

# Electronic Properties of Two-Dimensional Electron Liquids

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Two-dimensional electron gases based on conventional semiconductors such as Si or GaAs have played a pivotal role in basic 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 two-dimensional electron systems can also exist at oxide interfaces [1]. These electron systems are characterized by properties that fundamentally differ from those shown by semiconductors.

In the presentation we will provide an overview of our studies of the properties of these unusual electronic systems (see, *e.g.*, [2,3]) and explore the potential of electron liquids at oxide interfaces for the use in nanoscale electronic devices.

[1] A. Ohtomo *et al.*, *Nature* **419**, 378 (2002)

[2] N. Reyren *et al.*, *Science* **317**, 1196 (2007)

[3] J. Mannhart and D.G. Schlom, *Science* **327**, 1607 (2010)