

The Spring 2007 Condensed Matter Seminar series presents the following special seminar:

Prof. Andrei Toom
(Federal University of Pernambuco, Brazil)

“Variable-Length 1-D Local Interaction”

Abstract:

We take any finite set \mathcal{A} and lattit alphabet. Its elements are called letters. Any finite sequence of letters is called a word. Our configuration space is $\mathcal{A}^{\mathbb{Z}}$, that is the set of bi-infinite sequences, all the terms of which are letters. \mathcal{M} denotes the set of translation-invariant measures on $\mathcal{A}^{\mathbb{Z}}$. A class of linear operators on \mathcal{M} has been studied for seveeal decades under the name of "cellular automata". We study "substitution operators", a class of operators from \mathcal{M} to \mathcal{M} , which are generally non-linear, but have a natural interpretation of substituting one word by another. We concentrate at special cases, where there are only two letters called minus and plus and a small sample operators. We show that the processes generated by certain superpositions of these operators show phenomena relevant to statistical physics: ergodicity, non-ergodicity, phase transitions.

THURSDAY, MAY 10
9:30 A.M.
304 ROBESON HALL