Fermi Arcs in quantum materials

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Fermi arcs, the open segments of Fermi surface attracted significant interest in condensed matter community since their discovery in the pseudogap state of cuprates. This is because they defy traditional concept of Fermi surface as closed contours and are potentially linked to presence of unusual electronic states. Discovery of topological materials reignited interests in Fermi arcs because they were predicted to exists on at the surface of Weyl semimetals. These topological Fermi arcs and their spin textures may be of special interest for spintronics.

In this talk I will discuss new developments in understanding of Fermi arcs in cuprates, review materials that host Weyl states and spin textured Fermi arcs and present evidence for third type of Fermi arcs that were discovered in antiferromagnetic state of rare earth monopnictides. These states have properties similar to Weyl states, however they occur in topologically trivial hosts. In addition to spin textures they undergo new type of magnetic band splitting linked to antiferromagnetic order of the host.

References

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