics (DRP) is one such method that makes use of scanned images of the core plugs to determine the petrophysical properties of a reservoir, viz. porosity, permeability, saturation etc. DRP involves imaging the core samples and simulating the physical processes to understand the behaviour of the reservoir. DRP is now gaining popularity with vast applications in fields like, geology, groundwater studies, etc. In spite of its various applications there are certain limitations such as scaling issues, scanning at lower resolution than desired. Overcoming the limitations can help in pushing the DRP as a standard tool in reservoir exploitation programs.

### **About the Speaker**

Shruti Malik is currently a Senior Research Fellow at Department of Earth Sciences. She is working in the domain of Digital Rock Physics. She received her Masters (M.Tech.) in Applied Geophysics from Kurukshetra University, Kurukshetra. She intends to optimize an algorithm for performing segmentation and perform flow simulation to consider the effect of various petrophysical parameters on production of a reservoir.