Please find below a brief bio. of the speaker and the abstract of the talk.

Brief Bio - Naqueeb Ahmad Warsi graduated from the Faculty of Engineering and Technology, Jamia Millia Islamia, New Delhi with a B.Tech in Electronics and Communication Engineering in 2006. After that, he worked as a scientist for the Space Application Center (Indian Space Research Organization) until 2009. He then went on to obtain a PhD in information theory from the Tata Institute of Fundamental Research in Mumbai in 2015. He worked as a Postdoctoral researcher in the Department of Engineering Science at the University of Oxford from June 2015 - Feb 2016. He will soon be joining the Center for Quantum Technologies at the National University of Singapore to work as a Postdoctoral researcher. His research interests lie in the area of classical and quantum information theory, particularly information theoretic problems in the non-asymptotic regime.

Abstract - The goal of information theory is to understand the limits of data compression and communication in the presence of noise. Traditionally in information theory literature it is common to study the underlying problems in the asymptotic setting, often assuming that the channel characteristics do not change over multiple use. The proofs appeal to typicality of sequences or subspaces: the empirical distribution of symbols in a long sequence of trials will with high probability be close to the true distribution. However, information theoretic arguments based on typicality assume that both the source and channel are stationary and/or ergodic (memoryless), assumptions that are not always valid. In this talk we will discuss some information theoretic protocols in the information-spectrum setting wherein there is no assumptions on source or channel being stationary and/or ergodic (memoryless). Such results are more general, for one can recover the asymptotic bounds in the i.i.d. (independent and identically distributed) setting as a special case. The general information-spectrum results, while sometimes technically harder to show (for arguments based on typicality is no longer available), are often so strong that nothing is lost in deriving the asymptotic i.i.d. results from them. We discuss the following results in the talk:
1) Marton inner bound for the classical-quantum broadcast channel (joint work with Jaikumar Radhakrishnan and Pranab Sen)
2) Coding for classical-quantum channel with rate limited side information at the encoder (joint work with Justin Coon)