

# The absolute Galois group acts faithfully on regular dessins and on Beauville surfaces

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A foundational result in Grothendieck's theory of dessins d'enfants is the fact that the absolute Galois group  $\text{Gal}(\overline{\mathbf{Q}}/\mathbf{Q})$  acts faithfully on the set of all dessins. In my talk I will explain how to show that, in fact, the action is already faithful on more accessible, regular dessins. Moreover we prove the strongest result that the action is faithful on the underlying curves (quasiplatonic curves).

Furthermore, our methods allow us to prove two related conjectures by Bauer, Catanese and Grunewald according to which 1) the action of  $\text{Gal}(\overline{\mathbf{Q}}/\mathbf{Q})$  on the set of Beauville surfaces is faithful, and 2) for any  $\sigma \in \text{Gal}(\overline{\mathbf{Q}}/\mathbf{Q})$  different from the identity and the complex conjugation there is a Beauville surface  $S$  such that  $S$  and its Galois conjugate  $S^\sigma$  have non-isomorphic fundamental groups.

One of the main steps in the proof is to show that an automorphism of a profinite completion of a triangle group of hyperbolic type fixing all the open normal subgroups should be inner.

The talk is based on a joint work with Gabino González-Diez.