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"Property (TT)/T and homomorphism superrigidity into mapping class groups"

Mapping class groups (**MCG**'s), of compact oriented surfaces (possibly with punctures), have many mysterious features: in some aspects they behave like higher rank lattices (namely, irreducible lattices in higher rank algebraic groups); but in other aspects they as well do like rank one lattices. The following theorem, which is well known as the *Farb–Kaimanovich–Masur superrigidity*, states a typical *rank one phenomenon* for MCG's:

> *Every group homomorphism from higher rank lattices* (*such as* $\mathrm{SL}_3(\mathbb{Z})$ *and cocompact lattices in* $\mathrm{SL}_3(\mathbb{R})$) *into MCG's has* **finite** *image.*

In this talk, we show a generalization of the superrigidity above, to the case where higher rank lattices are replaced with some (*non-arithmetic*) *matrix groups over general rings*. Our main example of such groups is called the "**universal lattice**", that is, the special linear group of degree ≥ 3 over commutative finitely generated polynomial rings over integers, such as $\mathrm{SL}_3(\mathbb{Z}[x])$ and $\mathrm{SL}_4(\mathbb{Z}[x, y, z])$. To prove this, we introduce the notion of "*property* (TT)/T" for groups, which is a strengthening of *Kazhdan's property* (T).

We will explain these properties and relations to ordinary and bounded cohomology of groups (with twisted unitary coefficients); and outline the proof of our result.

The preprint on this talk is available at: **arXiv:1106.3769**