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Liquid and Solid Phases in Two-dimensional Electron Systems

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时间: 11月20日 (星期四) 15:00—16:30

地点: 北京大学物理大楼中212教室

张定, 2008年北大物理学院本科毕业, 2014年德国马普固体所获得博士学位(导师为诺贝尔物理学奖得主Klaus von Klitzing教授), 专长为极低温强磁场下输运测量, 主要研究对象是GaAs双量子阱中的量子霍尔态以及ZnO中二维电子系统的分数量子霍尔效应。目前在清华大学薛其坤院士团队做博士后。

报告摘要: Ultra-clean 2-dimensional electron systems (2DES) under a strong magnetic field host a zoo of emergent states: fractional quantum Hall liquids, stripe and bubble phases, Wigner crystalline states made of either electrons or holes. We report transport studies of these states in a semiconductor bilayer as well as in an oxide system. Firstly, a GaAs bilayer system will be discussed. Its additional layer degree of freedom engenders a novel quantum Hall state - the $\nu=1/2+1/2$ state. Also, the close spacing of the bilayer allows the realization of a sensitive technique to measure the chemical potential. Such a technique helps unveil the formation of Wigner crystalline states around integer quantum Hall states. Finally, we report the observation of even denominator fractional quantum Hall states and reentrant phases in 2DES at the MgZnO/ZnO interface.

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Photograph by Xiaodong Hu