CONDENSED MATTER COLLOQUIUM SERIES

#Ankara

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Arboreal Quantum Phases

The past decade has witnessed spectacular progress in the classification of gapped phases of systems with many quantum degrees of freedom. The long-wavelength description of such phases typically uses quantum field theory with fields placed on a manifold. Motivated by recent advances in quantum technologies that enable the creation of synthetic systems, we define and explore physics in arenas that do not tessellate a manifold, and hence do not yield to conventional quantum field theories on a manifold. The simplest such arenas are made from tree graphs. After introducing these arenas, I will discuss the physics of free fermions on such arenas and demonstrate several new features in the nature of phase transitions. I will then turn to more exotic topologically ordered (long-range entangled phases) in these systems. Highlight results include the demonstration that even the simplest gauge theory in these arenas is fractonic, and a result on the classification of such phases.

Oct, 21, 2025
Tuesday

19:00, (Ankara Time)

Click here for zoom link
Meeting ID: 432 931 6595
Password: 326852

Vijay B. Shenoy obtained his Ph.D. from Brown University in 1998. After a short stint at the Indian Institute of Technology Kanpur, he has been at the Indian Institute of Science, Bangalore. He works in condensed matter theory.

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