Department of Physics
THE UNIVERSITY OF HONG KONG

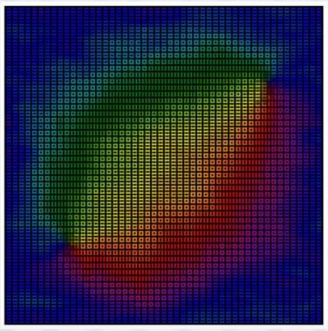
Physics Colloquium

The Enigma of the Deconfined Quantum Critical Point

Date: October 27, 2021 (Wednesday)
Time: 10:00 a.m.
Zoom Online Lecture: https://bit.ly/3G3wQt6
Meeting ID: 947 5336 5247
Password: 2859

Prof. Anders W. Sandvik
Boston University

Abstract:



The deconfined critical point has been proposed to describe “beyond Landau” quantum phase transitions between different ordered ground states of 2D quantum antiferromagnets. Despite years of efforts by many groups using computational model studies to characterize the ground-state transition between an antiferromagnet and a non-magnetic state with a pattern of singlets, the nature of this phase transition is still puzzling.

Moreover, a host of related phenomena that were not part of the original proposal have been discovered, e.g., emergent symmetries, unusual weak first-order transitions, helical dimer order, and possibly spin liquid phases terminating at deconfined critical points. I will summarize the current status of the deconfined critical point emerging from large-scale computer simulations.

I will also discuss recent experiments that finally show real promise to realize the deconfined critical point and many of its associated unusual quantum effects.

Biography:

Anders W. Sandvik is a Professor of Physics at Boston University.

He completed his MSc at Abo Akademi University in Finland in 1989 and his PhD in Physics at the University of California, Santa Barbara, in 1993. He carried out postdoctoral work at Florida State University and the University of Illinois at Urbana-Champaign before returning to Finland as a Senior Fellow of the Academy of Finland in 2000. He joined the faculty of Boston University in 2004.

He has held visiting appointments at the University of Tokyo (2008) and the Institute of Physics of the Chinese Academy of Sciences in Beijing (2018-20). He is a Fellow of the American Physical society, a Simons Investigator in Physics, and the 2021 recipient of the Aneesur Rahman Prize for Computational Physics. His research focuses on computational studies in quantum many-body physics. He is the inventor of the Stochastic Series Expansion method and other widely used simulation techniques. His detailed studies of lattice model models have provided unique insights into collective quantum many-body states and their quantum phase transitions.

Anyone interested is welcome to attend!

Phone: 28592360 Fax: 25599152