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# Crossover of the Specific Heat from the Quantum Hall to the Classical Regime (abstract) **FREE**

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## Attracting Girls into Physics (abstract)

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A recent international study of women in physics showed that enrollment in physics and science is declining for both males and females and that women are severely underrepresented in careers requiring a strong physics background. The gender gap begins early in the pipeline, from the first grade. Girls are treated differently than boys at home and in society in ways that often hinder their chances for success. They have fewer freedoms, are discouraged from accessing resources or being adventurous, have far less exposure to problem solving, and are not encouraged to choose their lives. In order to motivate more girl students to study physics in the Assiut governorate of Egypt, the Assiut Alliance for the Women and Assiut Education District collaborated in renovating the education of physics in middle and secondary school classrooms. A program that helps in increasing the number of girls in science and physics has been designed in which informal groupings are organized at middle and secondary schools to involve girls in the training and experiences needed to attract and encourage girls to learn physics. During implementation of the program at some schools, girls, because they had not been trained in problem-solving as boys, appeared not to be as facile in abstracting the ideas of physics, and that was the primary reason for girls dropping out of science and physics. This could be overcome by holding a topical physics and technology summer school under the supervision of the Assiut Alliance for the Women.

## Crossover of the Specific Heat from the Quantum Hall to the Classical Regime (abstract)

Rayda Gammag and Cristine Villagonzalo

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The specific heat,  $C_V$ , of a two-dimensional electron system in the quantum Hall effect (QHE) regime was calculated numerically. A peak was observed at temperature  $T_p$  uniform to all filling factors. This  $T_p$  signified the shift of dominance from the extended states to the localized states. After the peak decays  $C_V$  rose again, this time reflecting the destruction of the QHE and the emergence of the classical counterpart. The classical Hall was characterized by a  $T$ -invariant chemical potential.

## Characterization of $\text{La}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$ with Low Doping of Fe and Cr (abstract)

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We have characterized magnetization, transport, and structure of  $\text{La}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$  thin films and bulk powder samples undoped and with low doping of  $^{57}\text{Fe}$  (1% and 3%) and Cr (6%, 7%, and 8%). The powder samples were synthesized by solid-state reaction and thin films grown on (100)- $\text{SrTiO}_3$  STO, and (100)- $\text{LaAlO}_3$  LAO single-crystal substrates by high  $\text{O}_2$  pressure (500 mTorr) using dc magnetron sputtering. We found changes in the values of the magnetoresistance and metal-insulator transition temperatures, as well as the magnetization and Curie temperatures. These behaviors are dependent of the composition of the samples. However, we observed from the hysteresis loops that the coercitive field did not change significantly with Cr or Fe addition at different temperatures. Doping decreased the double exchange and the ferromagnetic order, possibly due to the competing influences from the strain relaxation.