



香港中文大學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

ITCSC Seminar

Entanglement in Physical States

By

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2:30pm – 3:30pm

Rm121, 1/F., Ho Sin Han Engineering Building, CUHK

Abstract:

Entanglement is the defining characteristic of quantum mechanics and it is at the root of many recent discoveries in quantum physics. It is the essential ingredient for quantum algorithms, it is necessary to explain exotic phases of the matter, and recently, it has been advocated to explain the foundations of statistical mechanics. The essential ingredient is to understand what is the typical entanglement in quantum states. Typically, quantum states are very entangled, and this implies that locally they look like thermal states. Unfortunately, typical quantum states are also not accessible, and therefore not physical. In this talk, we will define an ensemble of physical states and argue about the typicality of their entanglement. We will show that both the area law and the volume law for the entanglement entropy are typical (depending on how the ensemble is constructed) and that therefore the entanglement approach to the foundations of statistical mechanics is valid for physically sound situations.

Biography:

Dr. Hamma received his Phd from University of Naples Federico II 2005. He was a Postdoc at University of Southern California in 2006-2007 and MIT in 2008. He is a Distinguished Research Fellow at Perimeter Institute for Theoretical Physics and will be joining IIS, Tsinghua University as an Assistant Professor.

***** ALL ARE WELCOME *****

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