**Nonlocal and Quantum advantages in network coding for multiple access channels**

Ashutosh Rai

KAIST, Korea

We consider two-sender and single receiver discrete memoryless multiple access channels. We assume there is no feedback from the receiver to the senders. The input and output of the channel are classical information. Senders are space-like separated (i.e., there is no communication link between senders). Suppose senders share some entangled quantum state, then we study enhancement in reliable rates of transmission due to entanglement assistance to the considered channels. We show that entangled states shared between the senders can lead to better block codes to multiple copies of a channel and achievable rates of transmission can be improved by sharing entangled states between the senders. Considered channels are modeled on nonlocal games where output from the channel depends on whether inputs to the channel satisfy winning conditions in such games.