Seminar
Group of Algebra and Geometry

Strong map symmetry of $\mathrm{SL}(3, K)$ and $\mathrm{PSL}(3, K)$ for any finite field K

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joint work with António Breda

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According to Felix Klein Erlangen Program (1872), groups should be studied as groups of symmetries of geometric structures. In the context of this talk, the geometric structures to be considered are the objects of the category of regular oriented maps. In this category an object is either reflexible or chiral. Those groups which are automorphisms groups (groups of symmetries) of a reflexible regular oriented map are called strong map symmetric. There are many contribution for the study of this property for finite simple groups. In 2017 this property was already investigated for all finite simple groups except for the groups $\mathrm{PSL}(3, K)$ and $\mathrm{PSU}(3, K)$. In this talk, I will introduce the necessaries algebraic and geometric tools to study strong map symmetry of a group. As an example, I will consider the special linear group $\mathrm{SL}(3, K)$ over a finite field K, and show how we proved that this group is strong map symmetric. As a result, we deduced that also $\mathrm{PSL}(3, K)$ and $\mathrm{PSU}(3, K)$ are strong map symmetric and so, this conclude the classification of strong map symmetric finite simple groups.

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