ICTS Colloquium

Title	:	Computational phases of matter
Speaker	:	Abhishodh Prakash, ICTS-TIFR, Bangalore
Date	:	Monday, November 4, 2019
Time	:	3:30 PM
Venue	:	Emmy Noether Seminar Room, ICTS Campus, Bangalore
Abstract	:	Any information processing and computing requires the existence of resource states i.e. physical systems on which information can be stored, processed and retrieved at will. Magnetic materials have been very useful as resource states for classical computing. Here, the utility of these materials is a consequence of the phase of matter they belong to i.e. the long range order that exists in them due to spontaneously broken symmetries. I will talk about whether there exist such phases of matter that can act as resource states for quantum information processing and computing. I will focus on a particular scheme, called measurement-based quantum computation, and demonstrate how certain newly discovered short-range-entangled (SRE) phases of matter have the potential to be good resource states. While this was proven for certain limited quantum computational operations, I will describe compelling examples that suggests that a particular class of SRE phases may very well be a universal computational phase of matter.