▼科研費量子サイバネティクス、グローバル COE 共催セミナー

Lecturer: Dr. Beni Yoshida (Institute for Quantum Information and Matter, Caltech)
Title: Studying many-body physics through classical and quantum coding theory
Date: 3rd September. 2012 (Mon) 13:00 - 14:30
Place: Osaka University, D404-408

Abstract: In recent years, ideas from information science have become increasingly useful in condensed matter physics. In particular, it has been realized that many interesting physical systems in condensed matter physics may be described in the language of error-correcting codes. This fascinating similarity between two fields provides us with an exciting new avenue for an application of classical and quantum coding theory; "One may address various problems in many-body physics through coding theory". This talk is an attempt to demonstrate the usefulness of coding theory in solving some interesting problems which are at the interface between physics and information science. In particular, we address the following three problems;

1) Information storage capacity of discrete spin systems and its relevance to black holes.
2) Thermal stability of topological order and feasibility of self-correcting quantum memory.
3) Classifications of gapped quantum phases via topological classifications of quantum codes.

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