

SIEGEL MODULAR FORMS: SOME GEOMETRIC APPLICATIONS

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ABSTRACT

In this talk I will present some of the results of my PhD thesis. I will show some geometric applications of the theory of Siegel modular forms. In particular, I will focus on the role of scalar-valued and vector-valued Siegel modular forms as tools for the study of abelian varieties and their moduli spaces.

The first result I will present is a generalization of Mukai's result on the existence of a degree 8 endomorphism of the Igusa quartic, which is a compactification of the moduli space of principally polarized abelian surfaces with a level 2 structure. The Igusa quartic can be viewed as a Siegel modular threefold. By studying rings of scalar-valued Siegel modular forms, I will show that Mukai's result on the Igusa quartic can be extended to other Siegel modular threefolds.

The second result I will present is part of a joint work with Dalla Piazza, Fiorentino, Grushevsky and Salvati Manni. We give a new characterization of the locus of decomposable principally polarized abelian varieties through the image of the smooth 2-torsion points on the theta divisor. Here I will make extensive use of vector-valued Siegel modular forms.