1061-05-162 **Francisco Larrión** and **Miguel Pizaña*** (map@xanum.uam.mx), Moras 821 depto 201, Col Acacias, Del Benito Juárez., 03240 Mexico City, D.F., Mexico, and **Rafael Villarroel-Flores**. *On the Clique Behavior of Compact Surfaces.* Preliminary report.

A *clique* of a graph is a maximal complete subgraph. The clique graph $K(G)$ is the intersection graph of all the cliques of G. Iterated clique graphs are defined by $K^0(G) = G$ and $K^{n+1}(G) = K(K^n(G))$. We say that a graph is *clique-divergent* if the sequence of orders of its iterated clique graphs is unbounded, otherwise it is *clique-convergent*. Iterated clique graphs have been used in Loop Quantum Gravity (LQG) to explain the quantum space-time as an emergent property of the underlying discrete reality at the Planck scale and to tackle certain renormalization problems in LQG.

A *Whitney triangulation* of a topological space X is a graph G such that the geometric realization of its clique complex (simplexes = complete subgraphs) is homemorphic to X. We have then:

Theorem Almost every compact surface admits a clique-divergent Whitney triangulation; The only possible exception is the disk.

Theorem Almost every compact surface admits a clique-convergent Whitney triangulation; The only possible exceptions are: The sphere, the projective plane, the torus and the Klein bottle.

It is conjectured that all five unresolved cases are indeed exceptions. (Received April 12, 2010)