

**RESEARCH DESCRIPTION:  
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In recent years the main subject of my research activity was the study of the representation theory and the cohomology theory of discrete and topological groups as well as Lie Algebras. In the last two years I was particularly interested in the study of profinite and totally disconnected, locally compact groups.

The classical examples of profinite groups are Galois groups. The project I am working on with my PhD student, Claudio Quadrelli, and colleagues in London, Ontario, Canada, is the so-called "Elementary type conjecture" concerning the maximal pro- $p$  quotient of absolute Galois groups of fields. Little evidence is known so far supporting this conjecture. But the latest developments, in particular, the solution of the Bloch-Kato conjecture due to V. Voevodsky and M. Rost, provide new information which can be translated in this context using sophisticated techniques like abstract class field theory.

Another class of groups I am particularly interested in are totally disconnected, locally compact groups. Using classical ideas already present in J-P. Serre's book "Cohomologie galoisienne" I studied with my PhD student, Ilaria Castellano, a cohomology theory reflecting many interesting combinatorial and topological properties of such a group. The interesting representations arising in this context are cohomology groups with compact support of the geometrical realizations of certain combinatorial complexes which can be seen as a type of generalized "Steinberg representations".