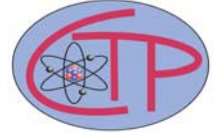




NEW YORK CITY COLLEGE OF TECHNOLOGY
Physics Department
Center for Theoretical Physics



Quantal Heating in Electron Systems with Discrete Spectrum

Presented by:

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Namm, Room 823

Abstract

Peculiar Joule heating, which occurs exclusively in conducting quantum systems, will be presented. The quantal heating has extraordinary properties and provides extreme violations of the Ohm's Law in normal metals. The heating may not increase the electron "temperature" and is absent in classical electron systems. It results in nontrivial spectral distribution of electrons, radical change of the electron transport, inducing transitions of the electrons into states, in which voltage (current) does not depend on current (voltage). The phenomena are observed in a conductivity of two-dimensional electrons placed in strong quantizing magnetic fields [1,2,3].

[1] J.Q.Zhang, S.Vitkalov, A.A. Bykov, Phys.Rev.B 80, 045310 (2009)

[2] A.A. Bykov, J.Q. Zhang, S. Vitkalov, A.K. Kalagin, and A.K. Bakarov, Phys. Rev. Lett. 99, 116801 (2007).

[3] S. A. Vitkalov, Int. Journal of Modern Physics B, 23, 4727 (2009).

Light refreshments will be served.