

JITCP Seminar

THE UNIVERSITY OF HONG KONG
HKU-UCAS JOINT INSTITUTE OF THEORETICAL AND COMPUTATIONAL PHYSICS
[Thursday afternoon, 4 pm, In Person]

Anyon Dynamics in FQHE and their Experimental Implications

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Anyons are topological objects with fractionalised charge and exotic statistics that can emerge from two-dimensional strongly correlated systems. We show that with fractional quantum Hall (FQH) effect, there are rich dynamics of anyons hosted by even the simplest topological phases. The analytic tools we developed, combined with large scale numerical calculations, show that anyons can undergo fractionalisation near the critical point between the nematic FQH state and the fully gapped FQH state. This leads to a BKT-type phase transition for the low-lying excitations of the Laughlin phase, even when the topological properties of the ground state remain the same. In addition, we show that anyons in FQH systems can be bosonized, and the microscopic interaction Hamiltonians capturing the statistical interactions between anyons can be explicitly derived. The duality from this bosonization scheme leads to previously unexplored families bosonic single-component FQH states at integer filling factors, with explicit microscopic model Hamiltonians. We will also discuss several experimental ramifications from our results.

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In Person Seminar

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Room 522, 5/F, Chong Yuet Ming Physics Building,
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Phone: 28592360, Fax: 25599152. Anyone interested is welcome to attend.