

Fractional Charge and Statistics in Fractional Quantum Hall States

13th Madan Lal Mehta Lecture by
Professor Bertrand I. Halperin
Harvard University

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Venue - Zoom 957 3705 6554 Passcode 730766

Live Webcast - <https://youtu.be/BTEvNWyhqFo>

The fractional quantum Hall states, which occur in certain two-dimensional electron systems in a strong magnetic field, are strongly correlated electron states that exhibit a number of very remarkable properties. It can be shown mathematically that these systems host quasiparticle with fractional charge and either fractional statistics or its extension, non-Abelian statistics. However, experiments to directly demonstrate these properties have proved challenging to carry out. My talk will review the definitions of these concepts, as they apply to quantum Hall systems, and will review some recent experimental developments related to them, including the recent observations of fractional statistics in the state at Landau level filling fraction $1/3$.



Bert Halperin is the Hollis Professor of Mathematicks and Natural Philosophy (Emeritus) at Harvard University. In a career spanning six decades, he has made important contributions to multiple areas of condensed matter physics, including static and dynamic critical phenomena associated with second-order phase transitions, melting transitions of two-dimensional films, quantum hall effects seen in two-dimensional electron gases at high magnetic field, and the electronic properties of nanoscale devices. Multiple generations of budding as well as established physicists have benefited in crucial ways from his wise counsel and deep scholarship, always shared with great generosity. His work has also been recognised with numerous honours and awards including the Buckley Prize, the Onsager Prize, the American Physical Society Medal for Exceptional Achievement in Research, and the Wolf Prize in Physics.