

Tuesday, November 4th @ 2pm
Schwinger Lounge

“Entropic Order”

Fedor Popov (SCGP Stony Brook)

Abstract: Ordered phases of matter, such as solids, ferromagnets, superfluids, or quantum topological order, typically only exist at low temperatures. Despite this conventional wisdom, we present explicit local models in which all such phases persist to arbitrarily high temperature. This is possible since order in one degree of freedom can enable other degrees of freedom to strongly fluctuate, leading to "entropic order", whereby typical high energy states are ordered. Our construction, which utilizes interacting bosons, avoids existing no-go theorems on long-range order or entanglement at high temperature. We propose a simple model for high-temperature superconductivity using these general principles.