

College of Arts and Sciences
Department of Mathematics
University of South Carolina

Math Colloquium

Torsion in Families of Abelian Varieties and Hyperbolicity of Moduli Spaces

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Thursday
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27

4:30 PM
LeConte 412

The group of rational points is an important but subtle invariant of an abelian variety defined over a number field. In the case of an elliptic curve defined over \mathbb{Q} , a celebrated theorem of Mazur asserts that there are only finitely many possibilities for the torsion part; the same is conjectured to be true for all abelian varieties over number fields though very little has been proven in higher dimensions. The natural geometric analog, known as the geometric torsion conjecture, asks for a bound on the torsion sections of a family of abelian varieties over a complex curve, and can be interpreted as the nonexistence of low genus curves in congruence towers of Siegel modular varieties. We will discuss a general method for bounding the genus of curves in locally symmetric varieties using hyperbolic geometry and apply it to some special cases of the torsion conjecture as well as some related problems. Along the way we will also deduce some results about the global geometry of these moduli spaces. This is joint work with J. Tsimerman.