PIERRE LEROUX, Université du Québec à Montréal, LaCIM et Département de mathématiques
Characterization and enumeration of projective-planar and toroidal $K_{3,3}$-subdivision-free graphs

In his 2003 Ph.D thesis at University of Manitoba, Andrei Gagarin has studied graph embeddability on the projective plane and the torus, from an algorithmic point of view, particularly when avoiding $K_{3,3}$-subdivision. Building on his results, we have been able to determine completely the structure of projective planar and toroidal $K_{3,3}$-subdivision-free graphs and to enumerate them.

Their characterization is expressed in terms of substitution of 2-pole planar networks for the edges of canonically defined non-planar graphs called *projective-planar cores* and *toroidal cores* respectively.

Their enumeration (both labelled and unlabelled) is achieved by using methods developed by T. Walsh in 1982 for edge substitutions in the context of 3-connected and homeomorphically irreducible 2-connected graphs.

This is joint work with Andrei Gagarin and Gilbert Labelle.