

Functional Properties of Electron Gases at Oxide Interfaces

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Two-dimensional electron gases (2-DEGs) based on conventional semiconductors such as Si or GaAs have played a pivotal role in fundamental science and technology. The high mobilities achieved enabled the discovery of the integer and fractional quantum Hall effects and are exploited in high electron mobility transistors. Recent work has shown that 2-DEGs can also exist at oxide interfaces. These electron gases typically result from reconstruction of the complex electronic structure of the oxides, so that the electronic behavior of the interfaces may differ from the behavior of the bulk.

In the presentation I will provide an overview of our recent experiments analyzing the properties of these unusual electronic systems and explore whether electron gases at oxide interfaces have the potential to be used in electronic devices.