Mathematics and Music: 

game-like, categorical and computational methods 
in the maths/music research

Abstract: Despite a long historical relationship between mathematics and music, the interest of mathematicians for Music Theory is a recent phenomenon. The aim of maths/music research is to give a structural multidisciplinary approach into computational musicology making use of advanced mathematical tools. This PhD project is based on the interplay between three main mathematical disciplines: algebra, topology and category theory. New results and perspectives are possible on important challenges: revealing through suitable mathematical tools musical properties, studying the computational aspects of musical processes, preparing to the automatic classification of musical styles. Some possible concrete themes of research could be the Fuglede conjecture and its connection to the construction of mosaic rhythmic canons, K-nets and PK-nets for transformational music analysis, persistent homology of musical data sets.

General Info: This PhD position in Mathematics and Music is a thematic fellowship being part of the Mathematics PhD program of the University of Padova: https://dottorato.math.unipd.it
The length of study is 3 years, starting on October 1, 2020.

Research group: the student will work under the supervision of Luisa Fiorot and Alberto Tonolo. This PhD project will be strengthened by an international experience, based on the collaboration with Moreno Andreatta, principal investigator of the SMIR Project at the University of Strasbourg.

Admission requirements: We are seeking highly motivated doctoral candidates. Eligible candidates must hold a master's degree, or acquire it at a specific deadline, typically before the beginning of the academic year. A background in either algebra, algebraic geometry, computational topology, mathematical morphology or category theory and knowledge in music theory or practice of a musical instrument will be appreciated.

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Application information: https://www.unipd.it/en/node/1053

Expected Deadline: May 4 - June 16 2020, application.