

# MECCANICA

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

JEAN BELLISSARD

(GEORGIA INSTITUTE OF TECHNOLOGY, USA)

## THE TOPOLOGY OF TILING SPACES

Tilings have been studied for a long time due to their fascinating beauty and symmetry properties. In the nineties, they were related to the description of aperiodic solids with long range order for the atomic position. However it is only during the last fifteen years that topology has been introduced to investigate some of their global properties. This review talk will introduce the notion of *Hull* or *Tiling Space*, and will focus on an important subclass of tilings, that are *repetitive* and have *finite local complexity* (FLC). It will describe various topological invariant such as its  $C^*$ -algebra, its  $K$ -group, and various equivalent definition of its cohomology. It will provide the latest results obtained to compute such invariants and give the so-called gap labeling theorem in full generality.

Part of this talk concerns a recent joint work with J. Savinien (GeorgiaTech).