

武汉物数所理论交叉学术交流系列报告 (第一三六期)

Itinerant ferromagnetism in 2-component Fermi gases

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LPTMS, Universite Paris-Sud XI
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频标楼4楼报告厅

About the speaker:

Prof. Shlyapnikov is Director of Research at CNRS, LPTMS, Orsay, France, and Professor in Univ. Of Amsterdam. His work on the theory of quantum gases was awarded by the Humboldt Prize (Germany) in 1999, by the Kurchatov Prize (Russia) in 2000, and by the International Bose-Einstein condensation Prize in 2011. He got the European Research Award in 2013. He published about 140 papers which have received more than 9400 citations and H-index of 48.



Abstract:

I will first give a brief overview of the studies of ferromagnetism in 2-component Fermi gases. It will be made clear that the well-known Stoner mechanism is not sufficient for creating an itinerant ferromagnet. I then turn to the one-dimensional case (1D) and show that the presence of attractive odd-wave interaction (analog of p-wave in 2D and 3D) can drive the system to the ferromagnetic state. I will give an example of how this happens at an infinite intercomponent contact repulsion, using Feshbach resonances for tuning the contact (even-wave) and odd-wave interactions. A promising system for the observation of the itinerant ferromagnetic state is a 1D gas of 40K atoms, where the s-wave and p-wave Feshbach resonances are very close to each other and the 1D confinement significantly reduces the inelastic decay.

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