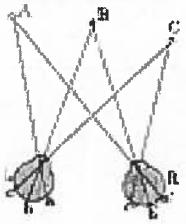

WEEKLY CALENDAR

Department of Physics and Astronomy
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February 19, 2007

General Seminar

"TBA"

3:40PM / Thursday, 22 February 2007 / Room 109

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. Philip Adams

Norman Mannella, Ph.D.
Stanford University

Special Seminar

"Interaction effects in low-dimensional electron systems"

3:40PM / **Monday, 26 February 2007** / Room 109 Nicholson

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. John DiTusa

Boris Narohzny, Ph.D.

International Center for Theoretical Physics (ICTP),Trieste, Italy

Recent advances in semiconductor and nano-technology allow manufacturing of a wide variety of novel low-dimensional and hybrid systems. These systems can be as small as few nanometres (so-called nano-particles) or comprise several layers of two-dimensional electron gases (in various hybrid structures or bilayer systems). The latter systems are created using doped semiconductor junctions and one can control electron density in each single layer by means of the external electrostatic potential. Such systems are widely used to study thermodynamic and transport properties of electrons in low dimensions with the focus on the interplay between disorder and interaction, as well as the mesoscopic effects.

In this talk I will describe theoretical ideas aimed at constructing a theory, which would take into account the effects of electron-electron interaction and disorder on equal footing and would be able to capture the basic physics of disordered systems, while at the same time could be adapted to particular geometries of systems of interest. Focusing on few examples, I will show how such a theory can be used to understand experimental data. I will specifically discuss applicability limits of obtained results and speculate on possible future generalizations that would allow to extend our understanding beyond these limitations.

Reminder:

Due to the Mardi Gras holiday there will be no classes Monday thru Wednesday February 19-21, 2007. The University will be closed on Tuesday, February 20, 2007. Classes resume on Thursday, February 22, 2007 at 7:30 a.m.

Publications:

"Fundamental Gravitational Limitations to Quantum Computing", **Rodolfo Gambini**, Rafael A. Porto, and **Jorge Pullin**, Gravity, Astrophysics, and Strings '05, eds. P. P. Fiziev and M. D. Todorov, St. Kliment Ohridski University Press, Sofia, 2006.