ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

# ICTS Seminar

**Title** : Quantum Spin Liquids and Emergent non-Abelian Gauge Fields in Controllable Quantum Matter

**Speaker** : Ashvin Vishwanath (Harvard University, USA)

**Date** : Friday, 06 May 2022

**Time** : 03:30 pm (IST)

**Abstract** : For decades, the classical order parameters framework of Landau-Wilson has dominated the discussion of condensed matter systems, with extensions to incorporate topological states of weakly interacting electrons. In this talk, I will focus instead on new physics that arises from strong interactions and its interplay with topology. A unifying theme will be the emergence of gauge fields, which will be illustrated with two recent works. The first describes a route to realizing a long sought-after phase - the Z2 quantum spin liquid - in an array of highly excited (Rydberg) atoms. Experimental progress towards this goal will also be briefly mentioned. Next, I will discuss new strategies to create quantum states including deconfined phases of non-Abelian gauge theories. Measurements play a key role in this proposal. Prospects for realizing these states in existing term quantum platforms will also be discussed.

**Venue** : Offline: Madhava Lecture Hall

Online: Please click on the below link to join the seminar

https://icts-res-in.zoom.us/j/84453201189?pwd=eVVCMDcxMmFTenlHUjExbG85WlBXdz09
Meeting ID: 844 5320 1189
Passcode: 555391