MECCANICA

A CONFERENCE IN HONOR OF SANDRO GRAFFI ON HIS 65TH BIRTHDAY

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On the most compact regular lattices in large dimensions

In this talk I will consider the computation of the maximum density of regular lattices in large dimensions using an approach based on statistical mechanics. The starting point will be some theorems of Rogers, which are virtually unknown in the community of physicists. Using his approach one can find many similarities (and differences) with the problem of computing the entropy of a system of hard spheres. The relation between the two problems is investigated in detail. Some conjectures are presented: further investigation is needed in order to check their consistency.