



**Field Transect: NER004, Tectonic evolution of NE Indian Craton, Meghalaya Plateau: Journey from Pre-Grenvillian - Grenvillian Orogeny to Pan-African Orogeny and Gondwana break-up**

**Geological Significance:**

- The Meghalaya Gneissic Complex comprises dominantly of granite gneiss with enclaves/restites of high grade metasediments and metabasics. Meghalaya Gneissic Complex records different phases of prograde to retrograde metamorphism varying from amphibolite to granulite grade with counterclockwise pressure–temperature path and different stages of deformation.
- The metamorphism of this terrain records Pre-Grenvillian to Grenvillian to Pan-African orogenic imprints. Recent studies in Proterozoic sediments (Shillong Group) reveal the repetitive cycles of volcano-sedimentary package.
- Numerous granitoids mostly of Pan African age have intruded the gneissic complex. The granitoids are mostly I-type and record magma-mingling processes.
- There was a gap of Paleozoic events in this part of Indian crust except development of narrow Gondwana basins in the western part of Meghalaya Craton. The plateau again rejuvenated during Cretaceous time when Alkaline Complex (Sung Valley Complex), subaerial volcanism (Sylhet Trap) and uraniferous sandstone (Mahadek sandstone) were deposited. Cretaceous sediments of Lower Mahadek suggest a marginal marine environment rather than typical fluvial origin. The emplacement of Sylhet Traps and depositional environment of Mahadek sandstone particularly of the lower uraniferous part is not defined. However, there is a scope for further study to relate them with Gondwana break-up. The interlayered carbonate and siliciclastic sediments of Tertiary age are well exposed in southwestern part of Meghalaya plateau.

**International Attraction:**

- ✓ The understanding of metamorphic evolution of Mesoproterozoic granulites in the Meghalaya Gneissic Complex is still an enigma to geoscientists world over. Their similarity with temporally related rocks elsewhere in the Indian shield indicates that the Shillong Plateau has been a part of the Indian shield since the Mesoproterozoic time. Evidence of Rodinia break-up is preserved in the volcano-sedimentary sequence of Shillong Group.
- ✓ The records of significant geological events of Grenvillian to Pan-African Orogeny to Gondwana break-up will help the researchers on global Pan-Gondwana reconstruction.

**Duration: 5 Days**

**Date of Excursion: Post Congress**

**Max. Participants:20**

**GEOTOURISM SITES:**



Clean water of Umngot river,  
Dawki



Natural root bridge, Mawlynn  
Meghalaya



Seven sister water falls,  
Cherrapunji

## Geological Field Photographs:



Exposure of garnet-cordierite gneiss



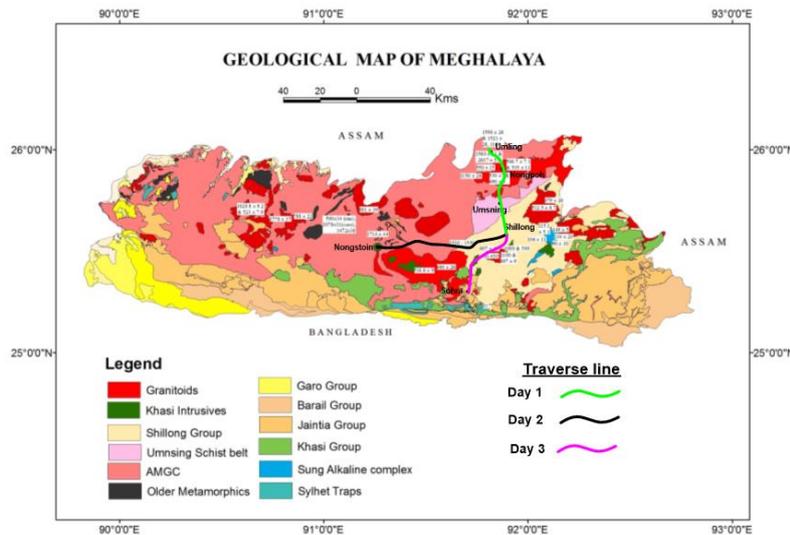
Outcrop of alternate mafic and charnockitic bands



Faulted contact between Proterozoic Shillong Quartzite and Cretaceous conglomerate



Basic granulite exposed at Kynshi



### GEOTOURIST SITES



Stalactite in limestone cave



Umiam lake, Barapani



Don Bosco Museum,  
Shillong



Arwah-Lumshynna Cave