PIERRE DERBEZ, Université Aix Marseille I

Maximal volume of graph manifolds

We first deal with the following question: given a closed orientable 3-manifold N, is there a Lie group G such that the maximal volume $\mathrm{vol}_G(N)$ of all representations of $pi_1 N$ into G does not vanish? When N is a geometric 3-manifold the answer is well known but the question is open for non-geometric manifolds. In the first part of the talk we define a large family of closed non-geometric graph manifolds whose maximal volume is virtually non-zero.

In the second part we use this family to study the following problem of M. Gromov: for which closed orientable 3-manifolds N the set $D(M,N)$ of all possible degree of maps from M to N is finite for any closed orientable 3-manifold M? This question is still open when N is a non-geometric graph manifold. We show that in this case the set $D(M,N)$ is finite for any graph manifold M.

Joint work with Shicheng Wang.