

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

“Berry Fermi Liquid Theory”

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Abstract: Landau's Fermi liquid theory is a milestone of condensed matter physics. It explained many properties in interacting Fermionic systems such as Helium-3 and electrons in metal. But there are interesting phenomena beyond the scope of Landau's theory, including the anomalous Hall effect and the chiral magnetic effect. In recent years, these phenomena have been explained by the Berry phase of the fermion. But such explanations relied on the picture of non-interacting single fermions. As we include interactions, does the Berry phase picture survive? Are there additional interesting phenomena? In this talk we answer these questions and justify our answer with a diagrammatic analysis to all orders in perturbation theory, and we provide an outlook on future directions.

12:00pm
Friday, November 13, 2015
LOW Seminar Room (6C-333)