change in Curie temperature could be related to the local density of states on the surface of the Co layer. Assuming that the surface is perfectly (111)-oriented, first principles calculations have shown that a charge modulation equal to approximately ±0.012 electrons/Co atom can be induced by the applied gate voltage. However, these calculations also predict that the Curie temperature should decrease with increasing electron number, which is in disagreement with the observed results.

The research team therefore offers a number of alternative explanations for their experimental observations, including the possible intermixing of the Co and Pt layers, as well as the formation of a two-dimensional ferromagnet. The latter case is particularly significant, as it implies that the ferromagnetic ordering is tied to the dimensionality of the system.

These results may lead to a better understanding of the mechanisms of thin-film magnetism and could even lead to the design of an electrically switched "field effect" magnet.

**Steven Spurgeon**

## News

## Materials Researchers

### John Cahn receives Kyoto Prize

Courtesy NIST

John Cahn, Emeritus Senior Fellow of the National Institute of Standards and Technology and affiliate professor at the University of Washington, received the 2011 Kyoto Prize in the category of advanced technology. He was cited for "outstanding contribution to alloy materials engineering by the establishment of spinodal decomposition theory." Cahn developed the theory of spinodal decomposition in alloy materials by incorporating the strain energy term into the free energy of the alloy system. It has made it possible to predict the optimal microstructures of alloy materials and to maximize their functions. The theory has led to the establishment of a design guideline for the development of alloy materials and contributed to the progress of both materials science and the materials industry. □




https://doi.org/10.1557/mrs.2011.317 Published online by Cambridge University Press