

# Fractional Quantum Hall Effect: The Next Frontier

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While most of the phenomenology of the fractional quantum Hall effect is explained as a consequence of the emergence of topological particles called composite fermions, some puzzles remain. I will talk about three directions that are currently being pursued. (i) The parton theory of the fractional quantum Hall effect [1] has been used to explain certain delicate fractional quantum Hall states [2-5]. (ii) Fixed phase diffusion Monte Carlo method allows a quantitative estimation of the phase diagram of the spin polarized states [6] as well as the crystal state [7]. (iii) A density functional theory has been developed that gives a faithful account of the topological properties of the fractional quantum Hall effect [8].

## References

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