



Sefydliad Gwyddorau Mathemategol a Chyfrifiannol Cymru
Wales Institute of Mathematical and Computational Sciences

Mathematical Physics Colloquium
Thursday 6th November 2008, Cardiff University
Seminar Room M/2.06, School of Mathematics

Programme

- 12.30 *Lunch*
- 13.30 *Dr Carlos Nunez (Department of Physics, Swansea University)*
Title: The Duality between Gauge Fields and Strings
Abstract: I will make an introductory talk to the progress that has been achieved in the last ten years in the area of AdS/CFT and its applications.
- 14.30 *Prof. Man-Duen Choi (Department of Mathematics, University of Toronto)*
Title: The magic of non-commutative computations
Abstract: Suddenly, there arrives the era of quantum computer, where a lot of practical problems have been realized as non-commutative matrix analysis. Indeed, the simple reflections of many real computations have appeared as sorts of magic shows in the environment of non-commutative probability/geometry.
- 15.45 *Tea*
- 16.30 *Prof. Denjoe O'Connor (School of Theoretical Physics, Dublin Institute for Advanced Studies)*
Title: Geometry in Transition
Abstract: A simple model is described which exhibits the phenomena of space-time geometry emerging in a phase transition from a non-geometrical phase. In a simple three matrix model we find an exotic line of discontinuous transitions with a jump in the entropy, characteristic of a first order transition, yet with divergent critical fluctuations and a divergent specific heat with critical exponent $\alpha=1/2$. The low temperature phase is a geometrical one with gauge fields fluctuating on a round sphere. As the temperature is increased the sphere evaporates in a transition to a pure matrix phase with no background geometrical structure. Both the geometry and gauge fields are determined dynamically.

David E Evans
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